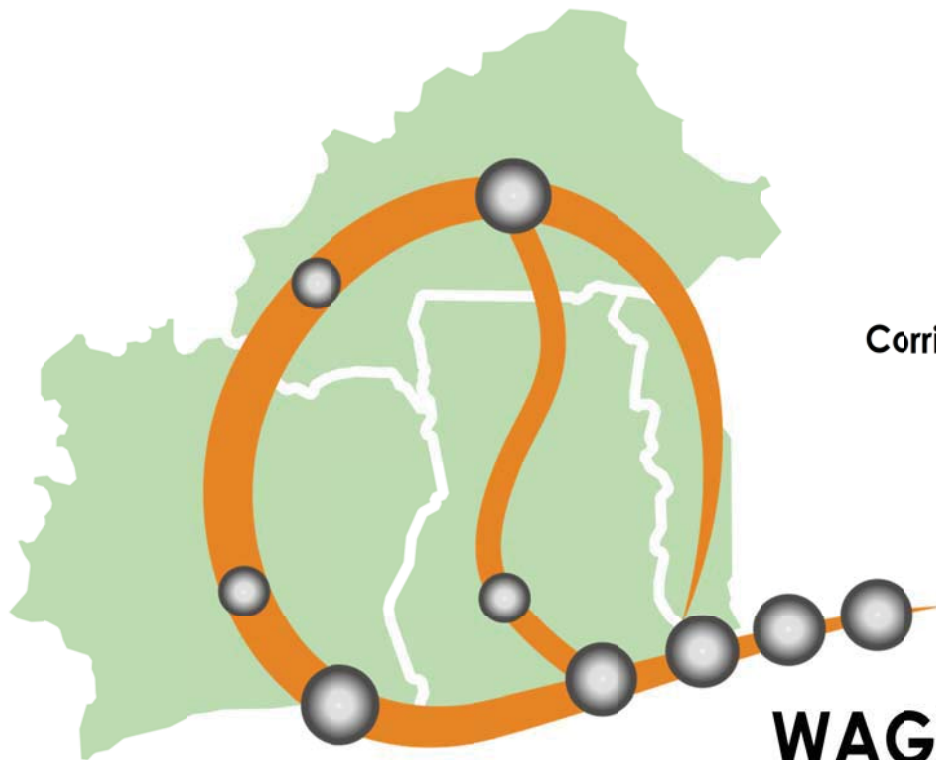


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THE PROJECT ON THE CORRIDOR DEVELOPMENT FOR WEST AFRICA GROWTH RING MASTER PLAN



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LIST OF ABBREVIATION

Abbreviation	English	French
ACA	African Cashew Alliances	-
ACS	Africa Coastal Services	-
ADCI	Agency for Development and Competitiveness of Industries in Côte d'Ivoire	Association des Démobilisés de Côte d'Ivoire
AFD	French Development Agency	Agence Française de Développement
AfDB	African Development Bank	-
AGEDI	Agency for Management and Development of Industrial Infrastructures	Agence pour la Gestion et le Développement des Infrastructures Industrielles
AGEROUTE	Road Management Agency of Côte d'Ivoire	Agence de Gestion des Routes
AGETUR	Executing Agency of Urban Work	Agence d'Execution des Travaux Urbains
AGI	Association of Ghana Industries	-
ANAC	National Agency for Civil Aviation	Agence Nationale de l'Aviation Civile
ANDE	National Environment Agency	Agence Nationale de l'Environnement
ANECI	National Water Agency of Côte d'Ivoire	Agence Nationale de l'Eau de Côte d'Ivoire
ANGE	National Agency for Environmental Management	Agence Nationale pour la Gestion de l'Environnement
ANPTIC	National Authority for Promotion of ICT	Autorité Nationale pour la Promotion des TIC
ANSUT	National Agency of Telecommunications Universal Service	Agence de Nationale du Service Universel des Telecommunications
APESS	Association for Livestock Promotion in Sahel and Savanna	Association pour la Promotion de l'Elevage au Sahel et en Savane
API-BF	Burkina Faso Investment Promotion Agency	Agence de Promotion des Investissements du Burkina Faso
API-ZF	Agency for Investment promotion and Free Zone	Agence de Promotion des Investissements et des Zones Franches
ARCEP	Regulatory Authority for Electronic Communications and Postal Services	Autorité de Régulation des Communications Electroniques et des Postes
ART&P	Regulation Authority of Telecommunication and Posts	Autorité de Régulation des Télécommunications et des Postes
ASYCUDA++	Automated System for Customs Data	-
ATP	Ashanti Technology Park	-
ATP	Agribusiness and Trade Promotion	-
BADEA	Arab Bank for Economic Development in Africa	Banque Arabe pour le Développement Economique en Afrique
BCEAO	Central Bank of West African States	Banque Centrale des Etats de l'Afrique de l'Ouest
BCF	Billion Cubic Feet	-
BCM	Billion Cubic Meter	-
BFCC	Burkina Faso Chamber of Commerce	Chambre de Commerce d'Industrie et d'Artisanat du Burkina Faso
BOAD	West Africa Development Bank	Banque Ouest Africaine de Développement
BOE	Barrel of Oil Equivalent	-
BOOT	Build–Own–Operate–Transfer	-
bopd	barrels of oil per day	-
BOST	Bulk Oil Storage and Transportation Company Ltd.	-
BOT	Build-Operate-Transfer	-
BPA	Bui Power Authority	-

Abbreviation	English	French
BPO	Business Process Outsourcing	-
bpsd	barrel per stream day	-
BSCF	Billion Standard Cubic Feet	-
BTS	Base Transceiver Station	-
BUMIGEB	Bureau of Mines and Geology of Burkina Faso	Bureau des Mines et Géologie du Burkina Faso
BUNEE	National Office of Environmental Assessment	Bureau National des Evaluations Environnementales
CAADP	Comprehensive African Agriculture Development Programme	-
CACDI	Support Centers on Competitiveness and Industrial Development	Centres d'Appui à la Compétitivité et au Développement Industriel
CBC	Burkina Faso Shippers' Council	Conseil Burkinabé des Chargeurs
CCI	Ivorian Chamber of Commerce and Industry	Chambre de Commerce et d'Industrie ivoirienne
CDB	China Development Bank	-
CDU	Crude Distillation Unit	-
CEB	Electric Community of Benin	Communauté Électrique du Bénin
CEET	Electric Power Company of Togo	Copagnie Énergie Électrique du Togo
CEFCOD	Education Center for Training and Development Consultancy	Centre d'Étude de la Formation et de Conseil en Développement
CEFORE	Centre for Business Formalities	Centre de Formalités des Entreprises
CEPICI	Investment Promotion Centre in Cote d'Ivoire	Centre de Promotion des Investissements en Côte d'Ivoire
CERT	Cell Fight Against Cybercrime	Renforcer la Cellule de lutte contre la cybercriminalité
CFT	Togo Railways	Chemins de Fer du Togo
CGECI	General Confederation of Enterprises of Ivory Coast	Confederation General des Entreprises de Cote d'Ivoires
CHU	University Hospital	Centre Hospitalier Universitaire
CIA	Central Intelligence Agency	-
CIAPOL	Ivorian Anti-Pollution Center	Centre Ivoirien Antipollution
CICs	Community information Centers	-
CIDR	International Development and Research Centre	Alliance Internationale de Développement et de Recherche
CIE	Cote d'Ivoire Electricity Company	Compagnie Ivoirienne d'Electricité
CIP	Common Industrial Policy	Politique Industrielle Commune
CIRAD	Research Center for International Agricultural Development	Centre de coopération Internationale en Recherche Agronomique pour le Développement
CNCT	National Shipper's Council of Togo	Conseil National des Chargeurs du Togo
CNG	Compressed Natural Gas	-
CNR	Canadian Natural Resources Limited	-
COCOBOD	Ghana Cocoa Board	-
COFENABVI	Confederation of National Federation of Meat and Livestock Chain	Confédération des Fédérations Nationales de la Filière Bétail et Viande
CONIWAS	Coalition of NGOs in Water and Sanitation	-
CPO	Crude Palm Oil	-
CPR	Rural Promotion Center	Centre de Promotion Rurale
CRISTO	Social Engineer Research Centre in Togo	Centre de Recherche et Ingénieur Sociales du Togo
CSIR	Council for Scientific and Industrial Research	-
CSLP	Strategic Framework for Poverty Reduction	Cadre Stratégique de Lutte contre la Pauvreté
CU	UEMOA Community Road Network	Réseau Routier de la Communauté UEMOA

Abbreviation	English	French
CWIQ	Core Welfare Indicator Questionnaire	-
CWSA	Community Water Supply and Sanitation Agency	-
DA	Directorate of Sanitation	Direction de l'Assainissement
DADO	District Agriculture Development Office	Bureau du Développement Agricole des Districts
DAEP	Directorate of Water Supply	Direction de l'Approvisionnement en Eau Potable
DAES	Directorate of Agricultural Extension Services	Direction des Services de Vulgarisation Agricole
DAFP	Directorate of Financial Affairs and Heritage	Direction des Affaires Administratives et Financières
DAHA	Directorate of Hydro-Agricultural Development	Direction des Aménagements Hydro-Agricoles
DAJUCIREP	Directorate of Legal Affairs; International Cooperation and Public Relations	Service des Affaires Juridiques, Coopération Internationale et de la Communication et des Relations Publiques
DANIDA	Danish International Development Agency	-
DAP	Directorate of Aquaculture and Fisheries	Direction de l'Aquaculture et des Pêches
DB	Doing Business	-
DCMTRIP	District Capital and Major Town Roads Improvement Project	-
DCS	Directorate of Crop Services	-
DDO	Diesel Distillate Oil	-
DF2VP	Directorate of Training, Extension, and The Value of Products	Direction de la Formation, de la Vulgarisation et de la Valorisation des Produits
DFA	Directorate of Finance and Administration	-
DFO	Diesel Fuel Oil	-
DFR	Department of Feeder Roads	-
DGADI	General Directorate of Irrigational Development	Direction Générale des Aménagements et du Développement de l'Irrigation
DGDER	General Directorate of Development of Regional Economy, Ministry of State, Ministry of Planning and Development	Direction Générale du Développement Economique Régional, Ministère d'Etat, Ministère du Plan et du Développement CI
DGDRME	General Direction of Rural Development and Irrigation	Directeur Général du Développement Rural et de la Maîtrise de l'Eau dans le domaine agricole
DGESS	General Directorate of Study, Planning and Statistics	Directeurs Généraux des Etudes Statistiques et Sectorielles
DGFOMR	General Directorate of Landholding, Training and Organization of Rural Society	Direction Générale du foncier de la Formation et de l'Organisation du Monde Rural
DGI	General Directorate of Industry	Direction Générale de l'Industrie
DGIHH	General Directorate of Infrastructure of Domestic Water	Direction Generale des Infrastructures de l'Hydraulique Humain
DGIR	General Directorate of Road Infrastructure	Direction Générale de l'Infrastructure Routier
DGMG	General Directorate of Mines and Geology	Direction Générale des Mines et de la Géologie
DGMN	General Directorate of National Meteorology	Direction Generale de Meteorologie Nationale
DGPA	General Directorate of Animal Production	Direction Générale des Productions Animales
DGPER	General Directorate of the Promotion of Rural Economy	Direction Générale de la Promotion de l'Économie Rurale
DGPPS	General Direction of Planning, Project Management and Statistics	Direction Générale de la Panification, du contrôle des Projets et des Statistiques
DGPRE	Directorate of Management and Protection of Water Resources	Direction de la Gestion et de Protection des Ressources en Eau
DGPSA	General Direction of Production and Food Security	Directeur Général des Productions et de la Sécurité Alimentaire
DGPSE	General Directorate of Livestock Prevision Statistics	Direction Générale de la Prévision et des Statistiques de l'Elevage
DGPV	General Directorate of Plant Production	Direction Générale des Productions Végétales

Abbreviation	English	French
DGR	General Directorate of Roads	Direction Générale des Routes
DGRE	Water Resources Department	Direction Générale des Ressources en Eau
DGSA	General Directorate of Animal Health	Direction Générale de la Santé Animale
DMU	Diesel Multiple Unit	Diesel de Multiple Unit
DNAGEP	Directorate of Animal Nutrition and Management of Pastoral Areas	Direction de la Nutrition Animale et de la Gestion de l'Espace Pastoral
DO	Delivery Order	-
DOPAF	Directorate of Professional Organizations and Support Funding	Direction des Organisations Professionnelles et de l'Appui au Financement
DPAEP	Directorate of Personnel Management and Adaptation of the Professional Environment	Direction des Personnels et de l'Adaptation de l'Environnement Professionnel
DPARHASA	Provincial Directorate of Agriculture , Water Resources , Sanitation and Safety of Food	Direction Provinciale de l'Agriculture, des Ressources Hydrauliques, de l'Assainissement et de la Sécurité Alimentaire
DPC	Data Protection Commission	-
DPE	Directorate of Livestock Productions	Direction des Productions d'Elevage
DPFA	Directorate of Promotion of Animal Value Chain	Direction de la Promotion des Filières Animales
DPSP	Directorate of Planning, Statistics and Programs	Direction de la Planification, Statistiques et des Programmes
DRAEP	Regional Directorate of Agriculture, Livestock and Fisheries	Les Directions Régionales de l'Agriculture, de l'Élevage et de la Pêche
DRARHASA	Regional Director of the Ministry of Agriculture, Water Resources , Sanitation and Food Security	Directrice Régionale du ministère de l'Agriculture, des Ressources Hydrauliques, de l'Assainissement et de la Sécurité Alimentaire
DRE	Directorate of Water Resources	Direction des Ressources en Eau
DRH	Human Resources Directorate	Direction des Ressources Humaines
DSA	Directorate of Animal Health	Direction de la Santé Animale
DSV	Directorate of Veterinary Services	Direction des Services Vétérinaires
DUR	Department of Urban Roads	-
EATP	Extended West Africa Agribusiness and Trade Promotion	-
EBID	ECOWAS Bank for Investment and Development	-
EC	Ghana Energy Commission	-
EC	Electric Conductivity	-
ECA	Economic Consulting Associates Limited	-
ECG	Electricity Company of Ghana	-
ECOWAP	ECOWAS Agricultural Policy	-
ECOWAS	Economic Community of West African States	-
EDF	European Development Fund	-
EDI	Electronic Data Interchange	-
EDM	Electronic Document Management	-
E-GOV	Electronic Governance	-
EIA	Environmental Impact Assessment	-
ENP	National Prospective Study	Etude Nationale Prospective
ENV	Household Living Standards Survey	Enquête sur le Niveau de Vie des Ménages
EPA	Environmental Protection Agency	-
EPZ	Export Processing Zone	-
ESATIC	African School of Information Technology and Communication	l'Ecole Supérieure Africaine des Technologies de l'Information et de la Communication

Abbreviation	English	French
ESOP	Service Companies and Producers Organizations	Entreprises de Service et Organisation de Producteurs
ETC	Electronic Toll Collection	-
F/S	Feasibility Study	-
FAIR	Fund Assistance for Regional Integration	Fonds d'Aide à l'intégration Régionale des Etats membres de l'UEMOA
FAO	Food and Agriculture Organization of the United Nations	-
FASDEP	Food and Agriculture Sector Development Policy	-
FBOs	Farmers' Body Organizations	-
FC	Forestry Commission	-
FCFA	CFA Franc African Financial Community Franc	Francs de la Communauté Financière Africaine
FDI	Foreign Direct Investment	-
FEDOCI	The Federation Development Cote d'Ivoire NGO	La Fédération des ONG de Développement de Côte d'Ivoire
FER	Road Maintenance Fund	Fonds d'Entretien Routier
FER-B	Road Maintenance Fund of Burkina Faso	Fonds d'Entretien Routier du Burkina Faso
FIDA	Foundation for International Development Africa	-
FINGAP	Financing Ghanaian Agriculture Project	-
FIRCA	Inter-professional Fund for Research and Agricultural Council	Fonds Interprofessionnel pour la Recherche et le Conseil Agricoles
FNE	National Water Fund	Fonds National de l'Ea
FONGTO	Federation of Non-Governmental Organization in Togo	Fédération des Organisations Non-Gouvernementales du Togo
FPSO	Floating Production Storage and Offloading	-
FRCI	The Republican Forces of Cote d'Ivoire	Forces Républicaines de Côte d'Ivoire
FREMIN	Restructuring Fund	Fonds de Restructuration
FSRU	Floating Storage and Regasification Unit	-
G2G	Government-to-Government	-
GACL	Ghana Airport Company Limited	-
GAFSP	Global Agriculture and Food Security Program	-
GAMA	Greater Accra Metropolitan Area	-
GAP	Good Agricultural Practices	-
GAR	Results Based Management	Gestion Axée sur les Résultats
GASIP	Ghana Agriculture Sector Investment Programme	-
GASSCOM	Ghana Association of Software and IT Services Companies	-
GAWMIF	Ghana Agricultural Water Management Investment Framework	-
GCAP	Ghana Commercial Agriculture Project	-
GAMA	Greater Accra Metropolitan Area	-
GCMS	Ghana Customs Management System	-
GCNet	Ghana Community Network Services Limited	-
GDP	Gross Domestic Product	-
GEPA	Ghana Export Promotion Authority	-
GESTOCI	Management Company of the Oil Stocks of Ivory Coast	Société de Gestion des Stocks Pétroliers de Côte d'Ivoire
GFZB	Ghana Free Zones Board	-
GHA	Ghana Highway Authority	-

Abbreviation	English	French
GHACEM	Ghana Cement Company Ltd.	-
Ghana Gas	Ghana National Gas Company	-
GHS	Ghanaian Cedi	-
GIDA	Ghana Irrigation Development Authority	-
GIPC	Ghana Investment Promotion Centre	-
GIZ	German Corporation for International Cooperation (<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>)	-
GJT	Golden Jubilee Terminal	-
GLSS6	Ghana Living Standards Survey Round 6	-
GM	General Mortars Locomotive Group	-
GMC	Ghana Manganese Company Limited	-
GMET	Ghana Meteorological Agency	-
GMIC	Ghana Multimedia Incubation Center	-
GMP	Gas Master Plan of Ghana	-
GNAPF	Ghana National Association of Poultry Farmers	-
GNPC	Ghana National Petroleum Corporation	-
GNR	General Nice Resources	-
GoG	Government of Ghana	-
GOIL	Ghana Oil Company Ltd.	-
GOSTIC	Group Operators of the sector of Information Technology in Cote d'Ivoire	Groupement des Operateurs de secteur des Technologies de l'Information de Cote d'Ivoire
GoT	Government of Togo	-
GPHA	Ghana Ports and Harbors Authority	-
GPRS II	Growth and Poverty Reduction Strategy 2006-2009	-
GPS	Global Positioning System	-
GRCL	Ghana Railway Company Limited	-
GRDA	Ghana Railway Development Authority	-
GRDP	Gross Regional Domestic Product	-
GRIDCo	Ghana Grid Company Limited	-
GSA	Ghana Shippers Association	-
GSA	Gas Supply Agreement	-
GSC	Ghana Shippers Council	-
GSGDA	Ghana Shared Growth and Development Agenda	-
GSGDA II	Ghana Shared Growth Development Agenda II 2014-2017	-
GSS	Ghana Statistical Services	-
GWCL	Ghana Water Company Limited	-
HFO	Heavy Fuel Oil	-
HIPC	Heavily Indebted Poor Countries	-
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immuno-Deficiency Syndrome	-
HVA	Improved Rural Water Supply	Hydraulique Villageoise Améliorée
IBP	International Best Practice	-
ICAO	International Civil Aviation Organization	-
ICAT	Institute Council and Technical Support	Institut de Conseil et d'Appui Technique

Abbreviation	English	French
ICD	Inland Container Depot	Intérieurs de Conteneurs
ICT	Information and Communication Technology	Technologies de l'Information et de la Communication
ICT4D	ICT for Accelerated Development	-
IDB	Islamic Development Bank	-
IFAD	International Fund for Agricultural Development	-
IFG-TG	International Fertilizers Group-Togo	International Fertilizers Group-Togo
IMF	International Monetary Fund	-
INERA	Institute of Environment and Agricultural Research	Institut National de l'Environnement et de Recherches Agricoles
INS	National Statistics Office	Institut National de la Statistique
INSD	National Institute of Statistics and Demography	Institut National de la Statistique et de la Demographie
IOC	International Oil Companies	-
IPP	Independent Power Producer	-
ISP	Internet Service Provider	-
ISRT	Inter-State Road Transit	-
ITC	International Trade Centre	-
ITES	IT Enabled Services Secretariat	-
ITRA	Togolese Institution of Agricultural Research	Institut Togolais de Recherche Agronomique
ITS	Intelligent Transportation Systems	-
ITU	International Telecommunication Union	Union internationale des télécommunications
IWRM	Integrated Water Resources Management	-
JAPTU	Joint Association of Port Transport Union	-
JICA	Japan International Cooperation Agency	Agence Japonaise de Coopération Internationale
KACE	Kofi Annan Centre of Excellence in ICT	-
kV	kilo Volt	kilo Volt
LAN	Local Area Networks	-
LCO	Light Crude Oil	-
LCT	Lomé Container Terminal	Terminal à Conteneurs de Lomé
LNG	Liquefied Natural Gas	-
LOTT	Orientation Law of Terrestrial Transport	Loi d'Orientation des Transports Terrestres
LPG	Liquefied Petroleum Gas	-
M/T	Metric Ton	-
MAE	Mean Annual Potential Evaporation-Transpiration	-
MAEH	Ministry of Agriculture, Livestock and Hydraulics	Ministère de l'Agriculture, de l'Élevage et de l'Hydraulique
MAEP	Ministry of Agriculture, Livestock and Fisheries	Ministère de l'Agriculture de l'Élevage et de la Pêche
MAHRA	Ministry of Agriculture, Hydraulics and Fishery Resources former MARHASA	Ministère de l'Agriculture, de l'Hydraulique et des Ressources Halieutiques former MARHASA
MAP	Mean Annual Precipitation	-
MARHASA	Ministry of Agriculture, Water Resources, Sanitation and Food Security	Ministère de l'Agriculture, des Ressources Hydrauliques, de l'Assainissement et de la Sécurité Alimentaire
MAT	Annual Mean Air Temperature	-
MC	Minerals Commission	-
MCLAU	Ministry of Construction, Housing, Sanitation and Urban Planning	Ministère de la Construction, du Logement de l'Assainissement et de l'Urbanisme
MCM	Million Cubic Meter	-

Abbreviation	English	French
MCT	Maersk Container Terminal	-
MDA	Ministries Departments and Agencies	-
MDENP	Ministry of development of digital economy and posts	Ministère du Développement de l'Economie Numérique et des Postes
MDG	Millennium Development Goal	-
MEAHV	Ministry of Water, Sanitation and Rural Hydraulic (former MAEH)	Ministère de l'Eau, de l'Assainissement et de l'Hydraulique Villageoise (ancien MAEH)
MEBF	Burkina Faso Business Centre	Maison de l'Entreprise du Burkina Faso
MEDD	Ministry of Environment and Sustainable Development	Ministère de l'Environnement et du Développement Durable
MEF	Ministry of Water and Forest	Ministère des Eaux et Forêts
METASIP	Medium Term Agriculture Sector Investment Plan	-
MICA	Minister of Industry, Commerce and Handicrafts	Ministère de l'Industrie, du Commerce et de l'Artisanat
MIDT	Ministry of Infrastructures, Development and Transport	Ministère des Infrastructures, du Désenclavement et des Transports
MIE	Ministry of Economic Infrastructure	Ministere des Infrastructures Economiques
MIM	Ministry of Industry and Mines	Ministère de l'Industrie et des Mines
MINAGRI	Ministry of Agriculture	Ministère de l'Agriculture
MINESUDD	Ministry of Environment, Urban Safety and Sustainable Development	Ministère de l'Environnement, de la Salubrité Urbaine et du Développement Durable
MIRAH	Ministry of Animal and Fishery Resources	Ministere des Ressources Animales et Halieutiques
MIT	Ministry of Infrastructure and Transport	Ministère des Infrastructures et des Transports
MLGRD	Ministry of Local Government and Rural Development	-
mmcfd	million cubic feet per day	-
MMDAs	Metropolitan, Municipal and District Assemblies	-
MMDRU	Migration Management Data and Research Unit	-
MME	Ministry of Mines and Energy	Ministère des Mines et de l'Energie
MMET	Ministry of Mines and Energy of Togo	Ministère des Minses et de l'Energie au Togo
MMscfd	Million standard cubic feet per day	-
MOB	Bagré Construction project	Maîtrise d'Ouvrage de Bagré
MOC	Ministry of Communication	-
MOEP	Ministry of Energy and Petroleum	-
MOFA	Ministry of Food and Agriculture	-
MoFEP	Ministry of Finance and Economic Planning	-
MoH	Ministry of Health	-
MOP	Ministry of Power	-
MOPE	Ministry of Petroleum and Energy	-
MoT/MT/MOT	Ministry of Transport	-
MoU	Memorandum of Understanding	-
MPARH	Ministry of Livestock and Fish Resources	Ministère de la Production Animale et des Ressources Halieutiques
MPEN	Ministry of Post and Economy	Ministère de la Poste et de l'Economie Numérique
MPER	Micro and Small Rural Enterprises	Micro et Petites Entreprises Rurales
MPI	Multidimensional Poverty Index	-
MPTIC	Ministry of Posts and ICT	Ministère des Postes et des TIC
MRA	Ministry of Animal Resources	Ministère des Ressources Animales
MRE	Ministry of Rural Equipment (former MAEH)	Ministère de l'Equipeement Rural (ancien MAEH)

Abbreviation	English	French
MRH	Ministry of Roads and Highways	-
MTADP	Medium Term Agricultural Development Programme	-
MW	Mega Watt	-
MWRWH	Ministry of Water Resources, Works and Housing	-
NDA	Northern Development Authority	-
NDP	National Development Plan	Plan National de Développement
NDPC	National Development Planning Commission	-
NEDCo	Northern Electric Distribution Company	-
NGO	Non-Governmental Organization	-
NHIS	National Health Insurance Scheme	-
NIE	Note of Impact on Environment	-
NIIT	National Institute of Information and Technology	-
NISD	National Institute of Statistics and Demographics	Institut National de la Statistique et de la Démographie
NITA	National IT Agency	-
NOC	Network Operations Centre	-
NPA	National Petroleum Authority	-
NSEZ	Northern Savannah Ecological Zone	-
NTP	National Transport Policy	-
NWP	National Water Policy	-
NWRMP	National Water Resources Master Plan	Plan directeur national des ressources en eau
OFID	Industrial Infrastructure Development Fund	Fonds de Développement des Infrastructures Industrielles
OMC	Oil Marketing Companies	-
ONAD	National Office for Sanitation and Drainage	Bureau National de l'Assainissement et du Drainage
ONATEL	The National Telecommunications Office	Office national des télécommunications
ONDR	National Office for Rice Development	Office National De Développement De La Riziculture
ONEP	National Office of Water Supply	Office of National de l'Eau Potale
OSBP	One Stop Border Point	Postes de Contrôle Juxtaposés
OTRAF	The Organization of Motor Carriers of Burkina	Le l'Organisation des Transporteurs Routiers du Burkina
PAA	Port of Abidjan	Port Autonome d'Abidjan
PACITR	Community Roads of UEMOA infrastructure and Transport Action Program	Programme d'Actions Communautaire des Infrastructures et du Transport Routiers
PADAT	National Agricultural Development Policy of Togo	Projet d'Appui au Développement Agricole du Togo
PAFASP	Agriculture, Forestry and Livestock Value Chains Support Program	Programme d'Appui aux Filières Agro Sylvo Pastorales
PAGIRE	National Action Plan for Integrated Water Resources Management	Plan d'Action National de Gestion Intégrée des Ressources en Eau
PAL	Port Authority of Lomé	Port Automome de Lome
PAM	Pan African Minerals Ltd.	Pan-African Minerals
PANSEA	National Action Plan for the Water Sector and Sanitation	Plan d'Actions National pour le Secteur de l'Eau et de l'Assainissement
PAPAN	Support Program for National Poultry Production	Programme d'Appui à la Production Avicole Nationale
PAPAOM	Project to support the development of a blueprint for a Oriented Agriculture Promotion to the Market	Projet d'Appui à l'élaboration d'un schéma directeur pour la Promotion d'une Agriculture Orientée vers le Marché
PAPISE	Action Plan and Program for Investment of Livestock Sector	Plan d'Action et Programme d'Investissements du Secteur Elevage
PAPSA	Agricultural Productivity and Food Security Project	Projet d'Amélioration de la Productivité agricole et de la Sécurité Alimentaire

Abbreviation	English	French
PASA	Agricultural Sector Support Project	Projet d'Appui au Secteur Agricole
PAUT	Urban Renovation Project in Togo	Projet d'Aménagement Urbain du Togo
PC	Petroleum Commission	-
PCESA	Agricultural Sector Economic Growth Program	Programme de Croissance Économique dans le Secteur Agricole
PDA	Master plan for Drainage/sewerage	Plan Directeur d'Assainissement
PDA	Agricultural Development Program	Programme Développement de l'Agriculture
PDADOH	Master plans on development of hydraulic works	Plans Directeurs d'Aménagement et de Développement des Ouvrages Hydrauliques
PDIS	Integral Development Program of Sammandeni	Programme de Développement Intégré de la vallée de Samendéni
PDRI-Mô	Development Project of Rice in the plain Mô	Projet de Développement Rural Intégré en plain Mô
PEC	Competitive Economic Poles	Pôles Economiques Compétitifs
PERH	Livestock and Fisheries Post	Postes d'Élevage et des Ressources Halieutiques
PETROCI	National Company for Oil Operations in Côte d' Ivoire	Société Nationale d'Opérations Pétrolières de Côte d'Ivoire
PID	Detailed Investment Plan	Plan d'Investissement Détaillé
PLANGIRE	Action Plan of Integrated Water Resources Management	Plan d'Actions National de Gestion Intégrée des Ressources en Eau
PMAG	Pharmaceutical Manufacturers 'Association of Ghana	-
PMI	Small and Medium Industries	Petites et moyennes industries
PND	National Development Plan	Plan National de Développement
PNDEL	National Policy Document Sustainable Livestock Development	Politique Nationale de Développement durable de l'Élevage
PNIA	National Agricultural Investment Program	Programme National d'Investissement Agricole
PNIASA	National Agriculture and Food Security Investment Programme	Programme National d'Investissement Agricole et de Sécurité Alimentaire
PNPER	National Project on Rural Entrepreneurship	Projet National de Promotion de l'Entrepreneuriat Rural
PNRMN	National Programme for Restructuring and Upgrading	Programme National de Restructuration et de Mise à Niveau
PNSR	National Programme for Rural Sector	Programme National du Secteur Rural
POSCIA	Sectoral Policy of Industry, Trade and Handicrafts	Politique Sectorielle du Commerce, de l'Industrie, et de l'Artisanat
PPA	Power Purchase Agreement	-
PPCB	Bagré Growth Pole Project	Projet Pôle de Croissance de Bagré
PPCS	Sahel Growth Pole Project	Projet Pôle de Croissance du Sahel
PPI	Priority Investment Programme	Programme Prioritaire d'Intervention
PPMED	Policy Planning Monitoring and Evaluation Directorate	-
PPP	Purchasing Power Parity	-
PPP	Public-Private Partnership	-
PPPs	Policies, Plans and Programmes	-
PPU	Presidential Emergency Programme	Programme Présidentiel d'Urgence
PRD	Regional Development Plan	Plan Régional de Développement
ProDRA	Program of Rural and Agricultural Development	Programme du Développement Rural Agricole
PROFIL	Project in Support of Agricultural Value Chains	Projet d'appui aux Filières agricoles
PRSP	Poverty Reduction Strategy Paper	Document de Stratégie de Réduction de la Pauvreté
PSDPA	Strategic Plan for Development of Livestock, Fisheries and Aquaculture	Plan Stratégique de Développement de l'Élevage, de la Pêche et de l'Aquaculture
PSRA	Strategic Plan for Revitalization of Poultry	Plan Stratégique de Relance de l'Aviculture

Abbreviation	English	French
QUIBB	Wellness Questionnaire of Basic Indicators	Questionnaire des Indicateurs de Base du Bien-Etre
RD	Departmental Road	Routes départementales
RD-PA	Provincial Directorates of Animal Resources	Directions Provençales des Ressources Animales
RD-RA	Regional Departments of Animal Resources	Directions Régionales des Ressources Animales
RF	Road Fund	-
RGPH	General Census of Population and Housing	Recensement Général de la Population et de l'Habitat
RN	National Road	Routes National
RR	Regional Road	Routes Régionales
SACS	African Society of Sausages and Meats	-
SADA	Savannah Accelerated Development Authority	-
SAZOF	Management Company of Free Zones	Compagnie de Gestion des Zones Franches
SCADD	Strategy for Accelerated Growth and Sustained Development	Stratégie de Croissance Accélérée et de Développement Durable
SCAPE	Strategy for Accelerated Growth and Promotion of Employment	Stratégie de Croissance Accélérée et de Promotion de l'Emploi
SDAU	Urban Development Master Plan	Schéma Directeur d'Aménagement et d'Urbanisme
SDE	Water Development Fund	Fonds de Développement de l'Eau
SDFA	Strategy for Agriculture Value Chain Development	Stratégie de Développement des Filières Agricoles
SDR	Rural Development Strategy	Stratégie de Développement Rural
SDU	Schematic Urban Master Plan	Schéma Directeur d'Urbanisme
SDUGA	Urban Master Plan for Greater Abidjan	Schéma Directeur d'Urbanisme du Grand Abidjan
SEA	Strategic Environment Assessment	-
SIC	State Insurance Company	-
SIPF	Ivorian Railway Asset Management Company	Société Ivoirienne de Gestion du Patrimoine Ferroviaire
SIR	Ivorian Refining Company	Société Ivoirienne de Raffinage
SITARAIL	The International Society for African rail transport	La Société internationale de transport africain par rail
SMB	Multinational company Bitumen	Société Multinationale de Bitumes
SME	Small and Medium sized Enterprises	-
SMIs	Small and Medium-sized Industry	-
SMTDP	Sector Medium-Term Development Plan	-
SNAT	National Strategy of Spatial Planning	Stratégie Nationale d'Aménagement du Territoire
SNCT	National Society of the Railways of Togo	Nouvelle Société Cotonnière du Togo
SNDCV	National Development Strategy for Food Crops Other than Rice	Strategie Nationale de Developpement des Cultures Vivrieres Autres Que le Riz
SNDI	Computer Development National Company	Société Nationale de Développement Informatique
SNDR	National Strategy for the Development of Rice Sector	Stratégie Nationale Revisée de Développement de la Filière Riz
SNPT	State National Phosphate Company	Société National Phosphate Togo
SODECI	Côte d'Ivoire Water Company	Societe de Distribution d'Eau de la Côte d'Ivoire
SODEMI	State Company for Mining Development	Societe pour le Developpement Minier de la Côte d'Ivoire
SODEXAM	-	Societe d'Exploitation de Développement Aeroportuaure Aéronautique Météo
SODIGAZ	Gas Distribution Company in Togo	Société de Distribution de Gaz au Togo
SOFIB	Group of investors of France	Société Financière de Banque
SONABEL	National Company of Burkina electricity	Société Nationale d'électricité du Burkina

Abbreviation	English	French
SONABHY	Company Burkinabe National Hydrocarbons	Société Nationale Burkinabè d'Hydrocarbures
SOPAFER-B	Trust Company of the Railway Assets of Burkina Faso	Societe de Genstion du Patrimoine Ferroviaire du Burkina
SPE	Society of Petroleum Engineers	-
SP-EAU	Agency for Water and Sanitation in Urban and Semi-Urban Area	Société de Patrimoine Eau et Assainissement en Milieu Urban et Semi-Urban
SPONG	Permanent Secretariat of Non-Governmental Organizations	Secretirat Permanent des Organisations Non Gouvernementales
SP-PAGIRE	Permanent Secretariat for the IWRM Action Plan	Secrétariat Permanent du Plan d'Action pour la Gestion Intégrée des Ressources en Eau
SRAT	Regional Spatial Development Plan	Schéma Régional de l'Aménagement du Territoire
ST&I	Science, Technology & Innovation	-
SYDAM	Automated Customs Clearance System of Goods	Système de Dédouanement Automatisé des Marchandises
SYVLIE	Virtual Importing and Exporting Operations Liaison System	Système Virtuel de liaison des operations d'Importation et d'Exportation
TCF	Trillion cubic feet	-
TdE	Togo Water Company	Societe Togolaise des Eaux
TEN	Tweneboa, Enyenra & Ntomme	-
TEU	Twenty-foot Equivalent Unit	Équivalent vingt pieds
TFP	Technical and Financial Partners	-
TOR	Tema Oil Refinery Limited	-
ToR	Terms of Reference	Termes de Référence
WAEMU (UEMOA)	West African Economic and Monetary Union	Union Economique et Monétaire Africaine
UNDP	United Nations Development Program	-
UNICEF	United Nations Children's Fund	-
USAID	United States Agency for International Development	-
USD	US Dollar	-
VALCO	Volta Aluminum Company	-
VAT	Value Added Tax	-
VITIB	Village for Information Technology and Biotechnology	Village des Technologies de l'Information et de la Biotechnologie
VLTC	Volta Lake Transport Company Ltd.	-
VRA	Volta River Authority	-
WACIP	West African Common Industrial Policy	-
WAGP	West African Gas Pipeline	-
WAIPRO	West African Irrigation Project	-
WAPCo	West African Gas Pipeline Company	-
WAPP	West African Power Pool	-
WARCIP	West African Regional Communications Infrastructure Programme	-
WD	Water Directorate	-
WEF	World Economic Forum	-
WHO	World Health Organization	-
WRC	Water Resources Commission	-
WRI/CSIR	Water Research Institute of the Council for Scientific and Industrial Research	-
WSDBs	Water and Sanitation Development Boards	-

Abbreviation	English	French
WSSDP	Water Sector Strategic Development Plan	-
WTP	Water Treatment Plant	-
XOF	CFA Franc	Franc CFA
ZAT	Zone of Technical Support	Zone d'Appui Technique

PART IV

CORRIDOR DEVELOPMENT PLAN FOR BURKINA FASO

Chapter 8 National Development Strategies for Burkina Faso

8.1 Existing National Development Plans in Burkina Faso

Burkina Faso does not have an officially endorsed National Development Plan at present, due to the political disturbance, which occurred in 2014 and 2015. In the absence of such a document, the Government of Burkina Faso prepared in 2005 a National Vision “Burkina 2025” constituting the base for future development strategies such as the SCADD and the PNDES. The vision aims to make Burkina Faso “a Nation of solidarity, progress and justice that complies with international codes and standards”

In reality, the National Strategy for Accelerated Growth and Sustainable Development for 2011-2015 (SCADD 2011-2015), which was finalized in October 2010, was considered as a reference for all sectoral and regional development plans and projects. However, recently, the Government of Burkina Faso has proposed a new “National Plan for Economic and Social Development” for the period extending from 2016 to 2020 which is sought to replace the SCADD and therefore lead the economic development of the country for the five years to come.

8.2 Vision 2025 for Burkina Faso

A long-term vision study on “Burkina 2025” was completed at the end of 2005. With the support of UNDP, the study involved about 60 members representing the country’s society including civil societies. The study identifies possible scenarios for Burkina Faso’s long-term development and updates a long-term development vision expressed by “a Letter of Intent for Sustainable Development Policy,” completed in 1995. The 1995 vision focused on human security, defined as economic security, access to education and health, food security, environmental security, and individual and political security.

“Burkina 2025” is Burkina Faso’s future vision targeted at 2025. The vision message is “The Burkina Faso, a nation of solidarity, progress and justice that complies with international codes and standards.”

- The nation solidarity refers to enculturation in openness, unity and peace
- The nation of progress refers to springs and expected progress
- Nation of justice refers to the foundations of governance

(1) Purpose of the Vision

The purpose of the vision is to build a prosperous and radiant nation respected by Africa, as well as by the world.

(2) Strategic Orientations

1) Development of the pillars of accelerated growth

- Accelerated growth model: (i) promoting growth poles, (ii) development of sector production and (iii) promotion of niches and clusters and (iv) promoting a pro-poor growth
- Development of priority sectors: (i) Agriculture, (ii) Mines, (iii) Crafts, (iv) Industries regarding culture and tourism, and (v) SMEs / SMIs.

- Promotion of economic integration and foreign trade: the opportunities it offers and providing opportunities for domestic production.
 - Development of infrastructure to support: (i) Agro-pastoral businesses, (ii) transport and logistics, (iii) ICT (iv) Energy (v) Urbanization and (vi) Institutions Support.
- 2) Consolidation of human capital and promotion of social protection**
- Job creation to increase revenues to improve living conditions and reduce poverty
 - Development of education, training, and professional technical education
 - Improving the health of the population
 - Provide drinking water and sanitation
 - Promotion of social protection
 - Access to modern energy services
- 3) Strengthening Governance**
- Strengthening economic governance through capacity building and economic management, control public finances and the coordination of the effectiveness of aid
 - Strengthening political governance by strengthening the republican character of institutions
 - Strengthening of administrative governance by administration of Republican Development
 - Strengthening local governance through promoting local development
- 4) Considerations of cross priorities in policies and development programs.**
- Promotion of gender equality by strengthening programs to reduce inequalities
 - Population management by strengthening programs controlling the demographic growth
 - Sustainable management of the environment and the optimal use of natural resources
 - Planning for implementation of the land policy
 - Capacity by setting implementation of the National Building Policy regarding capacity
 - Promotion of competitive Intelligence for the economic environment and identify opportunities for the country

8.3 Review of the “Strategy for Accelerated Growth and Sustainable Development” in Burkina Faso (*Stratégie de Croissance Accélérée et de Développement Durable: SCADD 2011-2015*)

(1) Objectives of the SCADD 2011-2015

The SCADD (2011-2015) document replaces the previous Strategic Framework for the Fight Against Poverty (CSLP: Cadre Stratégique pour la Lutte Contre la Pauvreté) which constituted a key reference for Burkina Faso Government socio-economic development policy for the years (2000-2010). The SCADD is based on the necessity to adjust weaknesses of the economy, and the vulnerability to external shocks, as well as low productivity in terms of agricultural and animal products, in addition to high production cost and raising poverty levels. It takes into account the results of the National Prospective Study “Burkina 2025”, and adopts a poverty reduction approach focused on developing productive capacities of the national economy. The persistence of several deficits in attaining the Millennium Development Goals, in addition to the demographic explosion (population growth at 3.1% per year between 1996 and 2006) have confirmed the necessity to formulate a coherent socio-economic policy, which would be translated during the 2011-2015 period through accelerated growth. As such the SCADD aims at pooling together the economy and the environmental viability, as well as social equity to induce a qualitative and sustainable mutation of the BF productive system

(2) Preparation of the SCADD

The SCADD development process was launched in March 2009 with the adoption of the concept note by the Government of Burkina Faso and was completed in December 2010. The strategy was based on thematic studies, as well as consultations at the sectoral, regional, and national levels to be realized. The following main studies were conducted between December 2009 and October 2010:

- Diagnostic study on the socioeconomic situation of Burkina Faso: "Progress and development gains of Burkina Faso 2000-2009" (December 2009 to April 2010);
- Independent evaluation of the implementation of the PRSP and Strategy Papers regarding the regional fight against poverty (CSRLP) (February-May 2010);
- Study on the determinants of accelerated growth and sustainable development in Burkina Faso (July-December 2010).

Based on the reports of the first two studies, a workshop on the review of a decade of economic and social development in Burkina Faso was organized to be held on 31 May and June 1, 2010 and identified the issues and national development challenges for the period 2011-2015.

(3) Major Points of the SCADD

The SCADD defined four strategic axes:

- The first being dedicated to developing the pillars of an accelerated growth based on priority development sectors, as well as on the supporting infrastructures and institutions for the production of wealth, keeping in mind the necessity to integrate sub-regional and regional economies in addition to the world market.
- The second Strategic axis, related to strengthening human capital and social protection, stresses income increase and employment, technical and professional training, and accessibility to basic social services (education, health, water...)
- The third strategic axis focuses on reinforcing economic, political and administrative dimensions of governance, as well as on strengthening local governance.
- The fourth strategic axis takes into account issues of gender, population, the environment, planning, and capacity building as crosscutting priorities in terms of development.

(4) Other Important Aspects

The SCADD document is structured around four chapters.

Chapter 1 takes stock of a decade of development, it assesses the recent performance of Burkina Faso in various areas (growth, poverty reduction, human development, local development and governance), identifies key challenges and draws lessons from the CSLP (Strategic Framework for the Fight Against Poverty) to enrich SCADD.

Chapter 2 defines the new growth and development strategy of Burkina Faso, and it gives a sense of direction to the SCADD over the period 2011-2015, ensuring that the vision is based on sectoral priorities to achieve the set objectives. The four retained strategic areas that constitute the main building blocks of SCADD are listed as follows:

- Development of the pillars of accelerated growth
- Strengthening of human capital and promoting social protection ,
- Strengthening governance, and
- Taking into account cross-cutting priorities in development policies and programmes

Chapter 3 deals with the implementation of the strategy through defining the macroeconomic and budget frameworks, the financing plan and the main operational instruments, which include an annual performance report.

Chapter 4 focuses on the risks that could affect the success of the development plan desired by the Government. Four broad categories of risks and threats have been enumerated to draw attention to the arrangements needed to minimize them. These are the financial risk, the risks related to natural conditions and poor adhesion of the actors, as well as the risk related to international and regional situations.

(5) Economic Growth Projected by National Development Plans for Burkina Faso (SCADD 2011-2015)

Faced with an insufficient GDP growth averaging 5.2% during the period 2006-2010 and a population growth rate of 3.1 %; the vision for 2015, entitled " Burkina Faso, a productive economy that accelerates growth, increases living standards, improves and preserves the environment and the living environment, through wise and efficient governance", focused on prioritizing economic growth and on achieving a better quality of life of the population. Accordingly, over the period 2011-2015, the SCADD aimed at achieving an average growth rate of real GDP of 10%.

Table 8.3.1 SCADD's Future GDP Growth Rates for Burkina Faso

	2012	2013	2014	2015
Primary sector	7.5	12.5	13.2	14.7
Secondary sector	11.7	11.9	12.1	12.2
Tertiary sector	9.7	13.6	14.5	15.6
Real GDP	9.8	10.4	10.7	10.8

Source: The Government of Burkina Faso, 2010, SCADD 2011-2015

8.4 Review of the “National Plan for Economic and Social Development” in Burkina Faso (*Plan National de Développement Economique et Social: PNDES 2016-2020*)

(1) Objectives of the PNDES 2016-2020

In order to lay the foundations for economic and socially sustainable development, which transforms the economic, demographic and social structures, and equally enables in a sustainable and cumulative manner average income growth, satisfaction of basic needs, poverty reduction, and improving of human capital, in addition to environmental sustainability and social equity; the Government of Burkina Faso has opted for the development and implementation of a National Economic and Social Development Plan (PNDES), taking into account lessons learned from implementation of previous national policies and plans.

The overall objective of the PNDES is to transform structurally the Burkinabe economy in view of a strong, resilient, and inclusive growth that generates decent jobs for all.

(2) Preparation of the PNDES

The PNDES was established by Decree No. 2016-001 / PM / CAB on March 4, 2016. The process is formally guided by a steering and supervision Committee (COS), thematic committees, a technical secretariat, focus groups and a drafting group.

The PNDES is structured into three main parts, namely: (i) diagnosis analysis of the economic and social situation, (ii) the strategy for economic and social development from 2016 to 2020, and (iii) provisions for implementation, monitoring and evaluation.

(3) Major Points of the PNDES

The PNDES has set a new vision for Burkina Faso as "a democratic, united and cohesive nation, transforming its economic structure and achieving strong and inclusive growth, through sustainable consumption and production."

Structural transformation is a distinctive feature of the development process that relies on good governance and quality of human resources and consists generally of four interrelated processes: (i) increasing the added value of consecutive producers in the primary sector to improve its productivity, (ii) the emergence of a modern economy based on industry and services, (iii) the improvement of urbanization and (iv) accelerating the demographic transition.

The formulated overarching principles in order to guide the PNDES implementation are: (i) national leadership, (ii) equity, (iii) subsidiarity and partnership, (iv) RBM (results-based management) and (v) proactivity.

Based on the overall objective and in view of the structural transformation process, the expected impacts of PNDES are: (i) improving the effectiveness of national and local governance, (ii) the emergence of a modern economy, based on a scalable primary sector and increasingly on dynamic process industries and services, which with an average growth of 7.3%, will become creators of at least 80,000 productive jobs per year, (iii) lower the incidence of poverty to less than 35%, (iv) the mastery of population growth to 2.7% in 2020, (v) the acceleration of human capital development level and (vi) changing production and consumption patterns are part of a sustainable development perspective.

(4) Other Important Aspects

The actions to be implemented under the PNDES in order to achieve structural transformation are based on three main strategic axes, namely Axis 1: institutional reform and modernization of the administration, Axis 2: developing human capital and Axis 3: dynamizing growth sectors for the economy and employment. These main axes are divided into strategic objectives with expected effects as summarized in Table 8.4.1:

Table 8.4.1 Summary Table for Achieving Structural Transformation

Axes	Strategic Objectives	Expected effects
<i>Axis 1: institutional reform and modernization of the administration</i>	SO11. Promote good political and administrative governance	EE1. Democracy, peace, security and justice are strengthened
	SO12. Promote good economic governance	EE2. Planning, management and financing of the development processes are effective
	SO13. Strengthen decentralization and support regional development and regional planning	EE3. The effectiveness of decentralization and local governance improved EE4. Support for regional and territorial development creates better conditions for the revitalization of local economies and the reduction of regional disparities
<i>Axis 2: Develop human capital</i>	SO21. Promote population health and ensure the demographic transition	EE5. Access to quality health services is guaranteed for all and the demographic transition is assured
	SO22. Increase the supply and improve the quality of education and training in line with the needs of the economy	EE6. Availability and employability of human resources improved
	SO23. Promoting research and innovation for the structural transformation of the economy	EE7. Research and innovation are more supportive of the structural transformation of the economy
	SO24. Promote decent employment and social protection for all, especially for young people and women	EE8. Decent employment and social protection are guaranteed for all, especially for youth and women
	SO25. Improving access to water, sanitation, quality energy service and quality of life	EE9. Universal access to water, sanitation and quality energy services is guaranteed
<i>Axis 3: dynamizing growth sectors for the economy and employment</i>	SO31. Develop a productive agro-forestry-pastoral sector, more oriented towards local agribusiness and based on the principles of sustainable development	EE10. The primary sector ensures food security, productive employment and the provision of local agribusiness.
	SO32. Develop a competitive industrial and artisanal sector, with high added value generator of decent employment	EE11. The industrial and commercial sector is more dynamic in terms of creating wealth, jobs and export
	SO33. Promote the expansion of high added value service industries generators of decent jobs	EE12. The tertiary sector is formalized, more dynamic and creative of decent jobs
	SO34. Develop quality infrastructure, reliable, sustainable and accessible to foster structural transformation of the economy	EE13. The quality, reliability and accessibility of infrastructure are guaranteed
	SO35. Reverse the trend of environmental degradation and ensure sustainable management of natural resources	EA14. The environment is preserved, resources management is ensured in a sustainable manner, and green economy is promoted

Source: Plan National de Développement Economique et Social (PNDES) 2016-2020 pp.42-43

8.5 Population Framework for Burkina Faso

(1) Past Population Trend in Burkina Faso

According to the 2006 population census, the national population of Burkina Faso was 14,017,262. The total population in Burkina Faso has grown rapidly in the past decades, resulting in the doubling of its population in just 21 years between 1985 and 2006. The annual growth rate of the population also increased from 2.38% between 1985 and 1996 to over 3 per cent between 1996 and 2006.

Among the 13 regions, the Centre Region where the capital city Ouagadougou is located has increased its population by 0.8 million which is at a great speed with a population annual growth rate of over 6% for the decade between 1996 and 2006. The second most populated region, Hauts-Bassins, where the second largest city Bobo-Dioulasso of Burkina Faso is located has also increased its population by over 0.4 million between 1996 and 2006 with the annual growth rate of 3.60%. Est Region which shares the border with Benin, Niger and Togo follows with the annual growth rate of 3.57%. Cascades Region, which is located at the boarder of Côte d'Ivoire, also increased its population with population annual growth rate of 4.75%.

On the other hand, although the population in Burkina Faso has increased by over 3% per annum, the population annual growth rate of Centre-Sud Region and Plateau-Centre Region between 1996 and 2006 was below 2.0%. It is likely that the people are migrating to the neighbouring Centre Region.

Table 8.5.1 Past Population of Burkina Faso by Region (1985, 1996 and 2006)

Region	Population			Increase in Population		Annual Growth Rate	
	1985	1996	2006	1985-1996	1996-2006	1985-1996	1996-2006
Boucle du Mouhoun	911,736	1,174,456	1,442,749	262,720	268,293	2.33%	2.08%
Cascades	257,553	334,303	531,808	76,750	197,505	2.40%	4.75%
Centre	633,965	941,894	1,727,390	307,929	785,496	3.66%	6.25%
Centre-Est	661,182	853,099	1,132,016	191,917	278,917	2.34%	2.87%
Centre-Nord	729,189	928,321	1,202,025	199,132	273,704	2.22%	2.62%
Centre-Ouest	787,644	943,538	1,186,566	155,894	243,028	1.66%	2.32%
Centre-Sud	444,011	530,696	641,443	86,685	110,747	1.63%	1.91%
Est	621,786	853,706	1,212,284	231,920	358,578	2.92%	3.57%
Hauts-Bassins	744,003	1,031,377	1,469,604	287,374	438,227	3.01%	3.60%
Nord	760,408	955,420	1,185,796	195,012	230,376	2.10%	2.18%
Plateau-Central	446,994	572,154	696,372	125,160	124,218	2.27%	1.98%
Sahel	521,911	708,332	968,442	186,421	260,110	2.82%	3.18%
Sud-Ouest	444,323	485,313	620,767	40,990	135,454	0.81%	2.49%
Total	7,964,705	10,312,609	14,017,262	2,347,904	3,704,653	2.38%	3.12%

Source: INSD, 2009, Analyse des résultats définitifs du RGPH 2006 Theme 2: Etat et Structure de la Population



Source: http://www.d-maps.com/carte.php?num_car=34386&lang=en

Figure 8.5.1 Regions in Burkina Faso

(2) Future Population Projection by INSD

Burkina Faso's National Institute of Statistics and Demography (INSD: *Institut national de la statistique et de la démographie*) has projected the future population of Burkina Faso by region to 2020 as shown in Table 8.5.2.

The projected population by INSD shows that the population annual growth rate declines between 2006 and 2010 and rises again from 2010 to 2015.

Table 8.5.2 Future Population Projection of Burkina Faso by INSD (2010, 2015 and 2020)

Region		1996 (Census)	2006 (Census)	2010 (Projection)	2015 (Projection)	2020 (Projection)
Boucle du Mouhoun	Population	1,174,456	1,442,749	1,586,748	1,821,059	2,086,333
	Annual Growth Rate		2.08%	2.41%	2.79%	2.76%
Cascades	Population	334,303	531,808	613,229	739,497	880,686
	Annual Growth Rate		4.75%	3.63%	3.82%	3.56%
Centre	Population	941,894	1,727,390	2,043,943	2,532,311	3,080,375
	Annual Growth Rate		6.25%	4.30%	4.38%	4.00%
Centre-Est	Population	853,099	1,132,016	1,262,783	1,470,903	1,704,810
	Annual Growth Rate		2.87%	2.77%	3.10%	3.00%
Centre-Nord	Population	928,321	1,202,025	1,334,860	1,547,565	1,787,082
	Annual Growth Rate		2.62%	2.66%	3.00%	2.92%
Centre-Ouest	Population	943,538	1,186,566	1,369,233	1,510,975	1,737,197
	Annual Growth Rate		2.32%	3.64%	1.99%	2.83%
Centre-Sud	Population	530,696	641,443	703,358	804,709	919,681
	Annual Growth Rate		1.91%	2.33%	2.73%	2.71%
Est	Population	853,706	1,212,284	1,369,233	1,615,740	1,891,813
	Annual Growth Rate		3.57%	3.09%	3.37%	3.21%
Hauts-Bassins	Population	1,031,377	1,469,604	1,660,910	1,961,204	2,297,496
	Annual Growth Rate		3.60%	3.11%	3.38%	3.22%
Nord	Population	955,420	1,185,796	1,306,619	1,502,527	1,724,065
	Annual Growth Rate		2.18%	2.46%	2.83%	2.79%
Plateau-Central	Population	572,154	696,372	764,574	875,910	1,002,106
	Annual Growth Rate		1.98%	2.36%	2.76%	2.73%
Sahel	Population	708,332	968,442	1,086,250	1,272,545	1,481,543
	Annual Growth Rate		3.18%	2.91%	3.22%	3.09%
Sud-Ouest	Population	485,313	620,767	687,826	795,549	916,994
	Annual Growth Rate		2.49%	2.60%	2.95%	2.88%
Burkina Faso	Population	10,312,609	14,017,262	15,789,566	18,450,494	21,510,181
	Annual Growth Rate		3.12%	3.02%	3.16%	3.12%

Source: INSD, 2009, Projections Démographiques de 2007 à 2020 par Régions et Provinces

(3) Scenarios for Development of Burkina Faso

Under the selected growth scenario (Corridor Development oriented to Sub-Regional Markets) for sub-regional corridor development, two patterns of future population by region are proposed for Burkina Faso.

The first pattern of population distribution is a pattern which promotes decentralized development following the decentralization policy of Burkina Faso.

The other pattern of population distribution assumes that population concentration would occur in larger cities along the main corridors.

Based on these two alternative patterns, two population frameworks for Burkina Faso by region are prepared as shown in

Table 8.5.3.

Table 8.5.3 Future Population of Burkina Faso by Region based on the Two Patterns

Unit: thousand

Patterns of Population Distribution		Pattern 1: Decentralized Development			Pattern 2: Concentration in Major Urban Centres		
		2015	2025	2040	2015	2025	2040
	Region						
Boucle du Mouhoun	Population	1,855	2,550	3,855	1,848	2,493	3,563
	Annual Growth Rate		3.25%	2.54%		3.02%	2.08%
Cascades	Population	769	1,078	1,617	767	1,065	1,622
	Annual Growth Rate		3.27%	2.45%		3.18%	2.65%
Centre	Population	2,706	4,066	6,774	2,739	4,288	7,392
	Annual Growth Rate		3.92%	3.21%		4.36%	3.34%
Centre-Est	Population	1,507	2,081	3,111	1,501	2,049	3,102
	Annual Growth Rate		3.24%	2.43%		3.13%	2.62%
Centre-Nord	Population	1,580	2,167	3,220	1,572	2,109	2,981
	Annual Growth Rate		3.18%	2.40%		2.92%	2.02%
Centre-Ouest	Population	1,530	2,044	2,954	1,511	1,933	2,735
	Annual Growth Rate		2.92%	2.24%		2.49%	2.24%
Centre-Sud	Population	812	1,080	1,552	802	1,017	1,357
	Annual Growth Rate		2.90%	2.19%		2.38%	1.70%
Est	Population	1,674	2,381	3,664	1,681	2,414	3,658
	Annual Growth Rate		3.51%	2.59%		3.58%	2.40%
Hauts-Bassins	Population	2,037	2,919	4,638	2,062	3,083	5,147
	Annual Growth Rate		3.60%	2.88%		4.06%	3.17%
Nord	Population	1,527	2,077	3,069	1,517	2,016	2,980
	Annual Growth Rate		3.13%	2.36%		2.90%	2.48%
Plateau-Central	Population	891	1,221	1,838	887	1,190	1,690
	Annual Growth Rate		3.22%	2.51%		2.97%	2.05%
Sahel	Population	1,313	1,854	2,838	1,317	1,876	2,976
	Annual Growth Rate		3.46%	2.56%		3.57%	2.88%
Sud-Ouest	Population	799	1,030	1,428	796	1,015	1,356
	Annual Growth Rate		2.53%	2.01%		2.39%	1.71%
Burkina Faso	Population	19,000	26,548	40,560	19,000	26,548	40,560
	Annual Growth Rate		3.34%	2.60%		3.34%	2.60%

Source: JICA Study Team based on INSD 2009 data

(4) Population Framework for Burkina Faso

The selected scenario for the population framework of Burkina Faso is shown in the table below.

Table 8.5.4 Population Framework for Burkina Faso by Region

Unit: thousand

Region		2006	2015	2020	2025	2030	2035	2040
Boucle du Mouhoun	Population	1,443	1,855	2,173	2,550	2,962	3,401	3,855
	Annual Growth Rate		2.83%	3.21%	3.25%	3.04%	2.80%	2.54%
Cascades	Population	532	769	918	1,078	1,251	1,433	1,617
	Annual Growth Rate		4.18%	3.62%	3.27%	3.02%	2.75%	2.45%
Centre	Population	1,727	2,706	3,354	4,066	4,878	5,786	6,774
	Annual Growth Rate		5.11%	4.39%	3.92%	3.71%	3.47%	3.21%
Centre-Est	Population	1,132	1,507	1,774	2,081	2,412	2,759	3,111
	Annual Growth Rate		3.23%	3.32%	3.24%	3.00%	2.73%	2.43%
Centre-Nord	Population	1,202	1,580	1,853	2,167	2,506	2,861	3,220
	Annual Growth Rate		3.08%	3.23%	3.18%	2.95%	2.69%	2.40%
Centre-Ouest	Population	1,187	1,530	1,770	2,044	2,338	2,644	2,954
	Annual Growth Rate		2.86%	2.96%	2.92%	2.72%	2.49%	2.24%
Centre-Sud	Population	641	812	936	1,080	1,234	1,393	1,552
	Annual Growth Rate		2.65%	2.89%	2.90%	2.69%	2.46%	2.19%
Est	Population	1,212	1,674	2,004	2,381	2,792	3,224	3,664
	Annual Growth Rate		3.65%	3.66%	3.51%	3.23%	2.92%	2.59%
Hauts-Bassins	Population	1,470	2,037	2,446	2,919	3,447	4,024	4,638
	Annual Growth Rate		3.70%	3.73%	3.60%	3.38%	3.15%	2.88%
Nord	Population	1,186	1,527	1,781	2,077	2,396	2,730	3,069
	Annual Growth Rate		2.85%	3.12%	3.13%	2.90%	2.64%	2.36%
Plateau-Central	Population	696	891	1,042	1,221	1,416	1,624	1,838
	Annual Growth Rate		2.78%	3.17%	3.22%	3.01%	2.77%	2.51%
Sahel	Population	968	1,313	1,564	1,854	2,169	2,501	2,838
	Annual Growth Rate		3.44%	3.56%	3.46%	3.19%	2.89%	2.56%
Sud-Ouest	Population	621	799	910	1,030	1,159	1,293	1,428
	Annual Growth Rate		2.84%	2.63%	2.53%	2.38%	2.21%	2.01%
Burkina Faso	Population	14,016	19,000	22,524	26,548	30,960	35,672	40,560
	Annual Growth Rate		3.44%	3.46%	3.34%	3.12%	2.87%	2.60%

Source: JICA Study Team based on INSD 2009 data

Chapter 9 Corridor Development Plan for Burkina Faso

9.1 SWOT Analysis for Burkina Faso in relation to Corridor Development

A SWOT analysis for Burkina Faso was conducted in relation to corridor development as shown in the table below. The result of the SWOT analyses for the WAGRIC sub-region is presented in Chapter 3.

Table 9.1.1 SWOT Analysis for Burkina Faso

Strength	Weakness
<ul style="list-style-type: none"> Burkina Faso is adjacent to Côte d'Ivoire and Ghana, which are major economies of the West African sub-region. Burkina Faso has four transport corridors to reach sea ports, namely ports of Abidjan, Tema, Lomé and Cotonou. They are in a competitive relationship. Out of the four transport corridors, a railway line is only operational in the Abidjan-Ouagadougou Corridor. Burkina Faso has economic sectors which have export products including cotton, gold and sesame. Burkina Faso has world-class mineral resources of development potential. Burkina Faso is located in the central area of the Sahel. Ouagadougou is at a cross roads. 	<ul style="list-style-type: none"> Burkina Faso has to rely on coastal countries' transport corridors, which are characterized by harassment for bribes, informal charges, and low quality infrastructure. Only one railway line is operating between Burkina Faso and the coastal countries' sea ports, connecting Ouagadougou, Bobo-Dioulasso and Abidjan. As a result, there is no competition on the railway line. Economic sectors targeting at neighbouring countries' markets are at the early stage of development in Burkina Faso. They have poor marketing ability to enter into the markets of neighbouring countries. Since it is located inland 1,000-1,200 km from sea ports, prices of goods and services are relatively high. Because of lower level of electricity supply, processing of agricultural and mineral products has not developed yet. Although some mineral resources are of international level in terms of quality and scale, their inland locations and costly economies are a hindrance to mineral resources development. Price fluctuation of mineral resources and agricultural products are adversely affecting not only national economic development, but also mineral resources development. Since rain fed agriculture is a dominant way of agriculture in Burkina Faso, it might suffer adverse impacts caused by the unstable weather due to global climate change, resulting in poor crop harvests sometimes. Agricultural productivity is relatively low and unstable, because improved varieties, fertilizer and agricultural machines are not yet popular among farmers in Burkina Faso.
Opportunities	Threat
<ul style="list-style-type: none"> Being located in the south of Burkina Faso, Côte d'Ivoire and Ghana have large potential for economic growth. When corridor infrastructure is well developed, Burkina Faso could have easier access to sub-regional markets of Côte d'Ivoire and Ghana. Being surrounded by Mali to the west and by Niger to the east, Burkina Faso could have a chance to establish and operate a logistics station for handling transit cargos between Mali/Niger and coastal countries. When global economies and mineral markets start recovering from their recession situation, it is considered that transportation for minerals could attract necessary investments. As a result, mineral resources development would be revitalized in Burkina Faso. Since the ports of Abidjan, Tema, Lomé and Cotonou compete with each other for attracting transshipment cargos and transit cargos, the efficiency of cargo handling would be improved and costs for cargo handling would be reduced. In addition to the completion among sea ports, transport corridors are put in a more competitive relationship by upgrading corridor infrastructure, reducing harassment for bribes and improving border crossing procedures. As a result, prices of various commodities in 	<ul style="list-style-type: none"> There is a risk of reduction of rain fed agricultural areas in the northern part of the country due to desertification caused by global climate change. Livestock production might decrease, faced with grassland reduction caused by expanding desertification due to global climate change. Economic growth of coastal countries, such as Côte d'Ivoire and Senegal, might attract migrant workers from Burkina Faso not only to the agricultural sector, but also to the field of intellectual workers in the coastal countries. The democratic political system has taken root in Burkina Faso's society gradually and while having gotten through the political crises, there is still a risk of having another political crisis, such as coups, in Burkina Faso. This situation might hinder the influx of foreign and domestic investment into Burkina Faso. Burkina Faso still has a risk of suffering from attacks by West Africa interior's terrorist groups. This situation might obstruct foreign and domestic investment into Burkina Faso. These kinds of hindering factors might slow down the development of corridor infrastructure connecting Burkina Faso with coastal countries.

<p>inland countries like Burkina Faso would decline.</p> <ul style="list-style-type: none"> • It is possible to expand lands for agricultural production by effectively utilizing surface and ground water sources. 	<ul style="list-style-type: none"> • Conflicts over water among water users might increase as the demand for water increases in Burkina Faso.
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Source: JICA Study Team

9.2 Objectives for Corridor Development in Burkina Faso

Burkina Faso has to promote north-south corridor development to the coastal countries, namely Côte d’Ivoire, Ghana, Togo and Benin. The objectives for developing the north-south corridors are set as follows:

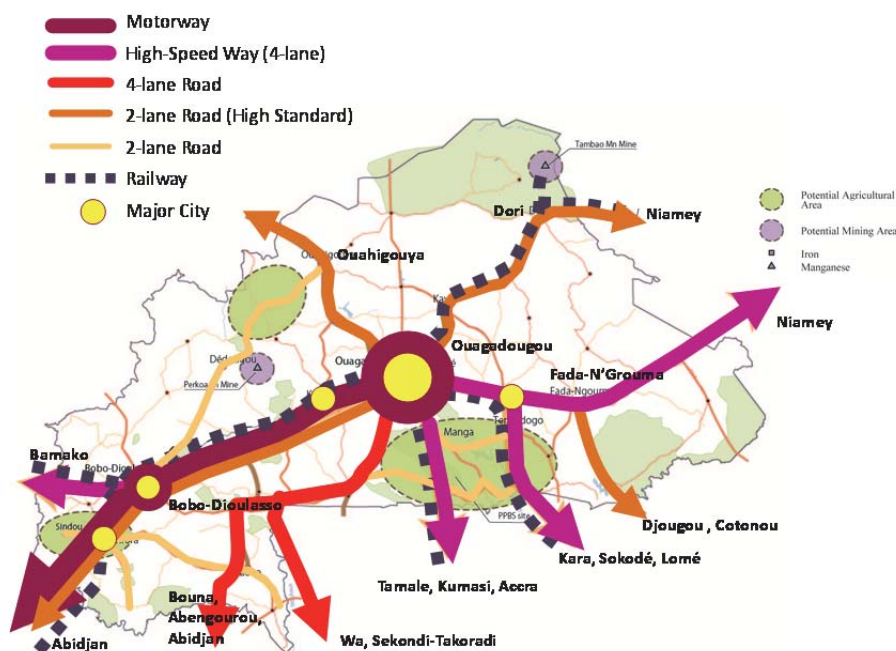
- To promote economic sectors development by improving and upgrading the function of north-south transport corridors and by inviting foreign and domestic investments in economic sectors
- To provide corridor infrastructure in order to widen the areas that can accommodate agricultural development in rural areas and manufacturing industrial development in regional cities
- To provide mineral potential sites with corridor infrastructure for the purpose of activating mineral resources development in Burkina Faso
- To contribute to wider spatial development by taking advantage of north-south corridor development within Burkina Faso

9.3 Super-Long Term Pattern of Burkina Faso’s Corridor Development

Based on the discussion through meetings with Burkina Faso’s stakeholders a corridor development scenario for the super long term (beyond year 2040) was prepared. The super-long term pattern of Burkina Faso’s corridor development aims to achieve the following:

- Physical and economic integration with Burkina Faso’s surrounding countries including Mali and Niger
- Development of diverse economic sectors targeting both overseas market and sub-regional markets
- Wide development in the country to improve the living standard of people in various areas of the country
- To secure high-speed transport corridor in order to attract investment in economic sectors

The corridor transport infrastructures to be developed by the super-long term are shown in the figure below.



Source: JICA Study Team

Figure 9.3.1 Burkina Faso's Super-Long Term Pattern of Corridor Development

9.4 Patterns for Corridor Development in Burkina Faso

Based on the super-long term pattern of corridor development, alternative patterns for corridor development were prepared by selecting priorities to be achieved by the target year 2040.

9.4.1 Patterns for Corridor Development in Burkina Faso for 2040

(1) Factors to Differentiate Corridor Development Patterns

In Burkina Faso, the following three types of factors to differentiate corridor development patterns are identified:

1) Types of Economic Sectors to be Promoted

- Economic Sectors Targeting Export to Overseas
- Economic Sectors Targeting Markets of Neighbouring Countries' Large Cities
- Economic Sectors of Ouagadougou (Advanced Services Sectors for National Markets and Manufacturing Sector targeting Sub-Regional Markets, as well as National Market)
- Mining Sector and Agricultural Cash Crop Production targeting Overseas Markets

2) Corridor Transport Infrastructure

- Development of corridor transport infrastructure to support the export to overseas.
 - Especially to Abidjan Port, Lomé Port and Tema Port
- Development of corridor transport infrastructure to support the sales (export) to neighbouring countries' large city markets.
 - Development of various transport corridors connecting Burkina Faso with Côte d'Ivoire, Ghana, Togo and Benin is required for promoting the sales to neighbouring countries' large city markets.
- Development of urban infrastructure to support economic sectors in Ouagadougou

3) Economic Sector Development by Taking Advantage of Existing Corridor Infrastructure

- In the southern part of Burkina Faso, east-west corridors connecting Primary Corridors to sea ports should be developed
- Not only transport corridors to neighbouring countries, but also transport corridors to the south should be developed for providing access to economic sectors' potential areas in the south.

(2) Three Alternative Corridor Development Patterns based on Different Types of Economic Sectors to be Developed as Priority

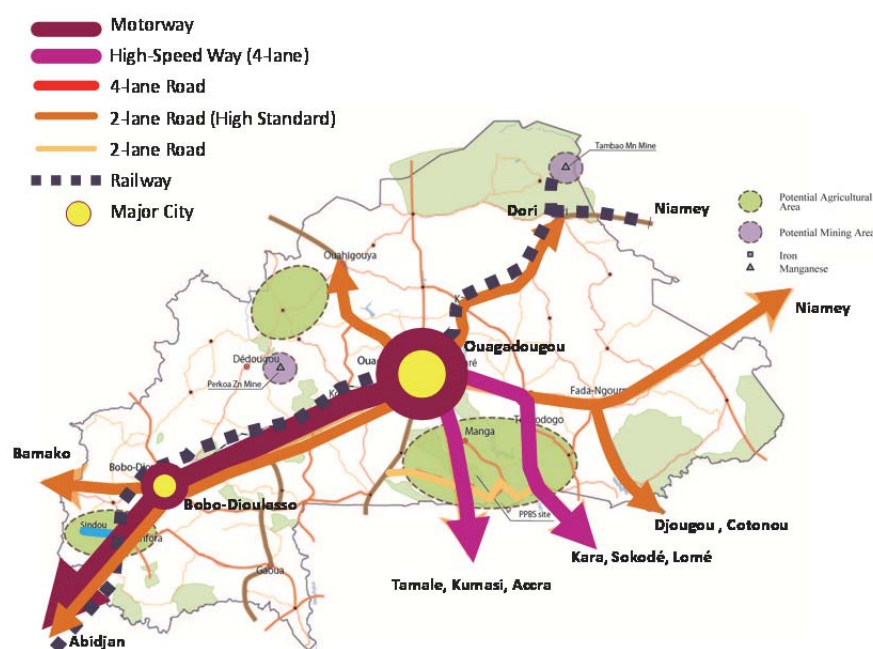
The following three patterns for corridor development are formulated by combining the different economic sectors to be promoted as priority for the year 2040:

- C-BF-1: Promotion of Economic Sectors Targeting Overseas Markets, as well as Economic Sectors in Ouagadougou
- C-BF-2: Promotion of Economic Sectors Targeting Sub-Regional Markets of Neighbouring Countries' Large Cities, as well as Economic Sectors in Ouagadougou
- C-BF-3: Promotion of Economic Sector Targeting both Overseas Markets and Sub-Regional Markets of Neighbouring Countries' Large Cities

1) Burkina Faso's Corridor Development Pattern C-BF-1: Promotion of Economic Sectors Targeting Overseas Markets, as well as Economic Sectors in Ouagadougou

Corridor Development Pattern C-BF-1 has the following characteristics in development of corridor infrastructure and economic sectors:

- Development of economic sectors targeted overseas markets, (including conventional mining sector and agricultural cash crop production), rather than economic sectors targeting sub-regional markets, are promoted.
- Development of economic sectors is promoted in Greater Ouagadougou, especially manufacturing sectors targeting national market.
- Upgrading of transport corridors to sea ports is emphasized for import from and export to overseas markets.



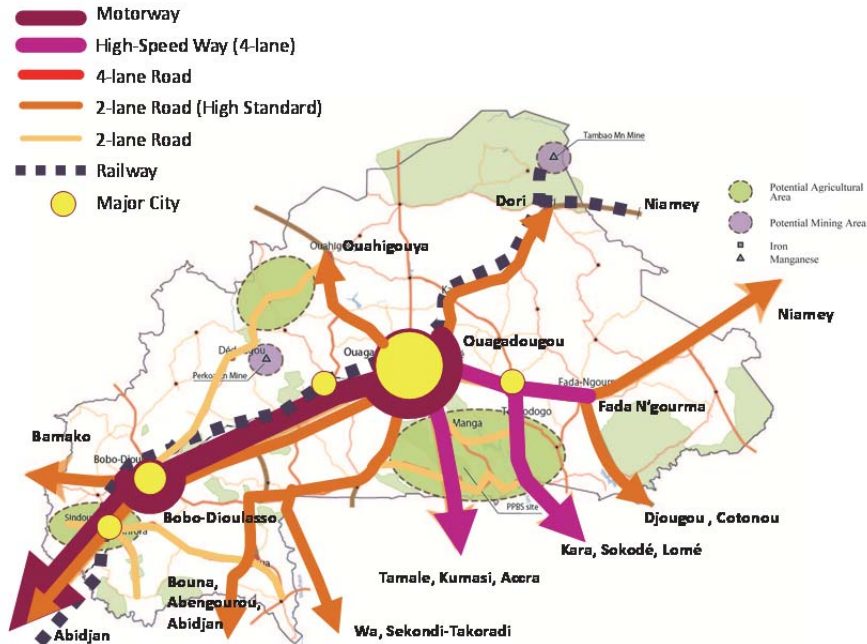
Source: JICA Study Team

Figure 9.4.1 Burkina Faso's Corridor Development Pattern C-BF-1 in 2040

2) Burkina Faso's Corridor Development Pattern C-BF-2: Promotion of Economic Sectors Targeting Sub-Regional Markets of Neighbouring Countries' Large Cities, as well as Economic Sectors in Ouagadougou

Corridor Development Pattern C-BF-2 has the following characteristics in development of corridor infrastructure and economic sectors:

- Development of economic sectors targeting markets of neighbouring countries' large cities is promoted.
- Development of economic sectors, especially manufacturing sectors targeting not only national markets but also sub-regional markets is promoted in Greater Ouagadougou.
- It is necessary to develop **various transport corridors** for promoting the production and sales targeting at markets of Côte d'Ivoire, Ghana, Togo and Benin.
- Furthermore, **east-west transport corridors** connecting with primary corridors should be developed for providing access to agricultural potential areas.
- Strong transport connection between Ouagadougou and Bobo-Dioulasso should be developed for attracting investments in economic sectors in south-eastern areas surrounding Bobo-Dioulasso, including Bobo-Dioulasso.
- Upgrading of transport corridors to Abidjan is emphasized for import from and export to Abidjan and also overseas markets.
- Multi-modal transport (combining rail transport and truck transport) should be developed on the basis of the existing Abidjan-Ouagadougou Railway (Sitarail) for connecting not only wide areas of Burkina Faso but also Mali and Niger with the sea ports and major cities along the coastal corridor.



Source: JICA Study Team

Figure 9.4.2 Burkina Faso's Corridor Development Pattern C-BF-2 in 2040

3) Burkina Faso's Corridor Development Pattern C-BF-3: Promotion of Economic Sector Targeting both Overseas Markets and Sub-Regional Markets of Neighbouring Countries' Large Cities

Corridor Development Pattern C-BF-3 has the following characteristics in development of corridor infrastructure and economic sectors:

- Development of economic sectors targeting markets of neighbouring countries' large cities is promoted.
- Development of economic sectors targeted overseas markets (including conventional mining sector and agricultural cash crop production) is promoted.
- It is necessary to develop **various transport corridors** for promoting the production and sales targeting at markets of Côte d'Ivoire, Ghana, Togo and Benin.
- Rather than developing only primary corridors connected to major sea ports, various transport corridors connected to neighbouring countries should be developed.
- Furthermore, **east-west transport corridors** connecting with primary corridors to major sea ports and major cities along the coastal corridor should be developed for providing access to agricultural potential areas.



Source: JICA Study Team

Figure 9.4.3 Burkina Faso's Corridor Development Pattern C-BF-3 in 2040

9.4.2 Comparison of Alternative Patterns for Corridor Development in Burkina Faso

The formulated three alternative patterns of corridor development (C-BF-1, C-BF-2 and C-BF-3) in the previous section are compared from the following perspectives:

- Characteristics of Spatial Development
- Effects on Rural Development
- Cost Performance of Corridor Infrastructure Development for Promoting Target Economic Sectors Development

(1) Corridor Development Pattern C-BF-1

1) Characteristics of Spatial Development

- Strong connection by motorway between Ouagadougou and Côte d'Ivoire through Bobo-Dioulasso
- Strong connection by upgraded trunk road between Ouagadougou and Togo
- Good connection by trunk road of Ouagadougou with Ghana
- Good connection by trunk road of Ouagadougou with Benin
- Good connection by trunk roads of Ouagadougou with Dori
- Good connection by trunk roads of and North-Eastern Part
- Full ring road for Ouagadougou
- Full ring road for Bobo-Dioulasso

2) Effects on Rural Development

- Development of rural tracks is not extensive since only trunk roads are upgraded.
- It is difficult to promote rural development due to shortage of rural tracks.

3) Cost Performance of Corridor Infrastructure Development for Promoting Target Economic Sectors Development

- Cost performance is low for reactivating economic sector development to generate a larger traffic volume for corridor transport infrastructure.

(2) Corridor Development Pattern C-BF-2

1) Characteristics of Spatial Development

- Strong connection by motorway between Ouagadougou and Bobo-Dioulasso
- Strong connection by upgraded trunk road between Ouagadougou and Togo
- Good connection by trunk roads of Bobo-Dioulasso with Côte d'Ivoire
- Good connection by trunk roads of Ouagadougou with Ghana
- Good connection by trunk roads of Ouagadougou with Benin
- Good connection by trunk roads of Ouagadougou with Dori
- Good connection by trunk roads of and North-Eastern Part
- Partial ring road for Ouagadougou
- Partial ring road for Bobo-Dioulasso

2) Effects on Rural Development

- In the southern and western part of the country, development of rural tracks could be more extensive than Scenario C-BF-1.
- It is possible to promote rural development due to development of rural tracks in the southern and western part of the country.

3) Cost Performance of Corridor Infrastructure Development for Promoting Target Economic Sectors Development

- Cost performance is better than Scenario C-BF-1 for reactivating economic sector development to generate a larger traffic volume for corridor transport infrastructure.
- Cost performance in the long term is better than Scenario C-BF-3 since Scenario C-BF-3 will need to construct not only motorway between Ouagadougou and Bobo-Dioulasso but also four lane road between Ouagadougou and Bobo-Dioulasso by 2040.

(3) Corridor Development Pattern C-BF-3

1) Characteristics of Spatial Development

- Strong connection by upgraded trunk road between Ouagadougou and Côte d'Ivoire through Bobo-Dioulasso
- Strong connection by upgraded trunk road between Ouagadougou and Togo
- Good connection by trunk road of Ouagadougou with Ghana
- Good connection by trunk road of Ouagadougou with Benin
- Good connection by trunk roads of Ouagadougou with Dori
- Good connection by trunk roads of and North-Eastern Part
- Partial ring road for Ouagadougou
- Partial ring road for Bobo-Dioulasso

2) Effects on Rural Development

- In the southern part and western part of the country, development of rural tracks could be more extensive than Scenario C-BF-1.
- It is possible to promote rural development due to development of rural tracks in the southern and western part of the country.

3) Cost Performance of Corridor Infrastructure Development for Promoting Target Economic Sectors Development

- Cost performance is better than Scenario C-BF-1 and C-BF-2. The cost of developing the primary corridor will be less than Scenario C-BF-2 and C-BF-3 can reactivating economic sector development to generate a larger traffic volume for corridor transport infrastructure.
- However, Scenario C-BF-3 requires the construction of four-lane dualized road between Ouagadougou and Bobo-Dioulasso by 2040 in addition to the future construction of a new motorway between Ouagadougou and Bobo-Dioulasso in the super long term.
- As a result, the selection of Scenario C-BF-3 to achieve Super Long-Term Goal would be more costly than that of Scenario C-BF-1 and C-BF-2 toward Super Long Term Goal because the connection between Ouagadougou and Bobo-Dioulasso is supported by both motorway and 4-lane dualized road in Scenario C-BF-3.

9.5 Selected Pattern of Corridor Development for Burkina Faso (Corridor Development Pattern C-BF-2)

Following the selected growth scenario for sub-regional corridor development (Growth Scenario 1) and based on the evaluation of alternative patterns of corridor development, the following corridor development pattern **C-BF-2: "Promotion of Economic Sectors Targeting Sub-Regional Markets of Neighbouring Countries' Large Cities, as well as Economic Sectors in Ouagadougou"** has been selected for the long-term future of Burkina Faso.

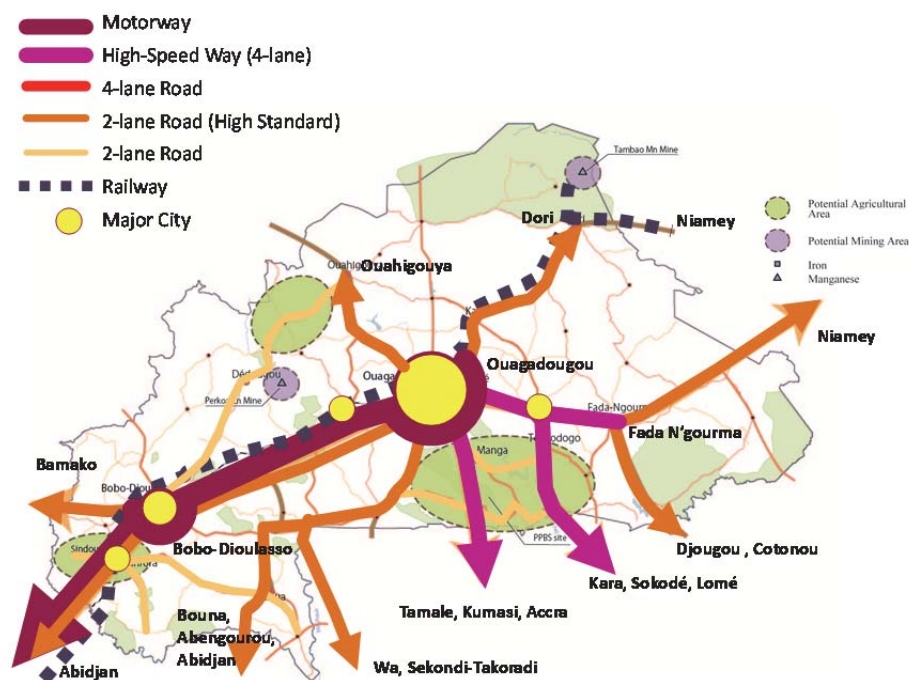


Figure 9.5.1 Selected Corridor Development Pattern for Burkina Faso in 2040

9.6 Phased Corridor Development Plan for Burkina Faso

In order to achieve the Corridor Development Pattern C-BF-2: “Promotion of Economic Sectors Targeting Sub-Regional Markets of Neighbouring Countries’ Large Cities, as well as Economic Sectors in Ouagadougou” by 2040, it is necessary to implement the following actions in a phased manner:

(1) Short Terms (2018-2025)

It is necessary to replace old road bridges and to improve deteriorated road pavements of primary transport corridors for the purpose of strengthening primary transport corridors of roads.

It is also necessary to replace old railway bridges and to improve deteriorated rail tracks of the existing railway connecting Abidjan and Ouagadougou for the purpose of strengthening the primary transport corridor of railway.

By taking advantage of those existing primary transport corridors, which are relatively in good conditions, it is essential to provide access roads to potential agricultural areas from transport corridors. At the same time, it is necessary to promote investment and development for irrigation facilities in sounding areas of Banfora.

By taking advantage of the existing railway operational up to Ouagadougou, it is essential to rehabilitate the existing track between Ouagadougou and Kaya and to newly construct a railway line between Kaya and Dori and furthermore up to Tambao in order to activate mining activities at Tambao Manganese Mine.

The existing railway between Abidjan and Ouagadougou should be utilized for promoting multi-modal transport by constructing multi-modal dry ports. It is also necessary to construct loading and off-loading facilities for cattle at railway stations in order to export live cattle to Côte d’Ivoire.

Moreover, in order to attract investments in economic sectors in the southern eastern areas surrounding of Bobo-Dioullasso, it is essential to enable cars and trucks to travel at a high speed by

constructing high-speed motorways partially between Ouagadougou and Bobo-Dioulasso. In the first phase, the southern sections (between N1 and N3) of the Outer Ring Road of Greater Ouagadougou are to be constructed, and furthermore, it is necessary to construct a motorway between Ouagadougou and Koudougou.

It is essential to develop signature agricultural products targeting sub-regional markets.

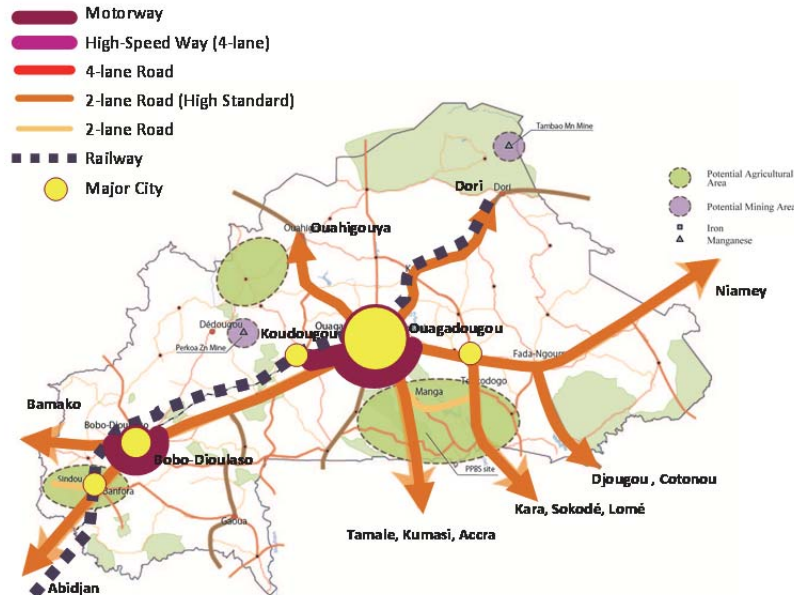


Figure 9.6.1 Corridor Development in 2025

(2) Medium Term (2026-2033)

Expansion of production and export of cattle is promoted. Promotion of investment and development is necessary for manufacturing in Bobo-Dioulasso.

It is necessary for Burkina Faso to develop specialized crops targeting middle-income consumers of sub-regional markets. Investment promotion for other agropoles is necessary. Development of signature agriculture products for sub-regional markets is essential.

In order to attract more investments in the southern western areas including Bobo-Dioulasso, it is essential to construct a southern section of Outer Ring Road of Bobo-Dioulasso. It is also essential to construct a motorway between Pâ and Bobo-Dioulasso to the east from Bobo-Dioulasso.

In order to speed up the connection between Ouagadougou and Lomé, it is necessary to upgrade the road between Ouagadougou and Koupéla to 4-Lane dualized road.

It is necessary to expand Bobo-Dioulasso multi-modal dry port in order to utilize the existing railway line for connecting with truck transport. For Bobo-Dioulasso, it is necessary to construct southern sections of Bobo-Dioulasso Outer Ring Road.

It is necessary to upgrade Bobo-Dioulasso International Airport for accommodating more frequent sub-regional and domestic flights.

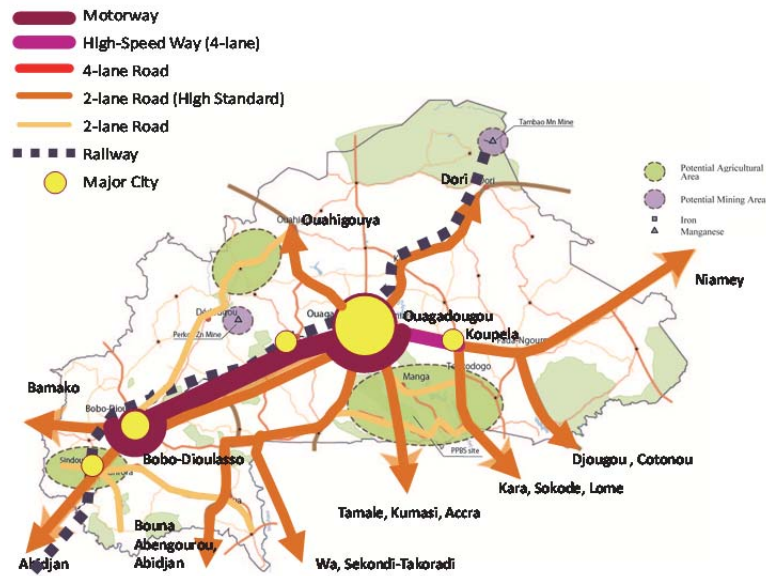


Figure 9.6.2 Corridor Development in 2033

(3) Long Term (2034-2040)

In order to strengthen the road network for Greater Ouagadougou, it is necessary to extend the eastern section (between N3 and N4) of Outer Ring Road.

In order to attract more investments to southern eastern areas of Burkina Faso, it is essential to complete the motorway between Ouagadougou and Bobo-Dioulasso by constructing a motorway between Pâ and Bobo-Dioulasso.

In order to upgrade the road from Ouagadougou to Lomé, it is essential to upgrade the road between Koupéla and Cinkassé to 4-Lane dualized road.

Upgrading of road between Koupéla and Fada-Genourma to 4-lane dualized road is important for to speed up the connection between Ouagadougou and Niamey and between Ouagadougou and Lomé. Bypass road for Fada-Ngrouma should be constructed.

A railway line from Lomé to Cinkassé is to be extended and a multi-modal dry port is set at Cinkassé. At the same time, loading and off-loading facility for live cattle at Cinkassé Railway Station together with cattle waiting pens

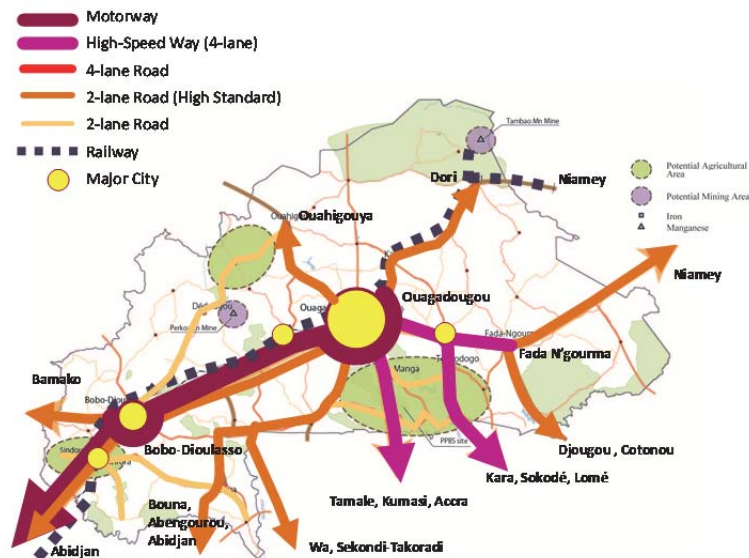


Figure 9.6.3 Corridor Development in 2040

9.7 Key Points for Burkina Faso's Corridor Development Plan

Located between 1,000 and 1,200 km from the coast, Burkina Faso is the only landlocked country in the four countries of WAGRIC Sub-Region, and high transport costs bear heavily on its economy. While mineral resources and cotton are exported outside the sub-region, agricultural and livestock products are also exported to neighbouring countries and well known by consumers of coastal areas. However, their volumes of production and export are not large enough to upgrade transport infrastructure of north-south corridors.

In view of large growth potential of coastal consumer markets, it is possible for Burkina Faso to increase their production and export to coastal sub-regional markets.

Fortunately, coastal countries have relatively well maintained transport infrastructure in the north-south direction (roads and railways) between the coastal and inland areas. Each of them is likely to try to upgrade corridor infrastructure (WAGRIC Master Plan strongly supports this policy) in order to reduce the regional disparity and to develop the economic sectors of the inland areas. It is time for Burkina Faso, too, to promote economic sectors targeting coastal markets and upgrade north-south corridor transport infrastructure to reach coastal areas.

Given this situation, in order to initiate and drive corridor development, Burkina Faso should implement the following measures by pushing the two types of buttons (necessary actions):

[Button A]: Development of economic sectors oriented to coastal consumers' markets of the sub-region should be promoted by making the following efforts:

- Improvement of access roads to potential agricultural areas from north-south corridors to coastal countries (Cote d'Ivoire, Ghana and Togo), and expansion of irrigation schemes in potential agricultural areas for increasing the production and export of existing products (agricultural and livestock products) oriented to sub-regional consumers' markets
- Development of new signature products oriented to middle-income populations of sub-regional markets (agricultural and livestock products and agro-processed and livestock-processed products)

[Button C]: North-south connectivity should be strengthened for reducing long-distance cargo transport costs for development of economic sectors in inland areas by taking the following action:

- Development of Multi-Modal Dry Port in Ouagadougou and Expansion of the Multi-Modal Dry Port in Bobo-Dioulasso for combining rail and truck transport for the purpose of expanding rail service areas and increasing rail transport demand, as well as for reducing cargo transport costs

[Button C]: North-south Connectivity should be strengthened by developing a high-speed transportation for attracting investment to economic sectors in inland areas as follows:

- Phased development of a motorway from Ouagadougou to Bobo-Dioulasso for strengthening the connectivity with coastal markets of Côte d'Ivoire
- Phased development of high-standard four-lane roads from Ouagadougou toward Togo and Ghana for strengthening the connectivity with coastal markets through Togo and Ghana

9.8 Priority Projects and High Priority Projects

9.8.1 Priority Projects

A total of 71 projects are selected as the priority projects to be implemented between 2018 and 2040 for Burkina Faso.

Priority projects to achieve the selected scenario by phases are listed in

Table 9.8.1 through Table 9.8.3.

These priority projects are selected by using the following criteria:

- Those projects which are required for implementing the ten essential strategies
- Those projects which could initiate and drive corridor development in line with the selected growth scenario
- Those projects which needs proactive implementation, ahead of increased demand for infrastructure or production of economic sectors
- Those projects which are technically and institutionally implementable

By using these criteria, the priority projects are selected not only from newly formulated projects by WAGRIC Project, but also from existing prioritized projects by individual countries' governments.

Table 9.8.1 Short-Term Priority Projects for Burkina Faso (2018-2025)

Sector	Priority Project for Burkina Faso
Agriculture	Marketing Support Project on the Bagré Growth Pole
	Project for Irrigation and Agribusiness Development in Douna, Karfiguéla and Kou Valley
	Project for Irrigation and Agribusiness Development in Sourou Valley
	Project for Irrigation and Agribusiness Development in Samendeni Valley
	Project for Development of Signature Agricultural Products and Marketing for Sub-Regional Markets Phase 1
	Project for Developing Irrigation Schemes in Wetlands
Livestock	Project for Basic Service Improvement for Cattle and Small Ruminants
	Project on Technical Development of Fodder Crop Production and Feeding Methods
	Project for Value Chain Development for Animal Products
Mining	Expansion of Mining Operation of Tambao Manganese Mine by Rehabilitation and Construction of Railway between Tambao and Ouagadougou through Dori and Kaya
Manufacturing	Integrated Development Project of Gounghin and Kossodo Industrial Zones in Ouagadougou <ul style="list-style-type: none"> • Expansion of Kossodo Industrial Area • Relocation of industries from Gounghin Industrial Area in the Centre of Ouagadougou to Kossodo Industrial Area • Rehabilitation of Gounghin Industrial Area
	Project for Human Resources Development for ICT Specialists
	Project for Establishment and Operation of Data Centre located in Ouagadougou
ICT	Project for Nationwide 5,000km Optic Fibre Cabling Project
	Project for Promotion of Utilization of Principles of Responsible Investments to Agriculture, Livestock and Fisheries Sectors
Investment Promotion	Promotion of Investment for Export Expansion of Cattle and Small Ruminants to Coastal Countries
	Promotion of Investment for Export of Beef and Other Animal Meat to Coastal Countries
	Promotion of Investment and Development for Bagrépole in Agriculture, Aquaculture and Agro-Processing
	Promotion of Investment and Development of Irrigated Agriculture in Karfiguéla, Douna and Vallé de Kou
	Promotion of Investment and Development for Manufacturing in Ouagadougou
	Promotion of Investment and Development for Manufacturing including Cotton Spinning Industry in Bobo-Dioulasso

Sector	Priority Project for Burkina Faso	
Road	Projects for Improvement of National and Regional Roads for Providing Better Access to Agriculture Potential Areas <ul style="list-style-type: none"> Improvement of Road (R21) between Banfora and Douna Improvement of Road (N17) connecting N5 and N16 (Guiba - Garango) Improvement of Road (R9 and N29) connecting N16 and N17 for Providing Better Access to Bagrépole Improvement of Road (N25) connecting N5 and N6 (between Pô and Nébou) Improvement of Road between Banfora and Mangodara 	
	Projects for Strengthening of Primary Transport Corridors by Upgrading Ring Roads, Replacement and Rehabilitation of Old Road Bridges and Improvement of Road Pavement <ul style="list-style-type: none"> Widening of Inner Ring Road (Tensoba Boulevard) of Ouagadougou Rehabilitation of National Road (N16) between Koupéla and Cinkansé (Border of Togo) Rehabilitation of National Road (N4) between Koupéla and Kantchari (Border of Niger) Construction of Inner Ring Road of Bobo-Dioulasso (Southern Section) Rehabilitation of National Road (N8) between Bobo-Dioulasso and Koloko (Border of Mali) Rehabilitation of National Road (N7) between Bobo-Dioulasso and Niangoloko (Border of Côte d'Ivoire) Replacement of Laleraba Bridge for Crossing the National Border between Burkina Faso and Côte d'Ivoire 	
	Projects for Construction of Motorway for Ouagadougou-Abidjan Corridor <ul style="list-style-type: none"> Construction of Southern Sections (between N1 and N4) of Ouagadougou Outer Ring Road (Southern Bypass) Construction of Motorway between Ouagadougou and Koudougou 	
	Railway	Project for Rehabilitation of Track of Kaya and Ouagadougou Railway Line and Construction of Railway between Tambao and Kaya through Dori for Transporting Manganese Ore from Tambao Mine
		Projects for Development of Loading and Off-Loading Facilities for Cattle at Railway Stations of the following railway stations together with Cattle Waiting Pens <ul style="list-style-type: none"> Railway Station in a Suburban Area of Ouagadougou Railway Station in a Suburban Area of Bobo-Dioulasso Railway Station in Kaya
		Preliminary Technical Study on Railway Development between Ouagadougou and Cinkansé
		Project for Replacement and Rehabilitation of Old Railway Bridges and Improvement of Track of Existing of Railway Line
	Urban Transportation	Project for Urban Transportation Master Planning for Greater Ouagadougou
	Logistics	Project for Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders
Project for Construction and Operation of One-Stop-Border Post (OSBP) at Laleraba (National Border between Burkina Faso and Côte d'Ivoire)		
Project for Operationalization of Cinkassé OSBP (National Border between Burkina Faso and Togo)		
Project for Construction and Operation of One Stop Border Post (OSBP) in Paga (National Border between Burkina Faso and Ghana)		
Project for Construction and Operation of Multi-Modal Dry Port for Ouagadougou including Construction of Access Road from N1 to Ouagadougou Multi-Modal Dry Port		
Project for Strengthening of Operation of Bobo-Dioulasso Multi-Modal Dry Port		
Project for Expansion of Bobo-Dioulasso Multi-Modal Dry Port		
Air Transport	Project for Construction and Operation of New International Ouagadougou Airport in Doshin	
	Project for Expansion and Renovation of Passenger Terminal Buildings of Existing Ouagadougou International Airport for Converting it to an Airport for Domestic and Sub-Regional Flights	
Electricity	Project for Electricity Interconnection Line (Kompienga-Porga [Benin]) Development	
	Project for Construction and Operation of Solar Power Plants in Rural Communes	
Water Resource	Project on Water Supply to Ouagadougou from the Ziga Dam (Ziga II) Stage 2	
	Project for Expansion of Water Supply System in Bobo-Dioulasso	

Source: JICA Study Team

Table 9.8.2 Medium-Term Priority Projects for Burkina Faso (2026-2033)

Sector	Priority Project for Burkina Faso
Agriculture	Project for Development of Signature Agricultural Products and Marketing for Sub-Regional Markets Phase 2
Livestock	Project for Continued Basic Service Improvement for Cattle and Small Ruminants
	Project on Continued Technical Development of Fodder Crop Production and Feeding Methods
	Project for Continued Value Chain Development for Animal Products
Manufacturing	Project for Construction and Operation of New Industrial Park along an Outer Ring Road in Bobo-Dioulasso
ICT	Project for Continued Human Resources Development for ICT Professionals
Investment Promotion	Continued Promotion of Investment for Export Expansion of Cattle and Small Ruminants to Coastal Countries
	Continued Promotion of Investment for Export of Beef and Other Animal Meat to Coastal Countries
	Promotion of Investment for Other Agropoles
	Continued Promotion of Investment and Development of Irrigated Agriculture
	Continued Promotion of Investment and Development for Manufacturing in Ouagadougou
	Continued Promotion of Investment and Development for Manufacturing in Bobo-Dioulasso
Road	Projects for Improvement of National and Regional Roads for Providing Better Access to Agriculture Potential Areas <ul style="list-style-type: none"> Improvement of Road between Dédougou and Ouahigouya through Tougan for Sourou Agricultural Potential Area Improvement of Road connecting N5 and N16 between Pô and Bittou Improvement of Road (N11) between Orodara – Banfora – Gaoua – Boarder of Côte d'Ivoire
	Projects for Construction of Motorways of Ouagadougou-Abidjan Corridor <ul style="list-style-type: none"> Construction of Southern Section (between N1 and N8) of Bobo-Dioulasso Outer Ring Road (Southern Bypass) Construction of Motorway between Koudougou and Bobo-Dioulasso
	Projects for Upgrading to 4-Lane High-Speed Ways to Neighbouring Countries <ul style="list-style-type: none"> Construction of 4-Lane High-Speed Way between Ouagadougou and Koupéla Upgrading of Road N6 to a High-Standard 2-Lane Road between Ouagadougou and Léo Upgrading of Road N 20 to a High-Standard 2-Lane Road between Léo and Djipologo (toward Eastern Corridor of Côte d'Ivoire) Upgrading of Road N 20 to a High-Standard 2-Lane Road between Ouessa and Hamile (toward Wa of Ghana) Upgrading of Road N 12 to a High-Standard 2-Lane Road between Djipolgo and Gatapoula (toward Bouna of Côte d'Ivoire)
Pipeline	Construction of Oil Multi-Products Pipeline between Ouagadougou and Bingo (National Border with Ghana)
Logistics	Strengthening of Operation of Laleraba OSBP (National Border between Burkina Faso and Côte d'Ivoire)
	Strengthening of Operation of Cinkassé OSBP (National Border between Burkina Faso and Togo)
	Strengthening of Operation of Paga OSBP (National Border between Burkina Faso and Ghana)

Source: JICA Study Team

Table 9.8.3 Long-Term Priority Projects for Burkina Faso (2034-2040)

Sector	Priority Project for Burkina Faso
Agriculture	Project for Development of Specialized Crops Targeting Middle-Income Consumers of Sub-Regional Markets
Livestock	Continued Expansion of Production and Export of Beef and Other Animal Meat to Coastal Countries
	Continued Expansion of Production and Export of Cattle and Small Ruminants to Coastal Countries
Road	Projects for Upgrading to 4-Lane High-Speed Ways to Neighbouring Countries <ul style="list-style-type: none"> Upgrading to a 4-Lane High-Speed Way between Koupéla and Cinkansé including Bypass for Koupéla (toward Togo) Upgrading to a 4-Lane High-Speed Way between Koupéla and Fada N'Gourma including Bypass Road for Fada N'Gourma (toward Niger and Benin) Upgrading to a 4-Lane High-Speed Way between Ouagadougou and Paga (toward Tamale)
Railway	Project for Development of Loading and Off-Loading Facility for Cattle at Cinkansé Railway Station together with Cattle Waiting Pens
Pipeline	Construction of Oil Multi-Products Pipeline between Bobo-Dioulasso and National Border with Côte d'Ivoire
Logistics	Project for Construction and Operation of Multi-Modal Dry Port of Cinkansé

Source: JICA Study Team

9.8.2 High Priority Projects

Out of priority projects formulated and shown in the above sections, the fifteen priority projects are selected as “High Priority Projects” for achieving the selected Corridor Development Pattern **C-BF-2: “Promotion of Economic Sectors Targeting Sub-Regional Markets of Neighbouring Countries’ Large Cities, as well as Economic Sectors in Ouagadougou.”**

Outlines, funding schemes and estimated project costs of the high priority projects are shown in Table 9.8.4.

Table 9.8.4 Outlines of High Priority Projects for Burkina Faso

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
1	A	1	Expansion of Mining Operation of Tambao Manganese Mine by Rehabilitation and Construction of Railway between Tambao and Ouagadougou through Dori and Kaya (Burkina Faso)	PPP	US\$ 606 million
<p><u>Project Outline</u> Exploitation and export of minerals is one of the most important products supporting the national economy of Burkina Faso. The export value of minerals accounts for over 66% (year 2016) of the total export value, while gold is the most important mineral for export. It is necessary for Burkina Faso to continue to expand mineral resources exploitation and export by diversifying its minerals. Tambao’s manganese is one of the important target minerals for increasing mineral production and export for Burkina Faso. The project will rehabilitate the existing rail section between Ouagadougou and Kay (103 km) and will construct two new rail sections, one section between Kaya and Dori (155 km) and another section between Dori and Tambao (83 km), in order to increase the transport volume of manganese ore from Tambao Mine to Abidjan Port. In addition to these rail sections to be rehabilitated and newly constructed, the transport of manganese ore from Tambao Mine to Abidjan Port depends on the existing Ouagadougou-Abidjan Railway (Sitarail). The annual transport demand of manganese ore for this railway is 1 million ton. This project is required for expansion of mining production of Tambao Mine, while preventing the deterioration of roads and reducing the transport cost of manganese ore. This project should be implemented by the private mining concessioner. However, the government should support the planning and construction of the railway in respect of land acquisition and coordination with local communities along the railway line. The rail section which is to be completed by this project would be part of the railway connecting Ouagadougou (Burkina Faso) and Niamey (Niger). Moreover, the rail sections of Dori-Kaya-Ouagadougou could also strengthen the transport capacity of live cattle from Burkina Faso and Niger to coastal countries.</p>					
2	A	1	Project for Development of Signature Agricultural Products and Marketing for Sub-Regional Markets (Burkina Faso)	ODA Technical Assistance & Private Investment	US\$ 5 million
<p><u>Project Outline</u> The project will aim at development of new agricultural products which can be produced in Burkina Faso and can be exported to neighboring countries in the sub-region by targeting middle income populations. Burkina Faso has developed fresh vegetable and fruits, such as tomato and strawberry, for exporting to coastal markets. In response to growing consumers’ markets of middle income populations in coastal areas, it is necessary for government agricultural research institutes to conduct research & development (R&D) activities in collaboration with private traders and buyers. Such R&D activities include 1) testing of new varieties of vegetable and fruits to be eaten raw, 2) testing of such new varieties vegetable and fruits with prospective consumers, 3) development and testing of low-cost methods for cold chain transport (by utilizing crushed ice and form coolers) and 4) testing of sales in supermarkets in coastal areas.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
3	A	1	Projects for Expansion of Livestock Production including 1) Project for Basic Service Improvement for Cattle and Small Ruminants, 2) Project for Technical Development for Fodder Crop Production and Feeding Method, and 3) Project for Value Chain Development for Animal Products (Burkina Faso)	ODA Technical Assistance and Private Investment	US\$ 8 million
<p><u>Project Outline</u></p> <p>The coastal countries in West Africa have increased the import of beef in the last decade because of the increase of middle-income populations in its coastal areas, mainly in large metropolitan areas, such as Greater Abidjan, Greater Accra and Greater Lagos. The beef consumed in coastal countries is imported in the form of raw meat not only from outside of the sub-region, but also it is imported in the form of live cattle from inland countries such as Burkina Faso, Mali and Niger.</p> <p>The traditional way of supplying cattle and other animals from inland countries to coastal countries is transhumant, in which seasonal migration of cattle and headers is organized following rain and grasses. At the same time, live cattle are transported by truck from inland countries, such as Burkina Faso, Mali and Niger, to coastal areas. However, in these two methods of supplying cattle to coastal markets, those cattle are not so well fattened before transporting and selling to coastal markets. Therefore, in order to increase the value added, it is important to fatten cattle by providing nutritious feed within Burkina Faso before transporting to coastal areas and slaughtering.</p> <p>There are two ways of fattening and transporting cattle before slaughtering. The one way is fattening cattle and slaughtering cattle within Burkina Faso and then transporting fresh beef to coastal areas. The other way is fattening cattle and transporting them by truck or by railway to coastal areas for slaughtering.</p> <p>In order to implement these ways for expanding supply volume of fattened cattle or beef to coastal markets, the following three measures or projects should be implemented:</p> <ol style="list-style-type: none"> 1) Project for Basic Service Improvement for Cattle and Small Ruminants <ul style="list-style-type: none"> • To establish a disease prevention and health extension system for cattle and small ruminants by establishing veterinary posts 2) Project for Technical Development for Fodder Crop Production and Feeding Method <ul style="list-style-type: none"> • To develop and disseminate fodder crop production and feeding methods for fattening of cattle and small ruminants for exporting to coastal markets, as well as for slaughtering in Burkina Faso 3) Project for Value Chain Development for Animal Products <ul style="list-style-type: none"> • To build and operate modern slaughterhouses in Ouagadougou and Bobo-Dioulasso • To create a cold chain system to supply fresh meat from Ouagadougou and Bobo-Dioulasso to coastal markets 					
4	A	2	Investment Promotion for Economic Sectors targeting Sub-Regional Markets	ODA Technical Assistance	US\$ 4 million
<p><u>Project Outline</u></p> <p>In 2013, the governmental agency for investment promotion (<i>Agence de Promotion des Investissements du Burkina Faso</i>, API-BF) was established. It has tried to attract investment to infrastructure development, as well as to the mining sector. However, it has not paid much attention to the growth potential of Burkina Faso's economic sectors targeting coastal markets in the sub-region.</p> <p>By emphasizing the importance and possibility to integrate and expand the size of sub-regional consumers' markets, it is possible for API-BF to attract investment to economic sectors targeting sub-regional consumers' markets. Such target economic sectors include those of agriculture, livestock, fisheries and agro-processing.</p> <p>The project aims to make a clear shift of investment promotion toward economic sectors orientated to sub-regional markets. For this purpose, the project will prepare new promotion materials, provide training to related agencies and personnel and implement actual activities for investment promotion.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
5	A	3	Project for Electricity Interconnection Line (Komienga-Porga [Benin]) Development (Construction of Interconnected Power Transmission Lines between Burkina Faso and Benin)	ODA Loan	US\$ 54 million
<p><u>Project Outline</u> In Burkina Faso, the peak demand for electricity has steadily increased at high annual growth rates of 9-15% since 2011. The power generation within Burkina Faso depends on thermal power plants using costly imported heavy oil and diesel oil. The current domestic power plants do not supply enough electricity to satisfy the whole load in Burkina Faso. In order to fill the short fall, Burkina Faso imports electricity through an interconnection line with Côte d'Ivoire under the system of West African Power Pool (WAPP). However, the interconnection line with Côte d'Ivoire is a single circuit 225kv transmission line. In order to improve the reliability of the power supply from other WAPP countries, it is important to establish new interconnection lines with Burkina Faso's surrounding countries. The project aims at establishment of another interconnection line with Benin for this purpose. The project will construct the following two facilities:</p> <ul style="list-style-type: none"> • Two circuits of 161kV transmission lines with a line length of around 30km • Substations with two 161kV/132kV transformers 					
6	A	3	Project for Development of Irrigation Schemes in Wetlands	ODA Technical Assistance and ODA Grant	US\$ 30 million
<p><u>Project Outline</u> Burkina Faso used to produce and export agricultural and livestock products to neighboring countries' markets, as well as oriented to domestic markets. However, the volumes of production and export of those products have not been so large recently. Since coastal demands of middle-income populations are increasing for agricultural and livestock products, and roads and railway are to be upgraded along corridors to coastal areas, it is possible to take measures for expanding the volume of production and export of such products to coastal markets. One of the measures is to expand irrigation schemes for agricultural production. Currently JICA provides technical assistance to Burkina Faso's Ministry of Agriculture and Water Resources in conducting a technical study for irrigation schemes in wetlands, including identification of possible sites for developing irrigation schemes. Based on findings of the technical study, this project will develop irrigation schemes for expanding agricultural production targeting sub-regional coastal markets.</p>					
7	A	3	Projects for Development of Cattle Loading and Off-Loading Facilities and Cattle Waiting Pens at Railway Stations (Suburban Ouagadougou, Suburban Bobo-Dioulasso and Kaya)	ODA Grant	US\$ 10 million
<p><u>Project Outline</u> In order to respond to the increasing demand for beef and meat of small ruminants in the coastal markets, the transporting of live cattle and small ruminants by railway from inland countries to coastal areas is one way for expanding the volume of export and reducing transport costs. In coastal areas, fresh meat will be made of such live cattle and small ruminants in modern slaughterhouses. For this purpose, it is necessary for Burkina Faso to create loading and off-loading facilities for cattle and cattle waiting pens at railway stations. This transport of live cattle and small ruminants will depend on the existing Ouagadougou-Abidjan railway and Kaya-Ouagadougou railway. The target areas for installing loading and off-loading facilities, as well as cattle waiting pens, are three railway stations, namely, one in Suburban Ouagadougou, one in Suburban Bobo-Dioulasso, and one in Kaya. These three railway stations will attract cattle and small ruminants from the following areas:</p> <ul style="list-style-type: none"> • Suburban Ouagadougou for receiving cattle from central areas of Burkina Faso, • one in Suburban Bobo-Dioulasso from western areas of Burkina Faso and Mali, and • one in Kaya from Sahel Region of Burkina Faso and Niger 					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
8	B	4	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders	ODA Technical Assistance	US\$ 4 million
<p><u>Project Outline</u> Burkina Faso used to be famous for exporting agricultural and livestock products to neighbouring countries. Burkina Faso's cowpeas, tomato and strawberry are very popular in the coastal consumers' markets within the sub-region. In addition to export of primary commodities, such as minerals and agricultural products, Burkina Faso should make significant efforts at expanding existing and newly developed products of agriculture, livestock and agro-processing oriented to growing coastal markets of the sub-region. For this purpose, it is necessary to strengthen the implementation of the customs union by taking advantage of the customs union, which has been institutionalized by the member countries of UEMOA and ECOWAS.</p> <p>The project aims at enforcement of implementation of the customs union and trade facilitating for sub-regional products with neighbouring countries of the sub-region. The project will establish new materials for training and train related agencies and personnel. Campaigns for customs union trade facilitation of sub-regional products will also be implemented together with WAGRIC countries and its surrounding countries under this project.</p>					
9	C	6	Project for Construction and Operation of Multi-Modal Dry Port in Ouagadougou	ODA Grant & PPP	US\$ 93 million
<p><u>Project Outline</u> Burkina Faso is connected with Abidjan Port by an existing long-distance railway, Sitarail. However, the service areas (catchment areas) of the railway are limited to the areas closer to Ouagadougou and Bobo-Dioulasso. Therefore, it is necessary to expand the service areas of the railway and increase cargo demand for the railway by combining rail transport and truck transport.</p> <p>At present, dry ports are popular and useful instruments for smoothing of national border crossings of cargo transport between Burkina Faso and surrounding countries. In Ouagadougou, there is one dry port functioning, but it is located away from the existing railway line. As a result, it is not operational as a facility to connect truck transport and rail transport.</p> <p>This Project aims at relocating, upgrading and expanding the existing dry port of Ouagadougou to a multi-modal dry port in Ouagadougou. The multi-modal dry port is composed of the following infrastructure and facilities:</p> <ul style="list-style-type: none"> • Cargo railway station • On-loading and off-loading machine • Truck Parking Lots • Bonded warehouses of customs office • Private companies' warehouses • Container yards • Customs offices • Private companies' offices <p>For this Project, a land area of 47 ha has been secured adjacent to the existing railway line in the western area of Greater Ouagadougou. Another 300 ha of vacant land is available next to the project site for future expansion. A pre-feasibility study for development of this multi-modal dry port was completed in 2012.</p>					
10	C	6	Project for Expansion of Multi-Modal Dry Port in Bobo-Dioulasso	ODA Grant & PPP	US\$ 50 million
<p><u>Project Outline</u> Bobo-Dioulasso has a multi-modal dry port adjacent to the railway. This dry port is used by trucks crossing national borders, and it is also used for combining rail transport and truck transport.</p> <p>The multi-modal dry port of Bobo-Dioulasso has a total area of 130 ha for its operation. However, currently only 19 ha of land have been used for operation of the multi-modal dry port. Cargo volumes using the multi-modal dry port of Bobo-Dioulasso have increased rapidly since 2010. A 6.8% increase of cargo from 2012 to 2013 and 16.2% increase of cargo from 2013 to 2014 were recorded.</p> <p>It is necessary for Burkina Faso to expand service areas of the existing railway, increase cargo transport demand for the railway and reduce transport costs. For this purpose, it is necessary not only to activate the function of the existing multi-modal dry port for combining rail and truck transport, but also to expand the capacity of the multi-modal dry port in Bobo-Dioulasso.</p> <p>This project aims at expansion of the facilities for the multi-modal dry port for satisfying the increasing cargo demand for the multi-modal dry port. Land development of 12 ha is planned, and furthermore, 40 ha of land development is considered.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
11	C	7	Construction of Southern Section (between N1 and N4) of Ouagadougou Outer Ring Road (Southern Bypass)	PPP	US\$ 410 million
<p><u>Project Outline</u> Greater Ouagadougou's urban areas have expanded from Ouagadougou Municipality to surrounding areas, accommodating 2.6 million urban populations in year 2015. Its urban population is expected to increase to over 7.7 million by 2040. The Outer Ring Road of Greater Ouagadougou is planned to run through a radius of 18 km. This will provide a large spatial framework for future urban expansion. On the other hand, this Outer Ring Road will have a large bypass road for the central area of Ouagadougou. The Southern Section (about 60 km) of the Outer Ring Road is to connect National Road No.1 (N1, Ouagadougou - Bobo-Dioulasso) and National Road No.4 (N4, Ouagadougou - Koupéla - Fada-Ngourma - Niamey). Between N1 and N4, there are two more national roads, namely N5 (from Ouagadougou to Tamale, Kumasi and Accra) and N6 (from Ouagadougou to Wa, and from Ouagadougou to Bouna, Abengourou and Abidjan). By using this Southern Section of the Outer Ring Road, a route out of the four national roads (N1, N6, N5 and N4) can be chosen without going through the central area of Ouagadougou. A multi-modal dry port will be located near the western end of this Southern Section of the Outer Ring Road. Large trucks can get easy access to this multi-modal dry port by using the Outer Ring Road without going through the central area of Ouagadougou.</p>					
12	C	7	Projects for Construction of Motorway between Ouagadougou and Koudougou and Motorway between Koudougou and Bobo-Dioulasso	PPP	US\$ 478 million US\$ 1,400 million
<p><u>Project Outline</u> Burkina Faso has four major corridors connecting with coastal countries and sea ports, namely, Ouagadougou-Abidjan, Ouagadougou-Tema and Ouagadougou-Lomé and Ouagadougou-Cotonou. In the WAGRIC Master Plan, it is recommended that one motorway should be developed for Ouagadougou-Abidjan Corridor and high-standard four-lane roads should be developed for Ouagadougou-Tema Corridor and Ouagadougou-Lomé Corridor. These three high-speed transportation routes are important for Burkina Faso to attract investment to economic sectors targeting coastal markets of the sub-region. The first phase of construction of the motorway between Ouagadougou and Bobo-Dioulasso will be the section between Ouagadougou and Koudougou (about 75 km). The second phase will be the section between Koudougou and Bobo-Dioulasso (about 230 km). Greater Ouagadougou, capital city of Burkina Faso, had 2.6 million urban populations in 2015, while Koudougou had 115,000 in 2015.</p>					
13	C	7	Project for Construction and Management of Data Centre in Ouagadougou	ODA Grant	US\$ 15 million
<p><u>Project Outline</u> Information, Communication and Technology (ICT) is an important growth driver among the economic sectors in Burkina Faso, in accordance with the National Development Plan. This project will establish a data centre at a technological park in Ouagadougou. The technology park is planned in the south of Greater Ouagadougou on National Road No.5 (Ouagadougou-Tema Corridor). The technological park is a kind of a high-technological industrial park, which would attract and accommodate ICT-related companies and technology-related companies. The data centre will aim to be the nerve centre of the government intranet, especially in the context of progressive development of e-Government. The data centre is to provide a back-up of international standards of security and to accommodate a large volume of data and computer applications in the environment with strict standards. This type of ICT-related facilities is important for providing job opportunities for ICT specialists.</p>					
14	D	10	Project for Strengthening of Airport Security by Installing Security Equipment	ODA Grant	US\$ 20 million
<p><u>Project Outline</u> More movements of goods and people will be generated within the sub-region and between the sub-region and outside the sub-region, due to development of the north-south corridors and the coastal corridor in the sub-region. To correspond to such increase in movements, it is necessary to install equipment and providing training to strengthen security at national borders, including airports.</p>					
			Total		US\$ 3,187 million

Chapter 10 Development Strategies for Economic Sectors of Burkina Faso

10.1 Agriculture Sector of Burkina Faso

10.1.1 Present Situation and Future Prospects of Agriculture Sector of Burkina Faso

Occupying more than 30% of GDP and more than 85% of the working population, the agricultural sector is a main source of livelihood and economic activity in Burkina Faso. However, approximately 50% of rural people, mostly crop producers, are still living under the poverty line and even suffer from food shortage in lean seasons. This is because the agricultural production is unstable due to extensive cropping practice and recent climate change, and the agriculture sector cannot generate a sufficient amount of income for crop producers.

Nevertheless, the country still has certain potentials for the agricultural development. It is estimated that there are nine million hectares of arable land, of which less than 50% are used. In addition, 1,200 water bodies (dams, lakes, ponds, rivers) are only partially utilised for agricultural production. Additionally, there are competitive crops, such as cowpeas, tomato and mango, which have had a good reputation in the sub-regional markets. As niche products, sesame, fonio and tiger nuts are grown in some parts of the country which can possibly lure international investors. In particular, strawberries grown in Burkina Faso are the only ones in West Africa, and are always in high demand in the coastal areas.

Aiming at sustainable economic growth by agricultural development, the government is preparing a new development strategy for the next five years 2016-2020. In accordance with the strategy, seven objectives and approximately 40 programmes/projects are planned including development of irrigation facilities and mechanization to expand crop production. The new strategy is to promote entrepreneurs of agricultural producers and manufacturers (processing) by strengthening the partnership within the private sector for better marketing. As markets exist for certain local agricultural products in the sub-region and whole West Africa, it will be possible to create a big impact to the national economic growth by taking those measures under the new strategies in the agricultural sector.

From market perspectives, Burkina Faso's agriculture is characterized by the orientation to neighbouring coastal markets of the sub-region.

In recent years, Burkina Faso has developed the following crops targeting overseas markets:

- Sesame
- Tiger nuts

On the other hand, Burkina Faso has been famous for the following products exported to coastal markets of the sub-region:

- Cowpea: production and marketing for the sub-regional markets
- Irish potato and tomato: production and development of related industry for targeting both domestic and sub-regional markets
- Strawberry and fonio: production and trade for sub-regional markets
- Mango: processing and trade for sub-regional markets
- Rice: production, processing and trade for domestic and sub-regional markets

The size of coastal consumers' markets will be expanding in response to prospective economic growth of WAGRIC countries. The demand for different types of agricultural products (vegetable and fruits for eating in fresh form) would increase in accordance with the increase of middle-income populations and life style changes.

10.1.2 Issues regarding the Agriculture Sector of Burkina Faso

The main issues in the sector are unstable production and not being a good income source for the rural producers. Thus farmers sometimes suffer from food shortage and poverty even though they produce agricultural products relatively competitive in regional market. Those problems are caused mainly by three points, namely; (i) extensive agricultural cropping practice, (ii) lack of adequate infrastructure in rural areas and (iii) undeveloped agro-industry of which details are explained below.

(1) Lack of Adequate Infrastructure in Rural Areas

The most important requirement for stable agriculture production is the full or complementary irrigation system and facilities. Indeed, more than 230,000 ha of irrigable land and 500,000ha of lowland (called 'bas-fond' in French) have not been utilized efficiently. For many years, measures have been taken by various projects but those experiences were not well recorded or followed up. In the light of the situation, the government is planning to implement integrated projects by developing the potential land that has been identified.

The rural tracks also should be rehabilitated or developed, even main roads and urban markets. The poor access causes extremely expensive shipping fees; which sometimes make up half to one third of the product price¹. Thus, most individual producers cannot go to markets and sell their products at a reasonable price. In consequence, producers have no choice but to sell their products at cheap prices when traders come to their places. This makes producers suffer lower income.

In order to expand the production of agricultural products targeting growing costal markets of the sub-region, it is important for Burkina Faso to expand agricultural land under irrigation schemes. At the same time, it is also important for Burkina Faso to improve access roads to agricultural potential areas from Ouagadougou-Abidjan Corridor, Ouagadougou-Tema Corridor and Ouagadougou-Lomé Corridor.

(2) Extensive Agricultural Practice

Most of the producers in the country are practicing rain-fed agriculture with extensive cropping due to lack of irrigation facilities in the country. Thus the production is highly influenced by the recent climate change, and the production is erratic and unstable. Additionally, agricultural inputs and machinery are barely used in the production because they are too expensive for the producers and/or they are not available in the rural areas because rural track condition mostly is not good. For that reason, neither the quantity nor the quality can be constant.

The products that are of unstable quantity and lower quality should sell for a lower price, and the producers cannot help selling at whatever the going prices are. If the producers cannot harvest enough food and cash crops, they must sell them immediately for survive for the time being, and therefore, they sometimes suffer from food shortage.

(3) Undeveloped Agro-industry

Due to the unstable production in quantity and quality caused by the above-mentioned two issues, agro-industrial activities, such as food processing, have not been so well developed in Burkina Faso. Traders collect agricultural products as a raw material from all over the country and send them to sub-regional countries, such as Ghana, Côte d'Ivoire and Nigeria. Agricultural products exported from Burkina Faso are processed and sold as foods or feed after adding value in other countries, and then such processed products are exported back into Burkina Faso.

¹ According to the report from officers in the Bagrépole

Furthermore, even if foods are processed in Burkina Faso, the processed food sometimes cannot be competitive in the domestic markets. In fact, the processed rice and sugar were not shared in the domestic markets. People, mostly wealthy people, prefer to buy the imported products that they are used to buying because they consider them to be cheaper and better quality even though they are not so cheap in actuality.

10.1.3 Objectives for Agriculture Sector of Burkina Faso

Needless say, the overall objectives of the agricultural sector are food security and poverty reduction since this sector is the main economic activity in Burkina Faso. Regarding those, the objective here is to realize stable production with certain quantity and quality in optimal location for each products, which is one of the fundamental means to achieve the overall objectives; ‘unstable agricultural production’ is the main bottle neck of food insecurity, less income of farmers and underdeveloped related industry in the country.

More than two thirds (2/3) of the region have the capacity to grow crops for food and/or cash if they improve rural environment such as irrigation facilities and rural road, and present production methods. If certain crops can be produced stably with certain quality and quantity there, it will be possible to feed people in the county and to sell the surplus to other countries. Moreover, the market size of the neighbouring coastal countries is expected to grow rapidly due to prospective economic growth and increasing middle-income populations.

Furthermore, agriculture-related industries can be created if raw materials are provided regularly in the country, and the value of agricultural products will be added which leads more income for farmers as well as for the country. However, the strategy and measures to gain competitiveness for domestic agricultural products competing to imported ones for the agricultural industrial development.

10.1.4 Strategies for Agriculture Sector of Burkina Faso

In order to achieve overall objective, the strategy of agriculture sector will be to optimise and develop supply chain of agricultural products in called as ‘Filière’ by crop and its use in accordance with domestic, regional and international demand. It is necessary to ; i) to focus on crops which are indispensable for food security, competitive at the present and potential to expand market share in the future and ii) to differentiate measures according crops, its destinations and range of supply chain development.

For instance, maize and rice, which are important as food crops particularly in domestic market, alternatively for self-consumption and for cash income by selling in sub-regional markets, should be promoted as well for food security and diversification of cash crops. Stabilising production in certain quality and quantity can make it easy to sell and raise the incomes of rural people. This also allows them to start related businesses like processing or control of the trade to the sub-regional markets.

Several cash crops produced such as pulse crops (cowpea, soy beans, ground nuts), fresh vegetables (tomato, Irish potatoes) and fruits (especially mango) etc. in Burkina Faso have already comparative advantages in variety in sub-regional and international markets. Additionally, the country has some niche products such as strawberry, fonio and tiger nuts, etc. which have a potential to be special and signature products in the future in both markets.

- The cross-cutting proposed measures for optimise and develop supply market of those crops are as follows: By developing or rehabilitating water facilities and rural roads connecting to the main road and/or the corridor for the issue of “Lack of Adequate Infrastructure in Rural Area”
- By implementing appropriate agricultural practices; inputs and material distribution, mechanization, techniques adapted to current environmental conditions, etc. for the issue of ‘Extensive Agricultural Practice’ and
- By organizing agricultural producers to make their products competitive through collective

sales and shipping adjustment as an agribusiness, and to attract private investors for creation of agro-industry for the issue of ‘Undeveloped Agro-Industry’.

By appealing the increasing potentiality of these agricultural products especially oriented to coastal sub-regional consumers’ markets, it is necessary to attract investment to the agricultural sector and trade sector related to agricultural products.

The specific measures which are different by crop, its main destination and range of supply chain development are described in the following table.

Table 10.1.1 Different Measures by Crop

Products	Main destination	Range of Supply chain to be developed (final products) in the country	Specific measures
Maize, Rice	Domestic market Sub-regional market (Senegal, Mali, Niger, Ghana & Nigeria)	Maize: un processed and milled Rice: threshed, milled or par boiled (processing)	-Capacity building on marketing -Warehouse development -Introduction of machinery and hygiene and quality control for processing, etc.
Pulse crops	Domestic market Sub-regional market (esp. coastal counties) International (EU)	Cowpea :Unprocessed Soya bean: Unprocessed or processed (oil, cake, feed) Ground nuts: Unprocessed or processed (paste)	
Fresh Vegetables	Sub-regional market (esp. Côte d'Ivoire and Ghana)	Unprocessed (fresh)	-Cold chain development -Introduction of hygiene and quality control , etc.
Fruits	Sub-regional market (esp. Côte d'Ivoire and Ghana) International market (EU)	Unprocessed or processed (dry fruits, juice)	-Warehouse development -Introduction of machinery and hygiene and quality standard for processing, etc.
Niche products	Sub-regional market (esp. coastal counties) International (EU, USA, Asia)	Unprocessed (fresh)	-R&D of the seed, production techniques, harvest management -Cold chain development (strawberry) - Capacity building on marketing

Source: JICA Study Team based on the interview from the MAAH, SONAGESS and the Ministry of Commerce and Trade

10.1.5 Programmes and Projects for Agriculture Sector of Burkina Faso

The above-mentioned measures can be independent projects, but it is highly advisable to consider coordination with on-going and newly planned projects. Moreover, some preparative or proposed projects may also be necessary. Based on the new agricultural policy 2016-2020 and comments from the Ministry of Agriculture and Water Resources (MAAH: *Ministre de l'Agriculture et des Aménagements Hydrauliques*), the following table describes the projects to be implemented for the agricultural development which may contribute mutually with the Corridor Development. The projects are classified according to the volume of contents; ‘Integrated Project’ is including several measures on many crops and issues, while ‘Specified Project’ is focusing on one objective such as establishment of an input distribution centre or one crop category such as a vegetable or niche crops.

Table 10.1.2 Integrated Projects of the Agricultural Sector

Projects	Objective and Main activities	Status
Bagré Growth Pole Project (PPCB): 2012-2017 (Boulgou, Zoungwéogo, Nahouri)	For reinforcement of rural livelihood activities to generate income, increase employment and lure private investment in the agricultural sector. A total of 2582ha has been prepared for improvement and has been reviewed by the World Bank. <u>Development of rural tracks is indispensable to solve current marketing problems for rice.</u> Target crops are mainly rice, but can be diversified like Irish potatoes, tomato, and sesame in the off-season.	On going
Integral Development Programme of Sammandeni (PDIS): 2008-2015 (1st), 2016-2019 (2nd)	For contributing to increased economic activity in the Project Area resulting in an increase in private investment, employment generation, and agricultural production with a potential irrigation scheme of 30,000ha. 20km of rural tracks and agribusiness promotion are included in the 2nd phase.	On going
Plan cadre d'aménagement de la vallée Sourou: 1986-	For promoting agri-business for rice, wheat , potatoes and vegetables. For that purpose, reorganization of producers, ICT network, and equitable productions are currently being supported. Additionally, establishment of an input procurement centre and mechanical workshop are included.	Planned
Agribusiness and Irrigation Development in Karfiguéla (Banfora)	Planned long ago but it has not been well developed due to an inadequate national budget. There is 750ha, which has a potential to develop rice, maize and fruit production as well as livestock by rehabilitating a dam. The rice processing (boiled rice) and export has already been started by women's groups	Planned

	and can be extended. Niche crops such as Tiger nuts and fonio production can be included in the project	
Agribusiness and Irrigation Development in Doana (Banfora)	For production development of Rice, Maize and Fruits and creation of related industry in 1500ha. Works are suspended due to degradation of facilities & no finance from international donors. Tiger nut production can be included in the project. West African Irrigation Project (WAIPRO) has already been supporting producers in terms of organization	Partially implemented
Food Supply Chain Development in Kou Valley (Houet)	For production development of Rice and Vegetables to satisfy food supply to Bobo-Dioulasso . The potential area is 1260ha where a small dam will be constructed as a solution to water shortage. Water concurrence with the centre of Bobo-Dioulasso are occurred thus the countermeasures should be considered.	Planned
Food Supply Chain Development in Banzon (Kénébougou)	For production development of Vegetables, Rice, Maize and Fruits and creation of related industries in 454ha. Survey was done but no financial source has been found.	Planned
Agricultural Productivity and Food Security Project (PAPSA) : 2009-2018	For poverty reduction through improvement of accessibility of poverty areas to growing markets. Target crops are main foods in the country, Maize, Rice and Cowpea , etc. Those who are in severe poverty areas, especially women and young people are targeted.	On going
Low Land Development Project	For stable agricultural production and off-season production by developing complementary irrigation. A JICA study is to distinguish the potential areas and design a MP and projects. From among them several projects which are most urgent to be done in terms of food security and rural economy will be chosen and implemented.	On going by JICA
Agricultural Sector Economic Growth Programme (PCESA): 2013-2018	For Capacity development of poor producers to increase food production, and food accessibility in rural markets. Conducted in the nature reserves for maize, rice, cowpea, yam and cassava .	On going

Source: MAAH and JICA

Table 10.1.3 Specific Projects of the Agricultural Sector

Projects	Contents	Status
Establishment of Supply Centres for Agricultural Inputs and Materials (CAIMA)	To ensure supplier agricultural inputs and equipment both in quantity and quality, establish supply centres and warehouses in rural areas where a management system is introduced in a focal point of production such as Dédougou Ouahigoua, Kaya, Tenkodogo, Fada N'Grouma,	Planned
Establishment of a United Assembly of Tractors	For acceleration of the process of agricultural mechanization and technology transfer for the intensification of agro-forestry-pastoral production several activities are planned by the government including, i) Acquisition of technology and materials for mechanization, ii) setting up a PPP unit for tractor manufacturing, iii) facilitate accessibility to agricultural equipment and vi) develop the local capacity . Workshops should be installed in points of production such as Dédougou, Bobo Doulasso, Kaya, Tenkodogo, Fada N'Grouma, Koupéla	Planned
Vegetable Market Oriented Cash Crop Production	For activating production and trade of onion, tomato and potato around big cities for increasing agricultural income through i) Rehabilitation of existed irrigation schemes for target vegetables, ii) Reinforcement of peasant organization activities and iii) Introducing animal raising in enclosed areas (chicken, pork), etc. Targets are must be around Ouaga and Bobo (Kidiago, Centre Nord, Haut Bassins)	Proposed by JICA study team based on a strategy of MAAH
Niche Products Supply Chain Development Project	For promotion of production, marketing and trading the products in sub-regional markets in collaboration with private traders. Activities to be included; i) Extension for new variety and production technics, ii) Marketing activities, iii) Actor matching (platform) and vi) Construction of warehouses and processing equipment, etc. Target: Production area (e.g. around Ouagadougou and Koudougou, and Central region)	Proposed by JICA study team based on a strategy of MAAH
Promotion of Sesame Production and Export Project	For promotion of production of high quality and meeting the demand of international markets to export in collaboration with private exporting companies or traders, and JICA projects. Activities to be included; i) Extension for new varieties and production technics, ii) Marketing activities, iii) Actor matching (platform) and vi) Construction of warehouses and processing equipment, etc. Target: Production area (e.g. Centre-Ouest and Centre-Sud)	Ongoing by JICA
Project for Development of Signature Agricultural Production and Marketing	For development and gaining competitiveness of the products which have competitiveness and potential to expand its trade in the future in all markets; domestic, sub-region and overseas. The activities are determined by the development of supply chain.	Proposed by JICA study team based on a strategy of MAAH
Development of Specialized Crops Targeting Middle-Income Consumers of Sub-Regional Markets		Proposed by JICA study team based on a strategy of MAAH

Source: MAAH and JICA

10.1.6 Profiles of Priority Projects for Agriculture Sector of Burkina Faso

In the context of the Corridor Development, the agricultural sector which receives benefit from transport infrastructure improvement for distribution of agricultural input and commodity in the beginning. The corridor itself cannot contribute to ease those distributions because most of rural areas are lacking of adequate rural feeder roads to the corridor. Thus it is indispensable to develop the rural tracks in order to access to the input and market together with introduction of soft component such as capacity building and financial service. At the same time, it is expected that the high demanded and competitive crops are produced stably by full or complementary irrigation facilities. If access to rural area is improved and the production is stable, many traders will come to buy the products from food deficit area in the country or the sub-regional countries through the corridor, especially from the coastal cities. After increasing the traffic, some towns along the corridor must be developed with traders or some producers can start businesses with the agricultural production as an industry. Finally, the agricultural sector can make the corridor more active and may spread the ripple effect to other places along the corridor, and contribute to sub-regional dynamic inclusive development in consequence.

From among the projects for the long term, taking account the interaction, the priority projects are selected by the criteria namely; i) those which are fundamental for future agricultural development to achieve the overall objective following the strategy, ii) those which can be expected positive impact by and for the Corridor Development and iii) those which can be a good example to be applied and followed in other areas or projects. The profile of the priority projects are described as follows.

(1) Marketing Support Project on the Bagré Growth Pole (Pôle de croissance de Bagré)

1) Rationale

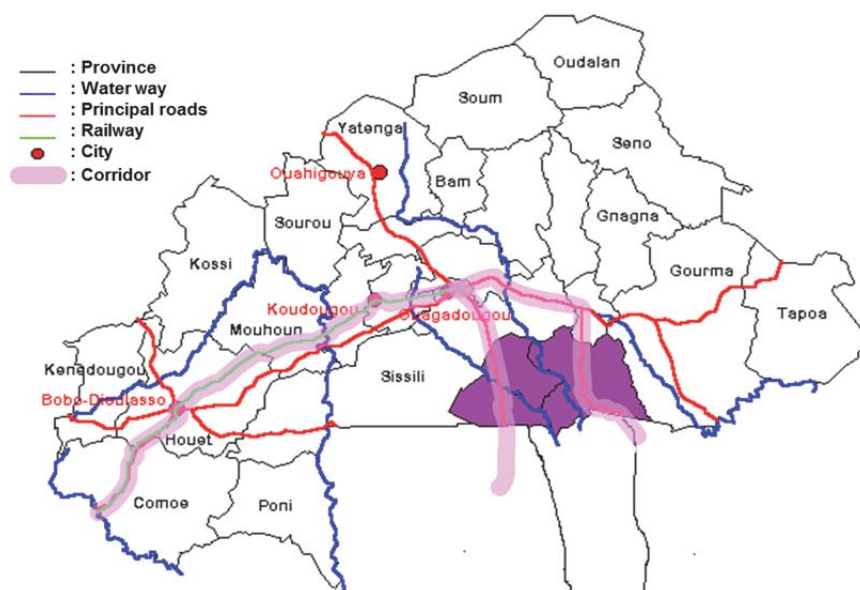
The original project (PPCB) financed by the World Bank has aimed at rural economic growth through an increase in private investment, employment generation, and local agricultural production. However, the local producers are not able to sell their agricultural products to gain economic benefit as they had expected due to lack of rural tracks to the urban markets and of marketing information. In consequence, it is said that more than half of the consumed rice is imported in the country, but a certain amount of local produce remains in production areas.

2) Objective

In order to determine how to optimize agricultural income in production areas and overcome a food shortage in the country, this project is to support the agricultural marketing aspects of the PPCB through the development or rehabilitation of the rural tracks, distribution of market information and then facilitation of the production and trading product with attraction of private sector. This may help the producers to sell their products throughout the country at an appropriate but competitive price and to extend their market to sub-regions; Côte d'Ivoire, Ghana and Togo which have large consumption areas for rice and vegetables.

3) Project Descriptions

Target areas : Province of Boulgou, Zoungwéogo and Nahouri (PPCB target areas)



Source: JICA Study Team based on the 'Présentation du Projet Pôle de Croissance de Bagré, Mission d'investisseurs de Dubaï , Bagrèpôle'

Figure 10.1.1 Project Location for PPCB

Main Activities

(a) Implementation of the Government

- i) Study the marketing situation: to identify rural tracks to be developed, the system of market information distribution, target markets and crops and necessary facilities and service for marketing.
- ii) Distribution of the marketing information: Introduction of a Mobile Market Information System, Establishment of an integrated Platform (formed by all players of a cluster).
- iii) Diversification of production and develop markets in and outside of the country, which is implemented mainly in the above-mentioned platform; introduction of profitable cash crops based on the initial study (possibility rice, Irish potato, tomato and sesame) for off-season, etc.
- iv) Organise cooperative or group of producers to collective acquisition of input and sales of products
- v) Promotion of investments to agriculture and agro-processing within Bagrèpôle, which are targeting coastal markets of the sub-region

(b) Implementation by Private Sector (tentative: to be determined after the above study)

- i) Construct/ rehabilitate warehouse and processing facilities to preserve and process the products in necessary before shipping
- ii) Provide micro financial and credit service to facilitate producers production and trading
- iii) Provide technical training to producers to control quality of products

4) Expected Benefits

Appropriate income generation for local producers by improving the quantity and quality of the products according to market demand

- Contribution to domestic food security in the country , and then in the sub-regional market
- Sustainable economic growth in the rural areas by diversification of crops and markets

5) Executing Agency and Related Institution

PPCB Authority

- General Directorate of Rural Economy Promotion (DGPER: Direction Générale de la Promotion de l'Économie Rurale) and General Directorate of Vegetation Production (DGPV:

- Conflict with transhumant pastoralists (livestock farmers) if the animal paths and/or water points are negatively influenced by the construction/rehabilitation of rural tracks

(2) **Project for Irrigation and Agribusiness Development in Douna, Karfiguéla and Kou Valley (Vallée de Kou)**

1) **Rationale**

The MAAH has planned to construct or rehabilitate irrigation facilities in Douna and Karfiguéla in Cascade and Kou valley in Haut Bassins, but those have hardly been implemented due to lack of national budget. At the present, 1,500ha, 750 ha and 1,260ha of potential land has been estimated in Douna, Karfiguéla and Kou Valley respectively, among which 410 ha,350 ha and all were already developed long ago.

Nevertheless, the producers have been growing cereals, especially rice and vegetables, utilising old facilities, and processing, e.g. parboiled rice for trading and exporting to Senegal on a small scale. If the producers are well organised and those facilities are well rehabilitated, the agricultural production and then related agribusiness can be enhanced targeting sub-regional markets. For this purpose, a West African Irrigation Project (WAIPRO) has already been supporting producers in terms of organization and a programme for rehabilitation of old irrigation facilities (New Programme on restructuration and enhancement of developed plains in Niofila/Douna: PRMV/ND).

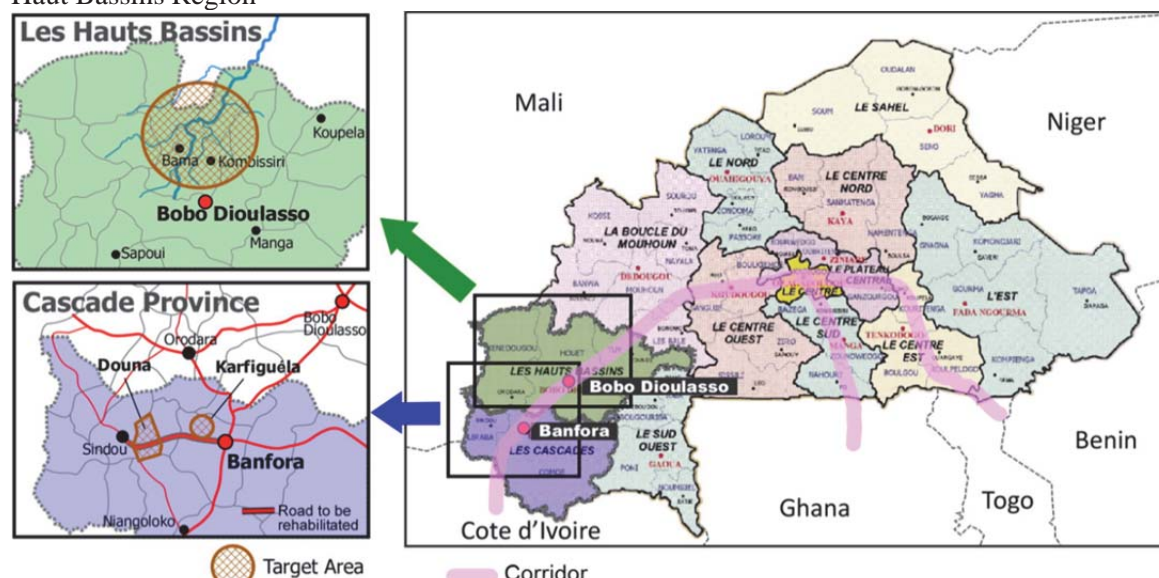
2) **Objective**

In order to promote and expand the existing and future agribusiness around Douna, Karfiguéla by utilising water resource of Moussodougou Dam and Kou Valley by utilising water of Kou river, this project is to develop (construct or rehabilitate) irrigation facilities and to introduce market oriented agricultural production and processing.

Regarding the Corridor development, it is desirable to rehabilitate a feeder road between Sindou and Banfora for Douna to utilise the corridor to Bobo-Dioulasso, Ouagadougou and Côte d'Ivoire. It is unnecessary to develop or rehabilitate the road for Kou valley because the road to Bobo Dioulasso has been well developed.

3) **Project Description**

Target Area: Cascade Region around Douna Department and Karfiguéla Village, Valley de Kou in Haut Bassins Region



Source: JICA Study Team

Figure 10.1.2 Project Location of Douna, Karfiguéla and Kou Valley and Rural Tracks to be rehabilitated

Table 10.1.5 Area to be Developed and Estimation Cost

Region	Location	Area to be developed(ha)	Estimation cost*(USD)
Cascade	Douna	790ha	4,560,000
	Karfiguéla	250ha	7,900,000
Haut Bassin	Valley de Kou	456ha	2,500,000

*Calculated with a cost referenced in case of 2nd and 3th canals development in Bagre Pole (only) is approx.USD10,000/ha including miscellaneous expense (10%) .

Source: JICA Study Team based on the information from DGPA, MAAH

Main Activities

(a) Implementation by the Government

- i) Study on the current agricultural activities referring to the existing document on irrigation and lowland development including JICA study/ projects to identify the area to be developed
- ii) Promotion of investments to irrigated agriculture, processing and marketing

(b) Implementation by Private Sector

- i) Technical support on the production, processing and marketing (agribusiness)
- ii) Introduction of new profitable crops and related technical support

4) Expected Benefits

- Increase agricultural income by optimising existing production and processing
- Contribution to local economic growth and crops distribution by promotion of market oriented production and marketing in sub-regional countries (Rice, Maize and Vegetables, etc.)
- Contribution to local economic growth by promotion of export oriented crops (Vegetables, Tiger nuts and Fonio etc.)
- Creation of a good practice model of agribusiness and creating a rippling effect to other areas
- Sustainable economic growth in the rural areas by diversification of crops and markets

5) Executing Agency and Related Institutions

- General Directorate of Hydraulic Amenities and Irrigation Development (DGAHDI: *Direction Général des Aménagements Hydrauliques et du Développement de l'Irrigation*), DGPER and DGPV in the MAAH
- USAID for West African Irrigation Project (WAIPRO)
- SOCO PAD (Société coopérative de la plaine aménagée de Douna : Cooperative Company of developed plains in Douna in the new programme on restructuration and enhancement of developed plains in Niofila/Douna
- Private company for rice mill and trade and /or fresh vegetable trade etc.

6) Implementation Schedule

The implementation schedule for this project is shown in the table below.

In fact the Strategy for Agricultural Value Chain Development declared that key and niche products should be promoted for rural and national economic growth. This also can contribute to sub-regional integration, since most of the agricultural products are sold in those markets. However, most of such kinds of products have been grown using traditional methods so its cultivars and production techniques have not been well developed. The quality and quantity do not conform to market demand due to unstable production. Thus, the production always is limited, does not generate agricultural income for producers and Burkina Faso as much as they could.

Hence, it is required to apply that experience and knowledge at the local level to establish its value chain.

2) Objectives

This project aims to strengthen production and marketing of key and niche products to contribute to the rural and national economic growth in terms of production and marketing. The products should be chosen according to market needs and interest of private investors not only in overseas markets such as EU, USA and Asian countries, but also in the sub-region as Côte d'Ivoire, Ghana and Nigeria. In this manner, the products also can contribute to sub-regional integration.

3) Project Descriptions and Activities

The target crops can be the ones which are demanded highly in overseas and sub-regional markets such as rice, maize, pulse crops, fresh vegetables, fruits and tiger nuts (*Cyperus esculentus*). According to the environmental adaptability and eating habits, the production level is different by crop. Thus the activities will be different by type of crop as follows.

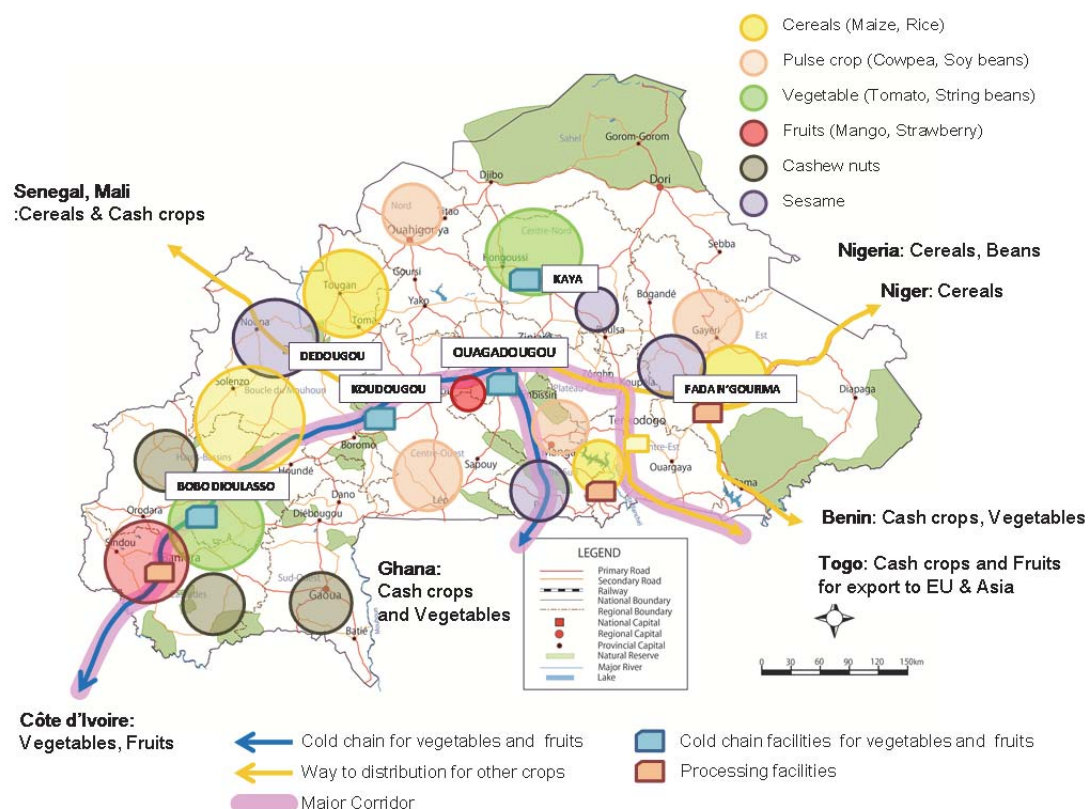
Table 10.1.7 Project Description by Target Crop

Target crops	Activities	Remarks
Cereals (Rice, Maize, Sorghum)	- Establishment of input procurement system - Rehabilitation of rural tracks and irrigation facilities. etc.	R&D was done long ago. Projet d'Appui au Développement des Filières Oléo-Protéagineuses (PADFOP)
Pulse crops (Cowpea and soy beans)	- Construction of storage and conditioning warehouse - Capacity development of existing farmers organizations - Extension regarding new farming techniques	
Vegetables (Tomato, String beans, Irish potatoes Strawberry etc.) and Fruits (Mango etc.)	- R&D on the cultivars and techniques adapted for each area - Establishment of seed production and input procurement system - Rehabilitation of rural tracks from production area to corridors - Development of irrigation facilities. - Establishment of farmers organizations - Capacity development of farmers organizations - Extension regarding new farming techniques	Several products for food security and marketing are in planning or ongoing such as a Support project for agricultural markets (PADMA) but it is necessary to start R&D of cultivars and techniques for certain crops
Tiger nuts and others	- R&D on the cultivars and techniques adapted for each area - Capacity development of farmers organizations - Extension measures for production techniques - Training on marketing for farmers organizations - Establishment of processing factory or facilities (juice) - Training on processing for farmers organizations	Tiger nuts juice is popular in Ghana

Source: JICA Study Team based on 'Stratégies de Développement des Filières Agricoles au Burkina Faso'

The demarcation of activities also is different by crop category between the government and private sector. Regarding cultivars and production methods for vegetable and fruits need to be researched and developed by the governmental research institutions, same as cereals and pulse crops but the private companies may start to develop by themselves according to market demand.

Since the cereals and pulse crops are produced and distributed in the domestic market and deficit area for the food, warehouse will be constructed by the government. In contrary, cold storage of fresh vegetables and fruits for sub-regional and international markets should be installed by the private traders or companies. Once such companies realise the demand of processed products, they will set up processing facilities. The location of signature crops, those existing destinations and necessary facilities by private sector for development are shown in the following figure



Source: JICA Study Team based on 'Stratégies de Développement des Filières Agricoles au Burkina Faso'

Figure 10.1.3 Location of the Signature Products and Necessary Facilities

In order to ship to all kind of market, the feeder roads (rural tracks) are to be developed, especially; the following roads need to be rehabilitated to activate distribution of agricultural products;

- Dédougou-Djibo-Kaya/ Dori : Cereals and Vegetables for domestic and sub-regional markets
- Léo to Koudougou and Pô to the Corridor : Pulse crops and Nuts for regional and international market
- Fada N'Grouma to Kupéla and Dori to the Corridor: Cereals and Vegetables for domestic and sub-regional markets

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Increase and stabilization of other products such as Maize, cowpea and soya beans
- Increase of signatures production which conforms to the sub-regional and international markets quantitatively and qualitatively
- Realization of constant trading of those products and generating stable income for the producers
- Development of a value chain for certain crops (Rice, Cashew nut, Sesame etc.) according to the markets; e.g. value addition, organic, etc.
- Emergence of synergy with the Corridor development through the increasing distribution of agricultural products and traffic

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- DGAHDI, DGPER and DGPV in the MAAH
- Direction in charge of rural tracks in the MDENP
- Union of Producers Organization/Cooperative in the target area

(4) Project for Development of Irrigation Schemes in Wetlands

1) Project Outline

Burkina Faso used to produce and export agricultural and livestock products to neighboring countries' markets, as well as oriented to domestic markets. However, the volumes of production and export of those products have not been so large recently. Since coastal demands of middle-income populations are increasing for agricultural and livestock products, and roads and railway are to be upgraded along corridors to coastal areas, it is possible to take measures for expanding the volume of production and export of such products to coastal markets. One of the measures is to expand irrigation schemes for agricultural production.

Currently JICA provides technical assistance to Burkina Faso's Ministry of Agriculture and Water Resources in conducting a technical study for irrigation schemes in wetlands, including identification of possible sites for developing irrigation schemes.

Based on findings of the technical study, this project will develop irrigation schemes for expanding agricultural production targeting sub-regional coastal markets.

2) Funding Scheme

ODA Technical Assistance and ODA Grant

3) Estimated Project Cost

US\$ 30 million

10.2 Livestock Sector of Burkina Faso

10.2.1 Current Situation and Future Prospects of Livestock Sector of Burkina Faso

The livestock sector, raising of cattle, sheep, goats pigs, donkeys, equines and poultry and related industries, is given the status as the second most important economic activity in the country, which occupies 11.3% of GDP with the 4.2% of growth rate in 2013. More than 80% of the household get income from economic activities of the sector. Of those people approximately 25% make a living mainly with the sector in particular the northern part of the country; region of North, North Central and Sahel. Although the sector has contributed to economic growth and people's lives in the country, it still is underdeveloped due to several problems, e.g. traditional extension raising style, distortion of animal marketing system and lack of financial and technical assistance. Thus the sector does not generate as much revenue as it can.

Nevertheless, Burkina Faso still has a potential advantage quantitatively and qualitatively. The country is one of the largest animal producing and exporting countries in the ECOWAS. Moreover all animal products have a good reputation; meat for sub-regional markets, dairy products for domestic markets, and animal skin and leather for international markets. For example, cattle was sold 343,000 heads in total to Côte d'Ivoire, Ghana, Benin and Nigeria etc., which is equivalent 70 million FCFA in 2014. It is said that the demands for those products have been surging recently.

In the light of the current situation, the government has started making efforts to take the advantage and develop the livestock sector. With the USAID, the Extended West Africa Agribusiness and Trade Promotion (EATP) has been implemented to establish a Burkinabe network of livestock fattening operators and wholesalers.

Thus, the livestock sector should be able to generate more income for rural producers and contribute more to the economic development in the country by supplying the products to sub-regional markets through interacting with corridor development.

10.2.2 Issues Regarding the Livestock Sector of Burkina Faso

The main issue of the sector in Burkina Faso is how to raise the livestock value to contribute properly to improve the livelihood of the people and the national economic growth.

The potential advantages of animal production are not being exploited as much as they can be. Mainly three things can be considered as obstacles, which interact with each other. The traditional livestock raising style, which is transhumant raising, is the main cause for the underdevelopment. The details are described as follows:

(1) Traditional Livestock Raising Style

Due to the tradition and the lack of technical modernization, most of the livestock husbandry is practiced by traditional grazing and transhumant raising style. Many animals are raised in Burkina Faso, and it is also one of the 'transit' places of the transhumance. A large number of animals are coming from Mali and Niger and staying and grazing in certain moment in the country when rainy season comes and grassland remains. Although certain quantity of crops residues can be used as a feed inside country, most of animals, local ones include are conducted after rainy season to in Côte d'Ivoire, Ghana and Togo and sold there, the final destination of transhumance. Thus almost none remain in Burkina Faso.

Moreover, this tradition is absolutely a trigger of the conflict with agricultural producers inside and outside the country. When the transhumance is conducted, the animals always enter farmlands and devastate growing crops. The pastoralists are always chased away and forced to go from place to place and undergo frequent harassment at police stops or suffer highway robberies. Therefore, it is said that many pastoralists (herders) want to raise their animals near their places of residence.

(2) Distortion of Animal Marketing System

The pastoralists prefer to sell their animals after being well fattened by transhumance, but usually they end up selling them alive in the countries where they feed and drive the herds. A report said that 70% of cattle are led by transhumance even now. The pastoralists just gain from the sales of the animals, and the other related products such as milk, skin and other by-products from the animals are sold at the final destinations.

Even for those which can be raised in the country, the animals are just shipped alive to other countries in a conventional unstructured way. In tradition, animal trade consists of many middlemen like collectors, wholesalers and retailers with complex systems from the country of origin to the coastal countries. The producers, even collectors are not well educated, mostly illiterate, and thus do not have enough market information. Thus they cannot avoid selling at cheaper prices relying on the complex redundant system.

This means that Burkina Faso, even though they are exporting a large number of ruminants in the ECOWAS, gets only the minimum sales from the animal production, and loses the chance to add to the value in the country.

(3) Lack of Technical Assistance

Considering that the first means of livelihood in Burkina Faso is crop production, the livestock sector has not been well allocated for in the national budget. The Ministry of Animal Resources and Fisheries (MRAH: *Ministère des Ressources Animales et Halieutiques*) has great difficulties improving the current situation by implementing effective measures, especially technical assistance for livestock producers. Moreover, it is also hard to employ enough technical personnel who should provide all concerned services to animal producers. For instance, related to the above mentioned issues, many transhumant pastoralists now want to stay in their places of residence and raise their animals. However, they can barely learn how to feed and fatten animals without pasturage or transhumance due to lack of extension officers only a small number of extension officers can instruct the pastoralists due to lack of personnel and knowledges. Also the animal producers cannot get necessary medicines and subvention, while crop producers get 30-50% subvention for purchasing agricultural inputs.

10.2.3 Objectives for Livestock Sector of Burkina Faso

The overall objective of the livestock sector is to generate proper income for livestock producers in rural areas, and to help grow the national economy at a rate appropriate by utilizing growth potential responding not only to domestic markets, but also to sub-regional markets, especially coastal markets. For that purpose, considering the main issues in the county, three general objectives should be set as follows:

- To raise and fatten animals effectively inside the country before exporting to neighbouring countries by introducing all necessary measures including the establishment of feeding places and facilities for animal raising, technical support and veterinary inputs
- To optimise the marketing system for animal products in the country by reforming the marketing system to be efficient and establish necessary structures and facilities
- To complement the technical assistance by collaboration with private sectors including agricultural traders or companies

Among those objectives, it is indispensable to raise as many animals as possible with technical assistance from the private sector such as traders or manufacturing companies. Generally, they have their own techniques to increase production and a standard of quality, and may want to go directly to production areas and to grow their products in concordance with the quantity and quality that they need. Agricultural traders or companies can also be interested in the livestock sector because they may be interested in animal dung and by-products for fertilization of soil. Or they might want to use the residues of the crops or processing as a fodder and silage which can possibly create new businesses.

10.2.4 Strategies for Livestock Sector of Burkina Faso

The livestock sector in Burkina Faso has strengths and opportunities; such as market potential inside and outside of the country and being a 'transit' place of transhumant animals and a large quantity of residues expected from crop production. With those advantages, it can generate income for producers and for the country related to national economic growth if the animals can be kept in the country and sold properly. Since demand of animal products is increasing in the coastal countries where Burkina Faso used to export live animals, it is reasonable to expand its export effectively by utilising the opportunities at the first step. And then, if the domestic demand also increasing with economic growth, the country will be able to export carcasses after slaughtering and adding more value in the country.

The strategies to achieve the above-mentioned objectives are as follows:

- To focus on raising of marketable animals in particular cattle to export to coastal counties for economic purposes (some animals are raised in the traditional manner as a custom, but they are not targeted here)
- To establish necessary places, structures and facilities to fatten and trade animals added value as much as possible inside the country to maximise income from the sector and to avoid problems raised by transhumance
- To fulfil basic literacy education and training on production and marketing for all players, especially producers, to have and follow proper information as professional producers and traders

10.2.5 Programmes and Projects for Livestock Sector of Burkina Faso

All programmes and projects in the sector are set up in conformity with policies and plans in force, in particular, the National Programme for the Rural Sector 2011-2015 (PNSR: *Programme National du Secteur Rural*) and the Action Plan and Programme for Investment in the Livestock Sector (PAPISE: *Plan d' Action et Programme d' Investissement du sous-secteur de l' Elevage*) and the National Policy for Sustainable Livestock Development 2010-202 5 (PENDEL: *Politique Nationale pour le Developpement durable de l' Elevage*). The projects which should be implemented for the

livestock development are described in the following table. If it is classified as an ‘Integrated Project’ it includes several measures to solve many challenges, while ‘Specified Project’ is focusing on one objective or one type of animal.

Table 10.2.1 Integrated Projects of the Livestock Sector

Projects	Objective and Main activities	Status
Abattoirs Installation of slaughterhouse in the Principal Cities of Burkina Faso (PIAV / BF) (Cattle- Small ruminants- Pigs and Poultry)	This project aims to provide modern infrastructure that meets hygiene standards and thus provides a framework for better support for livestock-pork and poultry producers. It will consist of the installation of compact slaughterhouses in the towns of Kaya and Ziniare and mobile slaughterhouses for poultry in the cities of Ouagadougou, Bobo Dioulasso, Boromo, Ouahigouya, Koudougou, Djibo, Koupela and Dedougou.	Planned
Pastoral Hydrology Program	The programme aims to improve the availability and permanent access to water for animals and livestock production activities. The specific objective is to construct 141 water points (solar pump drilling and 83 water bodies (slurry, water retention).	Planned
Reinforcement of capacity and professionalism of all livestock players	For building the capacity of the livestock producers in order to raise animals and trade them efficiently by introducing several types of training including literacy programs. Assisting the extension workers and organisation of producers groups or cooperatives are planned as main activities.	Planned
Securing sustainable management of animal resources	For creating an environment to facilitate properly producing livestock, the project aims to establish the legal framework to protect all producers and construction of hydraulic infrastructure. The intensification of animal raising is one of the components.	Planned
Increase the animal production	For increasing animal production, it aims to introduce fodder production and high nutritional feed and to improve the genetic potential of the domestic animals. A pathologic study is included to decrease the disease problems.	On going
Improvement of competitive animal production	To properly generate revenue from the livestock husbandry and trade, the project aims to promote to raise the quality of the animals. For that purpose, the norm is to be established and taught to the livestock producers.	On going
Security of meat production and supply	In accordance with PRIDEC, the project aims to normalise and optimise animal production inside and outside of the country. The main activates should all be measures to alleviate transhumant problems and to build the capacity of all players regardless of nationality or whether they are pastoralists. The establishment of coordination centres should be done, especially for transhumant and agricultural producers.	On going

Source: MRAH and JICA

Table 10.2.2 Specified Projects of the Livestock Sector

Projects	Contents	Status
Cold Slaughterhouse Construction in Bobo-Dioulasso	The overall objective of the project is to build and equip Bobo-Dioulasso with a new slaughterhouse meeting the international standards to be competitive in the national and international markets.	Planned
Establishment of a unit for the production of animal vaccines at the National Livestock Laboratory in Ouagadougou	To strengthen the capacity of the National Livestock Laboratory (LNE) and its network of regional laboratories capable of supporting government policy in Animal Health, Food Safety, Production of Vaccines and Quality Control of Veterinary Drugs.	Planned
Optimization of Biodiversity Benefits in Burkina Faso (OptABio-BF)	The project aims to optimize the use of the bio-digester in order to contribute to energy security and to improve food security, income Of rural households and the consolidation of private market bases of bio digester technology in Burkina Faso.	On going
Project Implementation of Aa purchase centre fro for Veterinary Medicines (CAMVET)	With the validation Support Program Agro-Pastoral (PAFASP) in 2013, the project was an important step in the process of improving the availability and accessibility of veterinary inputs. Thus, the Council of Ministers at its meeting of 28 April 2014 Adopted the report on the establishment of the Central Veterinary Drug Purchase Centre (CAMVET).	Planned
Broadcast Project of 1,100 Km for Livestock	The access of animals to pastoral resources in a country such as Burkina Faso is a major challenge with regard to the dominant breeding system. In recent years, the conflicts between different users of natural resources have been exacerbated, particularly between farmers and other farmers, causing strife. Livestock trails that ensure the movement of animals at any time without causing damage to the fields represent an alternative to minimize those conflicts that have degraded the social fabric over the years. It is for this purpose that this project is designed to mark the cattle tracks. To contribute more effectively to the increase in the income of the actors and to the economic and social growth of Burkina Faso through the export of meat.	Planned
Project to Establish value chain of Livestock/Meat by Promotion Corporation (SOBEVI / BF)	To promote the livestock-meat sector in order to better exploit the enormous potentials of livestock in general and of this sector in particular	On going

Projects	Contents	Status
Basic Service Improvement for cattle and small ruminants	For developing the activities of all players concerned with the large and small ruminants, it was programmed in 2007. The main activities are; capacity building of producers for professionalization, providing veterinary service and inputs for increasing production and productivity and financial system access and Market monitoring and information systems.	Partially executed
Traditional aviculture improvement support project (PAAT-MR)	For food security and income generation in rural areas the project aims to raise production of chickens. The idea was raised in 2007 based on the related action plan and mentioned in the PNSR. The main activities are; introduction of improved techniques for aviculture, market facilitation and necessary infrastructure	On going
Development of pork production	Since the pork consumption is increasing inside and outside of the country, especially in Benin, the project aims to promote pork production with efficient husbandry. However the large animals are very vulnerable and susceptible to diseases and stress, and it should be started after well studying and classifying the adapted species and raising methods.	On going
	Related to the project for increase of animal production, this project is to develop appropriate methods for fodder production and processing and feeding methods in order to raise as many animals in the country as possible. It also is expected to enable pastoralists to access domestic markets to sell their animals. The identification of fodder that can adapt to the environmental conditions in Burkina Faso, and the feeding methods can be created based on the fodders to be introduced.	Proposed by JICA study team based on a strategy of MRAH
Reinforcement of veterinary service and epidemic control	For improving epidemic prevention, the project aims to study the epidemics and pathogens, and establish the necessary surveillance and control systems. Private veterinarians can be introduced in the project.	Planned
Reinforcement of milk production	For improving milk production and processing which are mostly practiced individually and at the traditional level, and improving trade milk products in the country in the future. As main activities, it is necessary to improve the legal framework such as hygienic norms for private individual processors and organizations, and to build their capacity to meet the norm and quality to meet market demand.	Planned

Source: MRAH and JICA

10.2.6 Profiles of Priority Projects for Livestock Sector of Burkina Faso

In the light of high demand for animal products at the present, in particular in the coastal countries, it is desirable for Burkina Faso to focus on fattening and supplying animals and its products to those countries to increase livestock income at household level and national level as well. For that purpose, it is indispensable to increase number of live animals which are healthy namely enough weight and no disease inside country to add value more than transhumance.

Once a certain number of ‘exportable’ animals can be produced in rural areas, the rural tracks and the corridor development will contribute to the distribution of the products to the domestic and sub-regional markets by trucks, not by transhumance. If the production is increased more, a railway may be necessary to transport animals and/ or related products to the coastal countries to distribute them there. The livestock development can push the Corridor Development and promote regional integration in this manner.

For the livestock development as an economic sector in the country and regional integration with the Corridor Development, projects and measures which improve fundamental issues for stable production should be taken first of all. And then related facilities for fattening and livestock markets are to be developed to promote distribution of animals and animal products. In the point view, selected priority projects are described below.

(1) Project for Basic Service Improvement for Cattle and Small Ruminants

1) Rationale

Burkina Faso is one of the biggest animal producing and exporting countries in West Africa and the products are appreciated even in the sub-regional and international markets. However this sector has not really contributed as much to economic growth in the country as it can because most of the animals are sold alive in the coastal countries like Côte d’Ivoire and Ghana after being transported by trucks or by transhumance.

In the light of the situation, the government has planned to construct slaughterhouses or processing factories to maximise the value of animal production. However, some basic issues such as producers’

awareness and veterinary and input services have not been developed to date. In fact, veterinarians should be assigned in the slaughterhouses for the operation and the hygienic problems should be completely solved by the producers, but there are not enough veterinarians or extension officers in the country. Before constructing or modernising facilities for value addition, these basic services must be improved.

2) Objectives

Developing the activities of all players concerned with the large and small ruminants was programmed in 2007 in the Action Plan for meat of big and small ruminants. This project aims to build the capacity of producers for professionalization, fulfilling veterinary service and inputs for increasing production and productivity and financial system access and market monitoring and information systems to stable production and fattening in the country.

3) Project Description

Target Area

All provinces where livestock husbandry is practiced, especially the regions which are planned to have new slaughterhouses provided in the PIAV/ BF described in the above table ; Sahel, Nord, Centre Nord, Boucle de Mouhoun, Haut Bassin, and Est

Main Activities

- (a) Implementation by the Government
 - i) Improvement of animal production and health extension system including veterinary post
 - ii) Assignment of trained officer for all posts Professionalization of producers and local extension officers
 - iii) Encouragement of financial institution (micro credit, bank) to provide financial service for fattening and marketing Development of market information systems
- (b) Implementation by Private Sector
 - Development of veterinary service and inputs

4) Expected Benefits

- Establishment of foothold for construction and function of slaughterhouses
- Increase of animal production and monetization (income generation)
- Reduction of poverty, especially for livestock farmers and residents by appropriate marketing and trading
- Development of industries related to livestock; dairy and leather production
- Increase of exported animal products and gain of foreign currency
- Stabilization of animal product supply inside the country and in the sub-regional countries

5) Executing Agency and Related Institutions

- DGESS (Directorate General of Sectoral Studies and Statistics; *Direction Générale des Etudes et des Statistiques Sectorielles*), DGPA (Directorate General of Animal Promotions, *Direction Générale des Promotions Animales*) DGSV (Directorate General of Veterinary Service: *Direction Générale des Services Vétérinaires*) and DRRA (Regional Directorate for Animal and Fish Resources: *Direction Régionale des Ressources Animales et Halieutique*) etc. in the MRAH.
- DGC (Direction Générale du Commerce)/ DGPE (Direction Générale de la Promotion de l'Entreprise) in the MEFD (Ministère de l'Economie, des Finances et du Développement)
- DGC (Direction Générale du Commerce) and DGI (Direction Générale de l'Industrie) in the MICA (Ministère des Industries, du Commerce et de l'Artisanat)
- Private companies of veterinary service and inputs procurement

9) Social and Environmental Impacts

The project can cause many social and environmental issues to be considered and solved. The following impacts should be taken into account before operation:

- Reduction or degradation of traditional/ cultural activities and relics
- Social conflict due to mismanaged transition of livestock husbandry style (from transhumance)

(2) Introduction of Feed Production and Fattening Place

1) Rational

Securing feed has been a big challenge in the livestock sector in Burkina Faso since long ago to optimise and maximise domestic income from livestock husbandry. For that purpose, the MRAH have tried to introduce a feed making to promote intensification of livestock husbandry but it is not well developed due to shortage of raw materials for animal feed in the country

However, there should be a large quantity of residues after threshing and milling cereals, or manufacturing food such as such as rice bran, oilcake or bagasse after processing, which seem to be tilled in the crop field or just wasted. These residues are known as nutritious raw materials for animal feed which fatten efficiently adult animals, while young ones can be raised with natural grasses. Thus the availability of residues also can be a good incentive to invest for private sector in anticipation of increase of animal production to export or supply in the domestic market.

Fortunately livestock export markets have a source of nutritious raw material; cotton factory (SOFITEX) and sugar manufacturer (SOSUCO) locates near Bobo-Dioulasso to Côte d'Ivoire and many kinds of crops residues are expected from Bagré Pole site near Pouytenga, Bittou and Guelwongo to Ghana. If there is notorious feed and animal fattening place around livestock market in the country, pastoralists will prefer fattening their animals and sell them domestic markets, not to conduct them to coastal countries by transhumance.

2) Objective

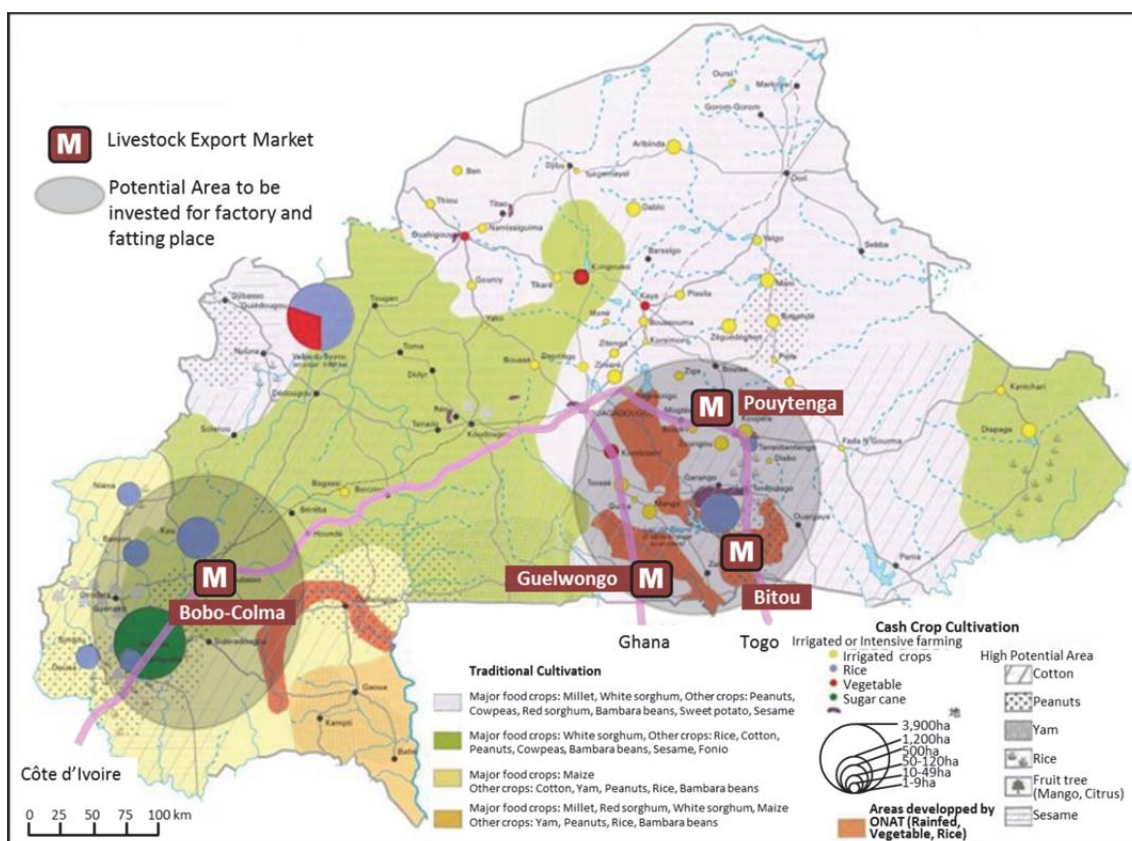
Targeting livestock markets specialised in export, the project aims to introduce feed production and fattening place near livestock markets in collaboration with private sector. Since the residues are expected to obtain near the above mentioned livestock markets, animal feed manufacturing factories and fattening system are to set up initially around there. Then, the feed production and fattening place will be established according availability of residues from crop production or food manufacturing.

3) Project Description

The project descriptions are as below.

Target Area

- Haut basin and Cascade region surrounding livestock market Bobo Dioulasso-Columa) : by utilising oil cake from cotton, bagasse and molasses from sugar refining, maize residues
- Centre-Est and Centre-Sud region surrounding livestock market Pouytenga, Bittou and Guelwongo : by utilising rice bran and other crop and vegetable residues



Source: JICA Study Team

Figure 10.2.1 Target Area for Feed Production and Fattening Places (by different crop area)

Main Activities

(a) Implementation by the Government

- i) Study on availability of residues and its sources
- ii) Identified area to be introduce feed factory and fattening place
- iii) Awareness making and management training for the community in the identified areas
- iv) Preparation of land for manufacturing feed and fattening place
- v) Preparation subsidy to private sector which establish feed factory and fattening place

(b) Implementation by Private Sector

- i) Preparation of necessary procedures and investment; land acquisition, development of factory and fattening place, preparation of necessary facilities
- ii) Contract for purchasing all materials necessary from source including natural fodder which will be mentioned below (3)
- iii) Operation of factory and fattening place by operating

4) Expected Benefits

The following impacts and benefits are expected from this project:

- Providing feed of good quality to promote fattening and selling animal in the country and generate more income inside the country
- Trade healthy animals at higher prices than present, thus providing good quality meat to the coastal countries
- Avoidance of conflict with crop producers, especially with the ones of other countries
- Promotion of an agribusiness by trading high nutrient feed and animal raising
- Providing good quality to the domestic and sub-regional markets in the future

- Fodder Crop Production and Public Ranch
- Infrastructure Development for Market Access Improvement Animal Products

9) Social and Environmental Impacts

The following social and environmental impacts should be taken into account:

- Social impact on resettlement residents for land purchase (if any happens)
- Environmental impact on waste landfill and/or garbage incinerator (if any)

(3) Development of Fodder Crop Production and Public Ranch

1) Rationale

The reason that most animals are sold outside the country after transhumance is the lack of available fodder and pastureland after the rainy season. Thus the livestock producers look for places near coastal countries that have enough forage and water. In particular, the pastoralists and animal traders as well want to fatten their livestock right before selling in the final destination.

Making animal feed and setting up pasture land as public ranch are one solution to raise and fatten animals as much as possible inside country to increase directly income from the sector because fattening inside country can add value comparing to selling animals after transhumance.

2) Objective

In order to increase animal production and to add value in the livestock husbandry inside county, this project is to develop appropriate methods for fodder crop production and public ranches according to function of areas. . The identification of fodder that can adapt to the environmental conditions in Burkina Faso, and the feeding methods that can be created based on the fodders to be introduced.

3) Project Description

The project descriptions are as below.

Target Area

Boucle de Mouhoun, Centre-Nord and Est where the climate condition is relatively suitable for vegetation and water resources and the livestock husbandry is quite prosperous.



Source: JICA Study Team

Figure 10.2.2 Location of Fodder Crop Production and Public Ranch

- Making consensus on developing pasture land and watering points and setting up animal paths
 - Social and environmental considerations and implementing countermeasures to mitigate any possible negative impacts before starting the project
 - Assurance and development of water resource
- (b) Actions for the livestock development
- Organization of the producers in the target areas
 - Capacity building of animal producers

8) Related Projects

Related projects are listed as follows:

- Project for Study for development and better use of Bas-fonds with water control by JICA
- Agriculture, Forestry and Livestock Value Chain Support Programme (PAFASP: *Programme d'Appui aux Filières Agro Sylvo Pastorales*)

9) Social and Environmental Impacts

The following social and environmental impacts should be taken into account:

- Conflict of land and water resources between crop producers and transhumant pastoralists
- Reduction in the flow rate of the streams due to construction of pasture land and watering points

(4) Project for Value Chain Development for Animal Products

1) Rationale

The MRAH has planned to intensify the animal production in existing production areas such as the regions of Sahel, Nord, Centre Nord and Est, but the animals are consumed and/or traded in major cities especially outside countries other than the production area. Thus it is necessary to link the producing areas to the cities which mainly consume and/or trade them to the national consumers and to other major consuming cities in Côte d'Ivoire, Ghana and Nigeria.

2) Objective

In order to facilitate establishment of an effective supply chain for animal products, the project aims to enhance the functionality of the markets related to animal products in the region of Sahel, Nord, Centre Nord and Est and also the other production areas, and link such markets to the final destinations. In particular, the market functionality is to be improved and made efficient by construction or rehabilitation of facilities, capacity building for the officers/ workers and establishment of a network according to the different functions and commodities handled in each location.

3) Project Description

The project descriptions are as shown below.

Table 10.2.6 Target City (Market) in the Project

Target Market	Main Function and Commodity	Origin	Destination	Remarks
Djibo	Collective market of all animals, Domestic consumers markets of Dairy products and Leather	Sahel region, Mali and Niger	Ouahigouya, Kaya and other small markets	Biggest collective animal market but without any modern facilities
Dori	Production and collective Market, Domestic consumers markets of Dairy products and Leather	Sahel region, Mali and Niger	Kaya, Fada N'Gourma and other small markets	Slaughterhouse was developed in the past, but all ruined.
Kaya	Animal transit trade and Leather production	Sahel region, (via Djibo, Dori), Nord region (Ouahigouya)	Ouagadougou & Bobo Dioulasso	Main transit trade place for domestic livestock Famous for leather craft
Fada N'Grouma	Biggest animal transit trade and export market	Niger, Sahel region, (via Djibo, Dori)	Togo, Benin, Nigeria, (Niger)	Main transit trade place for export and import of animals from/to the east
Ouahigouya	Animal transit trade market	Mali, Sahel region, (via	Bobo-Dioulasso,	Main transit trade place for export and

Target Market	Main Function and Commodity	Origin	Destination	Remarks
		Dijibo, Dori)	Ouagadougou	import of animals from Mali
Ouagadougou	Central Consuming market ,for meat, dairy products and leather	All areas including Dori and Djibo	Consumers around Ouagadougou	Biggest animal market exists here Cold slaughterhouse and warehouse are functioning
Bobo-Dioulasso	Second Biggest Consumer Market and export market	Mali, Sahel region, (via Djibo, Dori), Nord region(Ouahigouya)	Côte d'Ivoire, Ghana	Existing cold slaughterhouse is not functional Open slaughter area exists
Pouytenga	Biggest e export market linking to Ghana and Togo	Kaya, Fada N'Gourma	Ghana, Togo, Benin	Biggest export market for small ruminant and chicken
Hamélé, Guelwongo	Export market to Ghana	Ouahigouya, Kaya (Ouagadougou)	Ghana	Specialised in chicken export
Bittou	Export market mainly to Togo	Kaya, Fada N'Gourma	Ghana, Togo,	Small export market

Source: JICA Study Team based on the Annuaire des Statistiques de l'Elevage 2014 ,MRA , November 2015

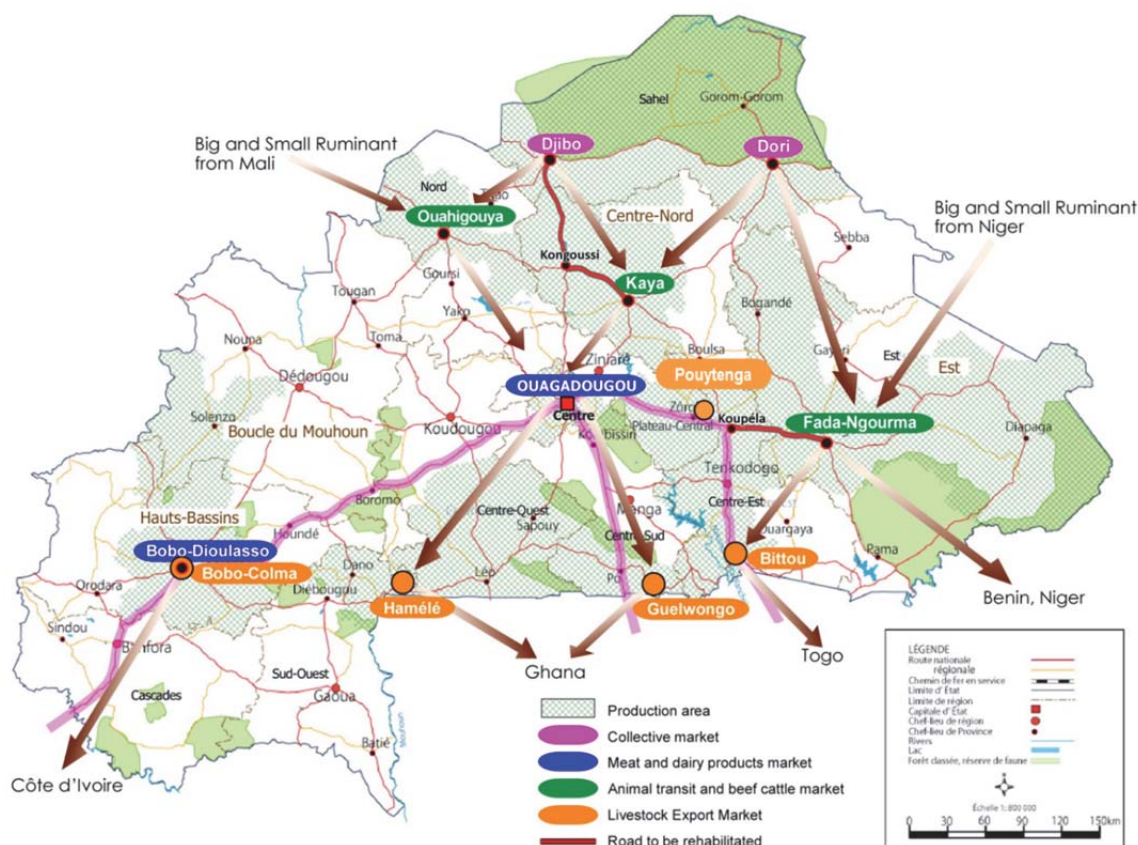
Main Activities

(a) Implementation by the Government

- i) Study on market functionality and identification of the issues to be solved and functions to be added for each market
- ii) Development of necessary facilities according to the results of the study, but some roads are identified to be rehabilitated in order to establish a physical linkage;
- iii) Fada N'Gourma to Koupéla
- iv) Djibo to Kaya via Kongoussi
- v) Capacity building of main players in the target markets
- vi) Development of marketing linkage system by creating a telecommunications network

(b) Implementation by Private Sector

- i) Development of slaughterhouse, warehouse and cold chain
- ii) Development of factory and facilities for meat processing



Source: JICA Study Team based on the Annuaire des Statistiques de l'Elevage 2014 , MRA, November 2015

Figure 10.2.3 Project Location for the Project and Rural Tracks to be Rehabilitated

and Investment Hub (EATP)

9) Social and Environmental Impacts

The projects will enhance the existing markets so there is nothing to be considered.

10.3 Fisheries Sector of Burkina Faso

10.3.1 Present Situation of Fisheries Sector in Burkina Faso

Due to its inland geographic location, the main fishery industry of Burkina Faso has long been the fresh water fishing. However, funded under the cooperation of Burkina Faso-Taiwan at Bagrépole, in the past years, aquaculture production has increased to 400 tonnes in 2008. Unfortunately, the Taiwanese company left Bagrépole a few years ago. Since then, the amount of aquaculture production has decreased again.

The supply of fish products in 2015 was 80,000 tons in Burkina Faso. Out of it, 20,000 tons was from domestic production, and 60,400 tons was from import. 4,500 tons was re-exported.

The National Development Strategy for Sustainable Fisheries and Aquaculture (SN-DDPA: Stratégie Nationale de Développement Durable de la Pêche et de l'Aquaculture à l'horizon 2025) is the framework for interventions in the sectors of fisheries including fresh water fishing and aquaculture for the 15-year period from 2011 to 2025.

There are currently two major ongoing projects for the fisheries sector in Burkina Faso:

- Capacity Development Project for Managing Fisheries Areas of Economic Interests (*Projet de renforcement des capacités de gestion des périmètres halieutiques d'intérêt économique*) by Burkina Faso' government
- Creating agribusiness employment opportunities for youth through sustainable aquaculture systems and cassava value chains in West Africa (*Création d'opportunités d'emploi pour les jeunes dans le secteur de l'agroalimentaire via des systèmes aquacoles et de chaînes de valeur du manioc durables en Afrique de l'ouest*) by the Food and Agriculture Organization of the United Nations (FAO)

For the acceleration of the fisheries sector, research on fish which can breed in less time (such as catfish instead of tilapia) is also ongoing. Regarding the fresh water fishing, fisheries management plans are being prepared for sustainable fishing, but some have not been revised, such as the plan for Bagré and Kompienga, which was prepared in 2005. Currently, there are fisheries management plans for the nine areas of fisheries of economic interests (PHIE: périmètres halieutiques d'intérêt économique) in Burkina Faso. These were prepared under the capacity development project; however, necessary funds for implementing these plans are not available.

10.3.2 Issues regarding the Fisheries Sector in Burkina Faso

The issues regarding the fisheries sector in Burkina Faso are defined as follows:

- Lack of knowledge regarding protecting the resources of freshwater fisheries, Even if management plans are prepared, there is no funding available for implementing such management plans
- Fisheries Management Plans for Bagré and Kompienga, which are the two largest water bodies for fishing are out of date and need revision
- Difficulty in finding and attracting private investment in the fisheries sector
- Lack of volume of fish caught and production in aquaculture to satisfy the demand in the area
- Limited research and development in fishing and aquaculture

- Lack of knowledge about fisheries among people engaged in the fishing sector

10.3.3 Objectives for Fisheries Sector in Burkina Faso

The objectives of the fisheries sector development in Burkina Faso are determined as follows:

- To develop sustainable fresh water fishing to maintain the fisheries resources
- To develop aquaculture to increase the amount of fish produced to support the increasing demand for fish within the country

10.3.4 Strategies for Fisheries Sector in Burkina Faso

The strategies for the fisheries sector development in Burkina Faso are the following:

- To implement and revise the Fisheries Management Plans for sustainable management of fisheries resources in the areas with major potential for the fisheries sector
- To promote intensive aquaculture and integrated semi-intensive aquaculture by utilizing existing aquaculture facilities in Bagré Pole
- To increase the production of fish by strengthening the research capacity and enhancing the connection between the researchers and the fisheries sectors
- To strengthen the capacity of people engaged in fisheries and aquaculture

10.3.5 Programmes and Projects for Fisheries Sector in Burkina Faso

The following programmes and projects are proposed for the fisheries sector in Burkina Faso:

- Project for Revising the Fisheries Management Plans for Bagré, Kompienga, Sourou and Ziga
- Project for Implementing the Fisheries Management Plans for Bam, Sirba, Toecé, Yakouta and Douna
- Fisheries Sector Management Project for Bagré Growth Pole Project
- Project to Support the Private Sector for Investing in Aquaculture
- Project for Supporting the Research Centre for Aquaculture at Bobo Dioulasso
- Vocational Training Project for the Fisheries Sector

10.4 Mining Sector of Burkina Faso

10.4.1 Present Situation of Mining Sector of Burkina Faso

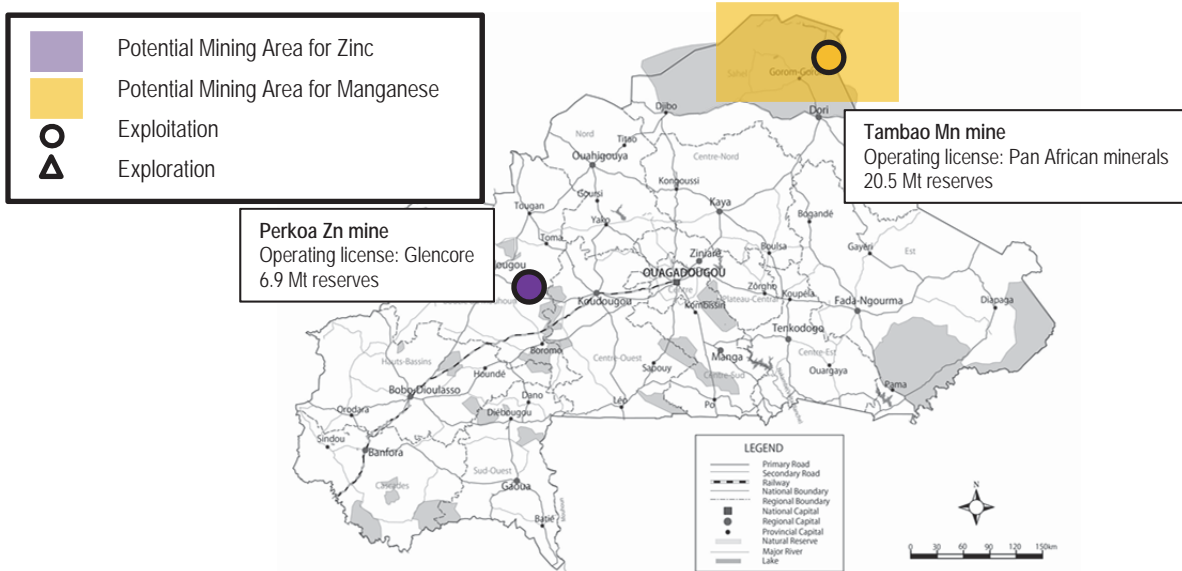
Gold is the most important mineral in terms of government revenues for Burkina Faso, and the gold production is growing despite its current low prices. Besides gold, manganese and zinc are the main producing minerals in Burkina Faso. However, manganese production at ACM Corporation's Kiere Manganese Mine, located 20 km north-east of Houde, has been suspended due to an incompliance of the private concessioner with the contract. The manganese ore used to be transported by truck to Abidjan.

The table below shows the recent mineral production in Burkina Faso.

Table 10.4.1 Mineral Production in Burkina Faso

	Year					
	2007	2010	2011	2012	2013	2014
Gold (oz)	10,245	639,105	982,813	894,163	1,021,539	1,117,000
Manganese (tons)	—	57,355	49,715	—	—	—
Zinc (tons)	—	—	—	—	57,254	95,000

Source: Ministry of Mines and Energy, 2015



Source: JICA Study Team

Figure 10.4.1 Existing and Potential Mining Sites in Burkina Faso

Table 10.4.2 Mineral Reserves and Resources and Production Forecast of Major Mines in Burkina Faso

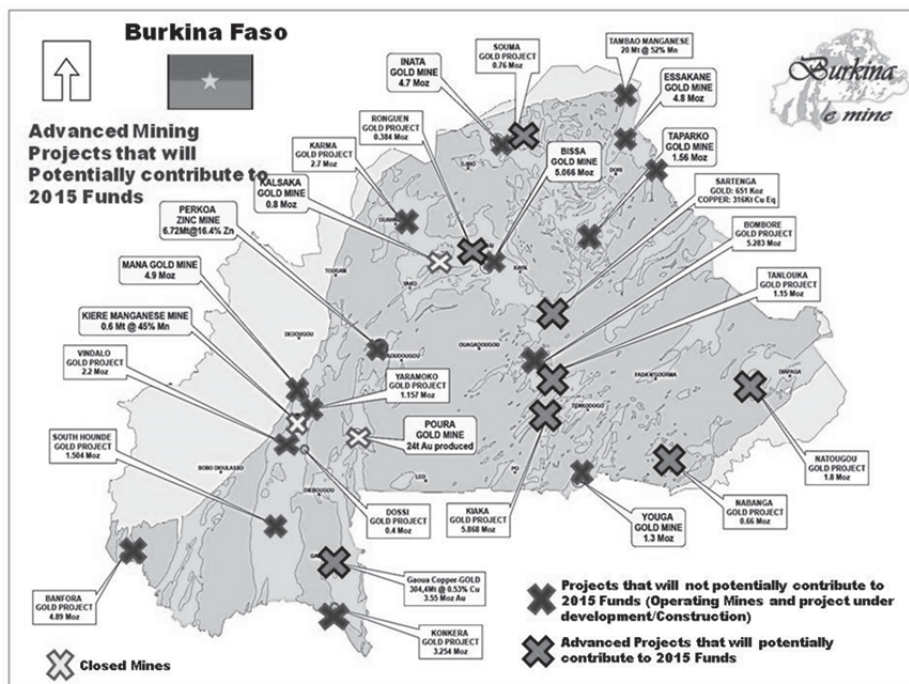
Ore Deposit	Reserves and Resources	Production forecast
Tambao Mn mine (Suspended)	107million tons measured, indicated and inferred resources*	3 million tons/year full production by 2017*
Perkoa Zn mine (Operating)	4.8 million tons measured and indicated resources 2.3 million tons inferred resources**	Mine closure due to the end of the life of mine which was approximately 5 years**

Source*: Timis Corporation Annual Report

Source**: GLENCORE HP (GLENCORE Resources & Reserves as at 31 December 2015)

(1) Gold Mine

In 2014, gold production reached 1.17 million ounces and contributed to the state budget 168.483 billion CFA francs. Most active gold mining sites are located in the central to the eastern part of Burkina Faso. Figure 10.4.2 shows the mining sites and deposits in Burkina Faso, including gold mining sites.



Source: Burukina-emine (Webpage: <http://www.burkina-emine.com>)

Figure 10.4.2 Distribution of Mineral Deposits and Mines in Burkina Faso

(2) Manganese Mine

1) Tambao Manganese Mine

Tambao mine is owned by Pan African Minerals Ltd. (PAM) and mining and environmental licenses for Tambao were awarded to PAM in 2013, and a 30-year lease agreement for the mineral terminal port in Abidjan had been signed. Production at Tambao had already been started and trial exportation had commenced. It is said that the concentrate was transported by truck to Côte d'Ivoire. The Burkina Faso government ordered PAM to halt production at Tambao. That's because the new government decided to review all previous mining contracts with private companies when Transitional President Michel Kafando took over. Through this process, the government warned that PAM did not follow the agreement which includes the rehabilitation and construction of railway lines, the construction of a road from Dori-Gorom Gorom, and the construction of a dam along the Beli River to provide water and hydro-electric power.

According to the news issued on REUTERS, Burkina Faso's transitional government lifted a suspension of miner Pan African Minerals' manganese export licence, which was imposed in March 2015. It seems that the unstable environment for the mining of Tambao will continue for the time being.

2) Kiere Mn mine

According to the Burkina e-mine, Kiere mine has a capacity of 600,000 tons but is only weakly exploited due to difficulties of equipment and qualified personnel. Indeed, 10 thousand tons of monthly operations were expected, but it produces only 3,000 to 4,000 tons per month and is considered a small scale mine.

(3) Zinc Mine

Perkoa Zn mine

Perkoa zinc mine is owned by GLENCORE, which is a giant zinc producer. According to homepage of GLENCORE, production for year 2015 was 0.50Mt grading 18.4% Zn. Current expected life of the mine is approximately 5 years based on reserves and approximately 6.5 years resources. Expiry date of the relevant mining concession licences: is 20 March 2027.

10.4.2 Issues regarding the Mining Sector of Burkina Faso

The following issues are identified for the mining sector in Burkina Faso:

- Non-compliance with agreements between the government and private mining companies concerning development of transport infrastructure for transporting extracted minerals, as well as fuel and equipment for mining activities
- Especially the new construction and rehabilitation of Tambao-Dori-Kaya-Ouagadougou rail sections are required for expanding the production of manganese ore in Tambao Mine
- Poor maintenance of the railway infrastructure between Ouagadougou and Abidjan due to low transport demand for the railway
- Difficulty in attracting more foreign investments in exploration and extraction of the mining sector
- Shortage of information on mineral resources provided to private sectors
- Negative impacts of mining projects on surrounding natural and social environments
- Lack of utilization of local people, including women from local communities, as labour force in mineral resource development in their country.
- Improper mining activities by artisanal small-scale mining

10.4.3 Objectives for Development of Mining Sector in Burkina Faso

The objectives for development of the mining sector in Burkina Faso are defined as follows:

- To sustain mining activities so that the mining sector could continue to contribute to the national economy and employment
- To develop transport infrastructure for transporting extracted minerals, as well as fuel and equipment for mining activities
- To attract more foreign investments in exploration and extraction of the mining sector by providing information on mineral resources
- To create an industrial structure which focuses not only on upstream industries but also downstream sectors including processing of mineral resources within the country
- To mitigate the impacts of mining projects on surrounding natural and social environments
- To utilize local people, including women from local communities, as labour force in mineral resource development in their country.
- To enable artisanal small-scale mining to engage in proper mining activities in full consideration for the environment and local community.

10.4.4 Strategies for Development of Mining Sector in Burkina Faso

The following strategies are formulated for development of the mining sector in Burkina Faso:

- To select potential target mines, formulate and implement an integrated programme for promoting sustainable mining activities by involving government organizations in charge of mining, railway and roads, as well as investment promotion
- To establish a mineral information data base and open it to the private sectors (strategy) for supporting investment promotion to the mining sector
- To raise the level of mining policies and laws to the same standards as those in advanced countries and develop mining businesses.
- To distribute taxes and royalties derived from mining activities to local communities and create a funding system that can contribute to community development, in addition to Corporate Social Responsibility (CSR) activities
- To establish a proper monitoring system of artisanal small-scale mining

10.4.5 Target Mines for Development of Mining Sector in Burkina Faso

The mines to be targeted for development of the mining sector in Burkina Faso are as follows:

- Tambao's manganese mine

Necessary interventions to promote sustainable development of Tambao's manganese mine are as follows:

- Rehabilitation and maintenance of roads from Kaya through Dori up to Tambao mine
- Rehabilitation of railway between Ouagadougou and Kaya
- New construction of railway from Kaya and Dori and up to Tambao mine
- Operation of railway from Tambao mine through Ouagadougou to Abidjan Port
- Improvement of railway access to mineral berth at Abidjan Port
- Improvement of mineral berth at Abidjan Port

10.4.6 Profiles of Priority Projects for Mining Sector of Burkina Faso

(1) Expansion of Mining Operation of Tambao Manganese Mine by Rehabilitation and Construction of Railway between Tambao and Ouagadougou through Dori and Kaya

1) Project Outline

Exploitation and export of minerals is one of the most important products supporting the national economy of Burkina Faso. The export value of minerals accounts for over 66% (year 2016) of the total export value, while gold is the most important mineral for export. It is necessary for Burkina Faso to continue to expand mineral resources exploitation and export by diversifying its minerals. Tambao's manganese is one of the important target minerals for increasing mineral production and export for Burkina Faso.

The project will rehabilitate the existing rail section between Ouagadougou and Kay (103 km) and will construct two new rail sections, one section between Kaya and Dori (155 km) and another section between Dori and Tambao (83 km), in order to increase the transport volume of manganese ore from Tambao Mine to Abidjan Port. In addition to these rail sections to be rehabilitated and newly constructed, the transport of manganese ore from Tambao Mine to Abidjan Port depends on the existing Ouagadougou-Abidjan Railway (Sitarail). The annual transport demand of manganese ore for this railway is 1 million ton.

This project is required for expansion of mining production of Tambao Mine, while preventing the deterioration of roads and reducing the transport cost of manganese ore. This project should be implemented by the private mining concessioner. However, the government should support the planning and construction of the railway in respect of land acquisition and coordination with local communities along the railway line.

The rail section which is to be completed by this project would be part of the railway connecting Ouagadougou (Burkina Faso) and Niamey (Niger). Moreover, the rail sections of Dori-Kaya-Ouagadougou could also strengthen the transport capacity of live cattle from Burkina Faso and Niger to coastal countries.

2) Funding Scheme

PPP

3) Estimated Project Cost

US\$ 606 million

10.5 Manufacturing Sector of Burkina Faso

10.5.1 Present Situation of Manufacturing Sector in Burkina Faso

The Strategy for Accelerated Growth and Sustained Development 2011-15 (SCADD 2011-15: *Stratégie de Croissance Accélérée et de Développement Durable*) was prepared for the promotion of poles of growth, the development of promising sectors, promoting niches and clusters, and the promotion of pro-poor growth to fight effectively against poverty. Particular emphasis is placed on the development of industry through the promotion and development of agricultural product processing enterprises. Currently, the next five year plan is being prepared.

Also, the Sectoral Policy of Industry, Trade and Handicrafts (POSCIA: *Politique Sectorielle du Commerce, de l'Industrie, et de l'Artisanat*), which was adopted by the Council of Ministers on 5 July 2012, was formulated by the Ministry of Industry, Commerce and Handicrafts (MICA: *Ministère de l'Industrie, du Commerce et de l'Artisanat*) and the related ministries. The main objective pursued in this policy is to meet the challenges of diversifying the Burkinabe economy through a dynamic and competitive private sector and creation of jobs.

Specifically, this will involve: (i) to develop a mass of competitive industries that are oriented toward processing local raw materials and exploiting emerging technologies; (ii) to promote promising sectors to increase the internal and external commercial potential; (iii) to develop the craft sector; (iv) to create a favourable environment for the emergence of a dynamic private sector; and (v) strengthen institutional and organizational capacities of MICA.

Moreover, the General Directorate of Industry (DGI: *Direction Générale de l'Industrie*) of MICA stresses the need for industrial zone development. Especially expansion of Kossodo Industrial Zone in Ouagadougou is important since Gounghin Industrial Zone has no room for expansion. Some factories moved from Gounghin Industrial Zone to other places mainly because the zone, which is located in the centre of the city, faces difficulties of transportation and logistics.

The government has also taken measures to extend Bobo-Dioulasso Industrial Zone and to create a dry port in Bobo-Dioulasso. Moreover, the creation of two new industrial sites at Tanghin Dassouri for the chemical industry and Koubri for the food industry both in the province of Kadiogo is taken into account.

10.5.2 Issues regarding the Manufacturing Sector of Burkina Faso

Especially from the viewpoint of the corridor development, the following are recognized as issues or constraints for industrial development in Burkina Faso.

- Unavailability of supporting infrastructure including specific industrial zones/areas devoted to manufacturers
- High cost of utilities (water and electricity)
- Constraints on the marketing and consumption of local products

10.5.3 Objectives for Manufacturing Sector of Burkina Faso

The main objectives of the manufacturing sector are as follows:

- To boost the whole economy along corridor areas
- To strengthen private sector activities

10.5.4 Strategies for Manufacturing Sector of Burkina Faso

The strategies determined for the manufacturing sector of Burkina Faso are as follows:

- To secure production space for manufacturers, especially along the corridor areas
- To improve support to agencies and organizations to develop and manage the industrial zones
- To introduce the following expected types of industrial sub-sectors such as food, beverage, and plastics for industrial zones as shown in Table 10.5.1 which can be consumed by the emerging middle income population in the sub-region

Table 10.5.1 Expected Types of Industries in Burkina Faso

Classification of sub-sector/ISIC	Prioritized types of sub-sectors by Ministry of MICA in the whole country	Typical types of industries along North-South Corridor	Existing types of industries along North-South Corridor	Expected Types of Industries along North-South Corridor
10 - Manufacture of food products (Based on fruits, vegetables, cereals, etc.)	V	V	V	X
11 - Manufacture of beverages	V		V	X
12 - Manufacture of tobacco products			V	
13 - Manufacture of textiles (including cotton ginning)		V		X*
14 - Manufacture of wearing apparel		V	V	X
15 - Manufacture of leather and related products			V	X
16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials			V	X
17 - Manufacture of paper and paper products				
18 - Printing and reproduction of recorded media			V	
19 - Manufacture of coke and refined petroleum products				
20 - Manufacture of chemicals and chemical products	V		V	X
21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	V			
22 - Manufacture of rubber and plastics products		V	V	X
23 - Manufacture of other non-metallic mineral products (cement)	V		V	X
24 - Manufacture of basic metals				
25 - Manufacture of fabricated metal products, except machinery and equipment			V	X
26 - Manufacture of computer, electronic and optical products				
27 - Manufacture of electrical equipment				
28 - Manufacture of machinery and equipment			V	
29 - Manufacture of motor vehicles, trailers and semi-trailers				
30 - Manufacture of other transport equipment				
31 - Manufacture of furniture			V	X
32 - Other manufacturing			V	
33 - Repair and installation of machinery and equipment			V	X

Source: JICA Study Team based on the Sectoral Policy of Industry, Trade and Handicrafts by Ministry of Industry, Commerce and Handicrafts (MICA) and various documents on industrial location factor by Industrial Location Centre of Japan

Note*: Revitalization and transformation of a traditional cotton-based spinning mill through the National Centre for Support of Cotton Handicraft Transformation in Bobo-Dioulasso (CNATAC) are expected.

10.5.5 Programmes and Projects for Manufacturing Sector of Burkina Faso

The following programmes and projects are proposed:

- Rehabilitation of the components of Gounghin Industrial Zone such as roads, electricity, telecommunication, water supply and sewerage and promotion of relocation of industries to Kossodo Industrial Zone or other areas to efficiently utilize the central district of Ouagadougou
- Expansion of Kossodo Industrial Zone with introduction of expected or prioritized type of subsector
- Development of new (third) industrial zone in Ouagadougou and/or at Tanghin Dassouri and Koubri both in the province of Kadiogo
- Development of a new Bobo-Dioulasso Industrial Zone
- Strengthening of vocational training by the Chamber of Commerce and Industries

10.5.6 Profiles of Priority Projects for Manufacturing Sector of Burkina Faso

(1) Integrated Development Project of Gounghin and Kossodo Industrial Zones in Ouagadougou

1) Rationale of the Project

Gounghin Industrial Zone, which is located in the centre of the city, faces difficulties of transportation and logistics. It is necessary to reduce traffic congestion and to efficiently utilize the central district of Ouagadougou.

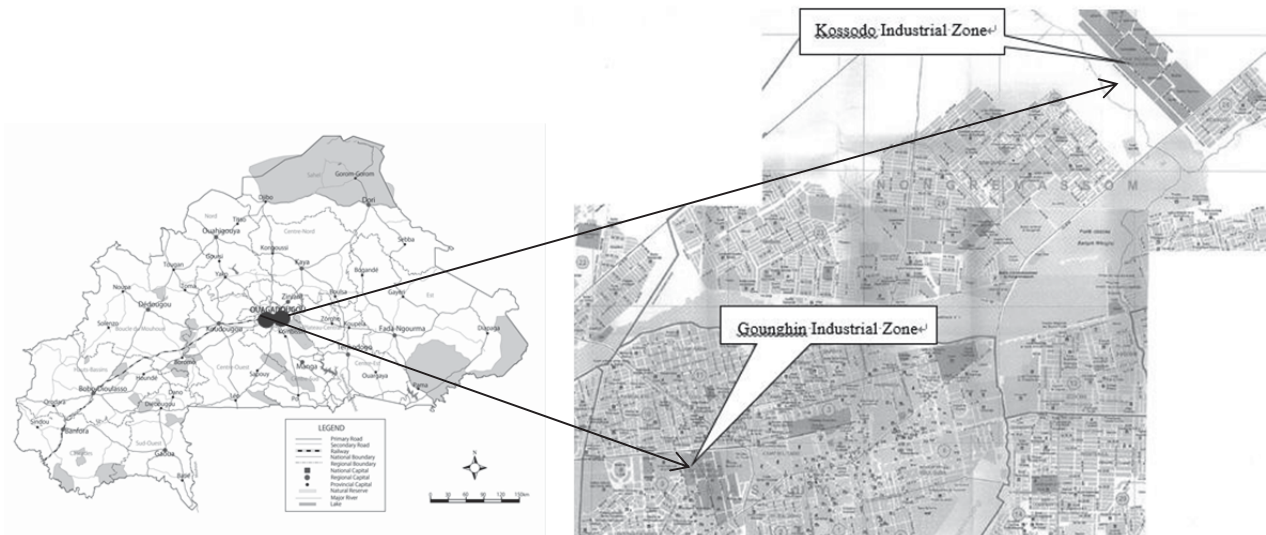
2) Objectives of the Project

- To relocate industries from Gounghin Industrial Zone to the expanded Kossodo Industrial Zone or other areas
- To rehabilitate Gounghin Industrial Zone

3) Project Description

The project descriptions are as below.

- To promote relocation, the government may provide an incentive package for enterprises. The construction of standard factories or readily available and fully serviced rental space for industries (serviced industrial apartments) for small and medium industries in the expanded Kossodo Industrial Zone is an option.
- The components of rehabilitation in the Gounghin Industrial Zone include roads, electricity, telecommunication, water supply and sewerage.
- Redevelopment of the central district in Ouagadougou through introduction of residential and commercial functions utilizing the vacant space after relocation of factories.
- As for the expansion of the Kossodo Industrial Zone, divided lots with adequate infrastructures including electricity, water, drainage and telecommunications will be created. Also, the Project is to provide management services for enterprises located in the Industrial Zones.



Source: JICA Study Team based on the information from the Ministry of Industry, Commerce and Handicrafts (MICA)

Figure 10.5.1 Location of the Integrated Development Project of Gounghin and Kossodo Industrial Zones

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Reduction of traffic congestion in the central district of Ouagadougou
- Removal of nuisance to industrial activities from the central district of Ouagadougou
- Efficient utilization of the land in the central district of Ouagadougou

5) Executing Agency and Related Institutions

The Ministry of Industry, Commerce and Handicrafts (MICA) would be the executing agency for the Project. Also, a private developer would play an important role if a PPP scheme is applied. MICA and a private developer will be responsible for rehabilitation plan of Gounghin Industrial Zone, basic design and detailed design of the expansion of Kossodo industrial zone, and preparation of management plans for the industrial zones.

6) Implementation Schedule

The implementation schedule for this project is from 2016 to 2020 (four years) with technical & financial support.

7) Necessary Action for Implementation / Critical Factor

Necessary action for implementing this priority project is as follows:

- Relocation of enterprises and planning for rehabilitation programmes

8) Related Projects

Development planning of the central district of Ouagadougou should be taken into consideration.

9) Social and Environmental Impacts

N.A.

10.6 Information and Communication Technology (ICT) Sector of Burkina Faso

10.6.1 Present Situation and Future Prospects of ICT Sector of Burkina Faso

ICTs have a decisive effect on the economic and social development of society and are, in a world of increasingly interconnected, an essential tool of sustainable human development.

Fully aware of these issues, the Government of Burkina Faso, following the reforms undertaken since 1990, particularly in the telecommunications subsector, consider ICT development as an important and overarching principle. Also, a national e-strategy was adopted on 13 October 2004 with the ambition to foster the convergence of telecommunication development policies, information technology and broadcasting, and ensure wide dissemination of ICT in society, their accessibility and their appropriation by all social classes and mobilizing their potential for the benefit of national development strategies. The inscription of the digital economy and jobs as a pillar of growth in the Strategy for Accelerated Growth and Sustainable Development SCADD adopted on 24 March 2011 confirmed the role of ICT in the development and growth of Burkina Faso.

The creation, January 2, 2013, of the Ministry of Development of the digital economy and jobs (MDENP) reflects the government's aim to make the digital economy and job support sector to boost the economic growth of Burkina Faso and other sectors of the economy.

Therefore, the development and formal adoption of a sectoral policy and an action plan were imperative.

The development and implementation of sectoral policy must not only promote growth and jobs in the digital economy sector in Burkina Faso, but will also serve to strengthen the contribution of this sector to the overall development of the country, particularly through the improvement of productivity, increased access to education supply, health care and public services, promoting good governance and job creation.

(1) ICT Policy of Burkina Faso

ICT policy is described in the Strategy for Accelerated Growth and Sustained Development 2011-15 (SCADD 2011-2015: *Stratégie de Croissance Accélérée et de Développement Durable*) as follows: "Besides its importance for the development of activities in all sectors, ICT is an important growth

vector. In this sector, the country has made impressive progress. The state has an infrastructure development strategy that is aimed at making ICT a powerful lever for development through a program it has set up to promote digital technology in all sectors”.

In view of industry challenges, the vision is available as follows: "By 2025, Burkina Faso will have a sector of electronic communications and postal service contributing to the building of a modern information society, inclusive and dynamic, which supports social and economic development."

As such, the mission of the digital economy and jobs are:

- Developing communications infrastructure;
- Accompany and promote the use of ICT, developing online services and local content;
- Develop a local industry based on ICTs;
- Promote modern postal services

In line with the realization of the vision of the sector, the overall objective of "Making electronic communications and postal services a major productive sector contributing to social and economic development of Burkina Faso and serving as a lever and accelerator for other sectors."

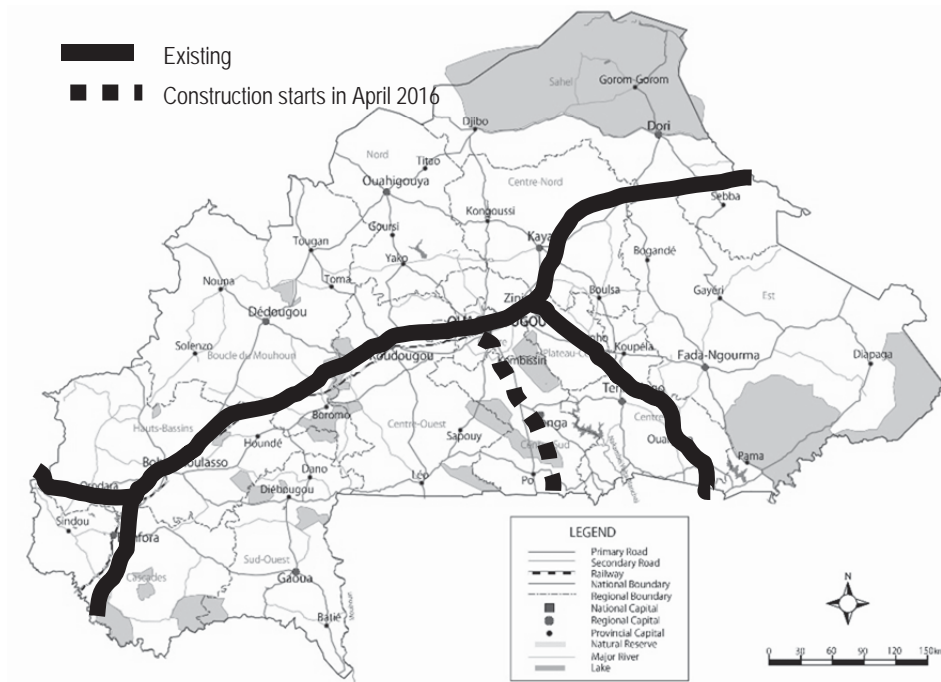
This overall objective that reflects the aim that the digital economy and jobs is trying to reach is available through three sector specific objectives:

- Promote equitable and affordable access to electronic communications infrastructure and ICT services tailored to the needs of populations;
- Promote the integration of ICT in all processes of the different economic actors;
- Promote access to modern postal services in the entire territory.

(2) Telecommunication Network

Backbone optic fibre cables are implemented and operated only in limited trunk lines, which are 1,400km in total length, by the National Telecommunications Office (ONATEL: *Office National des Télécommunications*) as shown in Figure 10.6.1, while a short line about 150km to be connected with Ghana will be constructed soon and another 5,000km are planned to cover most of the area. Because Burkina Faso is a landlocked country which cannot have an international sub-marine cable connection, many connections with coastal countries are very important.

Land lines are monopolised by ONATEL, while mobile services are fully provided by private operators. The last miles are still big challenges and even government offices in Ouagadougou need connectivity. Backbone Project will deploy 5,700 km of optical fibre across the entire national territory and will result in the creation of internet exchange point (IXP) and virtual landing point (VAP).



Source: JICA Study Team based on report from MDENP

Figure 10.6.1 Telecommunication Network in Burkina Faso

(3) ICT Park / Data Centre

The information and communications technology (ICT) is vital for all human society and specifically to that of developing countries. Also, in a few years, it must be the heart of domain for investments:

- Modernize and make more efficient public services;
- Providing better services to the population;
- To open up new services in the fields of agriculture, education and health;
- Meet the demands of companies that want greater efficiency for their competitiveness.

The overall objective of the Technopole project is to promote the consolidation, facilities and benefits granted by a sector emulation, installation of international companies and the creation of new resources through ICT.

To implement the project, land of 80 hectares in the southern extension area of the city of Ouagadougou (Po Road) was made available.

(4) Human Resources Development

One of the Sustainable Development Goals (SDGs) is to "build a resilient infrastructure, promoting sustainable industrialization that benefits everyone and encourages innovation." To achieve this objective, the telecommunications sector and information technology and communication needs quality human resources for the implementation of national sector development policies as the ability of companies to innovate and position themselves in a global value chain depends on the technical skills they have.

In the context of Burkina Faso, the issue of technical expertise in telecom / ICT is acute and has been discussed in several cooperation frameworks. One of the most important was the first national conference on the Digital Economy held from 5 to 7 November 2015 in Ouagadougou.

Thus, it was recommended, among others, to set up an emergency program for upgrading ICT skills, to develop a national policy for capacity building and skills and to create a management structure for skills in the ICT sector in the administration approach built on a Public / Private Partnership (PPP).

In addition, the creation of a fund to support training, research and innovation and supporting existing training centres are defined as goals by the Prime Minister under the Priority Action Plan (PAP) for the sector.

Thus, implementation of the following projects will greatly contribute to the transition of Burkina Faso into an information society:

- The Technopole ICT Project Ouagadougou;
- The Backbone project;
- Point the virtual landing project;
- Point project Internet exchanges;
- The G-Cloud project;
- The draft call centre Multimedia.

We can therefore deduce that the success and momentum of these above mentioned projects and programs may encounter difficulties because they will depend largely on the abundance and quality of specialized human resources in the present and future, especially for this sector as a component of "higher education in Telecoms / ICT".

(5) ICT Services

Building a digital industry in Burkina Faso is based on the creation of ICT technopolis Ouagadougou, a multimedia call centre and the implementation of an integrated ICT training system in Burkina Faso. The development and use of ICT services starts with the promotion of the use of Telecommunications / ICT, engaging the whole society in a process of appropriation of ICTs through training, capitalization of best practices in the field of ICT and the development of services and applications of e-Government.

(6) Future Prospects

Despite the gains made in the implementation of the sector policy letter, progress is still required to enable the digital economy sector and many positions to fill. The diagnosis of the sector through the weaknesses and threats highlighted the nature and importance of the challenges, which include:

- Developing infrastructure, quality services and uses;
- Create an environment of trust in the use of electronic communications services and an appropriate governance sector;
- Promote local content in the digital domain;
- Develop universal service including access to mobile devices;
- Promote the development of national expertise in electronic communications;
- Restructure the financial postal services;
- Promote innovative products and services through the interconnectivity of networks and the optimal use of information and communications technology;
- Develop the universal postal service.

The table below compares the current situation and proposed future demand of the ICT sector in Burkina Faso.

Table 10.6.1 Current Situation and Future Prospects of ICT Sector in Burkina Faso

	Now	2025	2040
Individual Usage of Internet	9.4% (2014)	50%	80%
Internet Usage at household	2.2% (2010)	30%	60%
Broadband subscription	0.08% (2013 only fixed line)	10%	30%
ICT HRs		10,000	30,000

Source: JICA Study Team based on ITU statistics and estimation

The ICT improvement can support other infrastructures which constitute corridors and industries that will be established along those corridors. Necessary measures have to be ready earlier than implementing new corridor infrastructures. In this sense, ICT infrastructure development must be prioritized. However ICT services must grow at the same time. It is because infrastructure development may cause easier access to foreign countries, and cause worry about more procurement of services, software and contents.

10.6.2 Issues regarding the ICT Infrastructure of Burkina Faso

The development of electronic communications infrastructure aims to improve the availability of adequate basic infrastructure, access to appropriate technologies and the environment of trust, essential to make available to citizens and businesses equitable, affordable telecommunications / ICT services and encourage their use.

In the sub-sector of Telecommunications / ICT, there is:

- Signing the technical contract for the realization of the national telecommunications backbone network (Backbone);
- Signing the donation agreement with the World Bank for the implementation of the Regional Project of electronic communication infrastructures in West Africa (PRICAO-BF);
- Interconnection fibre with Niger from Kantchari;
- The extension and strengthening of the National Computer Network Administration (RESINA) through:
 - The completion of a fibre optic loop forty kilometres long, connecting 90 major sites of the Administration in Ouagadougou;
 - The establishment and operation of wireless networks, WiMax type flow, in the thirteen heads of towns and regions in one capital of a Province (Tugan) with over eight hundred administrative sites already connected;
 - Maintenance of various central and shared equipment (WiMax base stations, optical loop, generator sets, inverters, routers, switches, ...);
 - Interconnection of RESINA by dedicated lines (LS) of the decentralized services of the MEF;
 - Strengthening internet access of RESINA in Ouagadougou, by increasing the bandwidth to 80 Mbit/s.

10.6.3 Objectives for Development of ICT Industry of Burkina Faso

The Technology ICT Ouagadougou, multimedia call centre and the implementation of an integrated ICT training system in Burkina Faso are the backbone of the development objective of the digital industry.

10.6.4 Strategies for ICT Industry of Burkina Faso

To achieve the vision set out above, the following strategic directions are retained to form the backbone of the sectoral policy of the digital economy sector and positions:

- Promote the integration of ICT in all aspects of economic, social and cultural life of Burkina Faso;
- Make Burkina Faso a country of ICT-based services;
- Promote the postal Subsector for supporting economic, social and cultural development of Burkina Faso;
- Promote sustainable development of universal high quality, effective and accessible postal services, to facilitate communication between the inhabitants of the planet.

10.6.5 Programmes and Projects for ICT Industry of Burkina Faso

The following projects are proposed for the ICT industry of Burkina Faso:

- Backbone project;
- The project of creating a community access centre;
- The proposed creation of a multimedia call centre;
- The proposed construction of a main data centre and a backup data centre;
- The project of construction and equipment of school ICT;
- The G-Cloud project;
- The technology park project;
- The project to support the strengthening of communication infrastructures;
- Broadband wireless connectivity project;
- The video conferencing project;
- The project Passport Burkina computer skills (SVMIP);
- The project e-Government;
- The security project RESINA;
- The project of strengthening the information administration system (PRSIA).

10.6.6 Profiles of Priority Projects for ICT Infrastructure of Burkina Faso

The following projects are picked as priority projects considering their relationships with the Corridor Development Master Plan.

(1) The Backbone Project

1) Rationale

Relationship with National Plan

- SCADD (2010-2015) mentions that ICT is an important growth driver
- SCADD also describes:
 - The creation of a technological and infrastructural environment favourable to telecommunication / ICT;
 - Support for the implementation of sectoral e-strategies;
- The achievement of communication, training, research and capacity building in the field of telecommunications / ICT.

Relationship with Corridor Development

Burkina Faso is located as a hub in the region which connects between coastal countries and inland countries. The hub must include an Information hub as well as transportation hub. This is very important for regional integration.

2) Objectives

The objectives for this project are as follows:

- Make available to players of a shared universal infrastructure sector for the transport of voice, image and data accessible throughout the territory.
- Building that infrastructure as well as other basic infrastructure, such as roads, so as to focus the competition of the operators on services and to maximize return of investment.

3) Project Description

Burkina Faso has undertaken to liberalize its telecommunications sector in the second half of the 1990s. This reform led to full market opening to competition starting in 2006. To date, three

operators holding global licenses and many value-added service providers are operating in the sector whose regulation is ensured by an independent regulatory authority, the Electronic Communications regulatory authority and Posts (ARCEP). Since the opening of the Sub-sector of telecommunications to competition, electronic communications services became an important development in our country. The main indicators achieved to 31 December 2013 are as follows:

- Five hundred twenty-seven (527) localities were connected to the fixed network;
- Telephone density of 65.68 telephones per 100 inhabitants;
- The total capacity of the bandwidth is 4683 Mbit / s (in 2014).

But many challenges remain. Access to broadband service or broadband remains embryonic and the poor quality of services is constantly criticized.

Recognizing that access to such broadband quality services and generally building an inclusive information society is conditioned by the availability of appropriate infrastructure in the territory, the Government decided to contribute to the establishment of such an infrastructure. Thus the government has initiated, through the Ministry of Telecommunications / ICT, the National Backbone project aimed at creating a broadband infrastructure linking 45 heads of provincial capitals. This project will ultimately be put at the disposal of all the actors of the sector infrastructure enabling them to provide quality services.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Development of the national territory in order to promote balanced economic and social development;
- To control the medium and long term energy costs by significantly reducing travel;
- To improve the quality of life of all citizens;
- The insertion of Burkina Faso in the information highways.

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Development of Digital Economy and Posts (MDENP: Ministère du Développement de l'Economie Numérique et des Postes)

6) Estimated Project Cost

To be estimated.

7) Implementation Schedule

The implementation schedule for this project is to be developed.

(2) Techno-pole and Data Centre

1) Rationale

Relationship with National Plan

- SCADD (2010-2015) mentions that ICT is an important growth driver
- SCADD also describes:
 - The creation of a technological and infrastructural environment favourable to telecommunication / ICT;
 - Support for the implementation of sectoral e-strategies
 - The achievement of communication, training, research and capacity building in the field of telecommunications / ICT

Relationship with Corridor Development

Planned location is at the entrance of Accra-Ouagadougou corridor. Therefore, this can support any corridor infrastructure easier and it is a good location for international connectivity and as an ICT integrated area.

2) Objectives

The objectives for Technopoles are as follows:

- Create a welcoming space to bring together expertise in the ICT sector and promote synergies;
- Provide a quality working environment (advanced infrastructure) and specific legal and tax incentives for ICT projects;
- Promoting innovation by hosting R & D activities of private companies in the ICT sector as well as centres of excellence in ICT Government;
- Stimulate and manage the transfer of knowledge and technology transfer;
- Contribute to the technical modernization of enterprises and the Burkinabe Government Agency;
- Support the growth of Burkinabe companies;
- Contribute to job creation;
- Create an ecosystem favouring the emergence of an information society in Burkina Faso.

The objectives for the Data Centre are as follows:

- Enable storing huge amounts of data that will be generated by the implementation of e-Government;
- Pooling IT resources in a context of scarce financial resources;
- Ensure continuity of services on the RESINA (business applications operating, messaging, IP telephony, ...) thanks to the redundancy of critical facilities;
- Securing computer data, as well as servers and applications for disaster (computer, natural ...)
- Optimize RESINA and the applications it allows to exploit

3) Project Description

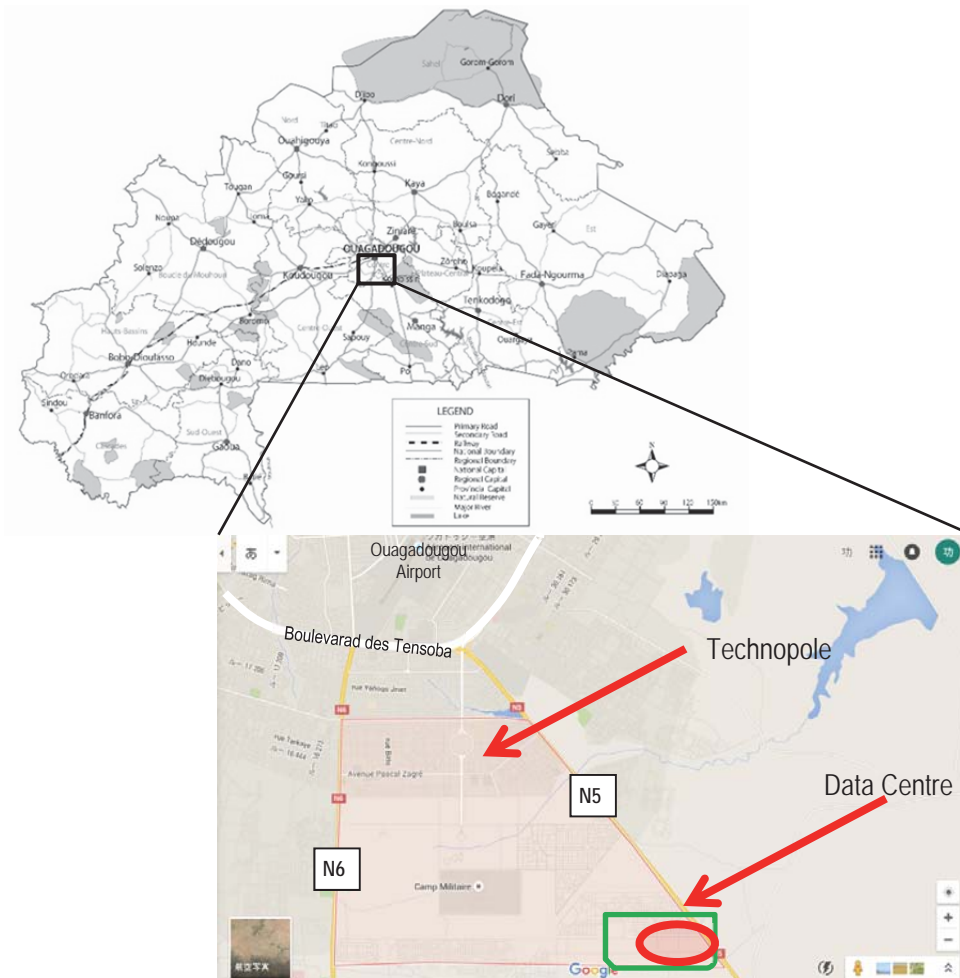
The Technopole develops business opportunities related to new technologies, particularly in the field of information and communications technology (ICT).

Through the promotion and support structures on the site, it supports businesses, projects and ideas generating new business models through a more productive organization of information technology, thus promoting synergies between research institutes and companies to develop innovative solutions.

The overall objective of the project is to create a technology park to promote the consolidation, facilities and benefits granted by a sector emulation, installation of international companies and the creation of new resources through ICT.

It is also aimed to build a new primary data centre and a backup to international standards of security and availability in accommodation of data and computer applications in an environment with strict standards (electricity, temperature, humidity, fire protection, communications, accessibility, etc.).

The primary Data centre will aim to be the nerve centre of the Governmental Intranet especially in a context of progressive development of e-Government.



Source: JICA Study Team based on a report from MDENP

Figure 10.6.2 Project Location for Technopole and Data Centre Project in Ouagadougou

4) Expected Benefits

The following impacts and benefits are expected in Technopole:

- The development of national expertise in the ICT field;
- Support for the creation and / or development of leading companies in the ICT field;
- The availability of a local supply of quality ICT services to business needs and Administration, may, in the medium term, make Burkina Faso a service country;
- The development of e-government, e-commerce, distance education, telemedicine and electronic content and services in local languages, adapted to the needs of rural areas;
- The creation of an attractive environment for foreign investors in the ICT sector;
- The creation of new employment opportunities;
- The creation of jobs and wealth based on the information society services.

The following impacts and benefits are expected in the Data Centre:

- Strengthen other sectors by providing easier utilization of ICT;
- More services and contents to citizens;
- It will become possible to use domestic services rather than foreign services. This contributes to the improvement of the national economy;
- The ICT industry will be born.

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Development of Digital Economy and Posts (MDENP: Ministère du Développement de l'Economie Numérique et des Postes)
- National Agency for ICT promotion (ANPTIC: Autorité Nationale pour la Promotion des TIC)

6) Estimated Project Cost

Estimated project cost is US\$15-20 mil only for data centre.

7) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 10.6.2 Implementation Schedule for Data Centre Construction Project in Burkina Faso

Item/Activity	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Note
T.P Design	■				
TP Construction		■	■	■	
DC Design		■			
DC construction			■	■	
Capacity Building			■	■	

Source: JICA Study Team

8) Necessary Action for Implementation / Critical Factor

Necessary action for implementing this priority project is as follows:

- Techno-Pole must be prepared prior to Data Centre.

(3) E-Government Project

1) Rationale

Relationship with the existing National Development Plan (SCADD)

- SCADD (2010-2015: ICT is important growth driver
- SCADD also mentions “Creating an ICT administration service to make it more efficient and transparent, through a generalization of access to information and the development of online public services.”

Relationship with Corridor Development

- Strengthening administration efficiency is very important for promoting corridor development.

2) Objective

The objectives are:

- To integrate ICT in territorial administrations and communities through the development of computerized information systems;
- Diversify and improve, through ICT, the quality and accessibility of services provided by the administration to citizens and users;
- Improve through ICT the effectiveness of Administration staff;
- Improve through ICT the visibility of government action, parliament, advisory bodies and mediation;
- Improve through ICT the visibility of local authorities and actions for development.

3) Project Description

E-government or e-government can be defined as: "The use of ICT as a tool to put in place a modern administration, fair, transparent and efficient at the service of the user"

This project will, in particular, set up an e-government platform for our country to provide a better service to users (citizens, businesses, and the Administration itself), bringing together in a single access point, various administrative services or information to reduce the time and energy spent by users to find the service they need.

4) Expected Benefits

The following benefits are expected in this project:

- Strengthen other sectors by easier utilization of ICT;
- More services and contents to citizens;
- Can use domestic services rather than foreign services. This contributes to the improvement of the national economy.

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Development of Digital Economy and Posts (MDENP)
- National Agency for ICT promotion(ANPTIC)

6) Estimated Project Cost

- Preliminary Phase US\$0.5 –1
- Pilot Phase +US\$1 – 2
- Global Phase + US\$5 - 10

7) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 10.6.3 Implementation Schedule for e-Government Project in Burkina Faso

Item/Activity	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Note
Design		■					
Preliminary			■				
Pilot				■			
Global				■	■		
Capacity Building		■	■				

Source: JICA Study Team

8) Related Projects

Related project is listed as follows:

- Techno Pole

10.7 Investment Promotion of Burkina Faso

10.7.1 Present Situation of Investment Promotion of Burkina Faso

Burkina Faso Investment Code shows Burkina Faso's interest in attracting foreign direct investment (FDI) to create industries that produce export goods and provide training and jobs for its domestic workforce. The code provides standardized guarantees to all legally established firms that are operating in the country, whether domestic or foreign. It contains four investment and operations preference schemes, which are equally applicable to all greenfield investments, mergers, and acquisitions. Under this code, all personal and legal entities lawfully established in the country, both domestic and foreign, are entitled to the following rights: fixed property; forest and industrial rights; concessions; administrative authorizations; access to permits; and participation in state contracts.

To support the creation of business, facilitate and simplify the process among different administrations, the Government of Burkina Faso in 2005 created eight enterprise registration

centres called Centres for Business Formalities (CEFORE: *Centre de Formalités des Entreprises*). To further encourage business and investment, the Government of Burkina Faso created the Presidential Investment Council in November 2007. This is an advisory body, chaired by the head of state, to make recommendations on the development and implementation of policies for promotion of investment. Moreover, the Government created the Investment Promotion Agency of Burkina Faso (API-BF: *Agence de Promotion des Investissements du Burkina Faso*) in March 2013. The API-BF is responsible for promoting and facilitating investment in the country and assists all investors and also promotes the prestigious image of Burkina Faso inside and outside the country.

10.7.2 Issues regarding Investment Promotion of Burkina Faso

The following points are described as challenges for investment promotion in Burkina Faso:

- Limited information about not only the investment environment but also general information, such as life styles in the country, is provided to foreign investors.
- API-BF has limited experience of investment promotion because it was just started in 2015
- Difficulty of attracting FDI because of limited market size in Burkina Faso
- No substantial utilization of the merit of customs union by UEMOA and EOWAS for attracting investment to economic sectors oriented to sub-regional markets

10.7.3 Objective for Investment Promotion of Burkina Faso

The objectives of the investment promotion for Burkina Faso are as follows:

- To create more favourable investment environment for Burkina Faso and WAGRIC Sub-Region
- To take advantage of the integrated and expanded sub-regional markets, especially coastal markets for attracting investment to economic sectors of Burkina Faso targeting the growing coastal markets
- To attract investment not only to the mining sector, but also to investment to necessary transport development for mining development

10.7.4 Strategies for Investment Promotion of Burkina Faso

The basic strategies for the investment promotion are the following:

- To remove restrictions on investment for improving the business climate
- To offer more appropriate services to potential investors by capacity building of the API-BF
- To promote private investment with strategic focuses on specific economic sectors, which are agriculture, livestock and agro-processing sectors targeting growing sub-regional markets
- To attract FDI to economic sectors oriented to sub-regional markets by utilizing the merit of customs union under UEMOA and ECOWAS, which is establishment of integrated and expanded sub-regional markets
- To attract investment to the mining sector, at the same time attracting investment to necessary transport development

10.7.5 Possible Measures for the Investment Promotion

The following measures are proposed:

- Policy arrangement for a stable business climate
- Strengthening of the institutional capacity of the API-BF and other institutions in charge of investment promotion and business climate policy
- Promotion of investment to priority projects for Burkina Faso, such as Export Expansion of

Cattle and Small Ruminants to Coastal Countries, Export of Beef and Other Animal Meat to Coastal Countries, Development for Bagrépole in Agriculture, Aquaculture and Agro-Processing, Development of Irrigated Agriculture in Karfiguéla, Douna and Vallé de Kou, and Development for Manufacturing in Ouagadougou.

10.7.6 Programmes and Projects for Investment Promotion of Burkina Faso

(1) Projects for Investment Promotion for Growth Economic Sectors

Investment promotion projects in the table below should be implemented in Burkina Faso to take advantage of integration and expansion of sub-regional markets as well as to increase the number of middle income population.

Table 10.7.1 Priority Projects for Investment Promotion for Growth Economic Sectors in Burkina Faso

Sector	Project	Short Term (2018-25)	Mid Term (2026-33)
Livestock	Promotion of Investment for Export Expansion of Cattle and Small Ruminants to Coastal Countries	●	●
	Promotion of Investment for Export of Beef and Other Animal Meat to Coastal Countries	●	●
Agriculture	Promotion of Investment and Development for Bagrépole in Agriculture, Aquaculture and Agro-Processing	●	
	Promotion of Investment and Development of Irrigated Agriculture in Karfiguéla, Douna and Vallé de Kou	●	●
	Promotion of Investment for Other Agropoles		●
Manufacturing	Promotion of Investment and Development for Manufacturing in Ouagadougou	●	●
	Promotion of Investment and Development for Manufacturing in Bobo-Dioulasso		●

Source: JICA Study Team

(2) Capacity development programmes for API-BF

1) Policy Shift to Investment Promotion for Economic Sectors oriented to Sub-Regional Markets

- To make a clear shift of policy on investment promotion with emphasis on economic sectors targeting sub-regional markets, especially coastal consumers' markets
- To appeal the merit of integrated and expanded sub-regional markets, which could create the enabling business environment for economic sectors oriented to coastal markets

2) Programme for Strengthening Information Services of API-BF to the Private Sector

- Provision of information and services on the investment climate, establishment of the API-BF Homepage with substantial contents in several languages)
- Promotion of mutual exchanges of information regarding investment (e.g. organizing investment seminars, dispatching investment missions, creating local company database)

3) Programme for Formulation of Investment Policy and Implementation of Law Enforcement by Expanding the Capacity of Investment Promotion Institutions in Burkina Faso

- Clarification of investment promotion policy (e.g. Promotion of public-private dialogue to appropriately understand investor's needs, Technical training programme for assisting in the formulation of investment promotion policies on the basis of the country's strengths and weaknesses)

- Strengthening the capacity of the staff of the API-BF (e.g. Learning good practices in developing countries which are successful in attracting foreign direct investment, Dispatching experts who are working as advisors on investment promotion to organize investment seminars and plan and manage investment missions)
- Strengthening of cooperation among related organizations to correspond with investors' needs (e.g. Establishing a coordinating committee to support a policy dialogue with related organizations for provision of necessary infrastructure)

10.7.7 Profiles of Priority Projects for Investment Promotion of Burkina Faso

(1) Investment Promotion for Economic Sectors targeting Sub-Regional Markets

1) Project Outline

In 2013, the governmental agency for investment promotion (API-BF: *Agence de Promotion des Investissements du Burkina Faso*) was established. It has tried to attract investment to infrastructure development, as well as to the mining sector. However, it has not paid much attention to the growth potential of Burkina Faso's economic sectors targeting coastal markets in the sub-region.

By emphasizing the importance and possibility to integrate and expand the size of sub-regional consumers' markets, it is possible for API-BF to attract investment to economic sectors targeting sub-regional consumers' markets. Such target economic sectors include those of agriculture, livestock, fisheries and agro-processing.

The project aims to make a clear shift of investment promotion toward economic sectors orientated to sub-regional markets. For this purpose, the project will prepare new promotion materials, provide training to related agencies and personnel and implement actual activities for investment promotion.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

US\$ 4 million

Chapter 11 Development Strategies for Infrastructure Sectors of Burkina Faso

11.1 Roads and Highways of Burkina Faso

11.1.1 Present Situation of Road and Highways in Burkina Faso

(1) Institutional Framework of the Road Sector in Burkina Faso

The Ministry of Infrastructure ensure the implementation and monitoring of government policy for the infrastructure and transport sectors. The General Directorate of Roads and the General Directorate of Road Maintenance under the Ministry of Infrastructure are responsible for the implementation and maintenance of road infrastructures, including engineering structures of national, regional and departmental roads. The road development in rural areas was handled by the General Directorate of Rural Tracks.

Road Maintenance Fund of Burkina Faso (FER-B) is an organization that is in charge of the toll collection and operation of toll booths on major national roads. The funds collected are used for the financing of routine and periodic maintenance of roads and for finance of the construction of new toll stations.

(2) Framework of Road Planning and Road Development in Burkina Faso

The Ministry of Infrastructure formulated a Strategy Paper for the Burkina Faso Transport Sector for the period of 2011-2025 that is a comprehensive strategy for development of transportation infrastructure and systems including the road network in Burkina Faso. This is the upper-level plan for the transport sector. The design of the strategy project has taken into account the Strategy of Accelerated Increase and Sustainable Development (SCADD). The priorities assigned to the transport sector are as follows:

- Development of Interurban Roads and International Roads
 - Developing and strengthening of the road network
 - Improving of transit conditions on international corridors
 - Reinforcing of the road management
 - Reinforcing of traffic service competitiveness
 - Consolidating of regional integration
- Development of Roads and Road Transport in Rural Areas
 - Upgrading of rural transport infrastructure
 - Improvement of rural transport services
 - Improvement of access for the rural population to intermediate means of transport
 - Strengthening of the institutional framework and upgrading of capabilities in organizations in charge of rural transport

(3) Existing Conditions of Road Network in Burkina Faso

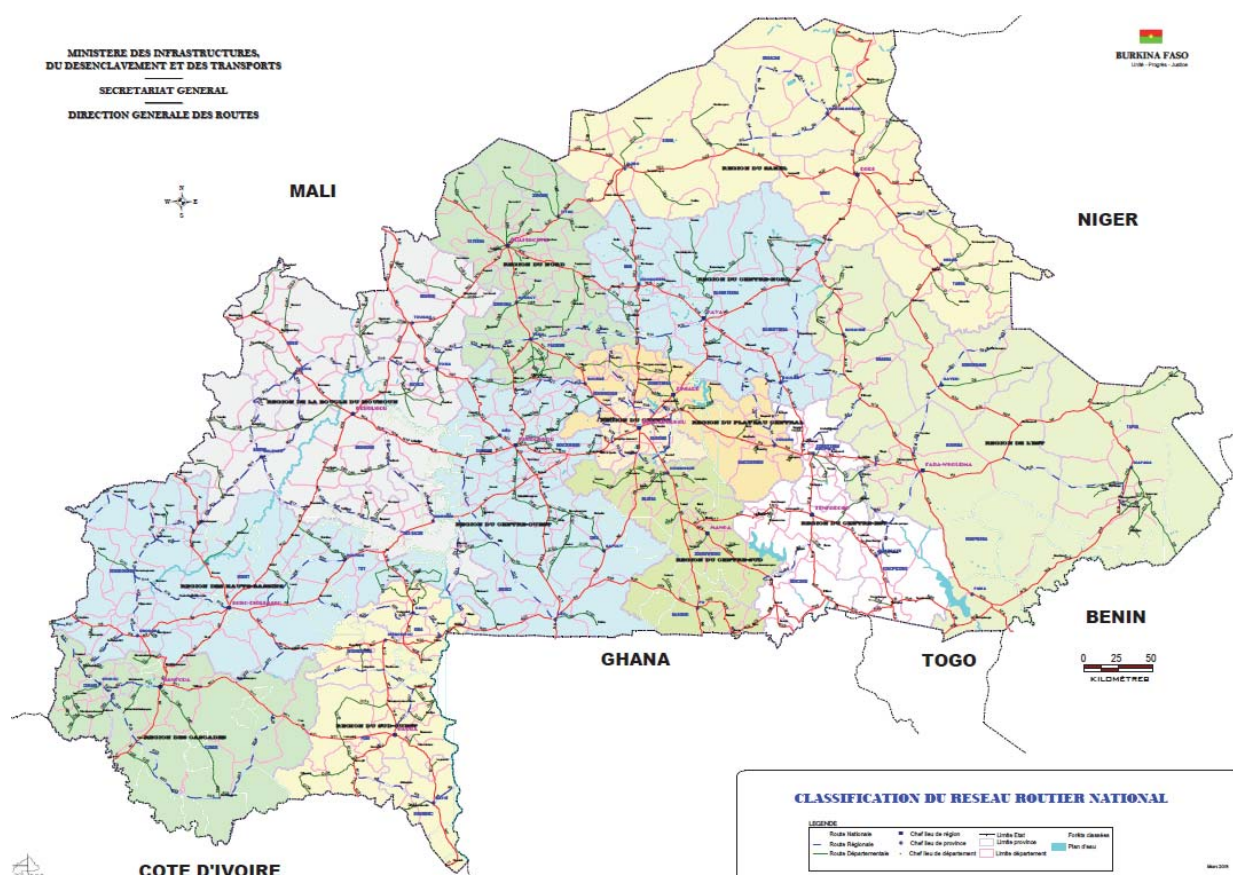
The road network has improved greatly in the past ten years due to investments and reforms undertaken during this period. The road improvement took place in terms of both quantity and quality. The length of the road network was originally 9,500 km and increased to around 15,272 km in 2014. The graded network is classified into three categories: the national roads (RN), the regional roads (RR) and the departmental roads (RD). With a length of 6,697 km, the national roads connect

the main towns of the regions and ensure links with the road networks of border countries. 52 % of national roads are asphalted, the remainder being primarily composed of ordinary earth roads. The regional roads fulfil the function of serving provinces and establish links between the main provincial towns. The ratio of asphalt pavement is only 2 %. The paving ratio of the departmental roads is less than 1 % against the total length of 5,000 km of departmental roads. In addition to this, the rural roads of 9,435 km are defined as the roads managed by the General Directorate of Roads.

Table 11.1.1 Road Length by Road Type in Burkina Faso

Administrative classification	Technical classification (km)				Total
	Paved road	Earth road (Modern)	Earth road (Ordinary)	Track Road	
National Route	3,454	100	1,891	1,253	6,697
Regional Route	82	-	165	3,334	3,581
Departmental Route	44	-	101	4,848	4,993
Total	3,579	100	2,157	9,435	15,272

Source: The Ministry of Infrastructures, Development and Transport (MIDT)



Source: Ministry of Infrastructures, Development and Transport (MIDT)

Figure 11.1.1 Road Network in Burkina Faso

(4) Corridor Development in Burkina Faso

1) Basic Policy of International Corridor Development

To deal with the problems of landlocked countries, such as high transportation costs, Burkina Faso has developed several alternative corridors to and from the international sea ports. The corridor development is essential to secure stable supply of goods for Burkina Faso. Hence the Ministry of Infrastructure is working to ensure the permanent good quality of these roads. The international corridors for Burkina Faso are as follows:

- Abidjan-Ouagadougou Corridor : Ouagadougou-Bobo Dioulasso-Abidjan (1,148 km)
- Tema-Ouagadougou Corridor : Ouagadougou-Accra / Tema (1,040 km)
- Lomé-Ouagadougou Corridor : Ouagadougou-Lomé (948 km)
- Cotonou-Ouagadougou Corridor : Ouagadougou-Cotonou (1,060 km)

2) Present Conditions of International Corridors

Major international corridors leading to sea ports are Burkina Faso’s lifeline for the socio-economy, and pavement has progressed as priority. The conditions of the corridors are mentioned below.

Abidjan-Ouagadougou Corridor: Ouagadougou-Bobo-Dioulasso-Banfora-Niangoloko

This corridor connects two principal cities, Ouagadougou, the capital, and Bobo-Dioulasso, the economic capital, in Burkina Faso and Côte d’Ivoire. The total length of road to Abidjan is 1,148km and the portion in Burkina Faso is around 500 km. This corridor has the advantage of having railways throughout the route. The route consisting of N1, N2 and N7 is built as two-lane national highway except in the urban areas of Ouagadougou and Bobo-Dioulasso. All sections are asphalted. UEMOA studied the feasibility of development of an expressway from Ouagadougou up to Abidjan.

- Ouagadougou-Bobo Dioulasso: Rehabilitation project was finished
- Bobo Dioulasso-Banfora-Niangoloko: F/S of rehabilitation project is in progress



Source: JICA Study Team

Figure 11.1.2 Road Condition of Abidjan-Ouagadougou Corridor

Tema-Ouagadougou Corridor : Ouagadougou-Po-Dakola-Accra / Tema

This corridor connects Ouagadougou and Accra, which is the capital of Ghana and continues on up to Tema Port. The total length of road to Tema Port is 1,040 km and the portion in Burkina Faso is around 170 km. The road consisting of N5 is built as a two-lane national highway. The rehabilitation

of this road section is done and all sections are entirely asphalted. The condition is satisfactory and fit for traffic conditions.



Source: JICA Study Team

Figure 11.1.3 Road Condition of Tema-Ouagadougou Corridor

Lomé-Ouagadougou Corridor: Ouagadougou-Koupéla-Tenkodogo-Cinkansé-Lomé

This corridor connects Ouagadougou and Lomé which is the capital of Ghana and continues on up to the Port. The total length of road to the port of Lomé is 948 km and the portion in Burkina Faso is around 290 km. The road consisting of N4 and N16 is built as a two-lane national highway and all sections are entirely asphalted. Although the rehabilitation had been advanced in this route, the road section between Koupéla-Tenkodogo-Border of Togo which has begun to deteriorate and it is becoming necessary to repair it. Especially, the section between Bittou and Cinkansé is seriously damaged.



Source: JICA Study Team

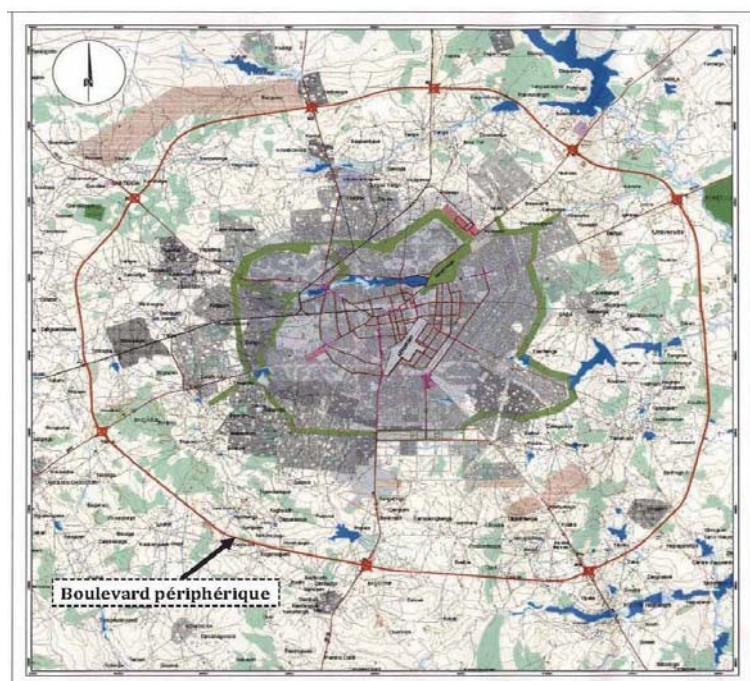
Figure 11.1.4 Road Condition of Lomé-Ouagadougou Corridor

Cotonou-Ouagadougou Corridor: Ouagadougou – Fada N’gourma – Cotonou

This corridor connects Ouagadougou and the port of Cotonou. The total length of road to Cotonou is 1,060 km and the portion in Burkina Faso is around 360 km. This corridor is a complementary corridor for Burkina Faso as compared with the other three corridors. The road consisting of N4 and N18 is a two-lane national highway. Although all sections have been entirely asphalted, the road section between Fada N’gourma-Border of Benin needs to be repaired.

(5) Existing Projects and Future Plans

- Bobo Dioulasso-Laleraba, Border Post (155km): Seeking the funds for rehabilitation and reinforcement work. If it is impossible to get funds from AfDB, UEMOA will consider investing in this project.
- Ouagadougou Outer Ring Road Project



Source : Travaux de construction et de bitumage du boulevard peripherique de la ville de Ouagadougou (125 KM), Ministry of Infrastructures, Development and Transport (MIDT), 2014

Figure 11.1.5 Ouagadougou Outer Ring Road Project

11.1.2 Issues on Roads and Highways in Burkina Faso

Burkina Faso’s issues on roads and highways are summarised as follows:

- Ouagadougou, capital of the nation, is located at an important point for international transportation to connect Sahelian countries, such as Burkina Faso, Niger and Mali, with each other, as well as with coastal countries. However, the strength of the road pavement that has been constructed is low, and there is a high rate of overloaded heavy vehicles. As a result, degradation of the pavement is rapid.
- As the volumes of Burkina Faso’s imports and exports increase every year, it is essential to carry out proper rehabilitation and maintenance on international trunk roads linking with coastal countries, especially with major sea ports.
- As urbanization of Ouagadougou and Bobo-Dioulasso and ownership of automobiles are on the increase, problems with urban traffic have emerged. Grade separations of roads have been carried out at many of important intersections and many more intersections will require such

developments in the future. Also, with the expansion of the urban areas, it will be necessary to construct outer ring roads not only to manage urban traffic and inter-city traffic, but also for urban expansion.

- Plans to relocate the present international airport and OuagaInter dry port, which are located in the central area of Ouagadougou's built-up areas has been considered by the government. It will be necessary to improve the access to these new transport facilities.
- Upgrading of the connectivity between Ouagadougou, the nation capital and the largest commercial city, and Bobo-Dioulasso, the second largest commercial city, is very important for forming a national development axis. The development of a motorway has already been investigated by the government.
- Strengthening of the accessibility of agricultural production areas such as cotton, etc., and the international trunk road is required in order to support exports.
- Agriculture accounts for the major portion of total economic production, but the condition of access roads from villages and farmlands to trunk roads are poor. It is necessary to develop road infrastructure not only to encourage people to cultivate more lands but also to attract investors for agricultural production, agro-processing and trading of agricultural products.
- Scattered unrepaired potholes have been observed and defects of rutting and shoving have been observed on some road corridors.
- Many pavement repairs in newly constructed road sections of certain road corridors have been observed. It seems that most of the defects have been caused by sub-grade failure of roads.
- The pavement type of shoulders of the existing major road corridors is Surface Treatment (DBST or SBST/Single Bitumen Surface Treatment). Most of those shoulders have been deteriorated and partly disappeared so as to obstruct passengers and bicycles trying to pass safely. Furthermore, this deterioration sometimes may cause damages to the edges of carriageways.

11.1.3 Objectives of Development of Roads and Highways in Burkina Faso

The road network development in Burkina Faso should aim at building the basic framework of the country and improving the accessibility to the neighbouring countries, mainly to coastal countries that have international sea ports. The major international roads to sea ports are a lifeline for Burkina Faso.

The road network should also support activation not only of socio-economic exchanges within the country, but also of socio-economic exchanges within the sub-region by improving road conditions and reducing travel time and costs. The overall goal of road development is to promote socio-economic exchanges and socio-economic development, to improve global competitiveness and to expand demand (both freight and passengers) for transportation. Especially, road development that can support agricultural development is essential for development of Burkina Faso.

The following objectives for road and highway development are identified:

- **Objective 1:** To contribute to economic sector development and enhance socio-economic exchanges within the country and between countries by establishing networks of roads and motorways centring on Ouagadougou and the three major north-south corridors, namely, 1) Abidjan- Ouagadougou, 2) Tema - Accra - Ouagadougou and 3) Lomé – Ouagadougou
- **Objective 2:** To establish a road and motorway network for sub-regional integration (between Sahelian countries and between WAGRIC countries) and national integration
- **Objective 3:** To promote development of areas which are relatively underdevelopment by strengthening north-south connectivity and providing better accessibility to agricultural potential areas

- **Objective 4:** To develop the road environment for realization of smooth and safe road transportation

11.1.4 Development Strategies and Possible Measures for Roads and Highways in Burkina Faso

In order to achieve the objectives for roads and highways, five strategies for development of roads and highways are formulated as described below. Possible measures to implement these strategies are also described in this section.

- **Strategy 1:** Development and reinforcement of international road corridors to coastal countries, especially to sea ports
- **Strategy 2:** Enhancement of the hub function of international and national road corridors of Ouagadougou and Bobo-Dioulasso (as the international gateways of Burkina Faso)
- **Strategy 3:** Development and reinforcement of international road corridors to Sahelian countries, such as Mali and Niger, to promote sub-regional integration including socio-economic exchanges
- **Strategy 4:** Improvement of accessibility for promoting the utilization of the development potential by improving roads linking with international road corridors
- **Strategy 5:** Capacity development and application of soft measures for improving road and traffic

(1) Strategy 1: Development and Reinforcement of International Road Corridors to Coastal Countries, especially to Sea Ports

Ensuring reliable accessibility to international sea ports is essential for Burkina Faso's import and export. Furthermore, the connection of Burkina Faso to the growing coastal economic belt areas will be essential for economic development of Burkina Faso. Road development that provides stronger access to Greater Abidjan, Greater Accra and Greater Lomé and Lagos should be continuously made up of high standard roads. The development of these roads composing the major international corridors should be promoted also for promoting regional development along the roads.

High-speed roads could be realized by dualization projects between Ouagadougou and Bobo-Dioulasso following the increase of traffic demand.

Target corridors for Strategy 1 are as follows:

- Ouagadougou - Abidjan (up to the border of Côte d'Ivoire),
- Ouagadougou - Accra/Tema (up to the border of Ghana),
- Ouagadougou - Lomé (up to the border of Togo),
- Ouagadougou - Cotonou (up to the border of Benin).

Possible measures for Strategy 1 include the following:

- Widening of trunk roads to four-lane roads, two lanes each way, for inter-city sections where high transport demands are expected
- Construction of bypass roads or ring roads in Ouagadougou and Bobo-Dioulasso
- Road development with asphalt concrete pavement that can withstand the traffic of heavy vehicles
- Development of truck stations and parking bays along the roads

(2) Strategy 2: Enhancement of the Hub Function of International and National Road Corridors of Ouagadougou and Bobo-Dioulasso (as the International Gateways of Burkina Faso)

In order to respond to increasing traffic demands and in order to smoothly access the Airport and Dry port, arterial road networks including the outer ring roads should be developed in the

Ouagadougou and Bobo-Dioulasso that will serve as the strategic nodes of the road network in Burkina Faso to promote smooth traffic and expansion of urban areas. And also, the bottleneck intersections should be improved in advance before large urbanization.

The target areas for Strategy 2 are as follows:

- Ouagadougou
- Bobo-Dioulasso

Possible measures for Strategy 2 include the following:

- Formulation of the urban road and transport plan, Installation of new public transport system.
- Construction of an outer ring road to connect with international road corridors in Ouagadougou
- Construction of access roads to a new airport and a new dry port in Ouagadougou
- Construction of a ring road or bypass to connect with the international road corridor in Bobo-Dioulasso
- Improvement of bottleneck intersections in Ouagadougou and Bobo-Dioulasso

(3) Strategy 3: Development and Reinforcement of International Road Corridors to Sahelian Countries, such as Mali and Niger, to Promote Sub-Regional Integration including Socio-Economic Exchanges

To promote sub-regional integration and socio-economic exchanges with Mali and Niger is important for economic growth for Burkina Faso, as well as for the increase Burkina Faso's importance as the geographical and economic hub of the Sahelian countries. This road will contribute to the expansion of the economic influences of Burkina Faso.

The target corridors for Strategy 3 are as follows:

- Ouagadougou – Bobo-Dioulasso - Bamako (up to the border of Niger),
- Ouagadougou - Koupéla - Niamey (up to the border of Niger)

Possible measures for Strategy 3 include the following:

- Widening of roads to four lanes, two lanes each way, for road sections, such as inter-city sections where high transportation demands are expected
- Construction of ring roads or bypass roads in major cities on the international corridors,
- Road development with asphalt concrete pavement that can withstand the traffic of heavy vehicles,
- Development of truck stations and parking bays along the corridor.

(4) Strategy 4: Improvement of Accessibility for Promoting the Utilization of Development Potential by Improving Roads Linking with International Road Corridors

Access roads to potential development areas from major cities and international road corridors should be provided. Pavement of roads and construction of bridges for connecting roads to villages and farm lands should be promoted in order to provide access to international road corridors.

Target development areas for Strategy 4 are as follows:

- Agricultural development potential areas including the southern part (Bagré Pole) and south-western part (surrounding areas of Banfora) of the country, as well as other areas along the international road corridors
- Mineral development areas including Tambao's manganese mine
- Tourism development areas

Possible measures for Strategy 4 include the following:

- Development of access roads (by paving and by construction of bridges)

- Development of access roads to railway cargo stations and major logistics bases (logistic centres and market places)
- Development of roads within development areas
- Pavement of roads with asphalt concrete
- Rehabilitation of roads with asphalt concrete
- Reinforcement or replacement of aged bridges

(5) Strategy 5: Capacity Development and Application of Soft Measures for Improving Road and Traffic

For ensuring efficient and safe use of roads, it is necessary to formulate the various plan regarding the road and transport, capacity development and strengthen the road administration function for this aspect.

Possible measures for Strategy 5 include the following:

- Urban transportation planning in the major city
- Implementation of road safety measures including enforcement of road safety rules
- Strengthening of administrative functions concerning road planning, design, construction and maintenance
- Strengthening of maintenance capabilities (maintenance planning capabilities, equipment, budgeting)
- Establishment of an overload monitoring system for heavy vehicles and strengthening of enforcement of axle load control
- Training of trucking companies to improve safe transport capabilities and to ensure compliance with regulations
- Designation of road routes and time in which large trucks are allowed to use them
- Establishment of road management systems including road inventory database

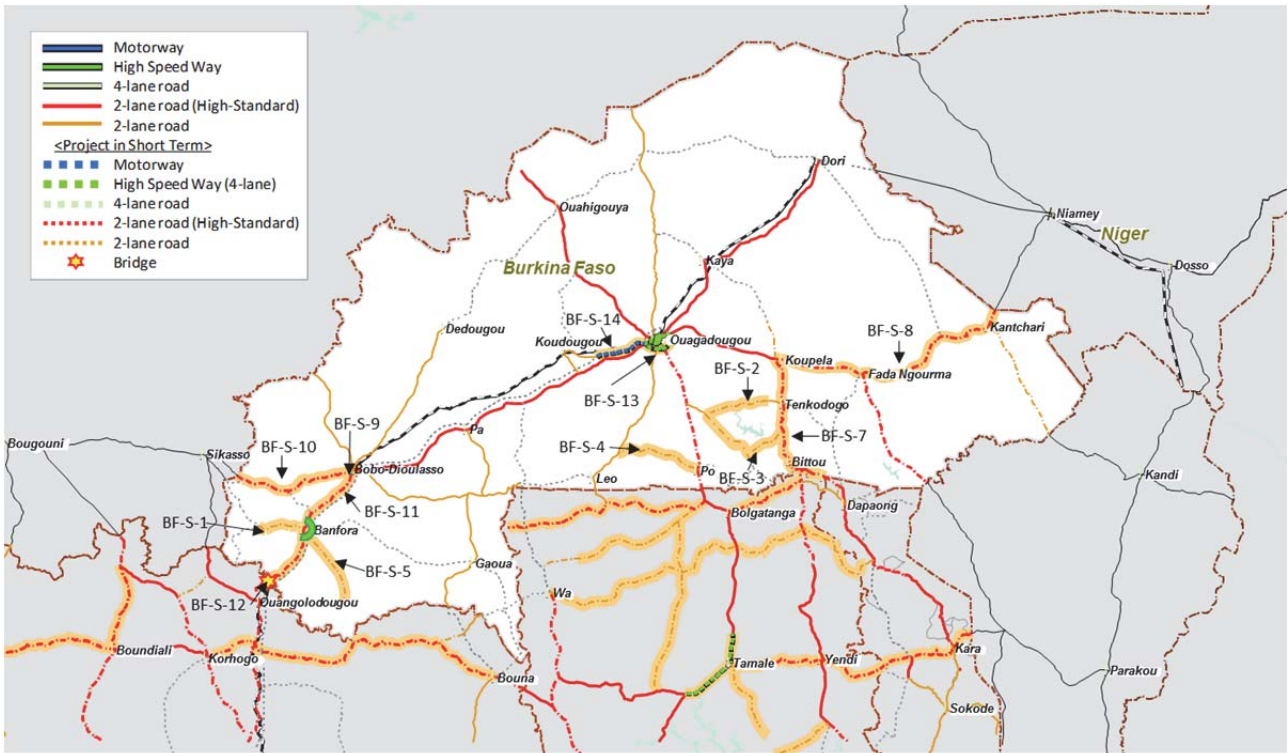
11.1.5 Programmes and Projects for the Development of Roads and Highways in Burkina Faso

The road projects that were selected based on the development strategy are shown in Table 11.1.2 and Figure 11.1.6 to Figure 11.1.8. These projects shown here are essential road projects which should be tackled strategically for corridor development of WAGRIC-CACAO. However, there are also other road projects which should be promoted by the government of Burkina Faso.

Table 11.1.2 Priority Project of Road Sector in Burkina Faso

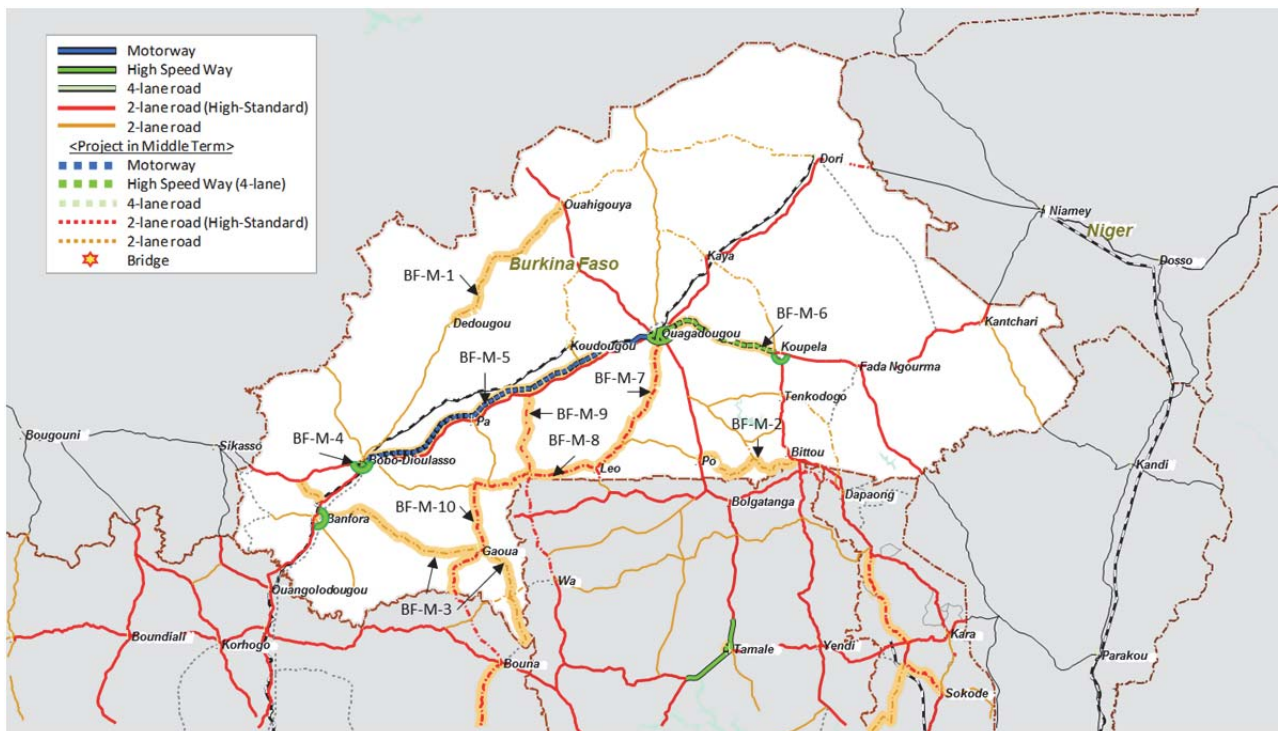
	Name of Priority Project	No. Lane	Length	Project Schedule		
				Short	Middle	Long
BF-S-1	Improvement of Road (R21) between Banfora and Douna	2	42 km			
BF-S-2	Improvement of Road (N17) connecting N5 and N16 (Guiba - Garango)	2	87 km			
BF-S-3	Improvement of Road (R9 and N29) connecting N16 and N17 for providing better Access to Bagrépole	2	105 km			
BF-S-4	Improvement of Road (N25) connecting N5 and N6 (between Pô and Nébou)	2	89 km			
BF-S-5	Improvement of Road between Banfora and Mangodara	2	50 km			
BF-S-6	Widening of Inner Ring Road (Tensoba Boulevard) of Ouagadougou	4	10 km			
BF-S-7	Rehabilitation of National Road (N16) between Koupéla and Cinkaseé (Border of Togo)	2	150 km			
BF-S-8	Rehabilitation of National Road (N4) between Koupéla and Kanchari (Border of Niger)	2	265 km			
BF-S-9	Construction of Inner Ring Road of Bobo-Dioulasso (Southern Section)	2	15 km			
BF-S-10	Rehabilitation of National Road (N8) between Bobo-Dioulasso and Koloko (Border of Mali)	2	132 km			
BF-S-11	Rehabilitation of National Road (N7) between Bobo-Dioulasso and Niangoloko (Border of Côte d'Ivoire)	2	154 km			
BF-S-12	Replacement of Laleraba Bridge for Crossing the National Border between Burkina Faso and Côte d'Ivoire	2	- km			
BF-S-13	Construction of Southern Sections (between N1 and N4) of Ouagadougou Outer Ring Road (Southern Bypass)	4	60 km			
BF-S-14	Construction of Motorway between Ouagadougou and Koudougou	4	70 km			
BF-M-1	Improvement of Road between Dédougou and Ouahigouya through Tougan for Sourou Agricultural Potential Area	2	188 km			
BF-M-2	Improvement of Road connecting N5 and N16 between Pô and Bittou	2	119 km			
BF-M-3	Improvement of Road (N11) between Orodara – Banfora – Gaoua – Boarder of Côte d'Ivoire	2	198 km			
BF-M-4	Construction of Southern Section (between N1 and N8) of Bobo-Dioulasso Outer Ring Road (Southern Bypass)	4	8 km			
BF-M-5	Construction of Motorway between Koudougou and Bobo-Dioulasso	4	55 km			
BF-M-6	Construction of 4-Lane High-Speed Way between Ouagadougou and Koupéla	4	157 km			
BF-M-7	Upgrading of Road N6 to a High-Standard 2-lane Road between Ouagadougou and Léo	2	167 km			
BF-M-8	Upgrading of Road N 20 to a High-Standard 2-lane Road between Léo and Djipologo (toward Eastern Corridor of Côte d'Ivoire)	2	81 km			
BF-M-9	Upgrading of Road N 20 to a High-Standard 2-lane Road between Ouessa and Hamile (toward Wa of Ghana)	2	104 km			
BF-M-10	Upgrading of Road N 12 to a High-Standard 2-lane Road between Djipolgo and Gatapoula (toward Bouna of Côte d'Ivoire)	2	142 km			
BF-L-1	Upgrading to a 4-Lane High-Speed Way between Koupéla and Cinkansé including Bypass for Koupela (toward Togo)	4	150 km			
BF-L-2	Upgrading to a 4-Lane High-Speed Way between Koupéla and Fada N'Gourma including Bypass Road for Fada N'Gourma (toward Niger and Benin)	4	157 km			
BF-L-3	Upgrading to a 4-Lane High-Speed Way between Ouagadougou and Paga (toward Tamale)	2	166 km			

Source: JICA Study Team



Source: JICA Study Team

Figure 11.1.6 Locations of Priority Road Projects in the Short Term in Burkina Faso



Source: JICA Study Team

Figure 11.1.7 Locations of Priority Road Projects in the Mid Term in Burkina Faso



Source: JICA Study Team

Figure 11.1.8 Locations of Priority Road Projects in the Long Term in Burkina Faso

11.1.6 Profiles of Priority Projects for Road and Highway Sector of Burkina Faso

(1) Construction of Southern Section (between N1 and N4) of Ouagadougou Outer Ring Road (Southern Bypass)

1) Project Outline

Greater Ouagadougou's urban areas have expanded from Ouagadougou Municipality to surrounding areas, accommodating 2.6 million urban populations in year 2015. Its urban population is expected to increase to over 7.7 million by 2040.

The Outer Ring Road of Greater Ouagadougou is planned to run through a radius of 18 km. This will provide a large spatial framework for future urban expansion. On the other hand, this Outer Ring Road will have a large bypass road for the central area of Ouagadougou.

The Southern Section (about 60 km) of the Outer Ring Road is to connect National Road No.1 (N1, Ouagadougou - Bobo-Dioulasso) and National Road No.4 (N4, Ouagadougou - Koupéla - Fada-Ngourma - Niamey). Between N1 and N4, there are two more national roads, namely N5 (from Ouagadougou to Tamale, Kumasi and Accra) and N6 (from Ouagadougou to Wa, and from Ouagadougou to Bouna, Abengourou and Abidjan). By using this Southern Section of the Outer Ring Road, a route out of the four national roads (N1, N6, N5 and N4) can be chosen without going through the central area of Ouagadougou.

A multi-modal dry port will be located near the western end of this Southern Section of the Outer Ring Road. Large trucks can get easy access to this multi-modal dry port by using the Outer Ring Road without going through the central area of Ouagadougou.

2) Funding Scheme

PPP

3) Estimated Project Cost

US\$ 410 million

(2) Projects for Construction of Motorway between Ouagadougou and Koudougou and Motorway between Koudougou and Bobo-Dioulasso

1) Project Outline

Burkina Faso has four major corridors connecting with coastal countries and sea ports, namely, Ouagadougou-Abidjan, Ouagadougou-Tema and Ouagadougou-Lomé and Ouagadougou-Cotonou.

In the WAGRIC Master Plan, it is recommended that one motorway should be developed for Ouagadougou-Abidjan Corridor and high-standard four-lane roads should be developed for Ouagadougou-Tema Corridor and Ouagadougou-Lomé Corridor. These three high-speed transportation routes are important for Burkina Faso to attract investment to economic sectors targeting coastal markets of the sub-region.

The first phase of construction of the motorway between Ouagadougou and Bobo-Dioulasso will be the section between Ouagadougou and Koudougou (about 70 km).

The second phase will be the section between Koudougou and Bobo-Dioulasso (about 230 km).

Greater Ouagadougou, capital city of Burkina Faso, had 2.6 million urban populations in 2015, while Koudougou had 115,000 in 2015.

2) Funding Scheme

PPP

3) Estimated Project Cost

Construction of Motorway between Ouagadougou and Koudougou: US\$ 478 million

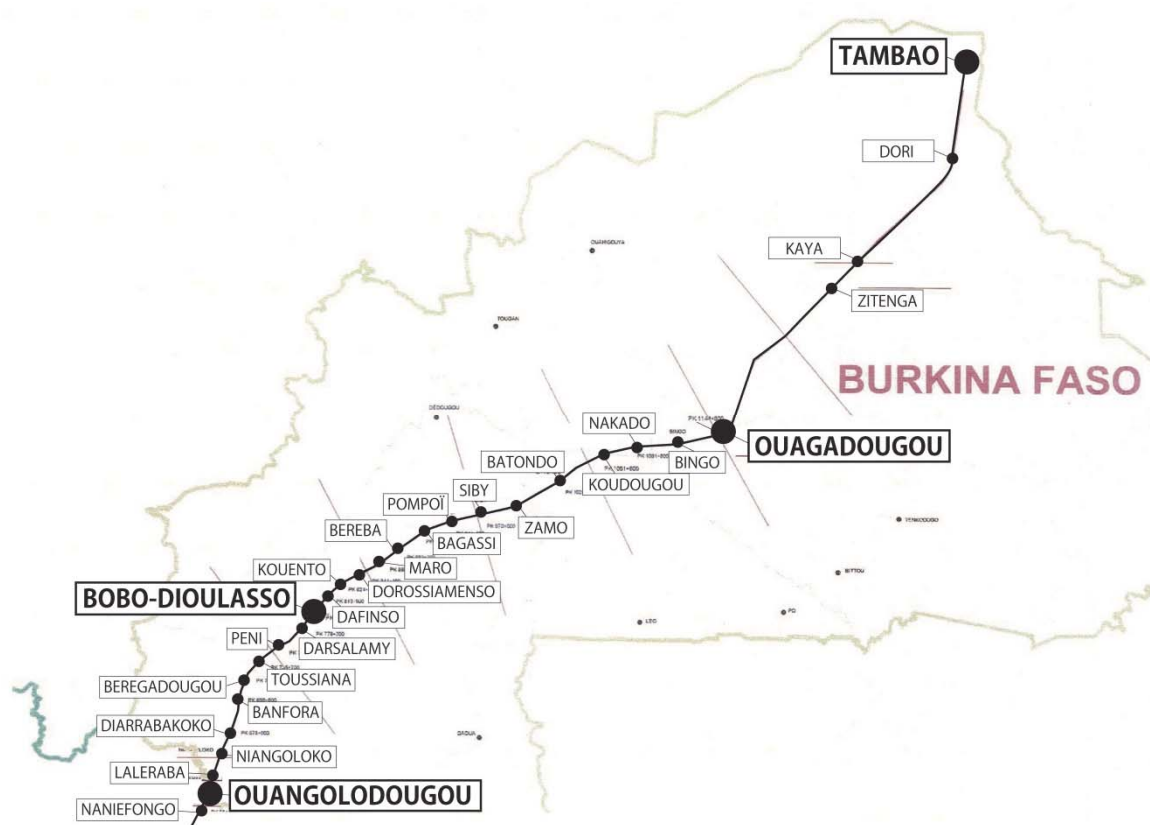
Construction of Motorway between Koudougou and Bobo-Dioulasso: US\$ 1,400 million

11.2 Railways in Burkina Faso

11.2.1 Present Situation of Railways Sector in Burkina Faso

(1) Present Railway Situation

The railway of Burkina Faso used to be part of the Abidjan-Niger Railway and its construction started from Abidjan in 1904 and reached Ouagadougou in 1954. The operation length is 518km between the border of Burkina Faso and Côte d'Ivoire, and Ouagadougou. The railway has a single track and its gauge is 1,000 mm. The train operation is not electrified.



Source: JICA Study Team based on the material from Sitarail,

Figure 11.2.1 Route and Stations of Railways in Burkina Faso

1) Passenger Transport between Abidjan and Ouagadougou

The present number of passenger trains operated is 3 trains per week in each direction. It takes 35 hours each way. The annual number of passengers in 2014 was 1,894 domestic passengers and 94,699 international passengers between Burkina Faso and Côte d'Ivoire. From 2010 to 2013, these numbers increased the domestic passengers at an average annual rate of 13.5%, and the international passengers at an average annual rate of 10.6%.

2) Volumes of Freight Transport Between Abidjan and Ouagadougou

Volumes of freight transport between Abidjan and Ouagadougou are shown in Table 11.2.1 Volumes of Freight Transport from Abidjan for North Bound and Table 11.2.2.

Major cargos transported from Abidjan to inland by railway in the period of 2011-2015 were as follows (in descending order):

- Petroleum to Burkina Faso
- Containers
- Rice
- Fertilizer to Burkina Faso
- Petroleum for re-export from Burkina Faso
- Corn to Burkina Faso

Major cargos transported from inland to Abidjan by railway in the period of 2011-2015 were as follows (in descending order):

- Cotton Balls from Burkina Faso (Containers)
- Cotton Balls from Burkina Faso (Non-Containers)
- Returning Empty Wagons
- Dry Vegetables from Burkina Faso

Table 11.2.1 Volumes of Freight Transport from Abidjan for North Bound

Cargo	Year				
	2011	2012	2013	2014	2015 (Until June)
Petroleum BF Local	80,261	187,953	197,527	167,978	230,000
Petroleum BF Export	44,539	20,030	35,606	52,733	40,000
Container	73,607	140,291	161,246	143,038	161,674
Cement to BF	26,675	11,379	5,839	2,560	10,000
Cement to CI	35	0	0	0	0
Fertilizer to BF	23,167	43,487	41,786	33,517	45,000
Fertilizer to CI	3,430	0	96	0	0
Bag to Mali + North CI	0	0	0	0	0
Container to Mali + North CI	0	0	0	0	1,394
Rice to BF	131,953	159,552	135,996	121,176	130,000
Wheat Flour to BF	34,094	46,922	36,930	21,658	27,000
Corn to BF	27,595	34,627	29,770	34,935	37,000
Sugar to BF	17,677	18,133	25,119	12,923	15,000
Other Cereals to BF	507	42	0	0	15,000
Vegetable Oil	29,934	28,174	24,519	25,881	32,000
Salt	5,526	6,161	6,170	6,492	8,000
Other commodity	38,464	39,060	35,227	24,844	33,000
Steel plate (rolled)	10,518	8,206	2,233	12,643	5,000
Vehicles	0	85	230	48	1,732
Drink water	104	1,091	0	707	200
Macadam	269	361	407	226	0
Others	38,924	36,523	32,715	23,274	23,000
Total	587,277	782,076	771,414	684,631	815,000

Source: Sitarail

Table 11.2.2 Volumes of Freight Transport from Burkina Faso for South Bound

Cargo	Year				
	2011	2012	2013	2014	2015
Livestock	16,244	8,645	7,336	3,426	5,000
Mango (Container)	7,209	5,341	6,248	3,695	5,000
Drink water	30	30	0	0	0
Return (sending back)	16,146	11,334	6,828	4,975	25,000
Manganese	0	0	0	0	0
Cotton balls to CI	7,751	437	0	0	0
Cotton balls to BF	12,066	25,029	22,120	18,090	25,000
Cotton balls to BF (Container)	423	2,884	8,028	20,018	30,000
Cotton balls to CI (Container)	0	646	0	0	0
Timber	219	0	0	0	0
Return (sending back) to Mali + North CI	0	0	0	0	7,000
Almond	0	0	4,936	12,290	4,000
Anacarde (Burkina fruit)	8,734	5,449	6,220	8,809	2,000
Cotton seed	0	0	0	0	0
Fertilizer (Made of cotton)	2,478	90	0	0	0
Sesame	8,237	13,135	13,931	12,101	7,000
Dry vegetable	18,419	13,948	15,264	16,027	22,000
Macadam	35	0	0	0	10,000
Others	19,615	19,686	6,711	20,839	10,000
Total	117,606	106,651	97,623	120,270	152,000

Source: Sitarail

(2) Institutions regarding Railway

The Ministry of Transport, Urban Mobility and Road Safety is responsible for railways in Burkina Faso.

1) SOPAFER-B

SOPAFER-B is a government organization of Burkina Faso, which was established in 1998. SOPAFER-B manages railway infrastructure, such as tracks, station buildings and other facilities and the rolling stock, which are the property of the Government of Burkina Faso.

2) Sitarail

Sitarail, a subsidiary of the Bollore Group, is a private company operating the railway between Abidjan and Ouagadougou in both Burkina Faso and Côte d'Ivoire. The shareholders of Sitarail include the governments of Côte d'Ivoire (15%) and Burkina Faso (15%) and employees (3%), as well as Bollore Group.

Sitarail has been operating the railway since 1995 under a concession contract with the governments of Burkina Faso and Côte d'Ivoire.

11.2.2 Issues on Railways Development in Burkina Faso

The following issues are identified on railways in Burkina Faso:

- Aging of railroad tracks, infrastructures, rolling stocks and equipment
- Low-level transportation service in terms of transport capacity, frequency, travel speed, time reliability and comfortability
- Low-level transit service in terms of cargo handling, storage function, procedure for documentation, and lack of adequate access roads from the transit terminal to arterial roads in Ouagadougou
- Lack of transport demand for rehabilitation and upgrading of the railway and expansion of new lines
- Weakness of the government regulatory body (SOPAFER-B) in regulating private concessioners' management and operation
- Little substantial effort at promoting multi-modal transport between railway and truck transport

11.2.3 Objectives for Railways Development in Burkina Faso

The objectives for railway development in Burkina Faso are set as follows:

- To achieve a proper share of cargo transport between railway transport and road transport
- To upgrade railway cargo transport services not only for providing cheaper, more rapid and higher security transport services, but also for providing a larger volume of long-distance cargo transport services. This could lead to the improvement of the environment of corridor competition between corridors in the WAGRIC countries, as well as in the ECOWAS sub-region
- To upgrade the railway passenger transport services not only for providing cheaper, more rapid and more comfortable services, but also providing a larger volume of long-distance passenger transport services
- To support the utilization of development potential like Manganese mining potential in Tambao

11.2.4 Strategies for Railways Development in Burkina Faso

The following strategies are formulated for railway development in Burkina Faso:

- To promote the rehabilitation of the existing railway for effective use of existing assets, improvement of service level, increasing the number of passengers and handling volume of cargos
- To strengthen multi-modal transit function by construction of multi-modal dry ports and railway

- transit terminals (for connecting railway and truck transport) at strategic nodes, and by providing access roads from railway transit terminals to arterial roads (international corridors)
- To promote attracting of investments to the rehabilitation of existing lines and construction of new lines to potential development areas, such as Tambao manganese mining areas
 - To strengthen the regulatory function of the Government of Burkina Faso for realizing Burkina Faso's public interests from railway assets (government property).

11.2.5 Programmes and Projects for Railways Development in Burkina Faso

The projects for railways in Burkina Faso are listed below.

(1) Short-Term Projects

- Rehabilitation of existing lines: Border of Côte d'Ivoire - Ouagadougou
 - Development of passing lines (sidings)
 - Enhancement of rolling stock for cargo transport
 - Construction of access road from terminal to arterial road network
 - Improvement of transit handling and documentation
 - Rehabilitation of stations
 - Development of secondary transport system from /to stations
 - Renewal of rolling stock for passengers
- Construction and rehabilitation of transit terminals between railway and truck transport: Bobo Inter and a new dry port at Ouagadougou
- Establishment of system to attract private investment
- Strengthening of regulatory function of SOPAFER-B for seeking public interest
- Preliminary Technical Study on Railway Development between Ouagadougou and Cinkansé
- Project for Replacement and Rehabilitation of Old Railway Bridges and Improvement of Track of Existing of Railway Line
- Project for Rehabilitation of Track of Kaya and Ouagadougou Railway Line and Construction of Railway between Tambao and Kaya through Dori for Transporting Manganese Ore from Tambao Mine
- Projects for Development of Loading and Off-Loading Facilities for Cattle at Railway Stations of the following railway stations together with Cattle Waiting Pens
 - Railway Station in a Suburban Area of Ouagadougou
 - Railway Station in a Suburban Area of Bobo-Dioulasso
 - Railway Station in Kaya

(2) Mid-Term Projects

- Upgrading of existing lines: Border of Côte d'Ivoire – Ouagadougou
 - Replacement of existing rails with heavy rails
 - Construction of additional sidings
 - Purchasing of new train engines and wagons, as well as passenger cars
- Upgrading of the existing line

(3) Long-Term Projects

- Project for Development of Loading and Off-Loading Facility for Cattle at Cinkansé Railway Station together with Cattle Waiting Pens

11.2.6 Priority Projects for Railways Development in Burkina Faso

The projects below were selected as priority projects for railways development in Burkina Faso.

- Preliminary Technical Study on Railway Development between Ouagadougou and Cinkansé
- Project for Replacement and Rehabilitation of Old Railway Bridges and Improvement of Track of Existing of Railway Line
- Project for Rehabilitation of Track of Kaya and Ouagadougou Railway Line and Construction

- of Railway between Tambao and Kaya through Dori for Transporting Manganese Ore from Tambao Mine
- Projects for Development of Loading and Off-Loading Facilities for Cattle at Railway Stations of the following railway stations together with Cattle Waiting Pens
 - Railway Station in a Suburban Area of Ouagadougou
 - Railway Station in a Suburban Area of Bobo-Dioulasso
 - Railway Station in Kaya
 - Project for Development of Loading and Off-Loading Facility for Cattle at Cinkansé Railway Station together with Cattle Waiting Pens

11.2.7 Profiles of Priority Projects for Railway Sector of Burkina Faso

(1) Projects for Development of Loading and Off-Loading Facilities for Cattle and Cattle Waiting Pens at Railway Stations (Suburban Ouagadougou, Suburban Bobo-Dioulasso and Kaya)

1) Project Outline

In order to respond to the increasing demand for beef and meat of small ruminants in the coastal markets, the transporting of live cattle and small ruminants by railway from inland countries to coastal areas is one way for expanding the volume of export and reducing transport costs. In coastal areas, fresh meat will be made of such live cattle and small ruminants in modern slaughterhouses. For this purpose, it is necessary for Burkina Faso to create loading and off-loading facilities for cattle and cattle waiting pens at railway stations. This transport of live cattle and small ruminants will depend on the existing Ouagadougou-Abidjan railway and Kaya-Ouagadougou railway.

The target areas for installing loading and off-loading facilities, as well as cattle waiting pens, are three railway stations, namely, one in Suburban Ouagadougou, one in Suburban Bobo-Dioulasso, and one in Kaya. These three railway stations will attract cattle and small ruminants from the following areas:

- Suburban Ouagadougou for receiving cattle from central areas of Burkina Faso,
- one in Suburban Bobo-Dioulasso from western areas of Burkina Faso and Mali, and
- one in Kaya from Sahel Region of Burkina Faso and Niger

2) Funding Scheme

ODA Grant

3) Estimated Project Cost

US\$ 10 million

11.3 Logistics Infrastructure in Burkina Faso

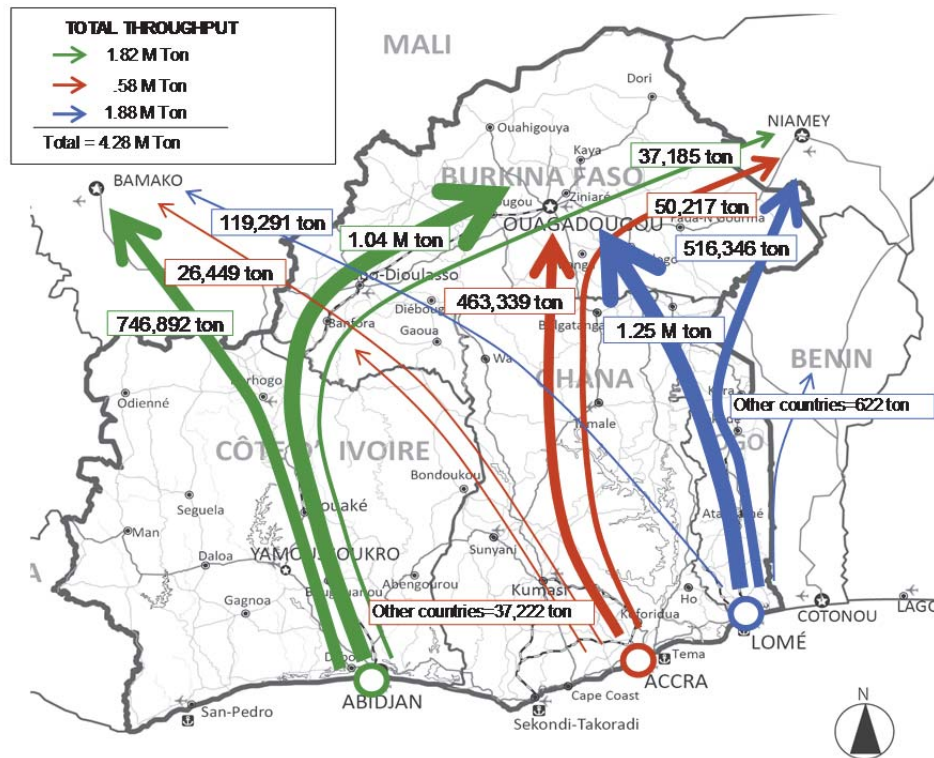
11.3.1 Present Situation of Logistics Infrastructure in Burkina Faso

(1) Present Situation

Being a land-locked country, Burkina Faso relies on the ports of coastal countries in receiving most of its imported cargoes and shipping out its exported cargoes. According to the World Bank's project entitled "Trade and Transit Facilitation in Landlocked Countries", a land-locked country location results in high trade transaction costs, with logistics costs accounting for 30% of the GDP; double that of other emerging economies and three times that for developed countries. This geographical disadvantage obliged Burkina Faso to strike a deal, be it a bilateral or multi-lateral agreement, with these coastal countries to formalize their cooperation.

These countries with useful ports for Burkina Faso include Côte d'Ivoire, Ghana and Togo which are part of this study. Other valuable ports for traders in Burkina Faso but outside of the scope of this study include Benin and Senegal. In 2014, of the 2.8 Million Ton cargoes received by the

Burkina Faso, 45.5% were through the port of Lomé. This was followed by the Port of Abidjan which facilitated about 1.04 (37.8%) million Ton of cargoes for Burkina Faso. Tema Port of Ghana has the lowest share which is about 0.46 Million Ton or equivalent to 16.7%.



Source: Prepared by the JICA Study Team based on data from each port authority
Figure 11.3.1 Volume of Cargoes to Land-locked Countries Handled by Major Ports (2014)

(2) Legal Framework

There have been several legal instruments enacted to govern trade between and among the ECOWAS and UEMOA countries. The major legal frameworks which govern trade and freight transport operation in Burkina Faso are as follows:

1) Transit Traffic and Interstate Transport

- Decision No 39/2009 / CM / UEMOA of 17 December 2009 on the establishment and management of the corridors of the Union.
- Directive No 08/2005 / CM / UEMOA of 16 December 2005 on the reduction of the number of checkpoints on interstate highways.
- Decision No 15/2005 / CM / UEMOA rules for implementing regional control plans on interstate highways. This decision spells out clearly that there should be no controls at all of transit traffic along inter-state roads and that all controls must be limited to the point of departure, border crossings and the point of arrival.
- ECOWAS Decision A/DEC/13/01/03. This relates to establishing the Regional Road Transport and Transit Facilitation Programme in Support of Intra-Community Trade and Cross-Border Movements.
- Supplementary Act /Sa.1/07/13. This relates to the Establishment and Implementation of the Joint Border Posts Concept within Member States of ECOWAS and establishes, among other things, the legal framework for the Joint Border Posts.
- 1982 ECOWAS Convention A/P.4/5/82 (Inter-State Road Transit of Goods - ISRT). This protocol calls for a single carnet (guarantee) system involving payment (single payment on departure) and sharing of guarantee fees among the sureties (guarantors) of countries of transit. This means that a guarantee fee of 0.5% will be paid at the port (assuming imported goods) and a mechanism to split the fee between the coastal country (entry point) and the land-locked country (final destination point) will be established. Currently, only Côte d'Ivoire and Mali

have agreed to implement a single guarantee system.

- UEMOA Règlement N°14/2005/CM/UEMOA Relatif à l'Harmonisation des Normes et des Procédures du Contrôle du Gabarit, du Poids, et de La Charge A l'Essieu Des Véhicules Lourds de Transport de Marchandises dans les États Membres de l'UEMOA. This regulation basically confirms the original axle load limit established by the 1982 ECOWAS IST Convention on Inter-State Road Transport which sets a limit of 11.5 tons per axle. For instance, maximum weight of cargoes to be loaded on a 6-axle truck is only 51 ton. Of the four governments, only the Togolese government is currently compelling truckers to observe the regulation.
- Cargo Quota System or Freight Sharing: The ECOWAS Inter-State Road Transportation Convention (No. A/P2/82) allows pairs of member states to conclude bilateral treaties that set quotas in terms of specific percentages of the freight passing through a coastal country's port en route to a landlocked country to the truckers of each of the two countries. Several such bilateral treaties exist, usually dividing imported goods into "strategic" goods and nonstrategic goods. Strategic goods are 100 percent allocated to the landlocked country and nonstrategic goods are allocated 2/3 to the landlocked country and 1/3 to the coastal country. (Impact of Road Transport Industry Liberalization in West Africa, USAID, 2012)

2) National Level (Burkina Faso)

- Decree No. 2001-544 / PRES / PM / MTT of 10 October 2001 on the organization of road control/checkpoints.
- Decree No. 2005-395 / PRES / PM / MITH / SECU / MFB / DEF of 19 July 2005 on the elimination of checkpoints on the road from Dakola – Ouagadougou - Bobo-Dioulasso - Koloko – border with Mali.
- Decree No 2002-072 / MITH / MS of 31 December 2002 determining domestic fixed traffic control posts.
- Order No. 2005 -053 / MITH / SG / DGTTM of 26 October 2005 establishing the powers, composition and functioning of the National Committee of transport facilitation and the Inter-State Road Transit.

3) Trade Policy

- ECOWAS Trade Liberalization Scheme (ETLS) and its various instruments - ECOWAS operational tool for promoting the West African region as a Free Trade Area.
- ECOWAS Common External Tariff - this is one of the instruments of harmonizing ECOWAS Member States and strengthening its Common Market.

(3) Existing Development Plan for Logistics Infrastructure

The 2016-2020 National Plan for Economic and Social Development (PNDES) of Burkina Faso provides a glimpse of how the government intend to address the logistics challenges facing the country. These challenges as enumerated in the plan include high transportation cost which hampers growth of the economy, high transaction cost, and inefficient logistics system. The plan acknowledged that to diversify the economy, a much needed upgrade of the logistics system is indeed in order. To realize such goal, the following actions were needed:

- Development of a hub which integrates road, rail and air. This means that strategic roads will continue to build as well as construction of Donsin Airport, rehabilitation of railway line and construction of new lines.
- Construction and rehabilitation of roads across the country and the development of rural roads to facilitate the movement of people and transporting goods including production flow.
- Developing warehouses in major production areas
- Development of multimodal logistics platform (MLP), particularly in Ouagadougou and Bobo-Dioulasso, to support export of products. For Ouagadougou MLP, the location is preferably near the airport. For Bobo-Dioulasso, the concern is to strengthen the existing dry port.

It should be noted as well that currently, the government is implementing two important projects: (i) Modernization of registration program of truck fleet (Modernisation et sécurisation des titres de

transports et la ré-immatriculation du parc de véhicule) and (ii) Truck Fleet Renewal (Le renouvellement du parc de véhicules lourds de transport). Likewise, the following studies and projects targeted for short term and medium term implementation are in the government's sight:

- Study on the distribution of freight on the Ouagadougou-Abidjan corridor;
- Establishment of a permanent mechanism for the renewal of the fleet of vehicles in Burkina Faso;
- Strengthening audit and monitoring capacity of road transport companies;
- Study for the integration of databases on traffic, stakeholders and services of road transport in Burkina Faso and the Republic of Côte d'Ivoire and definition of conditions and modalities of information sharing for traffic monitoring and carriers;
- Study of the establishment of a mechanism for the recovery and processing and upgrading of older, non-standard and non-use vehicles and scrapping premium in Boromo and Zorgho;
- Development of a strategic development plan for the Directorate General of Land and Maritime Transport;
- Interconnection of the information systems of the General Directorate of Land and Maritime Transport with those of the National Identification Office, Police-Gendarmerie (IRAPOL), Customs, Car Vehicle Control Center (CCVA) and General Directorate of Taxes (DGI);
- Reform of the National Committee for the Facilitation of Transport and Inter-State Road Transit;
- Strengthening the capacities of the staff of the Ministry (MTMUSR) through training and study tours

11.3.2 Issues on Logistics Infrastructure in Burkina Faso

The critical issues that need to be addressed by the Burkina Faso side to push forward the industry are presented in the table below.

Table 11.3.1 Major Issues affecting Logistics Infrastructure in Burkina Faso

Major Issues	Details
a. Weak (or lack) compliance on the laws and regulations enacted by regional bodies	<p>Level of compliance on the different enacted major laws by the regional bodies (ECOWAS and UEMOA) is as follows:</p> <ul style="list-style-type: none"> • 2005 Number of control points along the corridor by UEMOA—all controls must be limited to the point of departure, border crossings and the point of arrival. Compliance on this directive is very weak as evident by the multiple check points on all the three (3) corridors. • 2005 Axle load control by UEMOA – of the four governments, only the Togolese government is currently compelling truckers to observe the regulation. • ECOWAS protocol on Inter-State Road Transit of Goods (ISTG) – the envisioned single guarantee fee of 0.5% to be paid at the port (assuming imported goods) and a mechanism to split the fee between the coastal country (entry point) and the land-locked country (final destination point) will be established is still not completely realized. Currently, only Côte d'Ivoire and Burkina Faso have agreed to implement a single guarantee system. At Lomé Port, the two (2) chambers of commerce (guarantors) of Togo and Burkina Faso have signed an MOU in late 2015 to allow the two (2) customs bounds fees to be charged once at Lomé port however this has not been implemented yet. No progress is reported at the Tema/Accra-Ouagadougou corridor.
b. Inefficient procedure at the border leading to longer processing time and high cost (particularly Cinkasé OSBP)	<p>There are several factors which contribute to longer delay of trucks crossing the border. These include: lack of interconnection of customs, waiting for escorts at Burkina side, weak internet signal affecting access to ASYCUDA (including limited number of computers), difference working hours between Burkina Customs and those customs of coastal countries among others.</p> <p>At Abidjan Port, Customs bonds (0.50%) are now paid once at Abidjan Port since 2015 unlike in the past where Customs bonds were paid twice: (0.25% in Abidjan Port and 0.25% at Burkina Faso border). The same arrangement was previously made with Mali as well. At Lomé Port, the two (2) chambers of commerce (guarantors) of Togo and Burkina Faso signed an MOU in late 2015 to allow the two (2) customs bounds fees to be charged once at Lomé port however this has not been implemented yet.</p> <p>At Cinkasé OSBP, the border crossing can be very congested and long delay may result in a waiting time at the border of 1 or 2 days while usual time is estimated to an average of 6 hours.</p> <p>Likewise, the amount of fee charged by clearing agents to process documents at Cinkasé OSBP (USD 164 Togo side + USD 25 informal fee; USD 68 Burkina Faso side) represent about 7% of the total cost which is rather high. This is the highest border crossing cost among the three corridors. The positive development however is that there's an on-going effort thru JICA assistance to address this situation thru customs connectivity.</p>

Major Issues	Details
c. Presence of road blocks (road harassment)	<p>The number of control points in the territory of Burkina Faso is still considerably high which resulted in substantial delay and bribes. For instance, the number of control points between Burkina Faso and Côte d'Ivoire is reported to be 24 of which 6 control points are in Burkina Faso. Corresponding delay of these numerous stops is about 109 min excluding delays at the border crossing (69 min Côte d'Ivoire side and 40 min for Burkina Faso side).</p> <p>Based on the 2016 Logistics Survey undertaken in this study, the amount of harassment fee is almost insignificant on the total inland transport cost- merely 0.7% for Lomé corridor, 1.4% for Abidjan corridor and 3.8% for Tema corridor. Despite this encouraging development, zero harassment along the corridors should be pursued to elevate the level of service of the corridors and encourage economic exchanges among the countries.</p>
d. Escort system instead of GPS tracking system	<p>The three (3) coastal countries (Côte d'Ivoire, Ghana, Togo) introduced GPS to track movement of trucks in their respective territory. This is a positive development in the region since truck drivers can now move without depending on the schedule of an escort team. However, Burkina Faso has yet to adopt this system and is still employing the old system of custom escort.</p> <p>There is a need to advocate for a common use of GPS tracking (from port to Ouaginter) which should not be offloaded at the border. This will simplify the process (paying to a single GPS provider) and completely removed the escort system which slows down the flow of cargo movement.</p>
e. Inefficient clearance system at Ougarinter Dry Port and Bobo Dioulasso Dry Port and SETO railway station including weak internet connection	<p>According to dry port administrators, the facility's average clearance time for a container is 5 to 7 days (from the moment container enters the dry port till it leaves the facility) which offers many opportunities for improvement. A review of the dry port's data by ATWA reveals that 50% of containers not originating in Abidjan actually have a dwell time of less than 1 day, and 80 % of the containers have left the terminal after only 2 days. For cargo coming from Abidjan on the other hand average dwell time is about 13 days which merits a closer look.</p> <p>Likewise, one of the issues that have to be addressed at the Ouaginter is the poor internet connection which brings delays during the clearance process.</p> <p>On a positive note, Ouaginter has officially launched SYLVIE in February 2016. SYLVIE is a single point of entry for documents required for pre-clearance, integrating 7 government agencies, 5 private sector agencies, 10 banks and 5 insurance companies and the time it takes to go through the customs pre-clearance process will be reduced from 15 days to 3 days. The number of documents required for importing will be reduced from 10 to 7, and for export from 10 to 3.</p> <p>At the SETO container terminal of SITARAIL, 50% of the cargo is still left in the terminal after 8 to 9 days (ATWA, DANIDA, 2016) while the rest have to endure longer dwell time.</p>
f. Poor road condition from border to Ougarinter Dry Port and Bobo Dioulasso Dry Port	<p>There has been some notable progress in terms of strengthening corridors from coastal areas but they are still some sections in need of reinforcement. Some of which include the Burkina Faso side of Lomé-Ouagadougou corridor particularly between Cinkansé to Bitou, Côte d'Ivoire side of Abidjan – Ouagadougou corridor particularly between Bouaké-Laleraba.</p>
g. Overloaded trucks	<p>Over loaded trucks are rampant in the region. This facilitates rapid damage of road surface and most likely to meet accidents thus stopping this industry's practice is an urgent concern. Several studies revealed that the excess in supply of transport capacity results to low levels of truck utilization (fewer trips) and drives high transport prices. To maximize loads and revenues from limited trips and low vehicle utilization, operators' strategy is to overload their vehicles.</p>
h. Old vehicles are used to transport cargoes thus susceptible to frequent breakdown and accident	<p>It is common to witness trucks temporarily parked half-way on road's carriageway and in between towns because of break down. Old and poorly maintained trucks are serious issue confronting the industry in the region. Older trucks have greater probability to break down, have accidents and have significant contribution in air pollution. Likewise, older trucks normally swing up cost due to high maintenance cost and high fuel consumption. Older trucks require frequent routine and preventive maintenance thus higher maintenance costs per vehicle than new model vehicles. Fuel consumption increases with fleet age, thus increasing operating costs. This scenario obviously calls for effective mechanism to finance fleet renewal.</p>

Source: JICA Study Team

11.3.3 Objectives for Logistics Infrastructure in Burkina Faso

(1) Overall Objective

The overall goal for logistics sector in this study is to reduce transport and transaction costs by the establishment of an efficient multi-modal logistics system in the region. This bold target naturally calls for upgrading the logistics infrastructure (terminals and links), modernization of logistics operation (mechanization of remaining activities done manually), promotion of logistics human resources (that would contribute to professionalization of the industry) and gradual abolition of outdated systems governing the industry.

(2) Specific Objectives

The specific objectives for logistics industry in Burkina Faso are as follows:

- To strengthen multi-modal logistics system to exploit the strength of each mode
- To modernize logistics operation through increasing use of ICT to take advantage of the available modern technologies
- To promote professionalization of logistics industry in the country

11.3.4 Strategies for Logistics Infrastructure in Burkina Faso

The strategies are designed to achieve the three (3) objectives enumerated above. The strategy is divided into four categories which touch on infrastructure, logistics operation, and human resources development.

- Construction/improvement of multi-modal logistics terminals (logistics terminals which are well connected with the railway lines and roads) to integrate logistics infrastructure's operation for seamless transfer of cargoes from one mode to another
- Provision of cross-border facilities, utilization of modern ITS and data standardization for seamless flow of information
- Promotion of containerization to support intermodal logistics operation
- Promotion of human resources development for the logistics industry to contribute to professionalization of the industry

11.3.5 Infrastructure Programmes and Projects for Logistics Infrastructure in Burkina Faso

Table 11.3.2 Proposed Projects on Logistics Infrastructure in Burkina Faso

Project Name	Project Type	Expected Responsible Organization	Term	
			Short-Mid 2025	Long 2040
New Ouagadougou Multi-modal Dry Port	Logistics Terminal	Chambre de Commerce et d'Industrie (Chamber of Commerce) Ministry of Infrastructure (Ministère des Infrastructures)	x	
Expansion of Bobo Dioulasso Dry Port	Logistics Terminal	Chambre de Commerce et d'Industrie (Chamber of Commerce)	x	
Lalériba OSBP	Cross-border facility	UEMOA + Customs of Burkina Faso and Côte d'Ivoire as lead agencies	x	
Paga-Dakola OSBP (Burkina Faso/ Ghana)	Cross-border facility	Customs of Burkina Faso and Ghana as lead agencies	x	
Koloko-Heremakono OSBP (Mali/Burkina Faso)	Cross-border facility	Customs of Burkina Faso and Ghana as lead agencies		x
*Kantchari OSBP (Burkina Faso – Niger)	Cross-border facility	UEMOA + Customs of Burkina Faso and Ghana as lead agencies	x	x
Cinkasé-Ouagadougou Railway	Railway	TBD		x

Note 1: Laleraba OSBP and Paga OSB are priorities however they will be discussed in the Côte d'Ivoire and Ghana report respectively since the locations of these facilities are under their respective territory.

11.3.6 Programmes and Projects for Professionalizing Logistics Services and Trade Facilitation in Burkina Faso

Equally important are the non-infrastructure projects that would complement the infrastructure-based projects. These measures would address concerns regarding existing outdated systems that currently govern how cargoes are transported.

Table 11.3.3 Programmes and Projects for Professionalizing Logistics Services and Trade Facilitation in Burkina Faso

Project Name	Explanation
1. Institutional Strengthening and Capacity Building Support for Freight Transport Stakeholders in both the Public and Private Sectors	This project aims to strengthen the capacity of the Government and of professional associations in the transport, transit and trade sector to effectively provide efficient support and services to private operators operating primarily on the three corridors. This will also support activities that promote the professionalization of the road transport industry, as well as accompanying measures for the transport and logistics operators. It should be noted that the same project is about to commence in Côte d'Ivoire with the support of the World Bank. The project may include the following:

Project Name	Explanation
	<p>a. Strengthening the institutional capacity of the Ministry of Transport (MOT) and related agencies including Observatoire de la Fluidité du Transport (OFT - Transport Fluidity Observatory) and other related agencies.</p> <p>b. Support to transport operators by (i) building capacity for professional transport sector associations through the development of public and private training for transport and logistics profession, (ii) supporting informal transport operators which cannot comply with possible new regulatory requirements to convert them to other transport related activities or retrain them.</p> <p>c. Support to joint initiatives and formalization of public-private dialogue to facilitate trade on the corridor by (i) supporting communication campaigns on transport and trade reforms to build broad ownership and support, (ii) supporting regional dialogue among the countries on transport and transit facilitation issues on the corridors and (iii) supporting monitoring of transport conditions on three corridors through road users' survey, logistics costs measurements, and studies of pricing in the trucking industry.</p>
2. Development of Fleet (Truck) Renewal Scheme	<p>This project aims to support the development of a fleet renewal scheme that will allow truck companies to access credit lines to renew their old trucks. It will also support the institutional strengthening of the authority that will be tasked by the government to handle the scheme to ensure that it would gain adequate capacity in managing the activities of the project including relationships with commercial banks and trucking companies. The project may include the following:</p> <p>a. Support to the development of a self-sustaining Fleet Renewal Scheme and institutional strengthening for the agency assigned by the government to ensure that it has adequate institutional and management capacity to administer and manage the truck renewal scheme on behalf of the Government. These supports may include (i) designing of institutional and implementation arrangements for the involved stakeholders (commercial banks, truck operators and other stakeholders) to qualify for the credit line, (ii) selection of commercial banks to host the line of credit and the selection of operators qualified for truck renewal, including clear flow of funds, and (iii) support in competitive selection of a contractor to manage the truck scrapping system.</p> <p>b. Capacity building and technical assistance for the designated agency by the government to more effectively manage the truck renewal scheme.</p>
3. Support to Customs Modernization and Trade Facilitation along the Corridors	<p>This project aims to improve the efficiency of trade and transit procedures between Burkina Faso and Côte d'Ivoire, Burkina Faso and Ghana; and Burkina Faso and Togo. The primary activities are (i) ensuring efficient connection of customs information systems within the country (i.e. dry ports to border for the case of land-locked countries; ports to borders for coastal countries) and (ii) between the countries (i.e. inter-connection of two customs systems at the border). The proposed project may include the following components:</p> <p>a. Supporting the interconnection of the existing customs' management system on the four corridors (Ouagadougou-Abidjan, Ouagadougou-Tema/Accra, Ouagadougou -Lomé, Abidjan-Lagos) and implementation of new ICT systems to facilitate regional trade by unifying customs procedures.</p> <p>b. Modernization of customs' clearance procedures and promotion of coordination between customs departments to reduce congestion at gateway ports (Abidjan Port, Tema Port, Lomé Port) and border posts on the corridors and capacity building for customs officials.</p> <p>c. Training of customs officials and external users of customs systems, including support to professionalization of the clearing and forwarding industry through capacity building.</p> <p>d. Anti-harassment campaign including an information distribution campaign to different freight transport operators from both the public and private sectors.</p>
4. Enhancement of Government's Road Safety Program	<p>This project aims to focus on activities to improve the safety of road users including truck transport operators along the three corridors. It will also support the institutional strengthening and capacity building of the primary agency which has the overall mandate for road safety oversight. The following activities may compose the project:</p> <p>a. Capacity building for the primary agency tasked for road safety and monitoring of road safety on the three (3) corridors including effective enforcement of axle load control</p> <p>b. Launching of traffic safety campaigns on the three (3) corridors via television, radio, social activities and other means.</p> <p>c. Identifying accident black spots along the three (3) corridors.</p> <p>d. Provision of training equipment and other materials needed by the primary agency for road safety.</p>
5. Driving Enhancement Training for Truck Drivers Plying the International Corridors	<p>This type of project has been running since December 2015 in Côte d'Ivoire through the support of the European Union (EU). The plan for this project is to expand its coverage to the other countries, i.e. Burkina Faso, Ghana and Togo. The objective is to enhance truck driver's skills in driving and understanding of traffic laws, rules and regulations to facilitate the orderly and timely flow of traffic. The training would have two components: (i) theoretical and (ii) practical driving. The former would involve study of traffic rules and regulations while the latter would deal with actual driving of trucks and trailers.</p>
6. Management Enhancement Training for the Managers of Trucking Companies	<p>This type of project has been introduced in Côte d'Ivoire through the support from the EU. The target for this proposed project is to expand it to the other three (3) countries: Burkina Faso, Ghana, and Togo. The project includes training of managers (the person running the day-to-day activity of the truck company) in legislation covering domestic laws, regional trade regulation as well company management which cover book keeping, cost calculations, insurance, and human resources development among others.</p>

Source: JICA Study Team based on interviews

11.3.7 Profiles of Priority Project for Logistics Infrastructure in Burkina Faso

Although all the projects are selected from the view point of regional development and corridor development, there are some projects which have greater impact in terms of accelerating regional development hence given a priority. Likewise, project readiness (e.g. FS has been conducted), urgency from the government side to pursue the project, and significant impact into the international logistics chain were also given weight in coming up with the priority list..

(1) **Project for Construction and Operation of Multi-modal Dry Port for Ouagadougou including Construction of Access Road from N1 to Ouagadougou Multi-Modal Dry Port**

1) **Rationale**

The existing long-distance railway (Sitarail) has a limited size of service areas just near major railway stations. In order to take advantage of this existing railway function, it is necessary to expand its service areas by combining truck transport with rail transport. It becomes possible by development and operation of multi-modal dry port in major cities, such as Ouagadougou and Bobo-Dioulasso.

As mentioned in the “Strategic Objectives for WAGRIC Sub-regional Development”, continued investment in the traditional two economic sectors, i.e. minerals and agricultural crop production, should be pursued along with investment in transport infrastructure sector to accelerate region-wide development. This project is one of the critical projects in this direction. This will further strengthen the country’s position as transshipment hub to Mali and Niger as well as this new platform will allow seamless connection with the railway which is the cheaper means of transport cargoes to Abidjan Port.

From the point of view of urban development, it’s worth to note that when OuagarInter Dry Port was conceived, it was deliberately located at the outskirts of the city to avoid disrupting traffic flow in the city that might be caused by trucks entering and leaving the facility. But due to city expansion, the dry port is now within the city’s built up area. And for this reason, a proposal to build a new dry port in a new location outside the city was conceived.

2) **Objective**

The following are the objectives of the project:

- To provide a logistics facility with multi-modal function (serviceable by road and rail)
- To serve the growing volume of cargo traffic for Burkina Faso as well transit cargoes to neighbouring countries
- To decongest the city by relocating the facility to the outskirts of the city

3) **Project Description**

The project involves construction of a new dry port in a 47 hectares (with possible expansion up to 300 ha) vacant land as shown in the figure below. The location of the facility is close to the railway station and the envisioned new airport for easy transfer of cargoes.

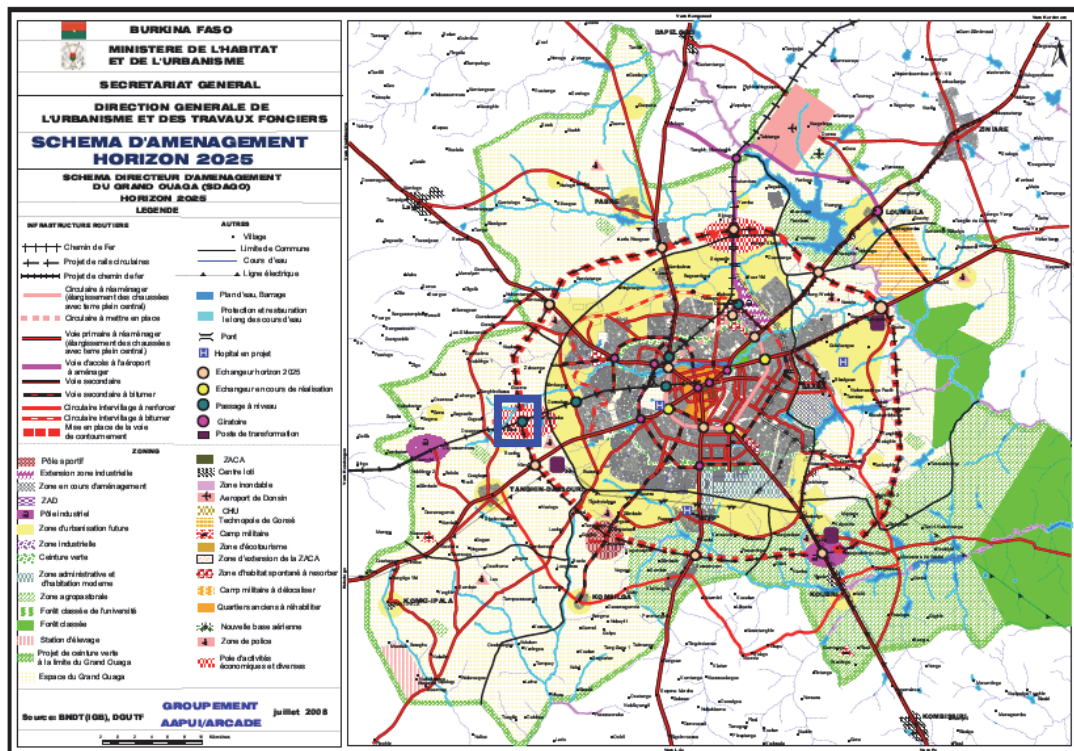
The multi-modal dry port is to equipped with the following facilities:

- Cargo railway station
- On-loading and off-loading machine
- Truck Parking Lots
- Bonded warehouses of customs office
- Private companies’ warehouses
- Container yards
- Customs offices
- Private companies’ offices

The operation of this multi-modal dry port should be done by giving concession to private companies.

A pre-feasibility study was completed in 2012 and full blown FS is on-going and funded by the African Development Bank.

This project should be supported by the projects for access road from National Road No.1 to the multi-modal dry port and for electricity and water supply.



Note: Location of the envisioned New Multi-modal Dry Port in Ouagadougou

Source: Ministère de l'Habitat et de l'Urbanisme (MHU)

Figure 11.3.2 Project Location for New Ouagadougou Multi-modal Dry Port

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Reduction of transport cost due to direct access of rail transport thus double handling of cargo is avoided
- Increase comfort on the facility users such as truck drivers, workers in the facility and others due to improved system and facilities
- Reduction of traffic congestion in the city due to diverted truck traffic

5) Executing Agency and Related Institution

According to the government, due to the scale of the project, the following agencies are involved:

- Ministry of Industry, Trade and Handicrafts (Ministère de l'industrie, du commerce et de l'Artisanat (MICA))
- Ministry of Infrastructure (Ministère des Infrastructures)
- Minister of transport, urban mobility and security (Ministère des transports, de la mobilité urbaine et de la sécurité)
- Ministry of Economy, Finance and Development (Ministère de l'Economie, des Finances et du développement)
- Ministry of Housing and Urban Development (Ministère de l'Urbanisme et de l'Habitat)
- Chambre de Commerce et d'Industrie (Chamber of Commerce)

6) Estimated Project Cost

CFA 56 Billion (government estimate)

7) Implementation Schedule

The new facility is targeted to operate in 2017

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Once the on-going FS is completed, the next critical step is to find a willing partner to finance the said project

9) Related Projects

Related projects are listed as follows:

- Construction of Southern Sections (between N1 and N4) of Ouagadougou Outer Ring Road (Southern Bypass)
- Construction of Motorway between Ouagadougou and Koudougou

10) Social and Environmental Impacts

Possible Social and Environmental Impacts are as follows:

- Social and environmental impacts are expected to be minimal since the area is not inhabited. Minimal impacts on the environment includes cutting of trees, cut and fill of soil and other construction activities related to clearing of the area.

(2) Expansion of Bobo-Dioulasso Multi-Modal Dry Port

1) Rationale

The current dry port facility has a total area of 130 hectares however only 19 hectares were fully developed. It started to operate in January 2010 and due to increase of cargo volume handled at the facility (i.e. data received from the dry port administrator revealed the 6.8% increase of cargo volume from 2012 to 2013 and 16.2% increase from 2014 to 2014; both growths were higher than what was recorded in Ouagadougou), and expansion plan was conceived by the government. The first part of the staging plan is to develop additional 12 hectares. During the last visit of the JST in August 2015, a feasibility of the 12 hectares was on-going. The next target is to develop additional 40 hectares. No activities were reported related to the additional 40 hectares. The ultimate target of the government is to fully develop the entire 130 hectares.

Likewise, this project will complement the development direction of other sectors. For instance, increase of crop production and thereby export output is planned for agriculture sector in the areas of Cascade region (Douna, Karfiguéla and Kou Valley) thru rehabilitation of irrigation project. Competitive products for export will find the facility answer to their needs.

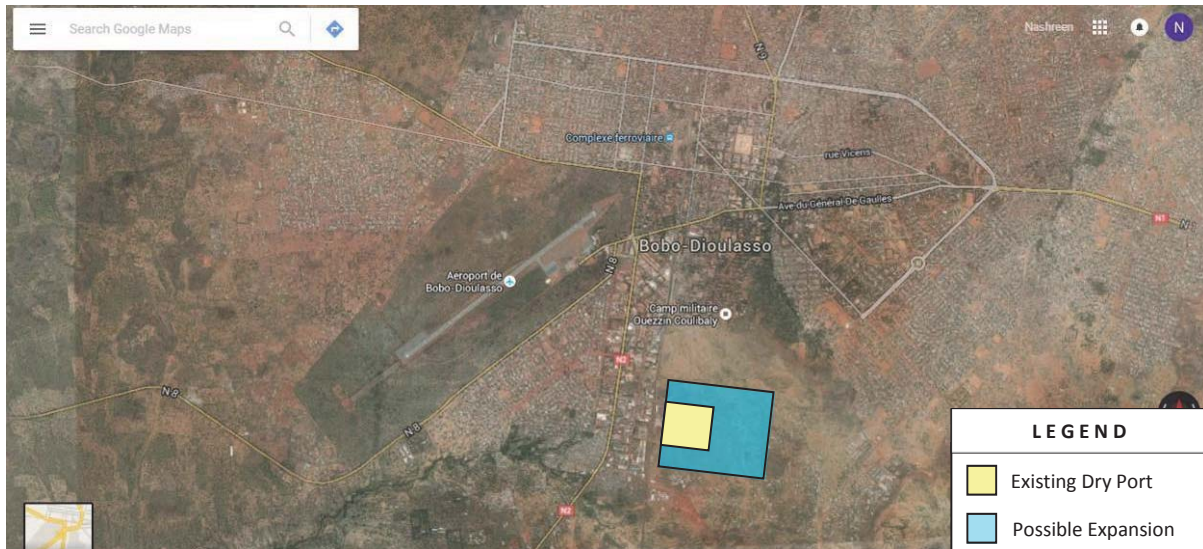
2) Objective

The objectives are as follows:

- To serve the increasing volume of cargoes to Burkina Faso and other neighbouring countries like Mali

3) Project Description

The project involves expansion of the dry port. Scope of works involved fencing of the additional area, cut and fill to create a level area, construction of additional buildings for administration and requirement of freight stakeholders, and erecting of other necessary infrastructure.



Source: JICA Study Team

Figure 11.3.3 Project Location for Expansion of Bobo Dioulasso Dry Port

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Ensured that all cargo traffic for Burkina Faso and neighbouring countries are accommodated thus contribute to the economy of the country
- Increase comfort on the facility users such as truck drivers, workers in the facility and others due to improved system and facilities

5) Executing Agency and Related Institution

Chambre de Commerce et d'Industrie (Chamber of Commerce)

6) Estimated Project Cost

US\$ 50 million

7) Implementation Schedule

Not available (this can be determined once a copy of FS is obtained)

8) Necessary Actions for Implementation / Critical Factor

Once the FS is completed, the next step is to secure a willing partner to finance the project

9) Related Projects

None

10) Social and Environmental Impacts

Possible Social and Environmental Impacts are as follows:

- Social and environmental impacts are expected to be minimal since the area is not inhabited. Minimal impacts on the environment includes cutting of trees, cut and fill of soil and other construction activities related to clearing of the area.

(3) Project for Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders

1) Project Outline

Burkina Faso used to be famous for exporting agricultural and livestock products to neighbouring countries. Burkina Faso's cowpeas, tomato and strawberry are very popular in the coastal consumers' markets within the sub-region.

In addition to export of primary commodities, such as minerals and agricultural products, Burkina Faso should make significant efforts at expanding existing and newly developed products of agriculture, livestock and agro-processing oriented to growing coastal markets of the sub-region. For this purpose, it is necessary to strengthen the implementation of the customs union by taking advantage of the customs union, which has been institutionalized by the member countries of UEMOA and ECOWAS.

The project aims at enforcement of implementation of the customs union and trade facilitating for sub-regional products with neighbouring countries of the sub-region. The project will establish new materials for training and train related agencies and personnel. Campaigns for customs union trade facilitation of sub-regional products will also be implemented together with WAGRIC countries and its surrounding countries under this project.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

US\$ 4 million

11.4 Air Transport Sector of Burkina Faso

11.4.1 Present Situation of Air Transport and Airports in Burkina Faso

(1) Present Operating Airports in Burkina Faso

In Burkina Faso, there are two international airports; Ouagadougou International Airport and Bobo-Dioulasso Airport. There are also 30 domestic airports which are operational but do not have regular flights.



Source: JICA Study Team

Figure 11.4.1 Location of Airports in Burkina Faso with Regular Flights

(2) Present Air Transport in Burkina Faso

There are currently 17 direct destinations from Ouagadougou International Airport; Abidjan, Addis Ababa, Accra, Algiers, Bamako, Bobo-Dioulasso (Domestic), Brussels, Casablanca, Conakry, Cotonou, Dakar, Dubai, Istanbul, Lagos, Lomé, Niamey, Paris (Source: OAG June 2015 Time Table, Air Burkina Website accessed on May 2017)

Cargo flights from Ouagadougou International Airport have 5 destinations including Liege, Luxembourg, Dakar, Dubai-Al Actium and Frankfurt.

Currently Burkina Air operates two round trip flights a week between Ouagadougou and Bobo-Dioulasso by Embraer 170 (70-seater).

(3) Present Situation of Ouagadougou International Airport

Ouagadougou International Airport served 527,000 passengers in 2014. The shares of flight passengers were 80% international passengers, 15% transit passengers and 5% domestic passengers.

The traffic volume of international passengers at the Ouagadougou Airport increased at an annual growth rate of over 5.1% from 2010 to 2014 while the traffic volume of international cargos increased at an annual growth rate of 5.4% from 2010 to 2014.

Although the share of domestic passengers is still limited, the number of domestic passengers at Ouagadougou Airport increased by an annual rate of 99.9% between 2010 and 2014.

(4) Present Situation of Bobo-Dioulasso Airport

At Bobo-Dioulasso Airport, airport facilities are various and those sizes are larger than required for the operating airport accommodating two regular flights a week. The control tower and operation building were newly constructed and operated. According to the information given by a controller, the airport has been developed for flight operation of passengers and cargos, but the current volume of air traffic is not large enough for the facilities.

The traffic volume of international passengers at the Bobo-Dioulasso Airport increased at an annual growth rate of 7.5% from 2010 to 2014. However, Bobo-Dioulasso Airport did not deal with air cargo from 2010 to 2014. The number of domestic passengers at Bobo-Dioulasso Airport increased by an annual rate of 5.4%.

(5) New Ouagadougou-Donsin Airport Development

ANAC (Agence Nationale de l'Aviation Civile) has a plan to develop a new airport in Donsin area, which is about 30 km north of Ouagadougou City. The reasons for relocation of the airport include concern for security, lack of land space for possible expansion, noise and air pollution and others.

According to ANAC, the estimated cost is around US\$ 2 billion and the new airport is envisioned to open in 2020.

11.4.2 Issues regarding Air Transport in Burkina Faso

At an early stage of regional development, land transport connection is necessary. However, in order to promote further development, air transport is also essential to promote economic development for inland countries like Burkina Faso. Then the enhanced development by air transport improvement would increase the demand for land transport in the international corridors.

(1) Issues of Ouagadougou Airport

Major issues of the Ouagadougou Airport are defined as the following:

- Insufficient aprons are under expansion in order to accommodate flights of large jet aircraft from Europe and an increasing number of international air cargo flights
- Superannuated terminal buildings and insufficient passenger processing facilities. For example, facilities for international and domestic air passenger are not clearly separated since Ouagadougou-Bobo-Dioulasso flights are mixed flights with international and domestic passengers. From a security viewpoint, this mixed situation should be improved.
- The passenger gate lounge does not have enough space resulting in its seats being fully occupied by passengers at large aircraft departures.
- Another problem of the passenger terminal building is that no boarding bridges are available to avoid rainwater inconvenience for passengers.

(2) Issues of Bobo-Dioulasso Airport

As the second airport of Burkina Faso, Bobo-Dioulasso Airport has to play a role of an alternate airport for Ouagadougou International airport when foreign and domestic aircrafts cannot land at Ouagadougou Airport due to bad weather or apron congestion.

11.4.3 Objectives for the Aviation Sector of Burkina Faso

The objectives for the development of the aviation sector in Burkina Faso are defined as:

- To expand the capacity of the International Airport for Ouagadougou for the future development of Burkina Faso
- To provide facilities to improve access to remote regions, enhance mobility and develop opportunities for travel within the country as well as to increase the frequency of domestic flights

11.4.4 Strategies for the Aviation Sector of Burkina Faso

The strategies for the development of aviation sector in Burkina Faso are the following:

- To increase the capacity of Ouagadougou International Airport for the future increase in both cargo and passenger flights including the new planned airport in Donsin, in order to respond to increase of flights among countries of the sub-region
- To encourage private sectors to participate in the aviation industry

11.4.5 Programmes and Projects for the Aviation Sector of Burkina Faso

- Project for Construction and Operation of New International Ouagadougou Airport in Donsin
- Project for Expansion and Renovation of Passenger Terminal Buildings of Existing Ouagadougou International Airport for Converting it to an Airport for Domestic and Sub-Regional Flights
- Project for upgrading Bobo-Dioulasso Airport

11.5 Electricity Supply of Burkina Faso

11.5.1 Present Situation and Future Prospects of Electricity Supply of Burkina Faso

In 2011, a peak demand was recorded to be 144MW. Since then, the peak demand has been steadily increasing at growth rates of 9-15%. In 2015, a peak demand of 244MW was recorded.

The import of electricity from Burkina Faso comes mainly from the 225kV interconnection line with Côte d'Ivoire.

The peak demand in Burkina Faso is projected to reach approximately 491MW under the high growth scenario and 399MW under the low growth scenario by the end of 2025, which is more than double compared to the current demand.¹

Table 11.5.1 Peak Electricity Demand in Burkina Faso

Year	2011	2012	2013	2014	2015
Peak Demand (MW)	162	175	200	218	244

Source: SONABEL

11.5.2 Issues on Electricity Supply of Burkina Faso

- High cost for generating electricity because it depends mainly on imported fossil sources (DDO, fuel ...)
- Marginal use of renewable energy sources, even though abundant solar energy is available in

¹ "Update of the ECOWAS Revised Master Plan for the Generation and Transmission Electrical Energy" conducted by WAPP

- Burkina Faso
- Frequent electricity blackouts mostly in working hours, caused by insufficient volume of electricity production for demand satisfaction
 - Overloading to transformers at peak hours and frequent failures of transmission lines
 - Low national coverage rate of electricity, estimated at about 35%

11.5.3 Objectives for Development of Electricity Supply in Burkina Faso

In the light of the issues on the power sector, the following objectives need to be set to develop the growth ring corridors originating from Ouagadougou in Burkina Faso:

- To reinforce interconnection lines with neighbouring countries within the West African Power Pool and to diversify sources of power supply so as to improve the reliability of the power supply
- To promote the expansion of power generation capacities by utilizing renewable energy, such as solar energy, in parallel with development of conventional power plants

11.5.4 Strategies for Electricity Supply of Burkina Faso

The following strategies are recommended for electricity supply in Burkina Faso in relation to the growth ring corridor development:

- Considering that Burkina Faso is an inland country where procurement costs of fuel, such as oil and gas, are costly, it is desirable to reinforce the interconnection lines with neighbouring countries, rather than developing power generation plants for fully satisfying the increasing power demand. According to SONABEL, the cost of imported power (60 CFA/kWh) is much cheaper than that of power supplied by thermal power plants (138 CFA/kWh).
- In order to supply the power to economic growth areas, power transmission lines should also be established along the three corridors coming from Abidjan, Accra and Lomé.
- Along with the development of transmission lines, it is required to build substations with large capacity transformers at the main points where the power is largely consumed. Even if the bulk power is transmitted through transmission lines that have sufficient capacity, planned outages would be required if transformers were overloaded.
- In view of the high cost of extending distribution lines in remote and rural areas, it would be efficient to establish a feeding system Off-grid from independent power sources, such as solar power and mini hydropower plants.

11.5.5 Programmes and Projects for Electricity Supply of Burkina Faso

The following projects are formulated and included in a development plan by the electricity company, SONABEL for power generation, power transmission and power distribution as follows:

(1) Projects for Development of Power Generation (2017-2020)

Table 11.5.2 Power Plant Development Plan for Burkina Faso

Type of Power Resource	Name of Plants	Power Output [MW]
Hydro	Bagré Downstream Hydroelectric Plant	16
Hydro	Bonifoli Hydroelectric Plant	5.1
Hydro	Folonzo Hydroelectric Plant	10.8
Hydro	Gongourou Hydroelectric Plant	5
Thermal	Fada Thermal Power Plant	7.5
Thermal	Thermal Power Plant of Ouagadougou	109
Thermal	Donsin Thermal Power Plant	100
Renewable	Solar Power Plant in Zagtouli	33
Renewable	Solar Power Plant in Zagtouli	17
Renewable	Zina Solar Power Plant	20
Renewable	Kodeni Solar Power Plant	17
Renewable	Solar Power Plant of Patte d'Oie	6.25
Renewable	Zano Solar Power Plant	11
Renewable	Pà Solar Power Plant	17
Renewable	Ziga Solar Power	1.1
Renewable	Fada N'Gourma Solar Power Plant	10
Renewable	Dori Solar Power Plant	15
Renewable	Dédougou Solar Power Plant	15
Renewable	Ouagadougou Solar Power Plant	30
Renewable	Between Bobo-dioulasso and Orodara Solar	10

Source: SONABEL

(2) Projects for Development of Power Transmission Lines for Burkina Faso

The system development plans in Burkina Faso are developed every year until 2020.

Year 2017

- 225 kV transmission line: Bolgatanga - PA5, [188 km]
- 225 kV power transmission line: PA5 - Zagtouli (C1), [22 km]
- 225 kV transmission line: PA5 - Zagtouli (C2), [22 km]

Year 2019

- 225 kV transmission line: Han (Ghana) - Kodeni (BF), [225 km]

The following plans are appropriate for the second point of the aforementioned objective:

Year 2017

- 90kV power transmission line: Paw of Goose - Komsilga, [24 km]

Year 2018

- 90kV power transmission line: Zagtouli - Koudougou, [100 km]
- 90kV electricity transmission line: Kodeni - Banfora, [80 km]

Year 2019

- 90kV electricity transmission line: Ouaga-Est - Kossodo (C1), [36 km]
- 90 kV electricity transmission line: Ouaga-Est - Kossodo (C2), [36 km]
- 90kV electricity transmission line: Ouagadougou - Patte d'Oie (C1), [23 km]
- 90kV electricity transmission line: Ouaga-Est - Goose foot (C2), [23 km]
- 90 kV electricity transmission line: Kodeni - Koua, [12 km]
- 90kV power transmission line: Kodeni - Bobo 1, [9 km]
- 90kV power transmission line: Koua - Bobo 1, [8 km]

Year 2020

- 225kV power transmission line: Ouaga-Est - PA5 (C1), [28 km]
- 225kV power transmission line: Ouaga-Est - PA5 (C2), [28 km]
- 161kV interconnection line: Kompienga – Porga [30km]

11.5.6 Profiles of Priority Projects for Electricity Supply of Burkina Faso

In consideration of corridor development in Burkina Faso, priority should be given to the following project, and a profile of that project is prepared as follows:

(1) Project for Construction of 161kV Interconnection Line (Kompienga-Porga [Benin])

1) Rationale

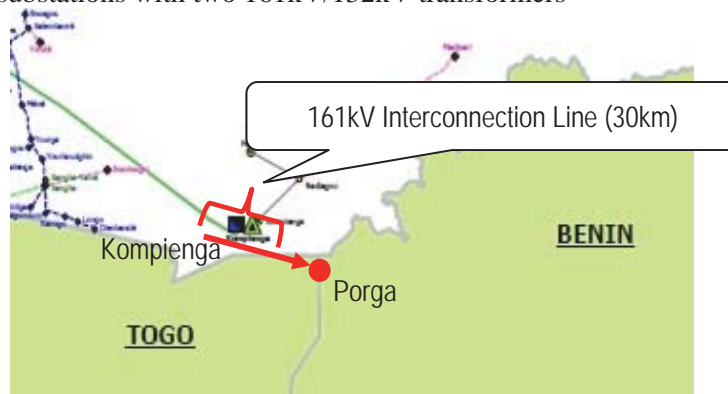
As of January 2016, the interconnection line with Côte d'Ivoire is a single circuit of 225kV transmission line only. In order to improve the reliability of the power supply from other countries, it is important to establish new interconnection lines with other countries, except for Côte d'Ivoire, and it is realistic to connect the existing substations located close to the boundary between Burkina Faso and adjacent countries so as to save on construction cost.

2) Objective

The objective of this project is to realize direct power trade between CEB and SONABEL and to improve the system reliability of the power grid in Burkina Faso.

3) Project Description

- Construction of two circuits of 161kV transmission lines with a line length of around 30km
- Construction of substations with two 161kV/132kV transformers



Source: SONABEL

Figure 11.5.1 Location of Proposed Interconnection Line

4) Expected Benefits

The following impacts and benefits are expected in this project:

- To contribute to the improvement of the system reliability and reduction in the number of power failures
- To enable selling surplus power to Togo and Benin

5) Executing Agency and Related Institution

Expected executing agencies and related institution for this project are listed below.

- Ministry of Mines and Energy (MME)
- Société Nationale d'électricité du Burkina (SONABEL)
- Communauté Électrique du Bénin (CEB)

6) Estimated Project Cost

The project cost would be estimated in Table 11.5.3. For estimation, it was calculated using standard unit price applicable to the construction work for power facilities in Japan and a ratio of construction cost between Japan and Ghana, “0.4”(Source: Website, “https://archi-book.com.”).

Table 11.5.3 Estimated Project Cost for 161kV Interconnection Line (Kompienga-Porga [Benin])
Development Project

Project Components	Estimated Cost [Million JPY]	Remarks
Transmission Facilities	1,440 ~ 4,440	2cct, 161kV, 30km
Substation Facilities	25.6 ~ 1,140	2 units of Transformers
Total	1,465.6 ~ 5,880	

Source: “Standard Unit Price for Construction Work of Power Facilities”, issued by Organization Cross-regional Coordination of Transmission Operators, JAPAN (OCCTO)

7) Implementation Schedule

The project implementation schedule is estimated to be around four and half (4.5) years.

Table 11.5.4 Implementation Schedule of 161kV Interconnection Line (Kompienga-Porga [Benin])
Development Project

	2017				2018				2019				2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasible Study																				
Route Survey																				
System Analysis																				
Social and Environmental Impact Assessment																				
Preliminary Studies																				
Final Line Routing																				
Permitting																				
Engineering and Procurement																				
Engineering																				
Procurement of Equipment																				
Financing																				
Construction and Commissioning																				
Construction																				
Commissioning																				

Source: Created by JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- To conduct a fFeasibility Study
- To conduct a sSocial and Environmental Impact Study

11.6 Water Resources of Burkina Faso

11.6.1 Present Situation of Water Resources of Burkina Faso

(1) Water Resources Potential and Water Use

According to FAO-Aquastat, the total renewable water resources in Burkina Faso is estimated at 13.5BCM/yr, of which 12.5BCM/yr are generated internally. The total reservoir capacity is 5.3BCM in 2011.

The estimated total volume of water use in 2000 was 505MCM/yr, which is about 3.7% of the total renewable water resources. The most consumable water use is for agricultural use (395MCM/yr), followed by domestic use (104MCM/yr) and industrial use (6MCM/yr).

(2) Legal Framework regarding Water

The existing water resources management and development are anchored on the following two documents.

- Water Policy and Strategies of 1998
- Water Management Framework Law of 2001

(3) Existing Plans and Programmes regarding Water

1) Water Sector in National Development Plan for Burkina Faso

The Strategy for Growth and Sustainable Development (SCADD) (2011-2015) is the latest national development plan in Burkina Faso. The SCADD shows the targets of water supply and sanitation in 2015 as follows.

- Rate of access to drinking water in urban area: 89%
- Rate of access to drinking water in rural area: 76%
- Rate of access to sanitation in rural area: 100%
- Rate of access to sanitation in rural area: 57%

2) Action Plan for Integrated Water Resources Management (PN-GIRE)

The PN-GIRE was prepared for Phase 1 in 2003 and for Phase 2 in 2009. The PN-GIRE for 2016-2030 has just been prepared in 2016.

3) National Plan for Water Supply and Sanitation (PN-AEPA), 2006-2015

In Burkina Faso, the National Programme for Water Supply and Sanitation (PN-AEPA) has been the framework that divides responsibilities between the different actors.

The PN-AEPA is distributed in rural and urban areas each comprising a component. The implementation of the rural component is placed under the responsibility of the General Directorate of Water Resources (DGRE), the General Directorate of Sanitation Wastewater and Excreta Waters (DGAEUE) and regional offices in charge of water and sanitation. The urban component is placed under the responsibility of the National Office for Water and Sanitation (ONEA) as part of its 2005-2015 development plan in relation to local authorities.

4) National Plan for Drinking Water Supply (PN-AEP), 2016-2030

The PN-AEP for 2016-2030 was prepared in 2015, which has the following vision and objectives.

Vision

In 2030, the water resources of the country are known and managed effectively to realize the universal right of access to water and sanitation, in order to contribute to sustainable development.

Objectives

- Satisfying the needs for sustainable drinking water in quantity and quality, population, applying an approach based on human rights (HRBA);
- To contribute to the sustainable management of water supply infrastructures, while respecting universal access to drinking water;
- To improve the control and management capacity of the subsector; and
- To contribute sustainably to meeting the freshwater needs of users and aquatic ecosystems.

11.6.2 Issues on Water Resources in Burkina Faso

The major issues on water resources management and development, which have been identified in relation to the corridor development, are shown in Table 11.6.1.

Table 11.6.1 Major Issues on Water Resources Management and Development in Relation to Corridor Development in Burkina Faso

Major Issue	Description
Increasing water demand for urban water supply	It is expected that the urban centres along the growth corridor will be developed more intensively, according to the corridor development. It is necessary to address the increasing water demand for urban water supply, in order to secure the appropriate urban environment for the regional growth. As shown in Table 11.5.2, the bulk water supply capacity per capita is expected to be reduced to almost half in 2025 compared to that in 2015 if there will be no additional water source development for major urban centres along major corridors.
Not fully utilized existing reservoirs	In Burkina Faso, a lot of dam reservoirs have been constructed. However, some large scale dams such as Bagré have not utilized its full storage capacity as planned.
Uncompleted Water Management Master Plan (SDAGE) at basin level	The pressure on water use will be increased by the corridor development. It is necessary to properly coordinate several kinds of water use by preparing and implementing Water Management Master Plan (SDAGE) at basin level. However, Water Management Master Plan (SDAGE) has been prepared in only two river basins out of five river basin authorities so far.
Lack of water information system	The water information system is fundamental for proper water management. However, it is still not adequate, and needs to be developed urgently.
Deterioration of water quality	The sediment concentration in Ziga dam, which is the major water source for Ouagadougou, is relatively high, making the treatment cost high. Further increase of sediment load from the watershed which could occur due to future land degradation in the watershed by the corridor development should be prevented. Furthermore, the increase in pollution due to illegal mining should also be prevented.

Source: JICA Study Team

Table 11.6.2 Bulk Water Supply Capacity per Capita for Major Urban Centres along Major Corridors

	Current Capacity (m ³ /day)	Current Actual Production (m ³ /day)	Population (2015)	Production per capita (lpd) (2015)	Population (2025)	Production per capita (lpd) (2025) without additional water source development
Greater Ouagadougou	158,000	158,000	2,510,000	62.9	4,734,000	33.4
Bobo-Dioulasso	49,500	49,500	791,000	62.6	1,417,000	34.9

Source: Capacity and actual production – ONEA, Population – JICA Study Team

11.6.3 Objectives for Management and Development of Water Resources in Burkina Faso

(1) Overall Objective

The overall objective of the water resources management and development in the present study is as follows.

- Sustainable and secured water source for major urban centres along major corridors and other water needs such as agriculture and power generation to support promising regional economic growth.

(2) Specific Objectives

To fully discuss the water resources management and development for the whole of all of the countries and covering all sub-sectors related to water is a big task which should be conducted by the appropriate responsible agencies as a separate study on the water sector. Instead, the present study specifically focuses on the following areas, on the basis of the existing water sector policy and plans.

- Water resources management for sustainable water use in relation to corridor development

- Water source development for urban water supply including conveyance, transmission and treatment for major urban centres along major corridors
- Large scale water resources development in relation to economic and infrastructure sector programs and projects shown in the present study

On the basis of the overall objective as well as the above-mentioned consideration, the specific objectives of the water resources management and development are set as follows:

- **Objective-1:** Sustainable and secured water source for major urban centres along major corridors
- **Objective-2:** Effectively utilized water resources for the economic and infrastructure sectors to support promising regional economic growth
- **Objective-3:** Well-functioning Integrated Water Resources Management

As for the major urban centres along major corridors, the following urban centres are selected for discussion in the present study.

- Ouagadougou
- Bobo-Dioulasso

11.6.4 Strategies for Water Resources of Burkina Faso

On the basis of the major issues as well as the current situation and future prospect described in the Situation Report in the Annex of the Final Report of the present project, the strategies to achieve the specific objectives are proposed to be set as shown in Table 11.6.3.

Table 11.6.3 Strategies on Water Resources Management and Development in Burkina Faso

Specific Objective		Strategy
Objective-1: Sustainable and secured water source for major urban centres along major corridors	1a: Ouagadougou	Strategy 1a-1: Conservation and effective use of existing Ziga dam Strategy 1a-2: Study and its implementation for new water source from Bagre dam with long-term perspective
	1b: Bobo-Dioulasso	Strategy 1b-1: Further development of groundwater resources in a sustainable manner Strategy 1b-2: Conveyance from Samandini dam in long-term perspective
Objective-2: Effectively utilized water resources for economic and infrastructure sectors to support promising regional economic growth		Strategy 2-1: Effective use of existing reservoirs Strategy 2-2: Implementation of planned irrigation projects
Objective-3: Well-functioning Integrated Water Resources Management		Strategy 3-1: Preparation of Water Management Master Plan (SDAGE) for all river basins in Burkina Faso Strategy 3-2: Enhancement of information system on water Strategy 3-3: Strengthening of water quality management and watershed conservation

Source: JICA Study Team

11.6.5 Programmes and Projects for Water Resources of Burkina Faso

The programmes and projects based on the strategies are listed in Table 11.6.4.

Table 11.6.4 Programs and Projects on Water Resources Management and Development in Burkina Faso

Specific Objective	Program and Project	Related Strategy	Expected Responsible Organization	Term	
				Short-Mid. 2025	Long 2040
Objective-1: Sustainable and secured water source for major urban centres along major corridors					
1a: Ouagadougou	Project on water supply to Ouagadougou from the Ziga dam (Ziga II) (Stage 1 is on-going)	1a-1	ONEA	x	
	Study for new water source development including conveyance from Bagre dam for Ouagadougou water scheme	1a-2	MEA/ ONEA	x	
	Implementation of new water source development for Ouagadougou water scheme	1a-2	MEA/ ONEA		x
1b: Bobo-Dioulasso	Expansion of water supply system in Bobo-Dioulasso	1b-1	ONEA	x	
	Implementation of conveyance from Samandini dam	1b-2	MEA/ ONEA		x
Objective-2: Effectively utilized water resources for economic and infrastructure sector to support promising regional economic growth¹					
2	Bagré Growth Pole Project (PPCB)	2-1	Bagrepole	x	
	Integral Development Programme of Sammandeni (PDIS)	2-1	DGADI	x	
	Agri Business and irrigation Development in Karfiguéla (Banfora)	2-1	DGADI	x	
	Agri Business and irrigation Development in Doana (Banfora)	2-1	DGADI	x	
	Sourou Valley Development Plan	2-2	DGADI	x	
	Food Supply Chain Development in Kou Valley (Houet)	2-2	DGADI	x	
	Low Land Development Project	2-2	DGADI	x	x
Objective-3: Well-functioning Integrated Water Resources Management					
3	Implementation of IWRM action plan	3-1 3-2 3-3	SP-PAGIRE	x	x

Source: Arranged by JICA Study Team based on information provided by relevant agencies

*1: The projects described in the agricultural sector and electricity supply sector in the present study are listed here.

11.6.6 Profiles of Priority Projects for Water Resources of Burkina Faso

Among the programs and projects listed in Table 11.6.4, the ones which are considered to be urgent or strategically important are preliminarily selected as priority projects as shown below.

(1) Project on Water Supply to Ouagadougou from the Ziga dam (Ziga II)

1) Rationale

This project is in line with the Strategy 1a-1: Conservation and effective use of existing Ziga dam.

The capacity of the existing Ziga dam has not yet been fully utilized. The expansion of WTP in Ziga dam is to utilize the unused capacity for municipal water supply to address the future increase in water demand.

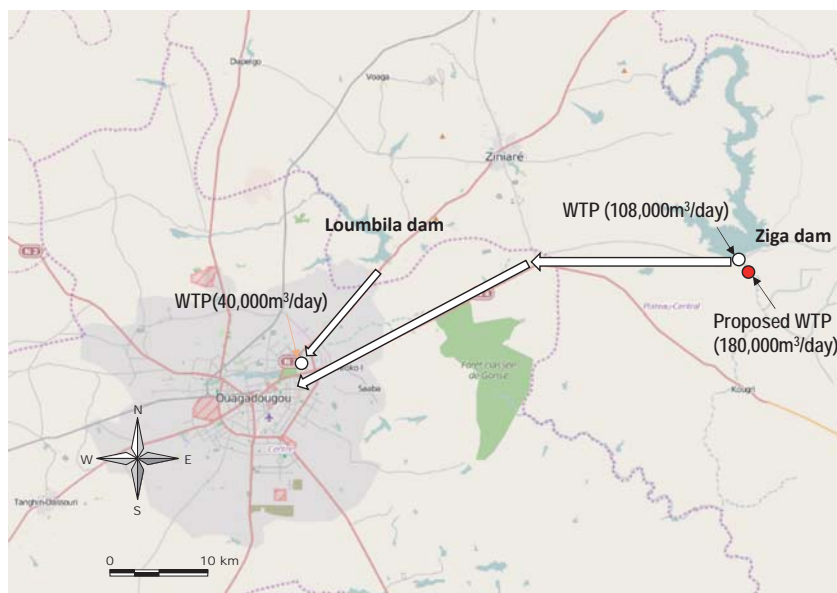
2) Objective

To secure adequate water sources the short-term (targeting at around 2025) for municipal water supply for Ouagadougou

3) Project Description

The project descriptions are as below.

- Construction of WTP (Total capacity=180,000m³/day), transmission mains, distribution network, fountains and social connection terminals



Source: Prepared by JICA Study Team based on Information provided by ONEA

Figure 11.6.1 Project Location for Project on Water Supply to Ouagadougou from the Ziga dam (Ziga II)

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in Ouagadougou

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- ONEA

6) Estimated Project Cost

107.3 billion FCFA.

7) Remarks

The extension of WTP in the Ziga dam (Phase II of the Ziga dam project) has been planned by ONEA. According to ONEA, the Phase II consists of two stages.

- Stage-1: Capacity = 108,000m³/day (2015-2017)
- Stage-2: Capacity = 72,000m³/day (after 2017)

The stage-1 is on-going and to be completed soon. However, the stage-2 should be realized toward 2025.

(2) Expansion of Water Supply System in Bobo-Dioulasso

1) Rationale

This project is in line with the Strategy 1b-1: Further development of groundwater resources in a sustainable manner.

This project is to strengthen the production water for the city of Bobo-Dioulasso in order to fill the gap and feed Péni from Bobo-Dioulasso treatment plant and also supply the unserved area in Bobo-Dioulasso.

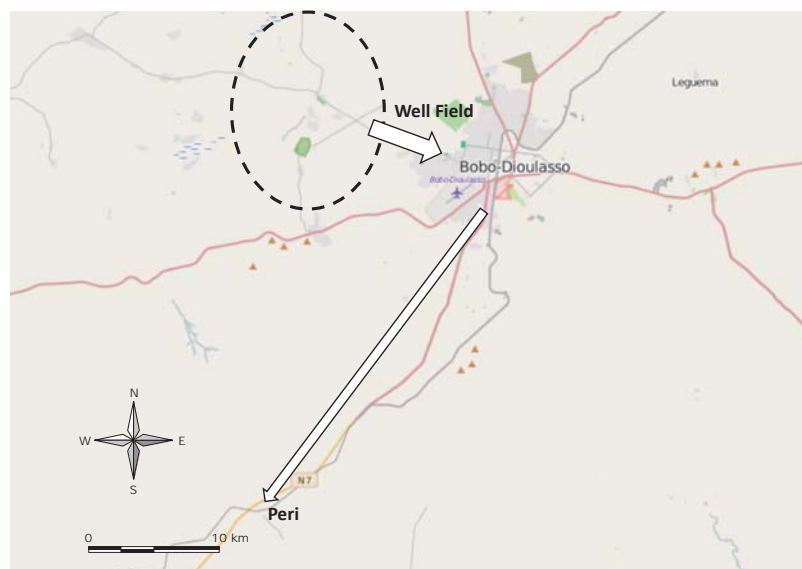
2) Objective

The project implementation will enable sustainable access to safe drinking water in the city of Bobo-Dioulasso, in the rural community of Péni and villages to be served along the route, targeting the access to water ratio improvement to reach 100% for Bobo-Dioulasso and Péni on the horizon of the project (2030)

3) Project Description

The project descriptions are as below.

- Development of five bore holes (Total capacity = 24,000 m³/day), Construction of pumping station (30,000m³/day), reservoirs, pipeline to Péni (about 36km) and distribution network



Source: Prepared by JICA Study Team based on Information provided by ONEA

Figure 11.6.2 Project Location for Expansion of Water Supply System in Bobo-Dioulasso

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in Bobo-Dioulasso and the surrounding area

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- ONEA

6) Estimated Project Cost

16.68 billion FCFA

7) Remarks

The study was conducted by ONEA in 2015.

(3) Preparation of Water Management Master Plan (SDAGE) for All River Basins in Burkina Faso

1) Rationale

This project is in line with the Strategy 3-1: Preparation of Water Management Master Plan (SDAGE) for all river basins in Burkina Faso.

It is necessary to properly coordinate several kinds of water use by preparing and implementing Water Management Master Plan (SDAGE) at the basin level. However, Water Management Master Plan (SDAGE) has been prepared in only two river basins out of five river basin authorities so far. This project is to prepare Water Management Master Plan (SDAGE) for Nakambe, Liptako and Gourme river basins.

2) Objective

Proper management of water resources at basin level

3) Project Description

The project descriptions are as below.

- Preparation of Water Management Master Plan (SDAGE) for Nakambe, Liptako and Gourme river basins and Periodical review of Water Management Master Plan (SDAGE) for all river basins

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Proper management of water resources at basin level in Burkina Faso

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- SP-PAGIRE

6) Estimated Project Cost

1.2 billion FCFA

7) Remarks

The preparation of Water Management Master Plan (SDAGE) for Nakambe river basin is on-going. Those for Liptako and Gourme river basins have not yet started.

(4) Project for Enhancement of Information System on Water

1) Rationale

This project is in line with the Strategy 3-2: Enhancement of information system on water.

The water information system is fundamental for proper water management. However, it is still not adequate and needs to be developed urgently.

2) Objective

To develop a nation-wide water information system for water management

3) Project Description

The project descriptions are as below.

- Strengthening of monitoring of water, Information system development, and water resources assessment

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Enhanced information on water, which can make water resources planning and management more effective and efficient

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- SP-PAGIRE

6) Estimated Project Cost

9.73 billion FCFA

7) Remarks

This is one of the activities in the IWRM action plan, which is recognized as one of the priority actions by SP-PAGIRE.

(5) Project for Strengthening of Water Pollution Management

1) Rationale

This project is in line with the Strategy 3-3: Strengthening of water quality management and watershed conservation and the Strategy 1a-1: Conservation and effective use of existing Ziga Dam.

In order to prevent an increase in sediment load and pollution due to degradation of the watershed including illegal mining activities, water pollution management should be strengthened.

2) Objective

To enhance the capacity for water pollution management

3) Project Description

The project descriptions are as below.

- Sensitising people, Introduction of simple technology such as retention basins, Introduction of good practice

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Proper water pollution management

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- SP-PAGIRE

6) Estimated Project Cost

4 billion FCFA

7) Remarks

This is one of the activities in the IWRM action plan, which is recognized as one of the priority actions by SP-PAGIRE.

Chapter 12 Urban Development Strategies for Burkina Faso

12.1 Urban Development in Burkina Faso

12.1.1 Present Situation on Urban Development in Burkina Faso

The urban population in Burkina Faso has been increasing constantly in the past decades. Its number doubled from 1.6 million to 3.2 million from 1985 to 2006. However, almost 80% of the national population in Burkina Faso still lived in rural areas in 2006 which remains predominantly rural.

Table 12.1.1 Changes in Urban Population in Burkina Faso

Year	Total Population	Urban Population	Share of Urban Population	Annual Growth Rate of Urban Population
1975	5,638,203	362,610	6.43%	-
1985	7,964,705	1,011,074	12.69%	10.8%
1996	10,312,609	1,601,168	15.53%	4.3%
2006	14,017,262	3,181,967	22.70%	7.1%

Source: INSD, 2009, Recensement Général de la Population et de l'Habitation de 2006 (RGPH-2006), Rapport d'Analyse des Données du RGPH-2006, Theme 09: La Croissance Urbaine au Burkina Faso

Centre Region holds the highest percentage of urban population (85.4%), followed by Hauts-Bassins Region with 37.6% of urban population. The urban population are concentrated in these two regions due to the two main cities of Burkina Faso, namely Ouagadougou and Bobo-Dioulasso. The population of the remaining 11 regions is by contrast highly rural with percentage high of 93.4% in Est Region, 93.3% in Sahel Region, 92.1% in Plateau-Central Region and 91.5% in Boucle du Mouhoun Region.

Table 12.1.2 Regional Distribution of Urban and Rural Population in Burkina Faso, 2006

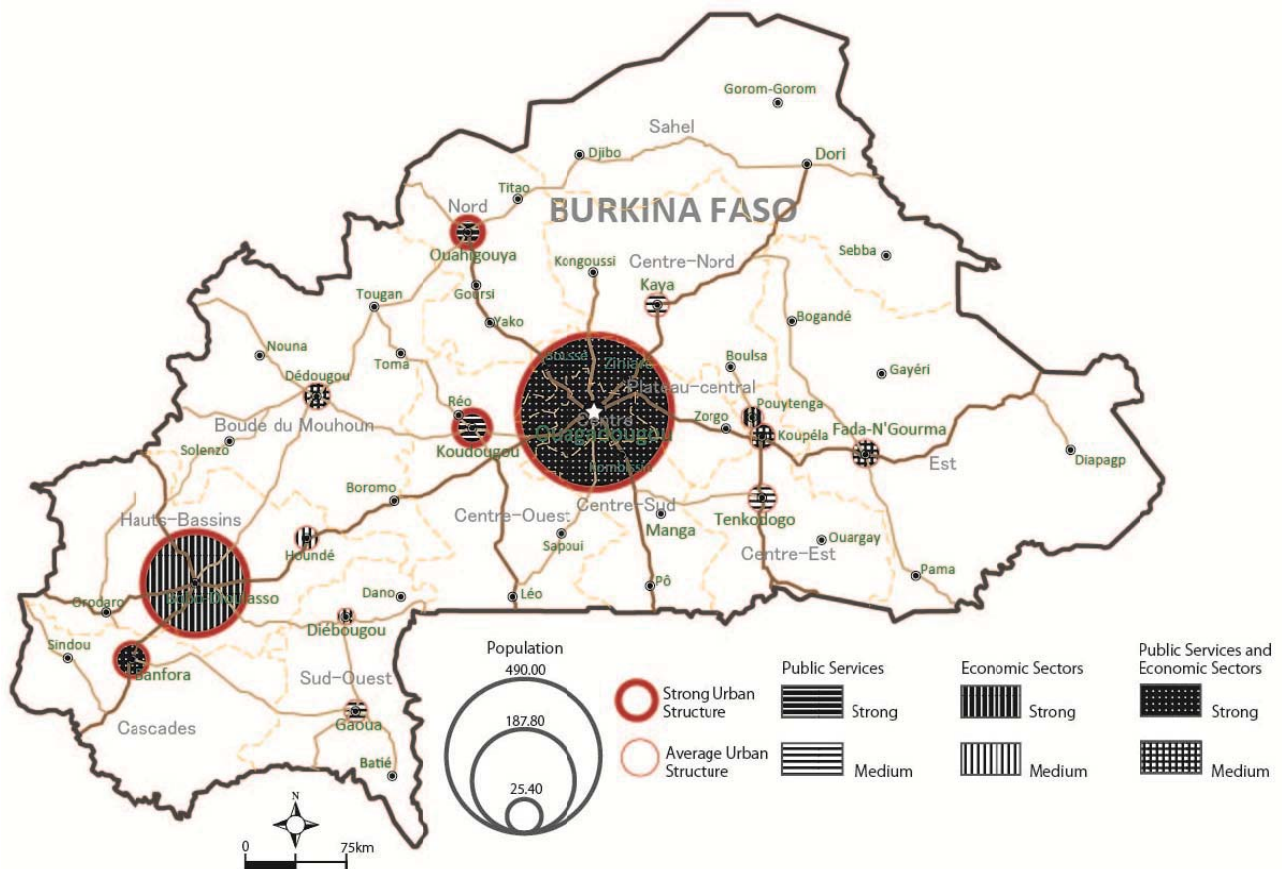
Region	Total Population	% of Urban Population by Region	Total Urban Population by Region	% of Rural Population by Region	Total Rural Population by Region
Boucle du Mouhoun	1,442,749	8.5%	121,923	91.5%	1,320,826
Cascades	531,808	19.3%	102,412	81.7%	531,808
Centre	1,727,390	85.4%	1,475,839	14.6%	251,551
Centre-Est	1,132,016	17.5%	198,496	82.5%	933,520
Centre-Nord	1,202,025	8.1%	97,462	91.9%	1,104,563
Centre-Ouest	1,186,566	13.2%	156,095	86.8%	1,030,471
Centre-Sud	641,443	10.5%	67,640	89.5%	573,803
Est	1,212,284	6.6%	79,715	93.4%	1,132,569
Hauts-Bassins	1,469,604	37.6%	552,781	62.4%	1,185,796
Nord	1,185,796	11.8%	139,585	88.2%	1,046,211
Plateau-Central	696,372	7.9%	54,949	92.1%	641,423
Sahel	968,442	6.7%	64,856	93.3%	903,586
Sud-Ouest	620,767	11.3%	70,214	88.7%	550,553
Total	14,017,262	22.7%	3,181,967	77.3%	10,835,295

Source : INSD, 2009, Recensement Général de la Population et de l'Habitation de 2006 (RGPH-2006), Rapport d'Analyse des Données du RGPH-2006, Theme 09: La Croissance Urbaine au Burkina Faso

12.1.2 Hierarchy of Urban Centres in Burkina Faso

According to the draft National Master Plan of Burkina Faso prepared in August 2012 (SNAT: *Schéma National d'Aménagement du Territoire*), the urban structure of Burkina Faso is categorized by the following four levels:

- 1st Tier - Metropolitan cities such as Ouagadougou and Bobo-Dioulasso;
- 2nd Tier - Regional or secondary and mid-size cities that are intended to structure a large space of a regional catchment that are Koudougou, Ouahigouya, Kaya, Tenkodogo, Koupéla-Pouytenga, Banfora, Gaoua, Dedougou, Houndé, Fada N'gourma and Dori;
- 3rd Tier - Intermediate cities of the provincial scale which number thirty-five and match the scale of the province;
- 4th Tier - Small cities at the commune level.



Source: JICA Study Team based on Draft Master Plan for National Territorial Development of Burkina Faso (SNAT: *Schéma National d'Aménagement du Territoire*) prepared in August 2012

Figure 12.1.1 Location and Size of Major Urban Centres in Burkina Faso

As shown in Figure 12.1.1, Ouagadougou is the political capital and economic centre of Burkina Faso. Its population is projected to be 2.56 million in 2015. The location of Ouagadougou is geographically at the central area of the territory of Burkina Faso.

Bobo-Dioulasso is the economic capital of Burkina Faso. Its population was projected to be 0.77 million in 2015. Bobo-Dioulasso is an intermediary city whose economy is mostly based on managing rural production. Today its main economic activities in the surrounding areas of Bobo-Dioulasso are large-scale cotton production, gardening, and arboriculture produce, especially cashews, citrus fruits, potatoes and mangos. Its catchment area stretches from 120 to 150 km and covers most of the western part of the country.

The urban development of the country has polarized around the two large cities. Over the past thirty years, the trend has intensified.

Urban centres selected for special attention in corridor development due to their current urban size are the two 1st tier urban centres and four of 11 the 2nd tier urban centres, which are along the primary international corridors, namely Greater Ouagadougou, Bobo-Dioulasso, Koupéla-Pouytenga, Koudougou, Banfora and Fada N'gourma. In consideration of the corridor development strategies, the following functions for major urban centres in Burkina Faso are designated for the future:

- Greater Ouagadougou: First-class international city for business and administration centre
- Bobo-Dioulasso: National centre for business, industry including agro processing and commerce
- Banfora: Regional growth pole with agro processing industry base and service centre for southwestern Burkina Faso
- Fada N'gourma: Regional growth pole with agro processing industry base and service centre for eastern Burkina Faso

12.1.3 Review of Urban Development Plans for Burkina Faso

In order to better guide each city in its development process, the Burkinabe Government adopted Law No. 017-2006 / AN of 18 May 2006, the Urban Planning and Construction Code, which stipulates the establishment of Urban Master Plans (SDAU: *Schéma Directeur d'Aménagement et d'Urbanisme*) as a main tool for planning of urban areas.

The SDAU determines land uses and identifies urban growth areas, as well as those areas to be protected due to their specificities. Moreover, the master plan proposes major infrastructure projects and urban facilities to be developed during the proposed planning horizon. The plan integrates and coordinates the objectives and actions of the central government, the local authorities, as well as the public and private institutions for sustainable urban development at the municipality level.

With the funding from the World Bank, the Ministry of Housing and Urban Development has prepared SDAU for the twelve regional capitals of Burkina Faso with this planning tool.

12.1.4 Future Urban Population Framework for Burkina Faso

The population of major urban centres in Burkina Faso is expected to continue to increase rapidly. It is projected that the population of Greater Ouagadougou will exceed 7 million by 2040 while the population of Bobo-Dioulasso is expected to become 2.2 million by 2040.

Table 12.1.3 Future Population of Major Urban Centres in Burkina Faso

Major Urban Centres		2006	2015	2025	2033	2040	Increase 2015-2040
Greater Ouagadougou ¹	Population	1,475,223	2,556,625	4,369,780	6,135,042	7,730,729	5,174,104
	Annual Growth Rate		6.30%	5.51%	4.33%	3.36%	4.53%
Bobo-Dioulasso ²	Population	489,967	770,914	1,215,413	1,708,641	2,246,939	1,476,025
	Annual Growth Rate			4.66%	4.35%	3.99%	4.37%
Koupéla-Pouytenga	Population	89,397	142,851	238,205	350,956	481,164	338,313
	Annual Growth Rate			5.25%	4.96%	4.61%	4.98%
Koudougou	Population	88,184	115,175	154,744	194,822	236,035	120,860
	Annual Growth Rate			3.00%	2.92%	2.78%	2.91%
Banfora	Population	75,917	120,617	192,768	271,960	360,672	240,055
	Annual Growth Rate			4.80%	4.40%	4.12%	4.48%
Fada N'gourma	Population	41,785	61,599	94,841	131,644	172,080	110,481
	Annual Growth Rate			4.41%	4.18%	3.90%	4.19%

Note 1: For year 2006, the population for Greater Ouagadougou only includes Ouagadougou Commune, while for the other years, the peripheral urbanizing areas around Ouagadougou Commune are included. (See Section 12.2.1 for detail)

Note 2: For year 2006, the population for Bobo-Dioulasso only includes urban area of Bobo-Dioulasso Commune (Bobo-Dioulasso City), while for the other years, the peripheral urbanizing areas in Bobo-Dioulasso Commune and Bama Commune are included. (See Section 12.3.1 for detail)

Source: JICA Study Team

12.1.5 Issues regarding Urban Development in Burkina Faso

With relation to the corridor development the following are recognized as issues or constraints for urban development in Burkina Faso:

- Overconcentration on Ouagadougou, the national capital, in terms of urban population and economic activities, in comparison with the second-tier cities along east-west corridor (between Bobo-Dioulasso - Ouagadougou - Katchari connecting Bamako, Ouagadougou and Niamey, which are also part of Abidjan-Ouagadougou, Tema-Ouagadougou and Lomé-Ouagadougou Corridors) highlighted in poor urban settings, insufficient economic activities and inadequate job opportunities
- Insufficient provision of public services (hospitals, universities, etc....) in the second tier cities
- Lack of stable electricity and water for both residential usage and industrial usage in urban centres
- Heavy vehicles passing through urban centres causing disturbance to socio-economic activities

12.1.6 Overall Objectives for Urban Development for Burkina Faso

The overall objectives for urban development of Burkina Faso are as follows:

- To transform major cities along the east-west corridor of Burkina Faso into hubs of economic development and attractive urban centers
- To prepare urban centres for a leading role in terms of economic development which could be activated by corridor development
- To upgrade functions of major urban centres so that they can play their expected roles
- To provide necessary public services at the second tier cities along major corridors
- To mitigate negative impact to be caused by corridor development

12.1.7 Strategies for Urban Development for Burkina Faso

In order to accomplish the overall objectives for urban development, and in anticipation of the impacts and opportunities generated by prospective corridor development projects, it is important to review the SDAUs of each urban centre taking into consideration the following:

- Transformation of urban structure for accommodating further development in relation to corridor development
- Infrastructure development and urban upgrading by taking into consideration the development of potential economic sectors and increase in urban population in major urban centres
- Construction of ring roads or bypass roads not only to avoid congestion in respective urban centres, but also to open up land for economic sector development.

12.2 Urban Development Strategies for Greater Ouagadougou

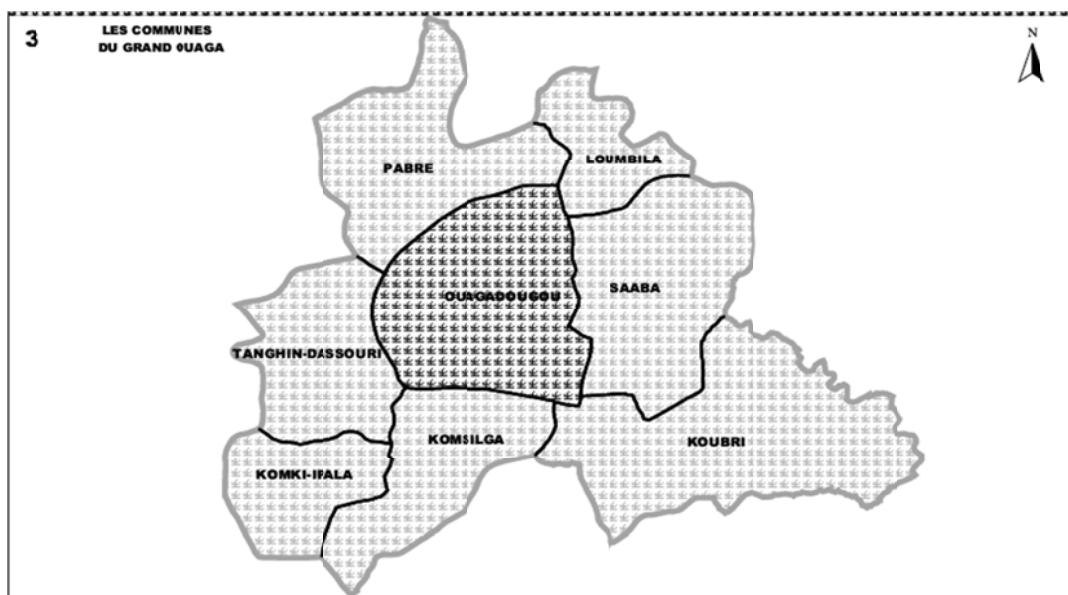
12.2.1 Present Situation of Greater Ouagadougou

(1) Urban Expansion of Greater Ouagadougou

The territory of Greater Ouagadougou covers Centre Region and part of Plateau-Centre Region containing eight cities (Figure 12.2.1) namely Ouagadougou, and the surrounding cities of Komki Ipala, Komsilga, Koubri, Pabré, Saaba, Tanghin Dassouri and Loubila¹.

Following a sustained demographic growth, Greater Ouagadougou area has been experiencing during the last decade an uncontrolled urban sprawl especially in some of the fringe areas around the city.

¹ Out of the eight cities of Greater Ouagadougou, Loubila belongs to Plateau-Central Region.



Source: SDAGO (Schéma Directeur d'Aménagement du Grand Ouagadougou), 2008

Figure 12.2.1 Territorial Extents of Greater Ouagadougou and the Cities in the Greater Ouagadougou Area

(2) Demography of Greater Ouagadougou

The Greater Ouagadougou area including rural areas lying within, has been experiencing a rapid urbanization trend, with a population assumed to be exceeding 2.5 million inhabitants in 2015 compared to 1,754,706 inhabitants in 2006 (). The population has been especially concentrating in Ouagadougou Commune in the past decades, but since 1996, some of the surrounding cities such as Komsilga and Saaba have increased their population by over 5% per annum which is high. Therefore, the capital area has been experiencing pronounced spatial imbalances in addition to several other major challenges that had to be addressed by the new urban master plan.

Table 12.2.1 Population of Greater Ouagadougou (1985, 1996 and 2006)

Cities	Population			Annual Growth Rate (%)		Area (km ²)	Population Density 2006 (persons/km ²)
	1985	1996	2006	1985-1996	1996-2006		
Ouagadougou City	459,826	745,462	1,475,223	4.49%	7.06%	2,805	616
Komki Ipala City	17,185	19,144	20,562	0.99%	0.72%		
Komsilga City	24,176	26,385	53,108	0.80%	7.25%		
Koubri City	32,331	39,041	43,928	1.73%	1.19%		
Pabré City	21,744	23,918	27,896	0.87%	1.55%		
Saaba City	31,179	30,198	50,885	-0.29%	5.56%		
Tanghin Dassouri City	47,524	52,810	55,172	0.96%	0.44%		
Loumbila City	15,557	25,889	27,932	4.74%	0.76%	177	158
Total of Surrounding Cities	189,696	217,385	279,932	1.24%	2.54%	-	-
Greater Ouagadougou	649,522	962,847	1,754,706	3.64%	6.19%	2,982	588

Source: INSD

(3) Existing Urban Master Plan

In 2008, a master plan for Greater Ouagadougou (SDAGO: *Schéma Directeur d'Aménagement du Grand Ouagadougou*) was formulated setting the year 2025 as a prospective horizon.

The following objectives were set by the SDAGO:

- To define the territorial extents of Greater Ouagadougou
- To control the spatial imbalance within Greater Ouagadougou
- To improve the living conditions of the populations of Greater Ouagadougou

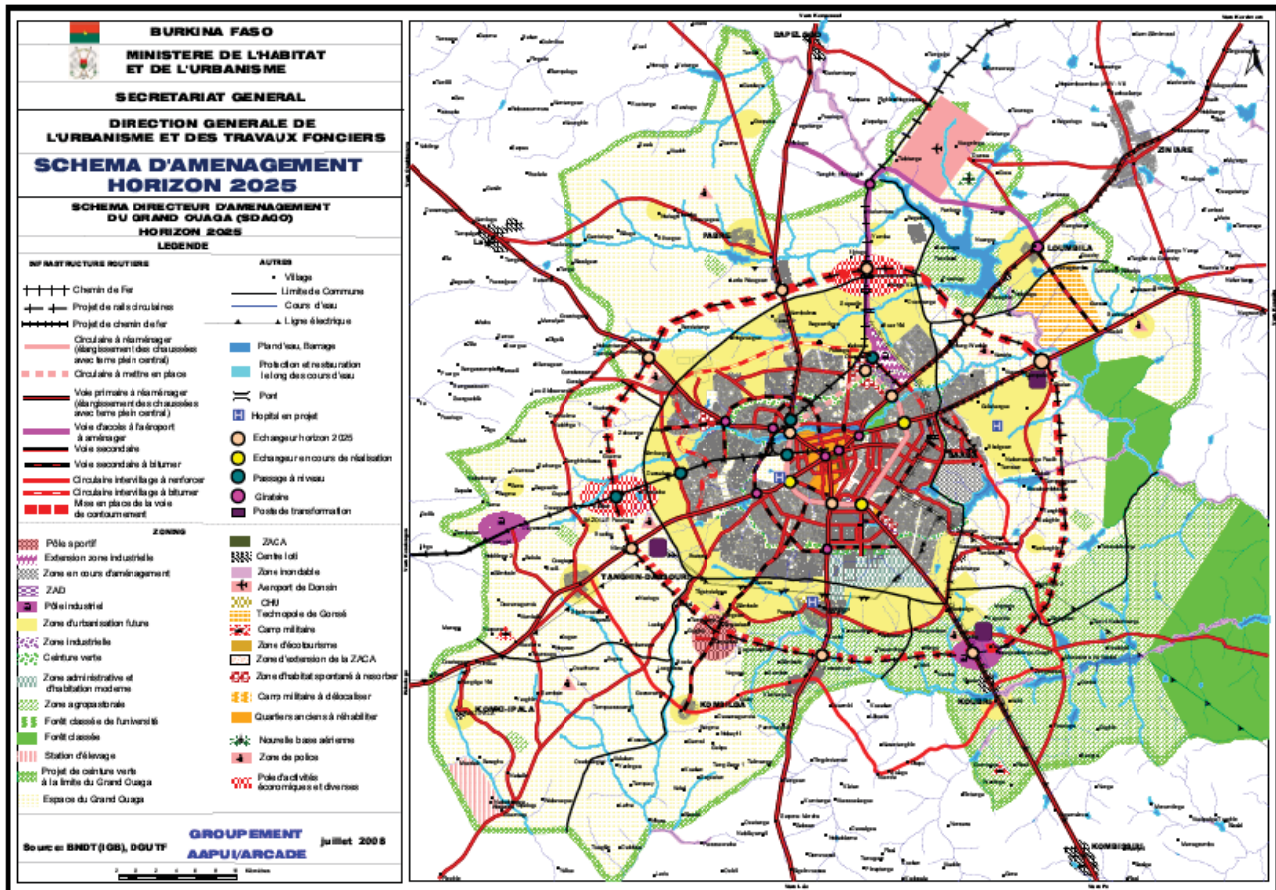
The SDAGO tries to address major challenges in terms of population growth, urban sprawl, job creation, provision of public and social services (water, electricity, health, and sanitation), and access to decent housing. The plan also identifies a new site for the development of a new airport in

Donsin to the north of Ouagadougou, and several industrial poles and economic zones spreading around the Outer Ring Road.

The proposed projects in the SDAGO are listed below.

- Future expansion zones,
- Development of a technopole in Consé,
- Two economic activity poles, that will develop around the logistics platform in the rural town of Tangin Dassouri
- An economic hub that can house an exhibition center as well as an international fair ground, a train and bus passenger station in between Ouagadougou and Pabré at the junction between two railway routes and the access rail line to the airport.
- Three industrial centres which will develop:
 - Around the SONABHY warehouse in Tangin Dassouri, close to the rail, for all types of industry;
 - In Koubri along the future rail line linking Burkina Faso and Ghana for the food industry;
 - In Kossodo for the strengthening and expansion of the industrial area of Kossodo.
- Two agropoles in Koubri and Loumbila
- A sports centre in the rural commune of Komsilga, including an Olympic swimming pool, a velodrome and a racetrack
- Agricultural and natural protection zones
- Rehabilitation and densification zones in old city neighbourhoods, servicing peripheral neighbourhoods, decommissioning of the industrial zone of Gounghin and allocating the site to public housing construction.
- Ecotourism and horticulture zone around Ouagadougou dams
- Security and defence areas in Koubri, Tangin Dassouri, Loumbila, and Komki-Ipala,
- Public services zones for building health facilities, schools, cemeteries, etc.
- Infrastructure structural plan identifying major transport projects sites such as roads, rails, the relocation of the existing airport to the new site of Donsin, interchanges, and roundabouts to be built for improving mobility in the Greater Ouagadougou area. In particular, the following infrastructure projects are already being implemented or in the pipeline:
 - Implementation of the bypass of the city of Ouagadougou
 - Implementation of access roads to the new airport
 - Railway interconnection with Ghana
 - Implementing the circular rails along the bypass road and integration of rail transit
 - Allocation of the existing airport site to ZACA after decommissioning (450 releasable plots and integration of the track to the road network)
 - Development of a city transportation plan for Greater Ouagadougou
 - Creation of central parking areas and bus terminals in the periphery
 - Urban densification to promote public transport

The conceptual spatial structure prepared by SDAGO for Greater Ouagadougou is shown in Figure 12.2.2.



Source: SDAGO 2008

Figure 12.2.2 Conceptual Spatial Structure of Greater Ouagadougou by SDAGO

12.2.2 Future Prospects for Greater Ouagadougou

Greater Ouagadougou is located in the centre of the country connecting the international corridors stretching to the capital cities of the surrounding countries, namely Abidjan, Accra, Lomé, Cotonou, Niamey and Bamako. Greater Ouagadougou is expected to develop as the first class international city for West Africa due to its strategic location at the connecting point of six international corridors and by attracting investment targeting not only Burkina Faso, but also the emerging middle income population in its surrounding countries.

Greater Ouagadougou is one of the most rapidly growing cities within the WAGRIC countries in terms of population. It is assumed that there will be increase of approximately 5 million inhabitants by 2040.

There are also new developments planned to be implemented, such as multi-modal dry port approximately 25km west of Ouagadougou (within Tanghin Dassouri) besides existing development such as a new international airport approximately 30km north-east of Ouagadougou in Donsin (within Loumbila) and relocation of manufacturing areas. These developments with the implementation of outer ring road would restructure the space of Greater Ouagadougou.

It is therefore necessary to prepare a new master plan for other related facilities and infrastructure by adjusting and modifying the existing SDAGO.

12.2.3 Issues on Urban Development of Greater Ouagadougou

Due to rapid urban and demographic growth, Greater Ouagadougou is faced with the following urban issues:

- Sprawling urban development and informal settlements caused by rapid population increase

- Underperforming drainage and wastewater networks
- Insufficient water supply and heavy dependency on ground water while at the same time wastewater is being discharged into the ground water aquifer
- Saturated road network
- Declining and poorly structured urban centres
- Necessity of preparing an integrated spatial development plan for Greater Ouagadougou in order to accommodate emerging changes

12.2.4 Objectives for Urban Development of Greater Ouagadougou

The following objectives are determined for the urban development of Greater Ouagadougou:

- To make maximum use of the potential of Greater Ouagadougou as national capital and its strategic location for international logistics in relation to the corridor developments (Abidjan-Ouagadougou Corridor, Tema-Ouagadougou Corridor, Lomé-Ouagadougou Corridor, Cotonou-Ouagadougou Corridor, Bamako-Ouagadougou Corridor and Niamey-Ouagadougou Corridor)
- To perform and fulfil the roles as the first-class international city not only as a business and administration centre but also for industrial production

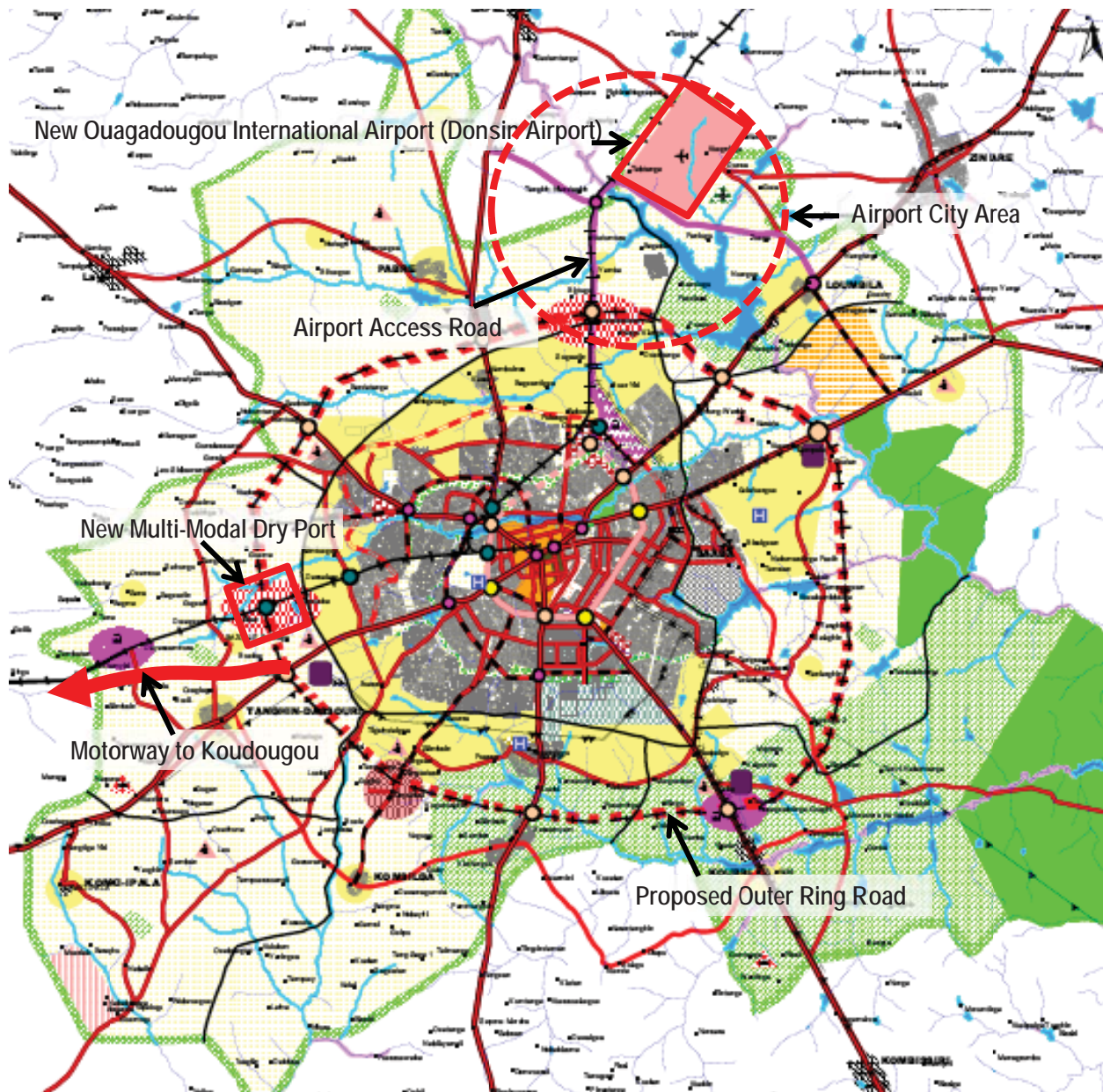
12.2.5 Strategies for Urban Development of Greater Ouagadougou

The following are the strategies for urban development of Greater Ouagadougou:

- To develop an international airport city in Donsin area for accommodating increasing population and economic activities by formulating a master plan for the airport city and by providing necessary infrastructures
- To construct an outer ring road not only for managing urban and through traffic but also future urban land expansion including new towns
- To implement the development of necessary urban road networks to ease the traffic pressure caused by motorization, population increase and development of transport corridors
- To implement necessary improvements and upgrading of public transportation for securing high urban mobility
- To provide enough electricity and water for the future inhabitants and industries of Greater Ouagadougou

12.2.6 Conceptual Spatial Structure for Greater Ouagadougou

The conceptual spatial structure for Greater Ouagadougou is shown in accordance with current SDAGO (Schéma Directeur d'Aménagement du Grand Ouagadougou), in Figure 12.2.3.



Source: JICA Study Team based on SDAGO

Figure 12.2.3 Conceptual Drawing to Transform Spatial Structure of Greater Ouagadougou

12.2.7 Programmes and Projects for Greater Ouagadougou's Urban Development related to Corridor Development

The following is a list of projects that should be developed within Greater Ouagadougou in an effort to complement the development of the WAGRIC Project.

- Construction of the Outer Ring Road for Greater Ouagadougou
- Formulation of a detailed master plan for the new multi-modal dry port area and the vicinities of the project including major road and rail infrastructure
- Formulation of a master plan for the new Donsin airport area. The aim is to redefine the long term vision of the project, trying to reposition this strategic gateway infrastructure in a sub-regional integration context
- Requalification and upgrading of existing urban centres
- Upgrading drainage and waste water treatment facilities
- Formulation of New Greater Ouagadougou Urban Master Plan targeting 2040

The following list of projects is sector priority projects of WAGRIC Master Plan for Greater Ouagadougou.

- Widening of Inner Ring Road (Tensoba Boulevard) of Ouagadougou
- Construction of Motorway between Ouagadougou and Koudougou
- Construction and Operation of Multi-Modal Dry Port for Ouagadougou including Construction of Access Road from N1 to Ouagadougou Multi-Modal Dry Port
- Integrated Development Project of Gounghin and Kossodo Industrial Zones in Ouagadougou
- Project for Development of Loading and Off-Loading Facilities for Cattle at Railway Station in a Suburban Area of Ouagadougou together with Cattle Waiting Pens
- Project on Water Supply to Ouagadougou from the Ziga Dam (Ziga II) Stage 2
- Project for Urban Transportation Master Planning for Greater Ouagadougou
- Project for Construction and Operation of New International Ouagadougou Airport in Doshin
- Project for Expansion and Renovation of Passenger Terminal Buildings of Existing Ouagadougou International Airport for Converting it to an Airport for Domestic and Sub-Regional Flights

(1) Construction of the Outer Ring Road for Greater Ouagadougou

1) Rationale

Ouagadougou, is expanding at a fast pace due to its gravitational mass being the capital city of Burkina Faso where most socio-economic infrastructure, services and opportunities are concentrated. The result is high traffic congestions in almost every part of the city leading to extensive delays, pollution and additional economic costs. The Master Plan of Ouagadougou has provisioned for an outer ring road that defines the city growth area, and most importantly helps deviating through traffic while serving strategically positioned economic infrastructures such as industrial areas and logistic centers along the different exists of the planned road infrastructure.

2) Objectives

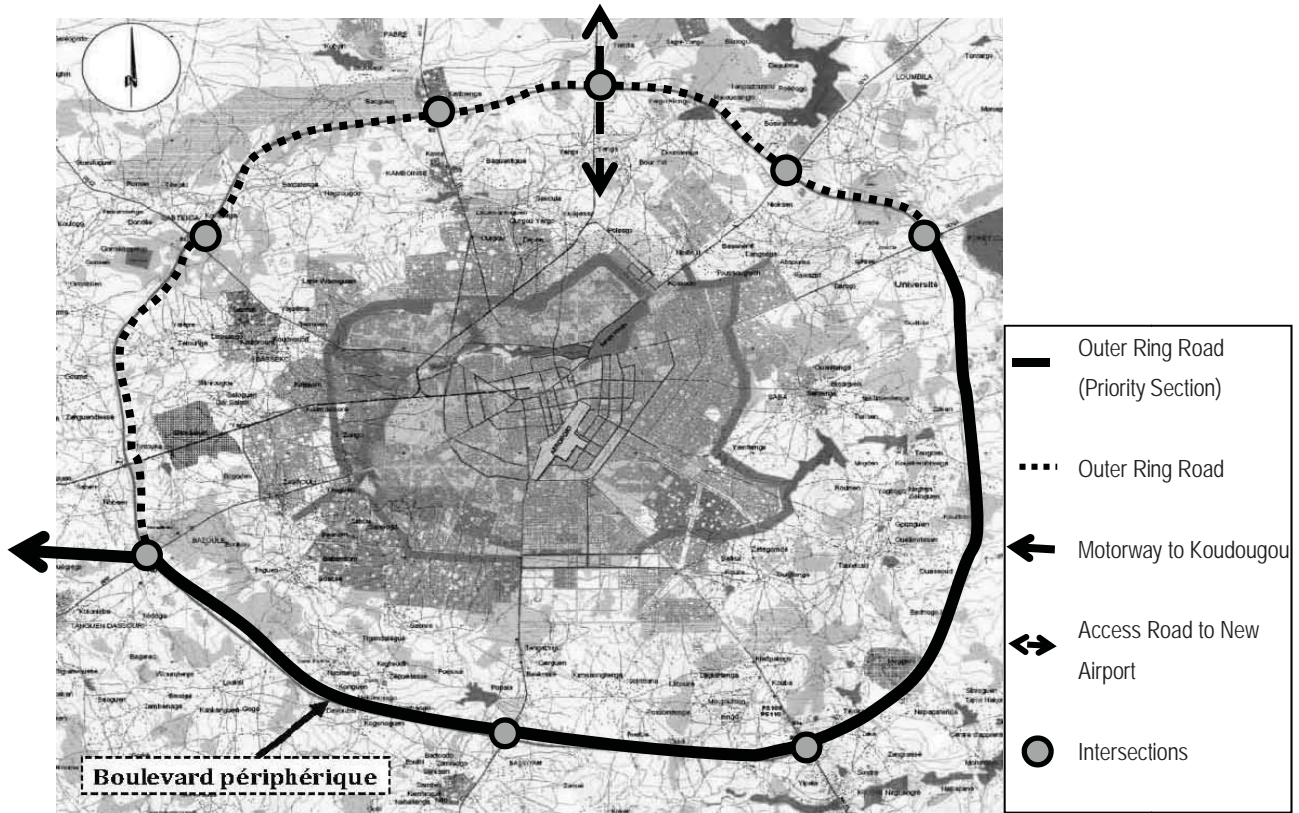
- To avoid through traffic into the city centre
- To facilitate access to major urban centers within the Greater Ouagadougou and avoid traffic congestion
- To serve newly planned economic infrastructures such as industrial zones and logistic centers
- To expand urban growth limits of major urban centres
- To enable high-speed travelling of motor cars and trucks on the transport corridors
- To reshape the spatial structure along the outer ring road.

3) Project Description

The project description and phasing are described below.

- To review existing right-of-ways of bypass roads and outer ring roads proposed in the master plan and propose the best connections to the major corridors
- To secure necessary land for the future implementation of such infrastructure projects
- To construct the outer ring road

In an effort to reduce cost and at the same time achieve quick wins by serving the major international corridors such as Abidjan - Ouagadougou Corridor, Lomé - Ouagadougou Corridor, and Tema - Ouagadougou Corridor, it is important to distribute the construction works of the outer ring road into at least two phases as shown in Figure 12.2.4. The first southern section of approximately 60km should therefore be given priority since it helps achieving the different strategic goals for WAGRIC Master Plan and could be scheduled for completion by the year 2025.



Source: JICA Study Team based on Ministry of Infrastructures, Development and Transport (MIDT), 2014, Travaux de construction et de bitumage du boulevard peripherique de la ville de Ouagadougou

Figure 12.2.4 Priority Sections of Ouagadougou Outer Ring Road

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Effective and efficient spatial development and deployment of economic sector activities along the outer ring roads
- Expansion and reorganization of the urban areas of Ouagadougou
- Effective management of traffic flows along the international corridors and within the city
- Facilitation of people and goods transportation

5) Executing Agency and Related Institutions

- Ministry of Infrastructure
- Ministry of Housing and Urban Planning, in cooperation with the regional and local administrations

6) Related Projects

- Formulation of a detailed master plan for the new multi-modal dry port area
- Construction of access road to New Ouagadougou International Airport

12.3 Urban Development Strategies for Bobo-Dioulasso

12.3.1 Present Situation of Bobo-Dioulasso

(1) Urban Expansion of Bobo-Dioulasso

Bobo-Dioulasso is the second largest city in Burkina Faso and is known as the economic capital of the country. The city is strategically located close to the Ivorian and Malian borders and develops along six major road axes with both national and international characters namely:

- National Road (RN1) Bobo-Dioulasso - Ouagadougou

- National Road (RN7) connecting Bobo-Dioulasso to Banfora to the borders with Côte d'Ivoire
- National Road (RN8) linking Bobo-Dioulasso to Orodara and the international border with Mali
- National Road (RN9) connecting Bobo-Dioulasso to Farmana to the border with Mali
- National Road (RN10) going through Bobo-Dioulasso – Dédougou – Tougan - Ouahigouya
- National Road (RN27) connecting Bobo-Dioulasso and Diébougou to the border with Ghana

Since 2000, the city of Bobo-Dioulasso has experienced a sustained growth, gaining in population and economic vitality. Residents have returned home following the internal crisis in neighbouring Côte d'Ivoire, helping to stimulate the economy. In that sense, the central government has invested development funds in the city, for example, upgrading of the international airport and building of the new African Centre for Economic and Social Studies, a college intended as the first piece of development of the second university of the country.

(2) Demography of Bobo-Dioulasso

Since 1996, Bobo-Dioulasso Town has increased its population rapidly with annual growth rate of almost 4.7%, while the population increase in its peripheral area was only 1.36% per annum. However, in some villages such as Dinderesso, Kouakoualé, Samagan and Saouléni the pressure of urbanization is high. These villages are located along the major roads.

Table 12.3.1 Population of Bobo-Dioulasso² (1985, 1996 and 2006)

Towns / Villages	Population			Annual Growth Rate (%)		Area (km ²)	Population Density 2006 (persons/km ²)
	1985	1996	2006	1985-1996	1996-2006		
Bobo-Dioulasso Town	228,668	309,771	489,967	2.80%	4.69%	770	688
Borodougou	845	957	1,312	1.14%	3.21%		
Dafinso	1,196	1,339	1,354	1.03%	0.11%		
Darsalamy	2,260	2,085	2,848	-0.73%	3.17%		
Dinderesso	427	331	518	-2.29%	4.58%		
Dingasso	1,505	1,879	1,475	2.04%	-2.39%		
Farakoba	-	-	1,415	-	-		
Kimidougou	504	567	808	1.08%	3.61%		
Kokorowe	595	670	731	1.09%	0.88%		
Koro	1,932	1,564	2,131	-1.90%	3.14%		
Kouakoualé	690	1,165	2,922	4.88%	9.63%		
Koumi	3,746	2,576	1,958	-3.35%	-2.71%		
Leguema	3,318	4,097	5,349	1.94%	2.70%		
Logofourouso	1,770	1,531	2,092	-1.31%	3.17%		
Matourkou	2,965	3,043	1,704	0.24%	-5.63%		
Nasso	1,498	1,465	1,794	-0.20%	2.05%		
Niamadougou	663	794	1,062	1.65%	2.95%		
Ouolokoto	1,181	1,944	1,395	4.63%	-3.26%		
Pala	1,021	1,597	963	4.15%	-4.93%		
Samagan	892	922	1,387	0.30%	4.17%		
Santidougou	931	961	1,240	0.29%	2.58%		
Tondogosso	824	1,128	1,289	2.90%	1.34%		
Yeguresso	954	1,591	2,167	4.76%	3.14%		
Banakélédaqa	2,319	2,903	1,670	2.06%	-5.38%		
Saouléni	219	-	596	4.88%			
Peri Urban Areas	32,255	35,109	40,180	0.77%	1.36%		
Total Planning Area for SDAU	260,923	344,880	530,147	2.57%	4.39%		

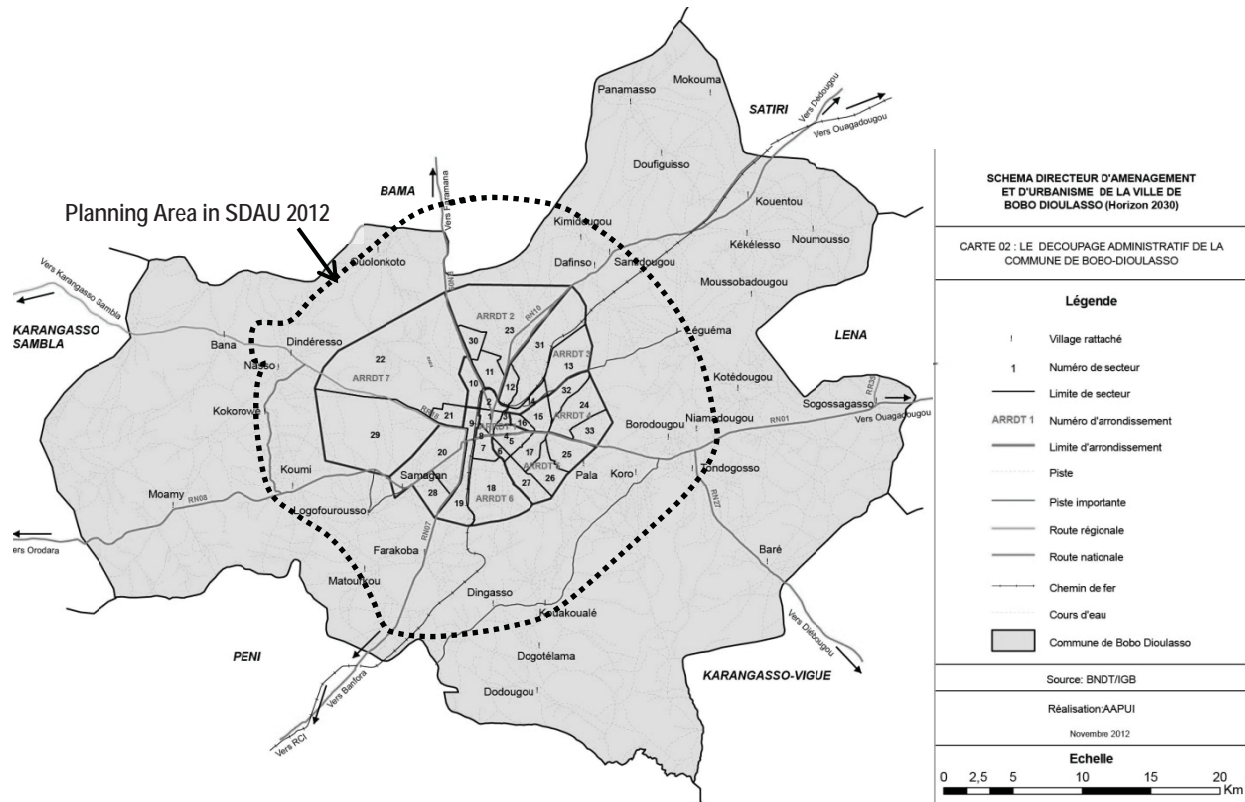
Source: JICA Study Team based on INSD

(3) Existing Urban Master Plan

In 2012, an Urban Master Plan (SDAU: *Schéma Directeur d'Aménagement et d'Urbanisme*) for Bobo-Dioulasso was formulated targeting year 2030. The planning area in the SDAU includes part of the areas in the Urban Commune of Bobo-Dioulasso and the Rural Commune of Bama.

This perimeter covers an area of about 770 km² representing 48% of the surface area of Bobo-Dioulasso Commune. (See Figure 12.3.1)

² The population of Bobo-Dioulasso in Table 12.3.1 is the population of Bobo-Dioulasso planning area determined in SDAU for Bobo-Dioulasso 2030.



Source: JICA Study Team based on SDAU for Bobo-Dioulasso, 2012

Figure 12.3.1 Bobo-Dioulasso Planning Area for SDAU

The following are the objectives in SDAU for Bobo-Dioulasso:

- To manage and channel spatial growth
- To rehabilitate the urban centre of the city
- To improve the living conditions of people

The adopted strategy of SDAU aims to contribute to a better spatial management and control of the city, and to promote socio-economic development within the SDAU perimeter.

Accordingly, SDAU proposes large spatial units including the following:

- Main urban centre within the current city grid
- Secondary urban centres to the north, in Banakélédaga, to the northeast in Léguéma, to the east, in Yegueresso
- Three secondary urban poles in the south at the level of Samangan-Logofourouso, Darsalamy, and Kouakoualé
- A protection area to the west, formed by the classified forests of Kou, Dinderesso and of the protection zone of the Nasso water intake

The conceptual spatial structure for Bobo-Dioulasso prepared by SDAU is shown in Figure 12.3.2.

- Lack of suitable road infrastructure
- Uncontrolled urban growth especially in flood prone areas
- Ill-equipped urban centre compared to the city's role at both the national and regional levels

12.3.4 Objectives for Urban Development of Bobo-Dioulasso

The following objectives are determined for the urban development of Bobo-Dioulasso:

- To make maximum use of the potential of Bobo-Dioulasso as the economic capital and its strategic location for international logistics in relation to the corridor developments (Abidjan-Ouagadougou Corridor and Bamako-Ouagadougou Corridor)
- To perform and fulfil the roles as the national centre for economic sectors development

12.3.5 Strategies for Urban Development of Bobo-Dioulasso

The following are the strategies for urban development of Bobo-Dioulasso:

- To construct an outer ring road not only for managing urban and through traffic but also future urban land expansion including new towns
- To implement the development of necessary urban road networks to ease the traffic pressure caused by motorization, population increase and development of transport corridors
- To provide enough electricity and water for the future inhabitants and industries of Bobo-Dioulasso

12.3.6 Conceptual Spatial Structure for Bobo-Dioulasso

The conceptual spatial structure for Bobo-Dioulasso is shown in Figure 12.3.3.



Source: JICA Study Team based on SDAU for Bobo-Dioulasso

Figure 12.3.3 Conceptual Drawing to Transform Spatial Structure of Bobo-Dioulasso (Draft)

12.3.7 Programmes and Projects for Bobo-Dioulasso's Urban Development related to Corridor Development

The following is a list of projects that should be developed within Bobo-Dioulasso in an effort to complement the development of the WAGRIC Master Plan.

- Construction of the outer ring road for Bobo-Dioulasso
- Upgrading of the airport and formulation of a detailed master for the airport zone
- Formulation of a detailed master plan to reconfigure and requalify the industrial areas and activity zones within the city
- Requalification and upgrading of the central urban area
- Upgrading drainage and waste water treatment facilities

The following list of projects is sector priority projects of WAGRIC Master Plan for Bobo-Dioulasso.

- Project for Development of Signature Agricultural Products and Marketing for Sub-Regional Markets (Facilities for Vegetables and Fruits)
- Project for Value Chain Development for Animal Products (Market for Meat and Dairy Products)
- Project for Construction and Operation of New Industrial Park along an Outer Ring Road in Bobo-Dioulasso
- Promotion of Investment and Development for Manufacturing including Cotton Spinning Industry in Bobo-Dioulasso
- Projects for Development of Loading and Off-Loading Facilities for Cattle at Railway Stations in a Suburban Area of Bobo-Dioulasso together with Cattle Waiting Pens
- Project for Expansion of Water Supply System in Bobo-Dioulasso
- Project for Strengthening of Operation of Bobo-Dioulasso Multi-Modal Dry Port
- Project for Expansion of Bobo-Dioulasso Multi-Modal Dry Port
- Construction of Southern Section (between N1 and N8) of Bobo-Dioulasso Outer Ring Road (Southern Bypass)

(1) Construction of the Outer Ring Road for Bobo-Dioulasso

1) Rationale

Bobbo-Dioulasso is the second largest city of Burkina Faso, and plays a major role as an economic city in balancing the spatial distribution at the national level. Within the WAGRIC Master Plan, the city is expected to attract additional economic activities drawing a substantial volume of traffic. In anticipation to projected high traffic congestions the SDUA of Bobo-Dioulasso has provisioned for an outer ring road that defines the city growth limits, and most importantly helps deviating through traffic while serving strategically positioned economic infrastructures such as industrial areas and logistic centres along the different exists of the planned road infrastructure.

2) Objective

- To avoid unnecessary through traffic leading to aggravated congestion
- To facilitate access to major sectors of the city and avoid traffic congestion
- To serve existing economic infrastructures such as industrial zones and logistic centres
- To expand urban growth limits
- To enable high-speed travelling of motor cars and trucks on the international corridors

3) Project Description and Phasing

The project description and phasing are provided below.

- To review existing right-of-ways of bypass roads and outer ring roads proposed in the SDAU

and propose the best connections to the major corridors including new motorway from Ouagadougou

- To secure necessary land for the future implementation of such infrastructure projects
- To reshape the spatial structure along the outer ring road

In an effort to reduce cost and at the same time achieve quick wins by serving the major international corridors such as Ouagadougou – Bobo-Dioulasso - Abidjan Corridor passing through Banfora, a specific part of the outer ring road has been designated as a priority to be constructed at the earliest stage of its implementation. (See Figure 12.3.4) This specific section situated at the south-eastern part of the city should therefore be given priority since it helps achieving the different strategic goals stated above. The construction of the remaining sections should follow depending on available budgets.

4) Expected Benefits

The following impacts and benefits are expected in this project:

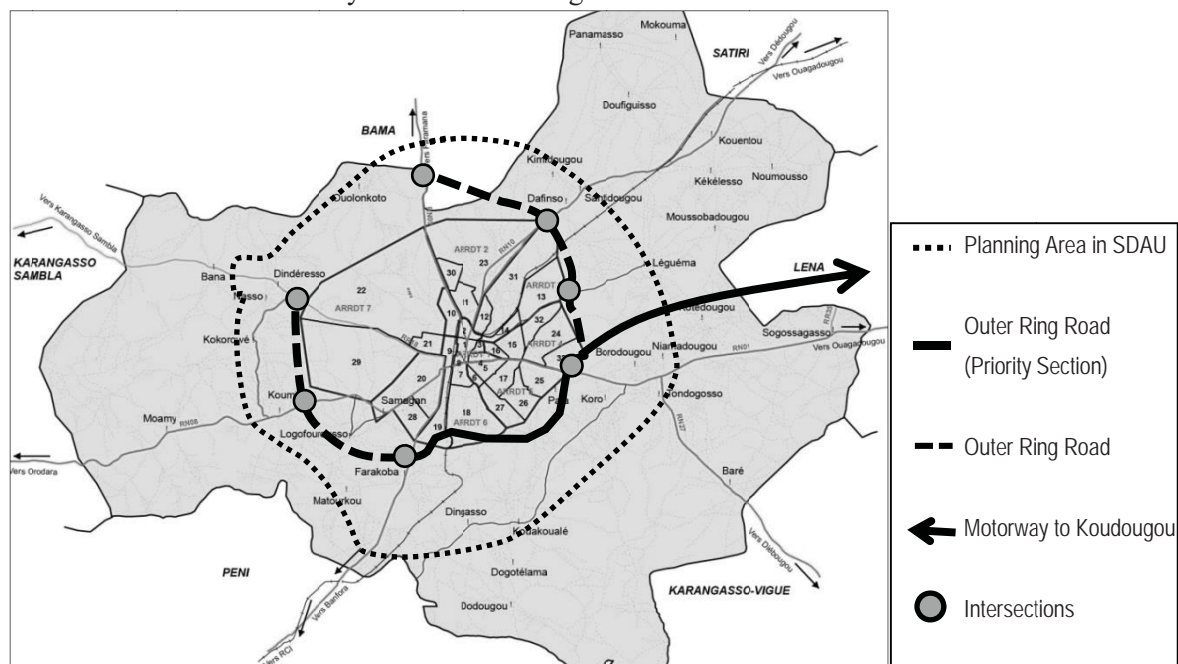
- Effective and efficient spatial development and deployment of economic sector activities along the bypass and outer ring roads
- Expansion and reorganization of the urban areas of Bobo-Dioulasso
- Effective management of traffic flows along the international transport corridors and within the city
- Facilitation of people and goods transportation

5) Executing Agency and Related Institutions

- The Ministry of Infrastructure, Development and Transport of Burkina Faso
- The Ministry of Housing and Urban Planning, in cooperation with the regional and local administrations

6) Related Projects

- Construction and Operation of New Industrial Park along an Outer Ring Road in Bobo-Dioulasso
- Construction of Motorway between Koudougou and Bobo-Dioulasso



Source: JICA Study Team based on the review of the proposed Bobo-Dioulasso outer ring road trace in the SDAU of 2012

Figure 12.3.4 Priority Section of Bobo-Dioulasso Outer Ring Road

12.4 Urban Development Strategies for Banfora

12.4.1 Present Situation of Banfora

(1) Urban Expansion of Banfora

Banfora urban commune is located in the extreme south-western part of Burkina Faso. The city is located 450 km from Ouagadougou, the capital, and 85 km from Bobo-Dioulasso, the second city of Burkina Faso. The city is located close to the Ivorian and Malian borders and develops along six major road axes with both national and regional characters namely:

- National Road (RN7) connecting Bobo-Dioulasso to Banfora to the borders with Côte d'Ivoire
- National Road (RN11) connecting Orodara to Banfora and the international border with Côte d'Ivoire
- Regional Road (RR21) connecting Banfora to Koloko at the border with Mali

The Urban Commune of Banfora is composed of an urban centre divided into 15 sectors, which is densely populated and of rural areas consisting of 22 villages. The total area of Urban Commune of Banfora is 935 km².

The 15 sectors include four former villages, namely, Takalédougou, Kiribina, Kossara and Tatana. These four villages have experienced higher increase in population than the 11 sectors of former Banfora Town, which is the former urban centre of Banfora.

(2) Demography of Banfora

Since 1996, Banfora Town has increased its population with annual growth rate of almost 3.4%, while the population annual growth rate in its peripheral area was also approximately 3.4%. However, in one of the village, Lemouroudougou, the pressure of urbanization seems to be high with annual growth rate of 5.62%.

Table 12.4.1 Population of Banfora³ (1985, 1996 and 2006)

Towns / Villages	Population			Annual Growth Rate (%)		Area (km ²)	Population Density 2006 (persons/km ²)
	1985	1996	2006	1985-1996	1996-2006		
Banfora Town ¹	-	54,213	75,917	-	3.42%	206 ²	400
Karfiguéla	-	1,038	910	-	-1.31%		
Lemouroudougou	-	876	1,513	-	5.62%		
Tangora	-	2,025	2,811	-	3.33%		
Tiékouana	-	914	1,166	-	2.46%		
Peri Urban Areas	-	4,853	6,400	-	2.81%		
Total Planning Area for SDAU	-	59,066	82,317	-	3.37%		
Urban Commune of Banfora	60,766	80,504	109,824	2.59%	3.15%	935	117

Note 1: The population for 1996 also includes 15 sectors of current Banfora Town.

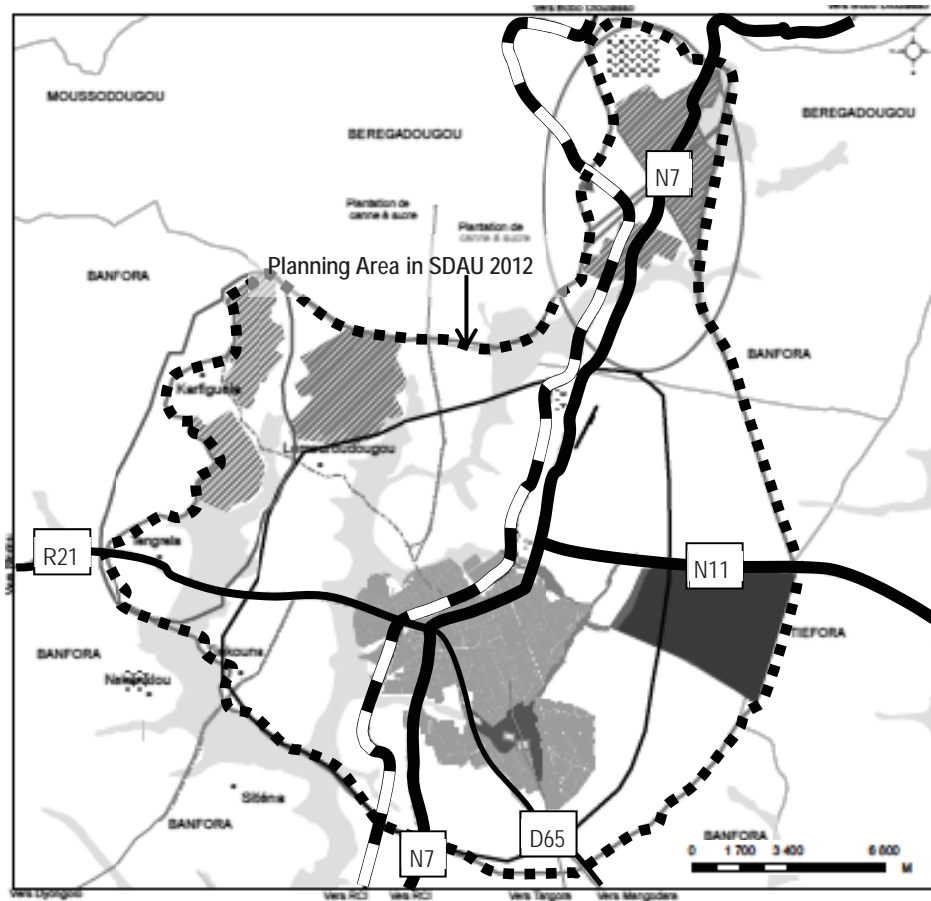
Note 2: The area includes part of Rural Commune of Bérégradougou, which is currently agricultural area with no resident, and is part of the planning area of SDAU shown in Figure 12.4.1.

Source: JICA Study Team based on the population censuses of 1985, 1996 and 2006

(3) Existing Urban Master Plan

In 2012, an Urban Master Plan (SDAU: *Schéma Directeur d'Aménagement et d'Urbanisme*) for Banfora was formulated targeting year 2030. The planning area in the SDAU includes part of the areas in the Urban Commune of Banfora and Rural Commune of Bérégradougou.

³ The population of Banfora in Table 12.4.1 is the population of Banfora planning area determined in SDAU for Banfora 2030.



Source: JICA Study Team based on SDAU for Banfora, 2012

Figure 12.4.1 Banfora Planning Area for SDAU

The following are the objectives in SDAU for Banfora:

- Industrial recovery
- Development of trade
- Enhancement of the tourism related potentials

The following three major strategies emerged to address the identified issues by SDAU:

- Space management and protection of the environment
- Infrastructure development
- Improved access to basic services

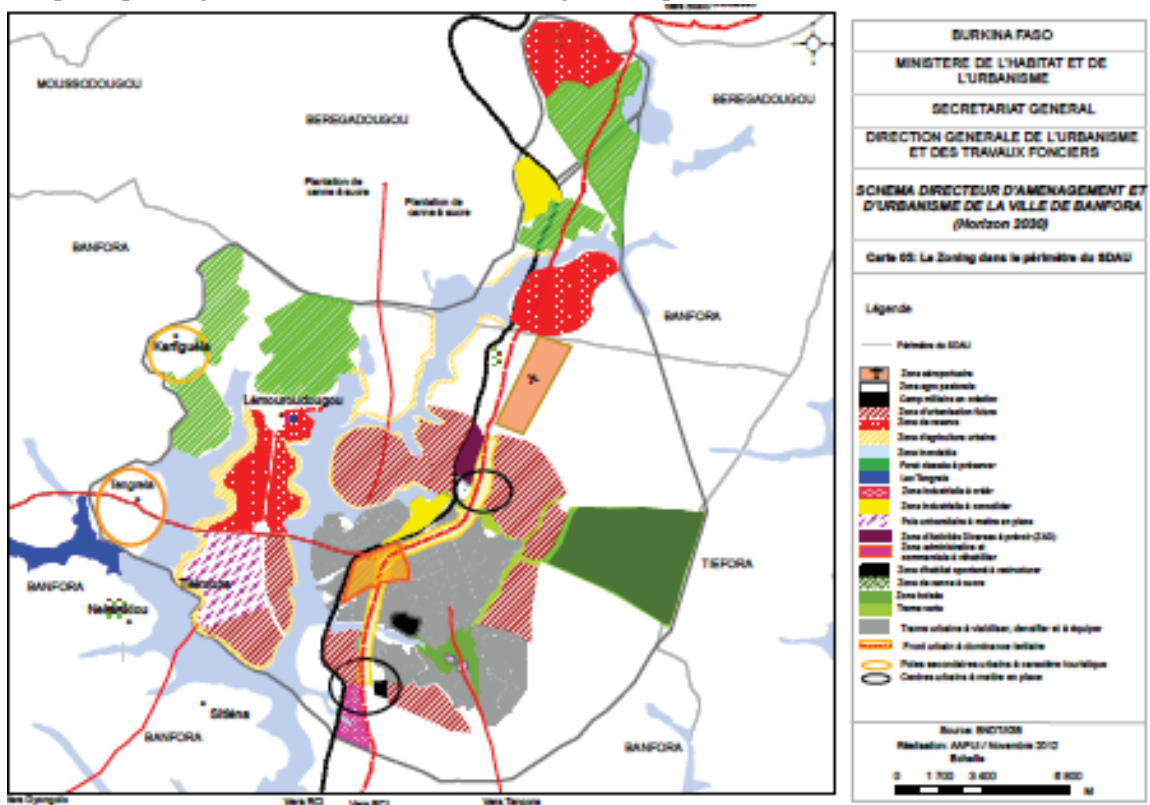
The targeted road programme includes the following actions:

- Construction of a bypass ring road that avoids the urban centre
- Opening up and servicing of neighbourhoods
- Establishing better road connections between the main urban centre and secondary urban poles
- Enhancing connections between secondary urban centres
- Construction of roundabouts to improve traffic flow at major nodes
- Putting in place tourist signage
- Redevelopment of national and regional roads within the urban area
- Redevelopment of RN 7 within the urban area as an urban central axis

The master plan also defines distinctive land uses for different areas designated as follows:

- Urban Areas are reserved for housing and related activities. They consist of residential areas with high urban mix and industrial zones, tourism and high education.

- Housing Areas are areas that include all urban functions and have the vocation to host, in addition to housing, all compatible related activities. They consist of the:
 - Main urban centre and secondary urban poles.
 - Future urban area which consists of the urbanized space between the existing urban fabric and the bypass.
 - Reserved area consists essentially of the space lying between the main urban centre and the secondary urban centres to the west, north-west and north. This area is considered as a reserve for future housing projects. It may therefore be used to adjust uncalculated growth demand related to the implementation of SDAU.
- Industrial Zone: The current industrial zone of Banfora consists of a small, landlocked site. Its capacity remains very low while the demand for industrial land is becoming increasingly higher. The new proposed industrial area is therefore intended to accommodate new industrial activities and warehouses as well as all related uses which cannot be accommodated in urban areas.
- Tourism Expansion Zones (TEZ) are areas designed to accommodate tourism activities related to the attractions of Tengrela (lake) and Karfiguela (waterfalls), these TEZ can develop around the concept of tourist resorts or tourism-related activities such as crafts.
- University Area: As a regional capital, Banfora is considering the establishment of a university that benefits all the Cascades Region. Surveys on site selection are also underway. The site of Tiékouna is proposed to accommodate the future university centre.
- Wooded Areas are restricted for urban development and include forests, orchards, homestead gardens, and rivers right of ways. No human settlement is allowed in these areas. The purpose of these zones is to improve the vegetation cover and protect the river banks which constitute the lungs of the city.
- Agropastoral Areas for agricultural and pastoral activities. In compliance with the development principles, agriculture and intensive farming can be practiced.



Source: SDAU for Banfora, 2012

Figure 12.4.2 Future Land Use Plan of Banfora by SDAU

12.4.2 Future Prospects for Banfora

Banfora is the capital city of Cascades Region and Comoé Province. As a regional administrative capital, the city plays an important role in the development of its area of influence and the Cascades Region as a whole.

Banfora originally developed as an administration centre as well as agricultural product collection centre for the south-western area of Burkina Faso. The city is accessible by National Road No.7 and the railway, linking Abidjan to Ouagadougou.

The WAGRIC Master Plan puts emphasis on development of economic sectors targeting growing middle income population in the coastal area and major cities in the sub-region including agricultural products for inland areas. The Master Plan also identified the south-western area of Burkina Faso as one of the major agriculture potential area and determined Banfora as regional growth pole with agro processing industry base and service centre for southwestern Burkina Faso.

In order for Banfora to develop as such regional pole, it is necessary to prepare sufficient electricity and water for future agro processing industries as well as to structure the urban area. It is also important to improve the access road to the agriculture areas in the region.

As Abidjan-Ouagadougou Corridor develops, the amount of traffic on the national road is also expected to increase. Therefore, it is necessary to secure land for implementation of outer ring road or bypass road.

12.4.3 Issues on Urban Development of Banfora

The following issues are defined regarding the urban development of Banfora:

- Under provision of public and social services as a regional pole
- Degraded urban environment and underperforming drainage system
- Limited infrastructure as a regional pole

12.4.4 Objectives for Urban Development of Banfora

The following objectives are determined for the urban development of Banfora:

- To make maximum use of the potential of Banfora with agricultural land and strategic location to access the major cities in the coastal area
- To perform and fulfil the roles as the regional pole
-

12.4.5 Strategies for Urban Development of Banfora

The following are the strategies for urban development of Banfora:

- To construct an outer ring road to bypass of the main urban centre that will deviate large trucks from crossing through the city centre and avoid congestion on the RN 7
- To implement necessary urban infrastructure such as electricity, water, drainage, urban roads, social infrastructures
- To improve the access road to the surrounding agricultural potential areas from Banfora

12.4.6 Programmes and Projects for Banfora's Urban Development related to Corridor Development

The following is a list of projects that should be developed within Banfora in an effort to complement the development of the WAGRIC Master Plan.

- Construction of the outer ring road for Banfora
- Developing a new industrial zone in Kosara to promote the development of the industrial sector

within the city

- Creating a higher education centre in Tiékouma
- Densifying and upgrading the urban centre of Banfora, improving the urban landscape and the traffic flow to promote the development of the city
- Strengthen and improve the existing structure for better urban mobility.
- Upgrading drainage and waste water treatment facilities

The following list of projects is sector priority projects of WAGRIC Master Plan for Banfora.

- Project for Irrigation and Agribusiness Development in Douna and Karfiguéla
- Project for Development of Signature Agricultural Products and Marketing for Sub-Regional Markets (Production of Mango and Strawberry, and Agro Processing Industry)
- Promotion of Investment and Development of Irrigated Agriculture in Karfiguéla and Douna
- Improvement of Road (R21) between Banfora and Douna
- Improvement of Road between Banfora and Mangodara
- Improvement of Road (N11) between Orodara – Banfora – Gaoua – Boarder of Côte d’Ivoire

(1) Construction of the Ring Road for Banfora

1) Rationale

Banfora is a strategic city in Burkina Faso and plays a major role as it commands the international traffic to Ouagadougou and Abidjan. Within the WAGRIC Master Plan, the city is expected to attract additional economic activities drawing a substantial volume of traffic. SDAU for Banfora also has provisioned for an outer ring road that defines the city growth limits, and most importantly helps deviating through traffic.

2) Objective

- To avoid unnecessary through traffic leading to aggravated congestion
- To expand urban growth limits of major urban areas within the city
- To enable high-speed travelling of motor cars and trucks on the international corridors

3) Project Description

The project description are provided below.

- To review existing right-of-ways of bypass roads and outer ring roads proposed in the master plan and propose the best connections to the major corridors
- To secure necessary land for the future implementation of such infrastructure projects
- To reshape the spatial structure along the outer ring road

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Effective and efficient spatial development and deployment of economic sector activities along the bypass and outer ring roads.
- Expansion and reorganization of the urban areas and economic infrastructure of Banfora
- Effective management of traffic flows along the international corridors and within the city
- Facilitation of people and goods transportation

5) Executing Agency and Related Institutions

- Ministry of Infrastructure, Development and Transport of Burkina Faso
- Ministry of Housing and Urban Planning, in cooperation with the regional and local administrations

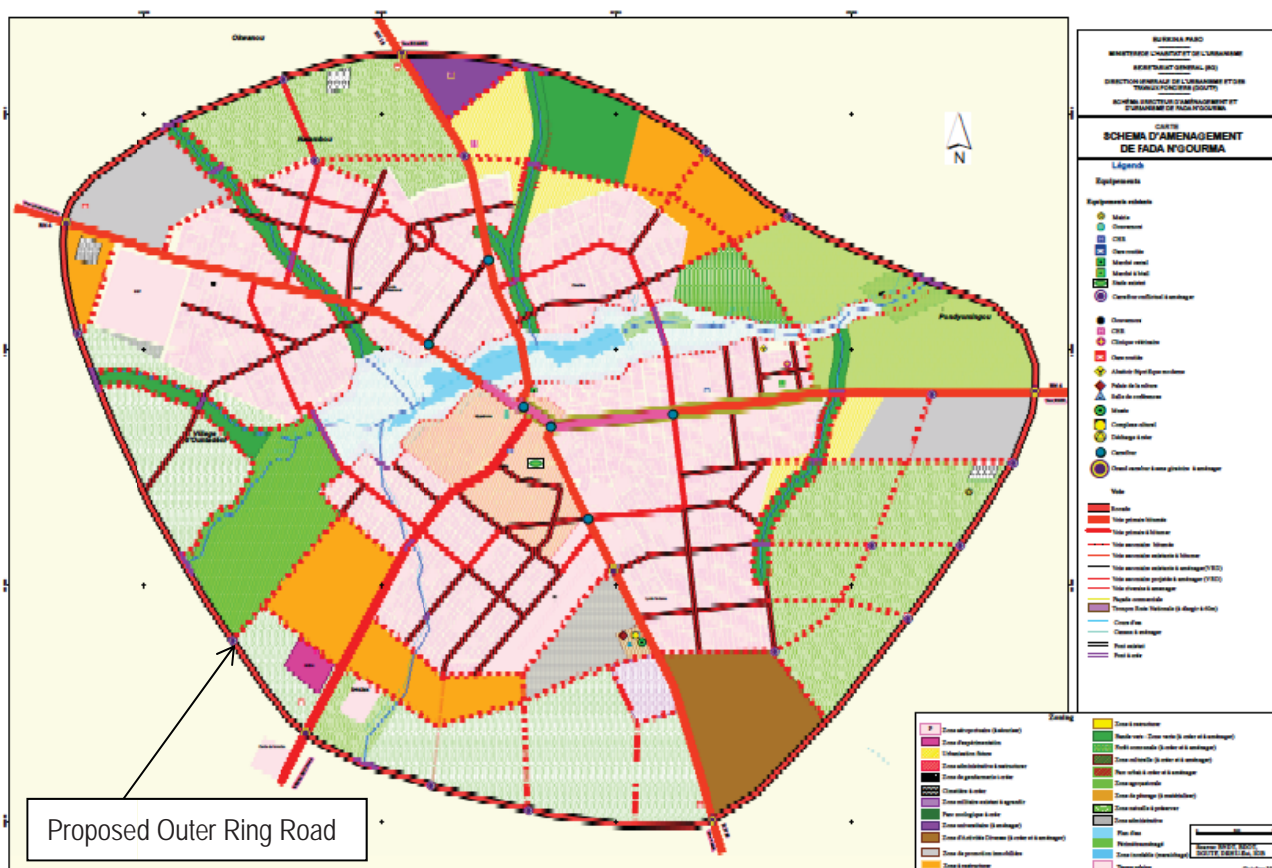
Table 12.5.1 Population of Fada N’Gourma (1985, 1996 and 2006)

Towns / Villages	Population			Annual Growth Rate (%)		Area (km ²)	Population Density 2006 (persons/km ²)
	1985	1996	2006	1985-1996	1996-2006		
Fada N’Gourma Town	20,857	29,254	41,785	3.12%	3.63%	-	510
Total Planning Area for SDAU	-	-	-	-	-	82	-

Source: JICA Study Team based on the population censuses of 1985, 1996 and 2006 and SDAU for Fada N’Gourma

(3) Existing Urban Master Plan

The Master Plan of Fada N’Gourma was prepared in October 2013 targeting 2026. The spatial configuration provides for the strengthening of urban functions by designating residential areas to be densified as well as future expansion areas, activity zones consisting of administrative, commercial, educational, multipurpose activity, cultural and agro pastoral areas, protection areas consisting of pasture areas, a zoo, an urban park, a green belt and a communal forest. The Master Plan also proposes a comprehensive road structure consisting of an outer ring road that defines the urban growth boundary of the city and works as a bypass for external traffic.



Source: SDAU for Fada N’Gourma, 2013

Figure 12.5.1 Spatial Configuration of Fada by SDAU

12.5.2 Future Prospects for Fada N’Gourma

Fada N’Gourma is the capital city of Est Region and Gourma Province. As a regional administrative capital, the city plays an important role in the development of its area of influence and the Est Region as a whole.

Fada N’Gourma originally developed as an administration centre as well as agricultural product and livestock collection centre for the eastern area of Burkina Faso. The city is accessible by National Road No.4 linking to Cotonou, Ouagadougou and Niamey. Due to its strategic location and role as a staging base for trade between Burkina Faso, Niger and Benin, Fada N’Gourma is well positioned to play an enlarged role at the sub-regional level once international corridor is developed.

The WAGRIC Master Plan puts emphasis on development of economic sectors targeting growing middle income population in the coastal area and major cities in the sub-region including livestock products for inland areas. The Master Plan also identified the eastern area of Burkina Faso as one of the major agriculture and livestock potential area and determined Fada N’Gourma as regional growth pole with agro processing industry base and service centre for eastern Burkina Faso.

In order for Fada N’Gourma to develop as such regional pole, it is necessary to prepare sufficient electricity and water for future agro processing industries as well as to structure the urban area. It is also important to improve the access road to the agriculture areas in the region.

It is therefore important to take into account the untapped inherent potentials of the city at the earliest stages and try to build upon them to promote future development.

12.5.3 Issues on Urban Development of Fada N’Gourma

The following issues are defined regarding the urban development of Fada N’Gourma:

- Uncontrolled rapid urban sprawl
- Under provision of public and social services
- Degraded urban environment and underperforming drainage systems
- Limited infrastructure as regional pole

12.5.4 Objectives for Urban Development of Fada N’Gourma

The following objectives are determined for the urban development of Fada N’Gourma:

- To make maximum use of the potential of Fada N’Gourma as a gateway city to the coastal area for Burkina Faso and Niger
- To perform and fulfil the roles as the regional pole

12.5.5 Strategies for Urban Development of Fada N’Gourma

The following are the strategies for urban development of Fada N’Gourma:

- To construct an outer ring road to bypass of the main urban centre that will deviate large trucks from crossing through the city centre and avoid congestion on the RN 4 and RN 18
- To implement necessary urban infrastructure such as electricity, water, drainage, urban roads and social infrastructures
- To improve the access road to the surrounding agricultural potential areas from Fada N’Gourma

12.5.6 Programmes and Projects for Fada N’Gourma’s Urban Development related to Corridor Development

The following is a list of projects that should be developed within Fada N’Gourma in an effort to complement the development of the WAGRIC Master Plan.

- Construction of outer ring road for Fada N’Gourma
- Promoting the role of Fada N’Gourma as a sub-regional commercial hub (wholesale markets etc.)
- Improving the urban landscape and the traffic flow to promote the development of the city
- Strengthen and improve the existing road structure for better urban mobility
- Upgrading drainage and waste water treatment facilities

The following list of projects is sector priority projects of WAGRIC Master Plan for Fada N’Gourma.

- Project for Development of Signature Agricultural Products and Marketing for Sub-Regional

Markets (Production of Cereals and Peas, and Agro Processing Industry)

- Project for Value Chain Development for Animal Products (Animal Transit and Beef Market)
- Promotion of Investment for Export Expansion of Cattle and Small Ruminants to Coastal Countries
- Rehabilitation of National Road (N4) between Koupéla and Kantchari (Border of Niger)
- Upgrading to a 4-Lane High-Speed Way between Koupéla and Fada N’Gourma including Bypass Road for Fada N’Gourma (toward Niger and Benin)

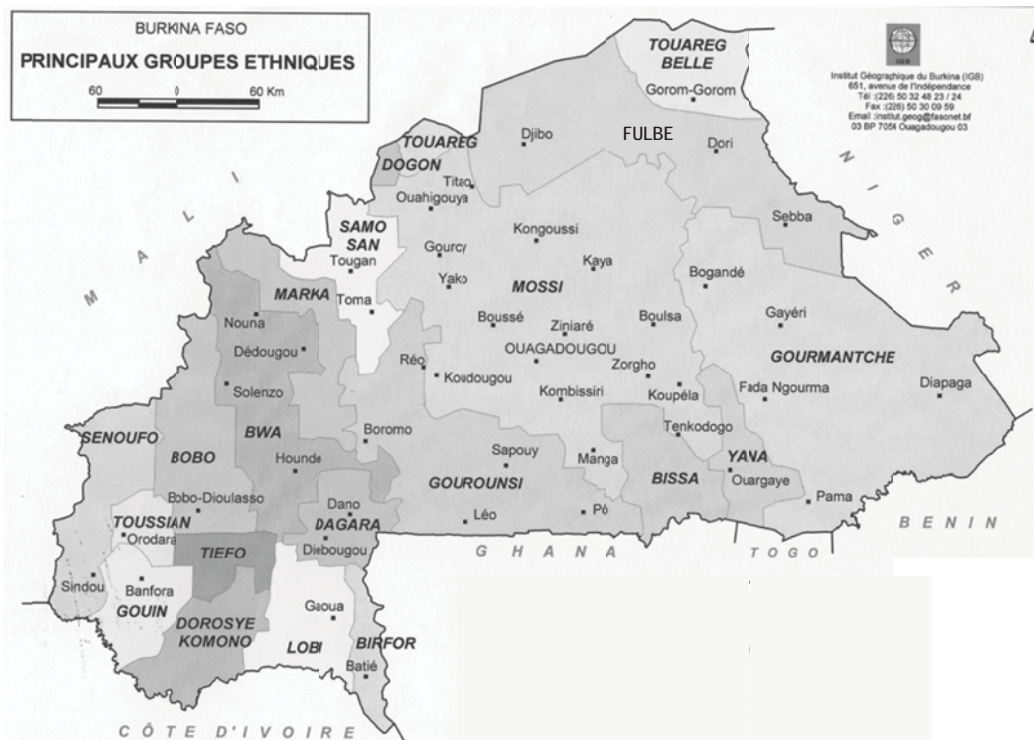
Chapter 13 Social Development Strategies for Burkina Faso

13.1 Present Social Situation in Burkina Faso

13.1.1 Current Situation of Social Structure in Burkina Faso

(1) Ethnicity

Burkina Faso is a multi-ethnic nation with 63 ethnic groups. The Mossi is the largest group living in the central part of Burkina Faso comprising approximately 53% of the population. Other major ethnic groups such as the Gourmantché, which is based in the east, the Fulbe (also known as Fula or Fulani) and Touareg are based in the north of Burkina Faso and Bobo (also known as Bobo-Dioula), Dagara, Gurounsi and Lobi which are based in the west of Burkina Faso. The share of these major ethnic groups are Fulbe 8.4%, Gourmantché 6.8%, Bobo 4.8%, Gourounsi 4.5%, Senoufo 4.4%, Bissa 3.9%, Lobi 2.5%, Dagara 2.4%, Touareg/Bella 1.9% and Dioula 0.8%.



Source: Centre National de la Recherche Scientifique et Technologique

Figure 13.1.1 Map of Ethnic Groups in Burkina Faso

(2) Religion

According to the Population and Housing Census 2006 (RGPH 2006: *Recensement Général de la Population et de l'Habitat de 2006*), 60.5% of the total population of Burkina Faso is Muslim, 19.0% is Catholic, 15.3% is Animism, and 4.2% is Protestant. Muslim people are mainly based in the northern, western and eastern parts of the country, whereas Catholics are based in the central part of the country. The majority of Fulbe and Bobo (Dioula) people are Muslim.

In 2006, the top share religion in both urban and rural areas was Muslim with approximately 60% of the population. On the other hand, for other religions, significant differences can be seen between

urban and rural areas. While the second largest religious group in the urban area is Catholic with 29.6% of the urban population, in the rural area 19.3% is animist which is just after Muslim. Although the share of people believing in animism in the rural area has decreased greatly compared to 1960 where almost 70% of the rural population believed in animism, still many people in the rural area believe in indigenous religion in Burkina Faso.

Table 13.1.1 Change of Religion in Burkina Faso from 1960 to 2006

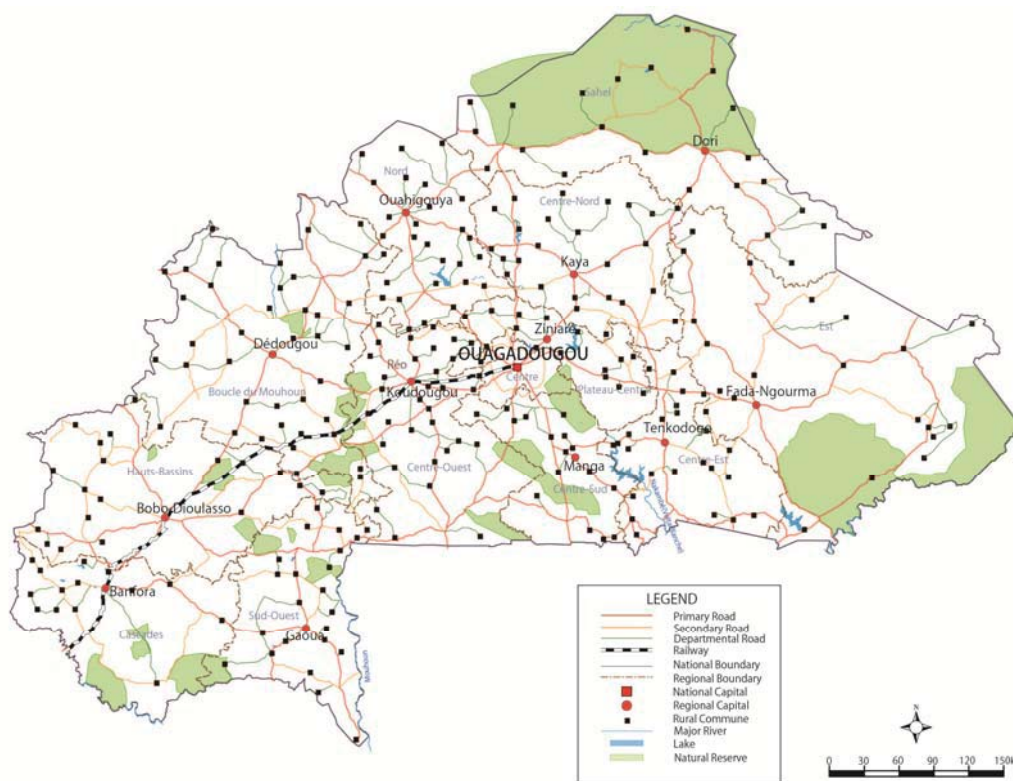
Year	Place of Residence	Religion (%)					Total
		Animism	Muslim	Catholic	Protestant	Others	
1960	Total	68.7	27.5	3.7	0.1	-	100.0
	Urban	18.2	55.0	25.3	0.9	0.5	100.0
	Rural	69.6	26.8	3.5	0.1	-	100.0
1991	Total	25.9	52.4	20.6		1.1	100.0
	Urban	2.2	62.0	34.0		0.8	100.0
	Rural	29.6	50.8	18.5		1.1	100.0
1996	Total	23.6	55.9	16.7	3.0	0.8	100.0
2006	Total	15.3	60.5	19	4.2	1.0	100.0
	Urban	2.0	62.2	29.6	5.2	1.0	100.0
	Rural	19.3	60.0	15.9	3.9	0.9	100.0

Source: Institut National de la Statistique et de la Démographie (INSD), Enquête démographiques de 1960-61, Enquête démographiques de 1991, RGPH 1996, and RGPH 2006

(3) Rural Settlement

According to the RGPH 2006, 10,835,295 people were living in rural areas, which was equivalent to 77.2% of the total population.

There are 316 rural communes in Burkina Faso and most rural communes are located in the central area of Burkina Faso. In the northern and eastern parts of Burkina Faso, there are fewer rural communes as shown in the figure below.



Source: JICA Study Team based on information from Ministère de l'Administration Territoriale et de la Sécurité

Figure 13.1.2 Location of Rural Communes in Burkina Faso

Most rural communes are located along the regional and departmental roads. The departmental roads connect the rural communes to the national roads or directly to regional and provincial capitals. Although there are not many, there are some rural communes along the major corridors. At the junction of the international corridors there is also one rural commune which is Pâ located at the junction of Abidjan-Ouagadougou Corridor and Ghana's Western Corridor.

(4) Social Structure and Traditional Communities / Leaders

The major ethnic groups in Burkina Faso are the Fulani in the northern part, Mossi in the central part, Gourmantché in the eastern part, and Bobo and Dioula in the western part.

Fulani people are nomadic pastoral people mainly based in the Savanna area. In the Fulani society today, almost everybody is in agro-pastoralism. Herding is men's work whereas tending and milking are women's work. The Fulani communities live in a hierarchically organized status and elders deal with political decisions and negotiations for safe movement of herds throughout the farmland.

Mossi people are basically agricultural people and each Mossi village has its own chief. A certain number of villages are ruled by one district chief. Since Mossi people are close to their local religion, Mossi rulers resisted converting to Muslim. Mossi people also live in a hierarchical society.

Gourmantché people do cultivation and harvesting during the rainy season while herding cattle during the dry season. They consider the village as the centre of their society and they have their own chief. They mainly believe in animism and the culture of Gourmantché people is similar to the Mossi's.

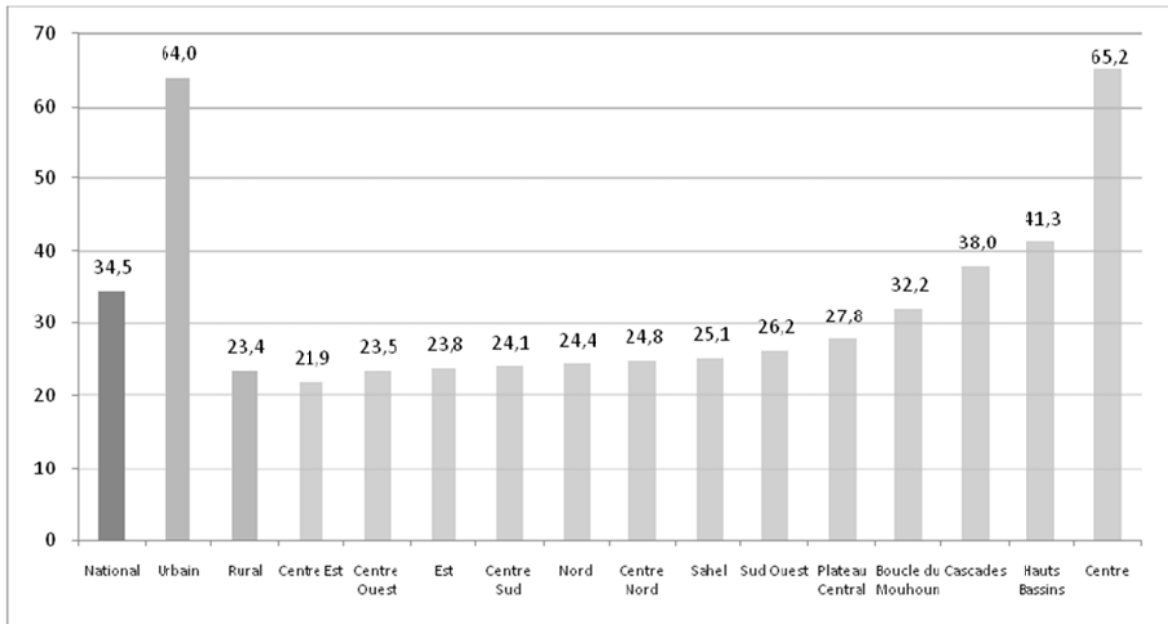
Bobo people and Dioula people are the ethnic groups which Bobo-Dioulasso was derived from. Bobo people and Dioula people are two different ethnic groups but are based in same area. The primary occupation of Bobo people is farming. Unlike Mossi people, Bobo people live in a collegial village society. Dioula people are often traders based in Cote d'Ivoire, Burkina Faso up to northern Ghana. The Dioula people in Burkina Faso live along the corridor (trade route) in the south-western part of the country. Since they are traders, Dioula maintain good relationships with their neighbours. Dioula also practice polygamy, and they have division of labour according to gender.

13.1.2 Present Situation of Social Services in Burkina Faso

(1) Education and Gender

In most rural areas in Burkina Faso, a form of self-education is valued where the children learn the norms of society from adults in their villages. Therefore, the necessity of an academic education is often underestimated in such rural areas. As a result, even if children enter school, the school attendance rate is low in some areas of Burkina Faso.

Figure 13.1.3 shows the regional difference of literacy rates in 2009 in the thirteen administrative regions. Literacy in Burkina Faso is essentially an urban phenomenon and the literacy rate is three times higher in urban areas (64.0%) than in rural areas (23.4%). The Centre Region, with the capital Ouagadougou (65.2%) and the Hauts-Basins regional capital Bobo Dioulasso (41.3%) have respectively the first and second largest adult literacy rates which are well above the national average. Overall, the urban literacy rate is twice the national average and that of the rural areas is 10% below the national rate (34.5%). The Centre-Est Region, has the least literate population of the thirteen regions of Burkina Faso. Its literacy rate is 22%, or 12% lower than the national average.

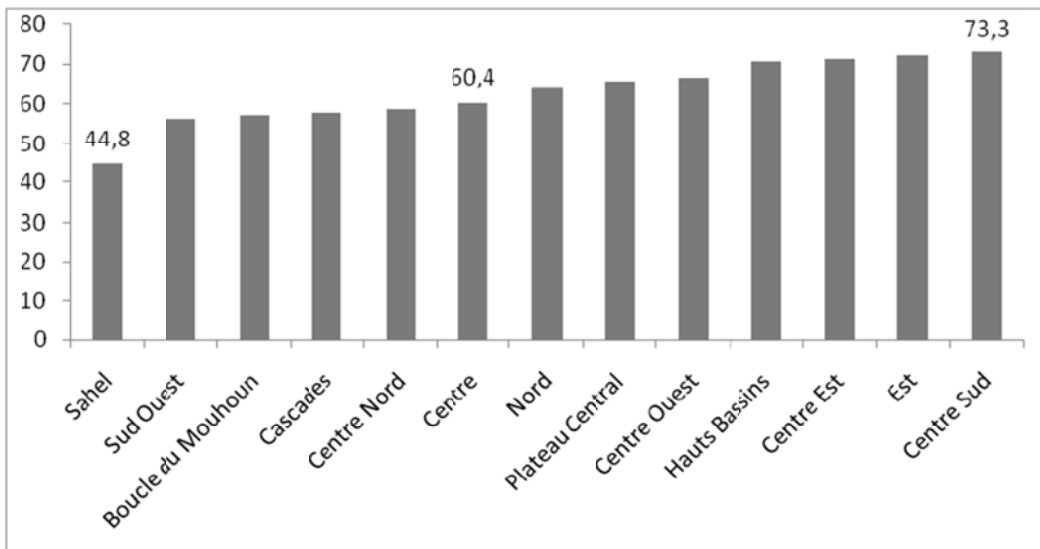


Source: INSD, 2015, Rapport Enquete Multisectorielle Continue (EMC) Phase 1 Rapport Thématique 2 Alphabétisation et Scolarisation

Figure 13.1.3 Difference of Literacy Rate by Region in Burkina Faso, 2009

(2) Health

As for utilization of modern health services in Burkina Faso, Figure 13.1.4 shows that in the Sahel Region only 44.8% of people requiring medical care have sought medical consultation at modern health facilities or from individual health personnel. In contrast, Centre-Sud Region has the highest rates of medical consultations (73.4%). Interestingly, the Centre Region, which houses the capital, Ouagadougou, ranks eighth of the thirteen regions (60.4%). This could be explained by the high cost of consultations, especially in private practice, which discourage some individuals from seeking professional medical assistance.



Source: INSD, 2015, Rapport Enquete Multisectorielle Continue (EMC) Phase 1 Rapport Thématique 2, Alphabétisation et Scolarisation

Figure 13.1.4 Attendance Rates of Health Facilities and Health Personnel by Region, 2014

The following table shows the trend of main reasons for death in district health facilities. Severe malaria is the biggest reason of death in Burkina Faso causing almost half of the deaths.

Table 13.1.2 Main Reasons for Deaths in District Health Facilities (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Severe Malaria	46.3	45.8	52.6	48.3	50.7	54.6	49.2	47.0	59.5
Meningitis	7.4	13.3	7.2	7.6	5.5	6.8	5.2	5.3	3.1
Bronchopneumonia	8.0	6.5	13.2	8.4	-	-	-	5.9	-
Bloodless Diarrhoea	1.7	2.0	2.7	10.1	1.4	1.0	1.2	0.8	1.2
Dysentery	0.4	-	-	-	-	-	-	-	-
Anaemia	8.7	7.8	4.3	7.7	7.2	6.6	5.4	5.6	1.8
Snake Bite	2.5	2.5	2.6	1.9	1.9	1.8	1.7	1.3	2.0
Combination of above seven symptoms	75.0	77.9	82.7	84.0	66.7	70.8	62.7	65.9	67.6

Source: Ministère de la Santé, 2014, Annuaire Statistique de la Santé 2013

Regarding the child mortality rate, the Demographic and Survey of Health and Multiple Indicators (EDSBF-MICS IV: *Enquete Demographique et de Sante et a Indicateurs Multiples*) in 2010 shows that the Centre-Est Region (8%) and Centre Region (9.3%) have the lowest infant mortality rate, while in the Sahel Region child mortality rate marks 23.5% and Sud-Ouest Region marks 19.5% which are the highest in the country. The child mortality rates in these regions are much higher compared with the average of Sub-Saharan African countries which was 12.1% in 2010.

In the case of HIV/AIDS prevalence rate, it has declined from 1.8 % (2003) to 1.0% (2010) as a whole and is lower compared to the other neighbouring coastal countries, however the Centre Region (except Ouagadougou) increased its rate from 0.2 % (2003) to 2.0% (2010). Although the rate is improving in Burkina Faso, the lack of knowledge about treatment and accessibility for women to health facilities due to their cultural aspects still need to be improved.

13.1.3 Present Situation of Economic Activities and Land Use

(1) Poverty Ratio

The poverty ratio of the population in Burkina Faso was 46.4 % in 2003. The Sahel Region and Plateau-Central Region, which are both located in the northern part of the country, marked the least poverty ratios out of the all regions (27.6% and 28.3% respectively) in Burkina Faso as of 2009. In contrast, the Nord Region, which shares a border with Mali has the highest poverty ratio of 57.4%. The Est Region, which shares borders with Niger, Benin and Togo, together with the region of Hauts-Bassins located next to the Nord Region also show high poverty ratios of 51.8% and 64.6% respectively.

(2) Economic Activities

The following table shows that in rural areas, 93.6% of the employed population is engaged in the primary sector, whereas only 27.0% of the employed population is engaged in the primary sector in urban areas. Therefore, it can be said that economic activities in rural areas are dominated by the primary sector whereas the tertiary sector in urban areas is in the majority with almost 60% of the people engaged in the tertiary sector.

Table 13.1.3 Composition of Employed Population by Industry in Urban and Rural Areas in Burkina Faso (2006)

		Primary Sector	Secondary Sector	Tertiary Sector	Unknown	Total
Urban	Number	288,661	110,706	640,636	31,019	1,071,022
	Share	27.0%	10.3%	59.8%	2.9%	100.0%
Rural	Number	5,282,408	88,478	231,453	42,337	5,644,676
	Share	93.6%	1.6%	4.1%	0.8%	100.0%
Total	Number	5,571,069	199,184	872,089	73,356	6,715,698
	Share	83.0%	3.0%	13.0%	1.1%	100.0%

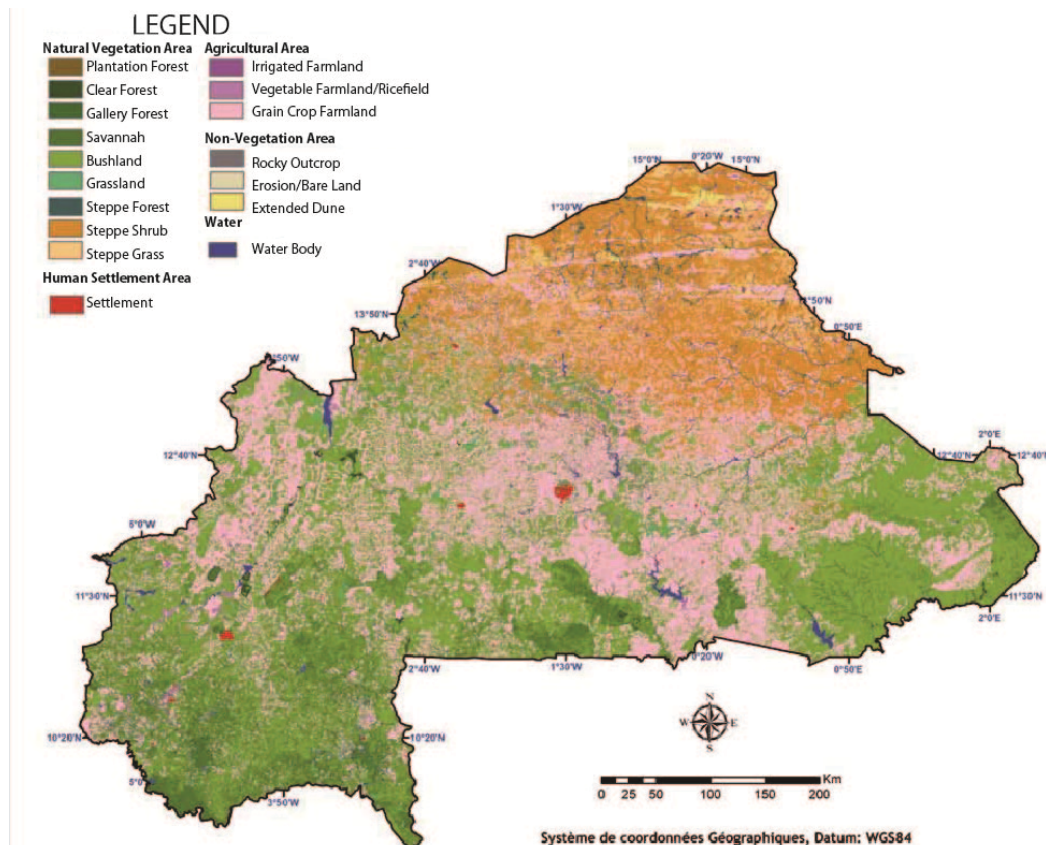
Source: INSD, 2009, Analyse des résultats définitifs du RGPH 2006 Theme 2: Etat et Structure de la Population

(3) Land Use

Urbanized areas in Burkina Faso are limited and most lands are still rural in the country.

According to FAOSTAT (Food and Agriculture Organization of the United Nations, Statistics Division), in 2011, 43% of the land areas of the country were agricultural lands, of which 48% were arable lands. Out of these agricultural areas, 51% are permanent meadows and pastures.

Most agricultural lands in Burkina Faso spread from the central area to the south as shown in the figure below. Especially in the centre, south centre and central west of Burkina Faso, most land uses are farmland. In such areas, there are not enough farmlands for the increasing population. In those villages, most lands of village territory have been reclaimed for farming, and as a result, the village territory has been mostly occupied by farmlands right up to the boundaries with their neighbouring villages.



Source: Observatoire du Sahara et du Sahel, 2015, Burkina Faso Atlas des Cartes d'Occupation du Sol

Figure 13.1.5 General Land Use of Burkina Faso

Loi N° 034-2009/AN, Portant Régime Foncier Rural (Act No. 034-2009 on Rural Land Tenure) of Burkina Faso determines the domain and land regime applicable to rural land and the land tenure security principles of all rural land stakeholders. This law is part of the land reform process underway and falls in line with the content of the National Rural Land Policy in Rural validated by the government in September 2007.

(4) Land Disputes

Most rural lands in Burkina Faso are not registered. As a result, rural communities are in a very vulnerable situation when infrastructure development and large-scale development are accelerated widely.

When investors come to purchase lands for development, often such rural lands are already used by local people for farming, pasturing, hunting and/or fishing. In some cases, such lands might also have a water body on which the community people depend for their daily life. Since the primary

sector is the dominant economic activity in the rural areas, the original residents could end up losing their livelihood due to large-scale development.

13.2 Social Development Strategies for Burkina Faso

13.2.1 Issues on the Social Development in Burkina Faso

(1) Vulnerable People over Land Ownership

Land disputes may occur between the original residents and newly arriving investors when the investors register land plots for their projects. This may occur since local farmers have not registered lands for their houses and agriculture, and investors could come to identify and register those occupied but un-registered lands. Moreover, the absence of an involuntary resettlement policy in Burkina Faso might raise rural people's risk of losing their lands on which they depend for their livelihoods.

(2) Employment Creation in Urban Areas

As a result of corridor development, more people from the rural areas will migrate to urban areas seeking jobs. It is necessary to create employment opportunities in urban areas to prevent the youth from getting involved in criminal activities.

(3) Regional Disparity of Less Accessible Areas

Even with development along the major corridors, areas that are less accessible from these major corridors would be left behind without getting much benefit from development. Transport or logistics do not reach these people, assistance for agriculture will not be provided, people will continue subsistence agriculture, and education and health services have to be limited or are unavailable. In addition, investment projects may come into these areas to find vast available land where governmental intervention for protecting people's land rights and to regulate the economic activities may be limited. Measures to secure the level of people's livelihood as well as to avoid enlargement of the regional disparity must be taken.

(4) Economic Activities during the Dry Season

As a result of economic development through corridor development, more people from the northern areas might migrate to the south during the dry season looking for more job opportunities. It is necessary to create employment opportunity in the northern area of the country since the development of social infrastructure in the southern area of the country and coastal countries cannot satisfy such increase in migrant workers.

(5) Gender Inequality and Disadvantages of Women in the Rural Area for Education

There is gender inequality in the education sector because the value of education for girls is not well recognized, for they are often expected by their family members to stay home to assist in house work as well as farming. Additionally, the illiteracy rate in the urban area is much higher than in the rural area in Burkina Faso.

(6) Lack of Understanding toward Secondary and Higher Education

The lack of understanding by communities toward school education is a cause for children and adolescents to be involved in activities, such as mining and the informal sector, instead of attending school. Especially, children from poor families prefer to work for immediate cash than have an education. Since such children end up with having a disadvantaged educational background, once the industry they are engaged in becomes a declining industry, they will have difficulty in finding the next work place which will cause high unemployment rates in particular areas of the country. Such people will also miss the chance to enjoy the positive impact of corridor development.

13.2.2 Objectives for Social Development in Burkina Faso

Considering the existing conditions and future corridor development, the following objectives are defined to tackle the identified issues in Burkina Faso:

- To promote local people's motivation for registration of rural lands for their agriculture and livestock by utilizing the land tenure law and monitoring the land ownership system
- To create employment opportunities, as well as to promote local industries in urban areas
- To improve basic education and promote primary health care at the local level
- To promote secondary and higher education
- To prepare necessary services to the rural communes which lie along the transport corridors
- To provide special attention to less accessible areas away from the transport corridors and major urban centres during the process of rapid development activities, such as Agropole development

13.2.3 Strategies for Social Development in Burkina Faso

The following strategies are formulated for social development in Burkina Faso:

- To raise the awareness and understanding of the communities and local people regarding their land rights and land values
- To empower urban communities by supporting local people, especially the youth, in starting their own businesses, as well as getting jobs
- To improve the primary education services and primary health care services in less accessible areas by mobilizing both government and community resources and initiatives
- To raise the awareness of parents and teachers for the importance of education, especially for girls, by promoting participatory community-based school management
- To improve employability of school graduates by promoting children's enrolment in secondary school education and vocational training
- To develop the capacity of local governments of the rural communes along the major corridors

13.2.4 Programmes and Projects for Social Development in Burkina Faso

The following projects and measures are proposed for social development in Burkina Faso:

- Project for Strengthening the Mechanism on Land Tenure Law Enforcement
- Project for Establishment of Financial Support System for Small and Medium Sized Agribusiness Enterprises
- Project for Enhancement of Local Industries during the Dry Season in Sahel Area
- Project for Construction and Rehabilitation of Schools and Classrooms
- Community-based School Management Projects in order to mobilize community resources for improving communities' primary schools and for transforming parents' minds toward children's education
- Project for Strengthening Secondary Education and Vocational Education
- Project for Health Infrastructure Development Planning by utilizing Hospital and Health Facility Mapping
- Capacity Development Project for the Local Governments of Pâ, Sabou and Kantchari

PART V

CORRIDOR DEVELOPMENT PLAN FOR CÔTE D'IVOIRE

Chapter 14 National Development Strategies for Côte d'Ivoire

14.1 Existing National Development Plans in Côte d'Ivoire

The existing National Development Plan in Côte d'Ivoire is the National Development Plan 2016-2020 (PND 2016-2020: *Plan National de Développement*) which was adopted on 9 December 2015 by the Government, on which the Law was unanimously adopted on 30 December 2015 by the National Assembly, and which was announced in May 2016.

The Government proposed a new economic strategy in May 2011, which was to reduce the poverty rate by more than half in 2020 and to make Côte d'Ivoire an emerging country by the same deadline. This overall strategy was broken down into two steps, namely, the first National Development Plan (PND 2012-2015) and the second National Development Plan (PND 2016-2020).

14.1.1 Foundations of PND 2016-2020

The Vision for Côte d'Ivoire is shown as follows in the prospective study "Côte d'Ivoire 2040":

"Côte d'Ivoire, industrial power, united in its cultural diversity, democratic and open to the world."

It is based on four pillars: (i) industrial power; (ii) a nation united in its cultural diversity; (iii) a democratic nation; (iv) open to the world.

The National Development Plan (PND 2016-2020) that capitalizes on lessons from implementing PND 2012-2015 and has its foundations in the Vision "Côte d'Ivoire 2040", aims to achieve the emergence of Côte d'Ivoire in 2020.

14.1.2 Strategic Directions

The overall outcome on the horizon of the plan is: "Côte d'Ivoire is an emerging country by 2020 with a strong industrial base", based on the following main pillars:

- the quality of institutions and good governance in all its forms;
- the availability and capacity of women and men to build a prosperous and emerging Côte d'Ivoire;
- changes in patterns of production and consumption to construct the emergence;
- the development of strategic infrastructure as a lever for the emergence and is consistent with the principles of environmental sustainability and;
- the beneficial integration into the network of regional and global trade.

The overall result of the PND 2016-2020 includes five strategic axes:

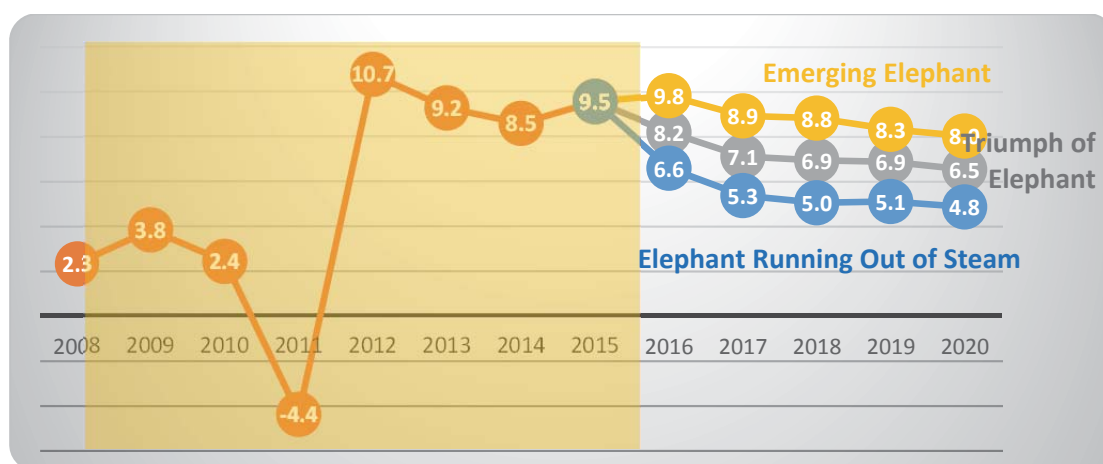
- Strategic Axis 1: Enhancing the quality of institutions and good governance;
- Strategic Axis 2: Accelerating the development of human capital and social welfare;
- Strategic Axis 3: Accelerating the structural transformation of the economy through industrialization;
- Strategic Axis 4: Developing harmoniously distributed infrastructure in the country and the preservation of the environment;
- Strategic Axis 5: Strengthening of regional integration and international cooperation.

14.1.3 Macroeconomic Framework and Budget

Under the PND 2016-2020, three macroeconomic framework scenarios were developed, namely, “the elephant running out of steam”, “the triumph of the elephant” and “emerging elephant”.

To support the ambition of the PND 2016-2020, the scenario is the «emerging elephant». This scenario means that proactive activities are based on the consolidation of political stability and a high level of productive investment, both public and private. These investments should particularly boost the development of industry, which is an essential pillar of the structural transformation of the Ivorian economy. Indeed, despite a relatively diversified productive industrial base compared to other countries of the sub-region, Ivorian industry still has significant room for improvement. The acceleration of structural change and the concomitant job creation remain unavoidable challenges to both ensure inclusiveness of the growth process and the march towards emergence.

The planned massive investments coupled with the rediscovered socio-political stability are expected to maintain growth at a relatively high level. The GDP growth rate is expected to increase from 9.8% in 2016 to 8.9% in 2017, 8.8% in 2018, 8.3% in 2019 and 8.0% in 2020. (See Figure 14.1.1)



Source: MEMPD/DGPLP

Figure 14.1.1 Evolution of GDP according to Three Scenarios

The expected growth of PND 2016-2020 requires a level of investment of 29.3109 trillion CFA, of which 11.0252 trillion is for the public sector. This is equal to 37.6% (including non-profit institutions).

The performance of the Ivorian economy over the period 2016-2020 will be driven by the growth of the primary, secondary and tertiary sectors. In fact, over this period, these sectors would register annual growth rate respective averages of about 5.8%; 11.5% and 9.2%.

Table 14.1.1 GDP Trends, Volume of Growth in Sectors and Investment from 2016 to 2020 (%)

Projections	2016	2017	2018	2019	2020
Real GDP Growth Rate	9.8	8.9	8.8	8.3	8.0
Investment Rate	20.2	21.2	22.4	23.3	24.0
- Public Investment Rate	7.8	8.0	8.5	8.7	8.8
- Private Investment Rate	12.5	13.2	13.9	14.6	15.2
Primary Sector	5.2	7.9	6.6	5.1	4.3
Secondary Sector	15.7	9.9	13.4	9.7	9.1
Tertiary Sector	9.5	10.5	9.1	10.1	10.0

Sources: MEF/DCPE, MEMPD/DGPLP

The macroeconomic and budgetary framework of the PND 2016-2020 requires a level of investment of 29,310,900 million FCFA, of which 11,025,200 million FCFA for the public sector (including non-profit institutions). Private investment totalled 18,285,600 million FCFA, or 62.4% of total investments. The estimate of revenue and expenditure for the period 2016-2020 is based on an

average growth rate of GDP of 8.7% over the period. The budget of the PND 2016-2020 is designated to be allocated among the five strategic axes as discussed above and as shown in Table 14.1.2.

Table 14.1.2 Summary of Priority Actions Matrix

Strategic Axes	Budget 2016-2020 (in million FCFA)	Annual Costs (million FCFA)				
		2016	2017	2018	2019	2020
TOTAL	30,000,000	4,234,863	5,278,628	5,992,788	6,790,882	7,702,840
AS 1	3,076,947	293,267	748,792	703,069	655,627	676,193
AS 2	6,026,557	505,412	1,010,931	1,029,423	1,498,273	1,982,518
AS 3	11,177,563	2,389,535	1,698,827	2,036,492	2,363,984	2,688,725
AS 4	9,252,440	1,017,009	1,679,564	2,087,146	2,183,927	2,284,794
AS 5	466,493	29,640	140,514	136,657	89,072	70,610

Source: PND 2016-2020 Volume III

14.2 National Spatial Development Strategies for Côte d'Ivoire

Both the last National Development Plan (PND) 2012-2015 and the present National Development Plan (PND) 2016-2020 reflect the importance of efficient utilization of the entire national territory of Côte d'Ivoire. Therefore, these two PNDs emphasized the development efforts at recovering and upgrading the economies and infrastructure, especially in the central and northern zones of the country because they were affected by the absence of government in the last civil war period.

However, in actuality, the national economies largely depend on Greater Abidjan and the southern part of the country. Moreover, in the last civil war period, the Greater Abidjan and southern part were also negatively and substantially affected by the lack of investment of both the government and private sectors.

General characteristics of phased spatial development strategies for Côte d'Ivoire are as follows:

Years 2012-2015:

It was inevitable for the government to give priority to Greater Abidjan and its surrounding areas and the southern part of the country, while the government implemented emergency recovery programmes for basic infrastructure, such as roads, school buildings and water facilities.

Years 2015-2020:

Much effort of the government and private sectors will continue to concentrate on development of the economies and infrastructures in Greater Abidjan and the southern part of the country in this PND period (2016-2020). However, gradually their efforts will go to the regions, mostly along major corridors.

Therefore, taking advantage of existing transport corridors (Abidjan-Ouagadougou and San-Pédro-Man-Odienné-Bamako), it is still possible to promote agricultural development in those areas along the transport corridors. Furthermore, it is also possible to extend agricultural development effort away from north-south major corridors by rehabilitating east-west roads.

Years 2020-2025:

Investment promotion in manufacturing industries tended to be behind other investment efforts. Since the government selected certain regional cities (including Bouaké, Yamoussoukro, Korhogo, San-Pédro and Man) as targets for developing industrial zones (free zones) for attracting industrial investment.

2025-2030:

When the global economy starts to recover from this recession, the prices of minerals including iron and manganese could go up. Then it is time for the government and private sectors to invest in construction of a railway for transporting iron ore from the western part of the country to San-Pedro Port for export.

While paying attention to the regions for pushing development, it will become important again to strengthen the physical structure of Greater Abidjan and its surrounding areas as part of the Abidjan-Accra-Lagos Economic Corridor.

2030-2040:

In the long term like 2030-2040, Greater Abidjan as part of Abidjan-Accra-Lagos Corridor becomes more important for the global competition of Côte d'Ivoire. At the same time, more business chances could emerge along the north-south corridors, due to the boosting economies of Abidjan-Accra-Lagos Corridor.

14.3 Population Framework for Côte d'Ivoire

(1) Past Population Trend in Côte d'Ivoire

According to the 2014 population census, the national population of Côte d'Ivoire was 22,671,331. The total population in Côte d'Ivoire has been growing rapidly in the past decades, resulting in more than doubling of its population in the 26 years between 1988 and 2014. However, the population annual growth rate decreased from 3.57% between 1988 and 1998 to below 2.5% between 1998 and 2014. (See Table 14.3.1)

Table 14.3.1 Population Trend of Côte d'Ivoire

Year	1975	1988	1998	2014
Population	6,709,600	10,815,694	15,366,672	22,671,331
Annual Growth Rate	-	3.74%	3.57%	2.46%

Source: INS (Institut national de la statistique), 2014, Principaux Résultats Préliminaires du RGPH 2014

(2) Population Framework for Côte d'Ivoire

The population framework of Côte d'Ivoire is shown in Table 14.3.2. The population of Côte d'Ivoire is projected to be more than 30 million by 2025 and more than 45 million by 2040.

Table 14.3.2 Population Framework for Côte d'Ivoire

Year	2015	2020	2025	2030	2035	2040
Population	23,217,271	26,393,493	30,470,452	35,165,668	40,107,210	45,142,028
Annual Growth Rate	2.28%	2.60%	2.91%	2.91%	2.66%	2.39%

Source: INS (Institut national de la statistique), 2014, Principaux Résultats Préliminaires du RGPH 2014

(3) Two Patterns of Regional Populations for Spatial Development of Côte d'Ivoire under the Selected Sub-Regional Corridor Development Scenario

Under the selected growth scenario (Corridor Development oriented to Sub-Regional Markets) for sub-regional corridor development, two patterns of future population by region are proposed for Côte d'Ivoire.

- Pattern 1: Balanced Development of Major Cities along North-South Corridors and the Coastal Corridor
- Pattern 2: Concentrated Development in the Coastal Corridor

The first one is a pattern which promotes development not only in Greater Abidjan, but also in major cities, such as Man, Daloa and Korhogo. The other pattern assumes that extreme concentration will occur in the larger cities along the coastal corridor including Greater Abidjan, San-Pédro and Gagnoa.

Based on these two patterns, two population frameworks by district for Côte d'Ivoire are prepared as shown in Table 14.3.3 Two Patterns of Future Population by District in Côte d'Ivoire Table 14.3.3.

Table 14.3.3 Two Patterns of Future Population by District in Côte d'Ivoire

Unit: thousand

Alternative Patterns District		Balanced Development of Major Cities along North-South Corridors and Coastal Corridor			Concentrated Development along Coastal Corridor		
		2015	2025	2040	2015	2025	2040
Abidjan	Population	4,824	6,364	9,746	4,824	6,788	11,015
	Annual Growth Rate	-	2.81%	2.88%	-	3.44%	3.28%
Yamoussoukro	Population	364	471	708	364	462	653
	Annual Growth Rate	-	2.61%	2.76%	-	2.44%	2.32%
Bas Sasandra	Population	2,340	3,121	4,829	2,340	3,066	4,883
	Annual Growth Rate	-	2.92%	2.95%	-	2.75%	3.15%
Comoe	Population	1,225	1,537	2,033	1,225	1,510	2,076
	Annual Growth Rate	-	2.29%	1.88%	-	2.12%	2.14%
Denguele	Population	295	369	487	295	363	477
	Annual Growth Rate	-	2.27%	1.87%	-	2.10%	1.85%
Goh-Diboua	Population	1,648	2,203	3,123	1,648	2,164	3,159
	Annual Growth Rate	-	2.94%	2.35%	-	2.77%	2.55%
Lacs	Population	1,286	1,659	2,267	1,286	1,630	2,263
	Annual Growth Rate	-	2.58%	2.10%	-	2.41%	2.11%
Lagunes	Population	1,503	1,863	2,433	1,503	1,831	2,451
	Annual Growth Rate	-	2.17%	1.79%	-	2.00%	1.96%
Montagnes	Population	2,440	3,313	5,213	2,440	3,254	4,784
	Annual Growth Rate	-	3.11%	3.07%	-	2.93%	2.60%
Sassandra-Marahoue	Population	2,343	3,012	4,503	2,343	2,959	4,154
	Annual Growth Rate	-	2.55%	2.72%	-	2.37%	2.29%
Savanes	Population	1,660	2,318	3,748	1,660	2,278	3,430
	Annual Growth Rate	-	3.40%	3.25%	-	3.22%	2.77%
Bandama	Population	1,468	1,849	2,711	1,468	1,817	2,506
	Annual Growth Rate	-	2.34%	2.58%	-	2.16%	2.17%
Woroba	Population	871	1,203	1,778	871	1,182	1,763
	Annual Growth Rate	-	3.28%	2.64%	-	3.11%	2.70%
Zanzan	Population	951	1,188	1,563	951	1,167	1,529
	Annual Growth Rate	-	2.25%	1.85%	-	2.07%	1.82%
Côte d'Ivoire	Population	23,217	30,470	45,142	23,217	30,470	45,142
	Annual Growth Rate	-	2.76%	2.66%	-	2.76%	2.66%

Source: JICA Study Team



Figure 14.3.1 Districts of Côte d'Ivoire

(4) Population Framework for Côte d'Ivoire

The selected scenario for the population framework of Côte d'Ivoire is shown in the table below. According to projections, Côte d'Ivoire's population is expected to be about 30 million by 2025 and about 45 million by 2040.

The most populous district will continue to be the Autonomous District of Abidjan which includes Greater Abidjan with a population of more than 7.5 million in 2040. Montagnes District will also continue to be the second most populated district in Côte d'Ivoire, of Ivory Coast with more than 5 million in 2040.

Table 14.3.4 Population Framework by District in Côte d'Ivoire

District		2014 (Census)	2015	2020	2025	2030	2035	2040
Abidjan	Population	4.707.404	4.824.315	5.501.025	6.364.063	7.384.322	8.516.728	9.745.655
	Taux de Croissance Annuel	-	-	2,66%	2,96%	3,02%	2,89%	2,73%
Yamoussoukro	Population	355.573	363.517	410.088	470.511	542.238	621.667	707.718
	Taux de Croissance Annuel	-	-	2,44%	2,79%	2,88%	2,77%	2,63%
Bas Sasandra	Population	2.280.548	2.340.454	2.685.211	3.121.285	3.635.850	4.207.820	4.829.238
	Taux de Croissance Annuel	-	-	2,79%	3,06%	3,10%	2,97%	2,79%
Comoe	Population	1.203.052	1.225.014	1.357.823	1.536.843	1.729.898	1.900.285	2.033.497
	Taux de Croissance Annuel	-	-	2,08%	2,51%	2,39%	1,90%	1,36%
Denguere	Population	289.779	294.977	326.510	369.169	415.157	455.624	487.110
	Taux de Croissance Annuel	-	-	2,05%	2,49%	2,38%	1,88%	1,35%
Goh-Diboua	Population	1.605.286	1.647.938	1.893.131	2.202.772	2.539.344	2.854.303	3.122.655
	Taux de Croissance Annuel	-	-	2,81%	3,08%	2,88%	2,37%	1,81%
Lacs	Population	1.258.604	1.286.178	1.448.254	1.659.255	1.887.834	2.096.146	2.267.284
	Taux de Croissance Annuel	-	-	2,40%	2,76%	2,61%	2,12%	1,58%
Lagunes	Population	1.478.047	1.502.779	1.654.781	1.863.467	2.088.183	2.283.612	2.432.779
	Taux de Croissance Annuel	-	-	1,95%	2,40%	2,30%	1,81%	1,27%
Montagnes	Population	2.371.920	2.439.828	2.827.687	3.312.714	3.883.735	4.520.149	5.212.997
	Taux de Croissance Annuel	-	-	2,99%	3,22%	3,23%	3,08%	2,89%
Sasandra-Marahoue	Population	2.293.304	2.342.558	2.632.857	3.012.125	3.463.125	3.962.201	4.502.611
	Taux de Croissance Annuel	-	-	2,36%	2,73%	2,83%	2,73%	2,59%
Savanes	Population	1.607.497	1.659.555	1.954.481	2.318.328	2.745.832	3.224.556	3.747.661
	Taux de Croissance Annuel	-	-	3,33%	3,47%	3,44%	3,27%	3,05%
Bandama	Population	1.440.826	1.467.907	1.630.850	1.849.192	2.110.535	2.399.200	2.711.360
	Taux de Croissance Annuel	-	-	2,13%	2,54%	2,68%	2,60%	2,48%
Woroba	Population	845.139	871.221	1.019.397	1.203.098	1.405.163	1.601.620	1.778.356
	Taux de Croissance Annuel	-	-	3,19%	3,37%	3,15%	2,65%	2,12%
Zanzan	Population	934.532	951.029	1.051.397	1.187.630	1.334.453	1.463.298	1.563.107
	Taux de Croissance Annuel	-	-	2,03%	2,47%	2,36%	1,86%	1,33%
Côte d'Ivoire	Population	22.671.511	23.217.271	26.393.493	30.470.452	35.165.668	40.107.210	45.142.028
	Taux de Croissance Annuel	-	-	2,60%	2,91%	2,91%	2,66%	2,39%

Source: JICA Study Team

Chapter 15 Corridor Development Plan for Côte d'Ivoire

15.1 SWOT Analysis for Côte d'Ivoire in relation to Corridor Development

A SWOT Analysis for Côte d'Ivoire was conducted in relation to corridor development in Côte d'Ivoire. The result of the SWOT analyses for WAGRIC countries is presented in Chapter 3.

Table 15.1.1 SWOT Analysis for Côte d'Ivoire

Strength	Weakness
<ul style="list-style-type: none"> • In West Africa, only the railway between Abidjan and Ouagadougou connects a sea port with an inland country. Stable train operation (both cargos and passengers) between Abidjan and Ouagadougou is available, even though the train speed and transport capacity are limited. • Since inland countries, such as Burkina Faso and Niger, have mineral potential to be exploited in the future, it is possible for the railway to gradually upgrade and attract more mineral cargos. • In the last socio-political crisis, Greater Abidjan did not have much damage to its infrastructure and industries, on which Côte d'Ivoire will be able to drive its economic growth. • Côte d'Ivoire has played the central role for UEMOA countries. • Côte d'Ivoire is West Africa's centre accommodating sub-regional headquarters of foreign companies. Multi-national companies and renowned companies across West African have their business and production bases in Greater Abidjan. • Côte d'Ivoire has relatively stable sources for earning foreign currency. As a result, Côte d'Ivoire is only one country with trade surplus among WAGRIC countries. 	<ul style="list-style-type: none"> • The economic disparity between Greater Abidjan and other regional cities is quite large. The level of economy and infrastructure of the second and third largest cities in Côte d'Ivoire is relatively poor compared to that of Greater Abidjan. As a result, economic sector development is not easy in regional cities. • Since the national territory is relatively huge and rural population is sparsely distributed, basic infrastructure development, such as rural roads and electricity, requires a large amount of investment. • Since Greater Abidjan heavily accumulated a large amount of urban population and economy, traffic congestion is severe, requiring large investment in infrastructure. In turn, this situation would create more demand for infrastructure. As a result, it is not easy to solve such urban infrastructure problems in Greater Abidjan. • Since urban areas of Greater Abidjan is separated and surrounded by lagoons, bridges are necessary for securing accessibility and mobility to key urban facilities, such as urban centre, airport and sea port. • Since the sea port and airport for Greater Abidjan have remained located in the central area, traffic concentration takes place, resulting in bottle necks in urban transportation.
Opportunities	Threat
<ul style="list-style-type: none"> • Côte d'Ivoire has shown its recovery of political stability to international communities and investors by the re-election of President Ouattara in December 2015. Under these circumstances, it is expected that foreign and domestic investments would increase, leading to industrial investment and production based in industrial zones of regional cities. • On the background of political stability mentioned above, electricity situation of Côte d'Ivoire is much better than other countries of the Guinean Gulf, especially Ghana and Nigeria, it is considered that more foreign and domestic investments would be attracted by Côte d'Ivoire. • Since the end of the last socio-political crisis, reconstruction of infrastructure and reinstallation of public services in central and northern part of the country has been done in an urgent manner, it is considered that the basic foundation for economic sector recovery has been provided. Therefore, there is no small possibility of industrial recovery and economic growth in Côte d'Ivoire. • Since Greater Abidjan will have quite a large urban population almost reaching 10 million in the near future, a business environment favourable for high-level and high-end urban services could emerge in Greater Abidjan, due to its accumulation of very large urban population and urban economy. • Since traditional food crops, such as yam and cassava, have high productivity in Côte d'Ivoire, the export of such food crops to inland neighbouring countries is expected to increase. Moreover, the expansion of rice production is expected to increase not only to satisfy Côte d'Ivoire's domestic demand, but also to export rice to 	<ul style="list-style-type: none"> • Socially unstable situation might arise due to continuing high-level of unemployment, especially among the youth in regions. • Since the end of the last socio-political crisis, economic sectors of central and northern part of Côte d'Ivoire have not yet recovered well from suffering of lack of public services and investment during the 12-year socio-political crisis. If this situation continues, dissatisfaction of people in central and northern parts would arise, resulting in no cohesion of society within Côte d'Ivoire. • Urban areas of Côte d'Ivoire, especially Greater Abidjan, might be the targets of attacks by West Africa interior's terrorist groups. Such risks continue to be not so low. • Although President Ouattara was reelected in December 2015, Côte d'Ivoire has become politically stable. However, since President Ouattara will not be able to participate in the next presidential election of 2020, there might be risks for political instability or chaos around 2020. • Since the volume of water utilisation increases in Côte d'Ivoire, conflicts over water use might increase between water users.

<p>neighbouring countries.</p> <ul style="list-style-type: none"> • Côte d'Ivoire's upgrading of the quality of agro-processing of cacao and others would enable those products could enter into the markets of other countries of Guinea Gulf, such as Nigeria and Ghana. • Since there is relatively ample water resource undeveloped yet in western part of the country, it might be possible for Côte d'Ivoire to generate much electricity enough to satisfy its increasing domestic electricity demand but also to export electricity to neighbouring countries through the West Africa Power Pool. 	
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Source: JICA Study Team

15.2 Objectives for Corridor Development in Côte d'Ivoire

There are two types of corridor development that are possible in Côte d'Ivoire. The one is north-south corridor development based on international transport corridors. The other is coastal corridor development based on the Abidjan-Accra-Lomé-Cotonu-Lagos transport corridor.

(1) Objectives for North-South Corridor Development in Côte d'Ivoire

- To promote economic sectors development by utilizing north-south transport corridors
- To upgrade north-south corridor transport infrastructure in order to connect with Burkina Faso's transport corridor infrastructure by responding to increased corridor transport demand and for the purpose of promoting further development of the economic sectors in the northern part of the country
- To provide infrastructure in order to widen the areas that can accommodate agricultural development in rural areas and manufacturing industrial development in regional cities
- To contribute to wider spatial development by taking advantage of north-south corridor development within Côte d'Ivoire

(2) Objectives for Coastal Corridor Development in Côte d'Ivoire

- To upgrade economic sectors development by utilizing the coastal Abidjan-Accra-Lomé-Cotonu-Lagos transport corridor by utilizing the benefits to be created by a customs union which will promote sub-regional economic integration
- To upgrade coastal corridor transport infrastructure in response to increased corridor transport demand and for the purpose of promoting further development of the economic sectors in metropolitan areas of Greater Abidjan and San-Pédro
- To provide infrastructure in order to widen areas that can accommodate not only manufacturing industrial development, but also ICT-BPO and other service sector development, in Greater Abidjan and San-Pédro
- To contribute to wider spatial development by taking advantage of coastal corridor development within Côte d'Ivoire

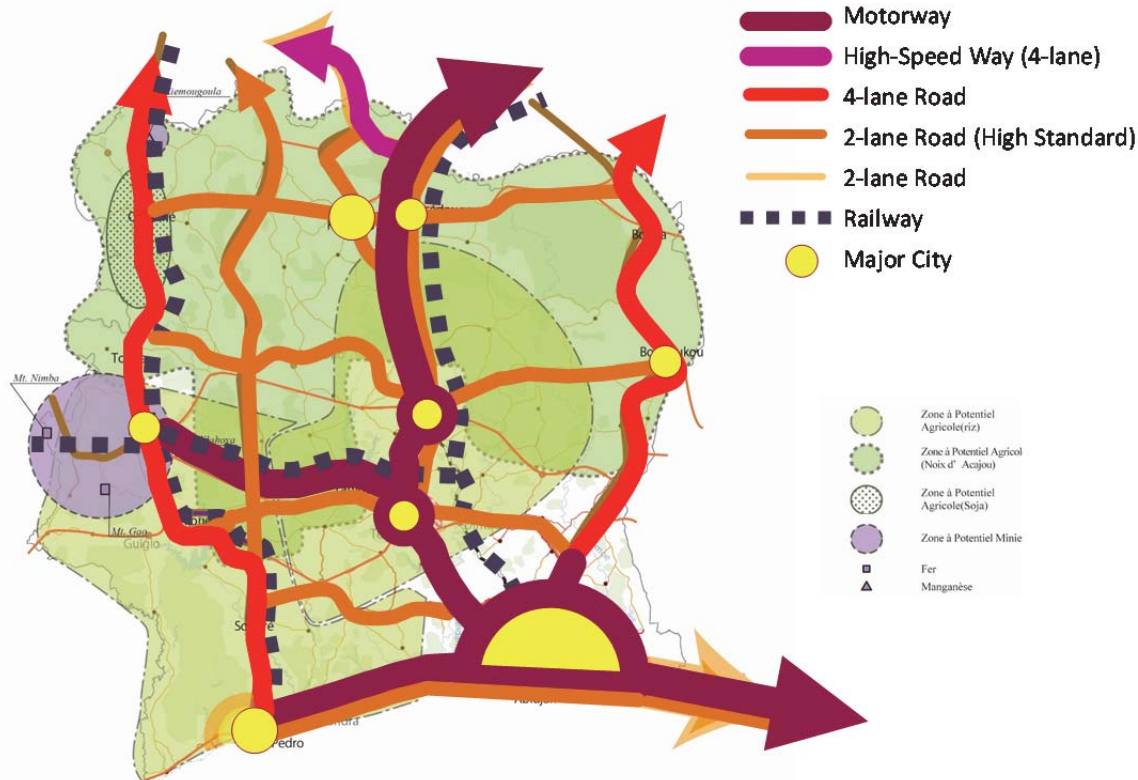
15.3 Super-Long Term Pattern of Côte d'Ivoire's Corridor Development

Based on the discussion through meetings with Côte d'Ivoire's stakeholders a corridor development pattern for the super-long term (beyond year 2040) was prepared. The super-long term pattern of Côte d'Ivoire's corridor development aims to achieve the following:

- Physical and economic integration with Cote d'Ivoire's surrounding countries including Mali
- Development of diverse economic sectors targeting both overseas market and sub-regional markets

- Wide development in the country to improve the living standard of people in various areas of the country
- To secure high-speed transport corridor in order to attract investment in economic sectors

The infrastructures to be developed by the super long term are shown in the figure below.



Source: JICA Study Team

Figure 15.3.1 Côte d'Ivoire's Super Long Term Pattern of Corridor Development

15.4 Patterns for Corridor Development in Côte d'Ivoire

Based on the super-long term patterns, alternative patterns for corridor development were prepared by selecting priorities to be achieved by the target year 2040.

15.4.1 Pattern for Corridor Development in Côte d'Ivoire for 2040

(1) Factors to Differentiate Corridor Development Patterns

The following four types of factors are utilized for differentiate corridor development patterns (C-CI-1 and C-CI-2) in Côte d'Ivoire:

Types of Economic Sectors to be Promoted

- Major types of agricultural sectors to be promoted in northern part of Côte d'Ivoire
 - Both development of medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) and support to small-scale agriculture are equally promoted. The medium and large-scale agriculture is based on foreign and domestic investment, while promoting out-grower schemes.
 - Support to small-scale agriculture is emphasized with less reliance on foreign and domestic investment in the agricultural sector.

- Major economic sectors for regional cities in central and northern part of Côte d’Ivoire
 - Manufacturing industries and ICT & BPO industries in addition to commerce and service sectors in well-targeted regional cities, namely Bouaké and Yamoussoukro
 - Manufacturing industries and ICT & BPO industries in addition to commerce and service sectors in widely selected inland regional cities including Bouaké, Yamoussoukro, Korhogo, Ferkessédougou, Man and Bondoukou.
 - Mostly commercial and service sectors to support regional cities but also their surrounding rural areas, as well as additional economic sectors of ICT & BPO
- Major economic sectors for coastal metropolitan areas along the coastal corridor, including Greater Abidjan and San-Pédro
 - To promote development of Greater Abidjan by attracting and accommodating not only manufacturing industries and ICT & BPO industries targeting at sub-regional markets, but also sub-regional business function, advanced financial services, high-end medical services, higher education services and international recreational services, in addition to existing commerce and services
 - To promote development of Greater Abidjan by attracting manufacturing industries and ICT & BPO industries, in addition to existing commerce/services and government administration function
 - In addition to Greater Abidjan, to promote development of San-Pédro by attracting manufacturing industries and ICT & BPO industries, in addition to existing commerce/services and government administration function

(2) Two Alternative Patterns for Corridor Development in Côte d’Ivoire for the Year 2040

The following two patterns of corridor development are formulated by combining the different economic sectors to be promoted as priorities for the year 2040:

- C-CI-1: Both Abidjan-San-Pédro Corridor and Abidjan-Man Corridor are strengthened, in addition to Central Corridor, Eastern Corridor and Western Corridor
- C-CI-2: Abidjan-San-Pédro Corridor Development is strengthened, in addition to Central Corridor, Eastern Corridor and Western Corridor

1) Côte d’Ivoire’s Corridor Development Scenario C-CI-1: Widely Targeted Inland Development, as well as Abidjan-San-Pédro Corridor and Abidjan-Man Corridor Development

Corridor Development Patterns C-CI-1 has the following characteristics in development of corridor infrastructure and economic sectors:

- Major types of agricultural sectors to be promoted in central and northern part of Côte d’Ivoire: Medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) targeting not only domestic markets but also sub-regional markets of neighbouring countries, by promoting foreign and domestic investment, as well as small-scale agriculture
- Manufacturing industries and ICT & BPO industries in addition to commerce and service sectors in widely selected inland regional cities including Bouaké, Yamoussoukro, Korhogo, Ferkessédougou, Man and Bondoukou
- Major economic sectors to be promoted for the coastal metropolitan area of Greater Abidjan: Not only manufacturing industries and ICT & BPO industries targeting sub-regional markets, but also sub-regional business function, advanced financial services, high-end medical services, higher education services and international recreational services, in addition to existing commerce and services

- In addition to Greater Abidjan, to promote development of San-Pédro by attracting manufacturing industries and ICT & BPO industries, in addition to existing commerce/services and government administration function



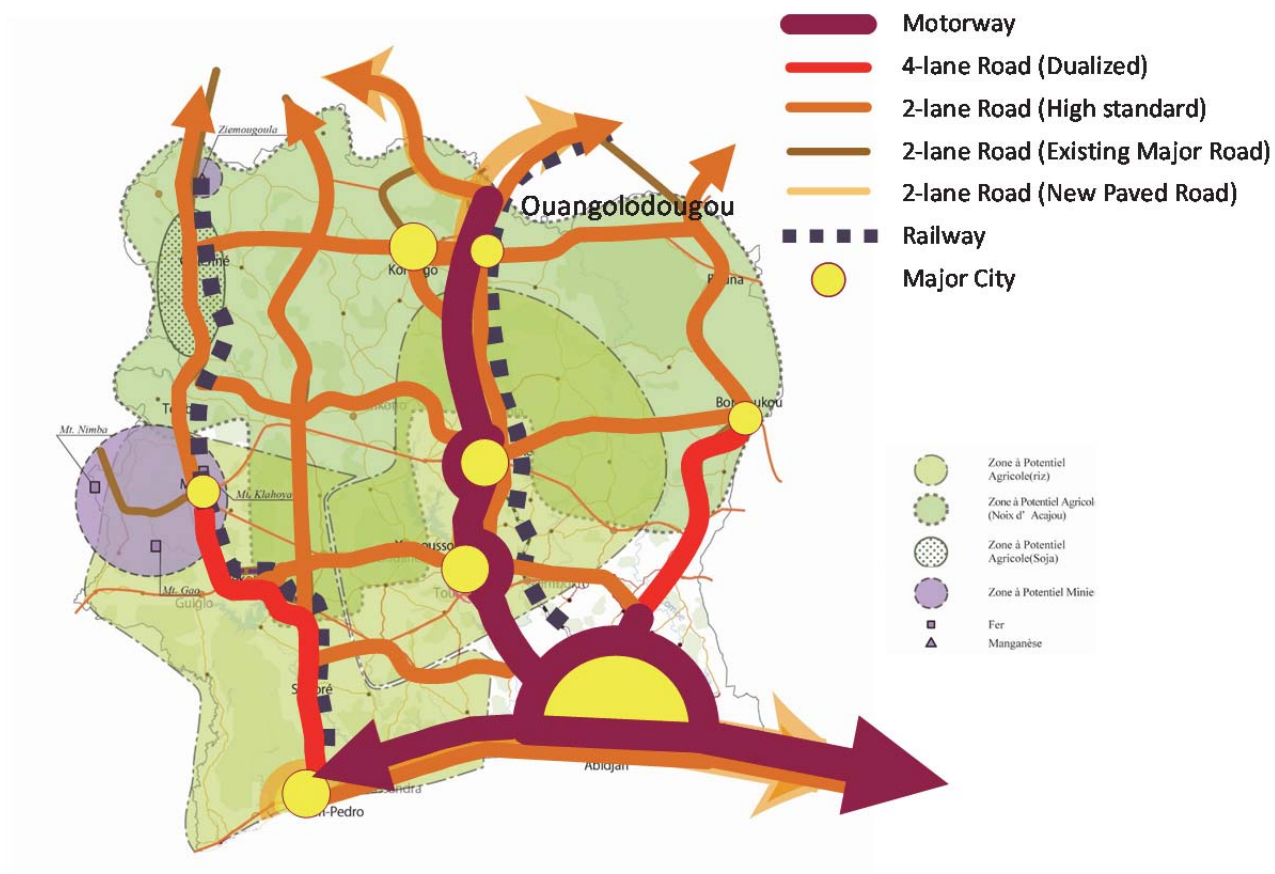
Source: JICA Study Team

Figure 15.4.1 Côte d'Ivoire's Corridor Development Pattern C-CI-1, 2040

2) Côte d'Ivoire's Corridor Development Pattern C-CI-2: Well-Targeted Inland Development along Abidjan-Ouagadougou Corridor, as well as Abidjan-San-Pédro Corridor Development

Corridor Development Pattern C-CI-2 has the following characteristics in development of corridor infrastructure and economic sectors:

- Major types of agricultural sectors to be promoted in the central and northern part of Côte d'Ivoire: Not only medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) based on foreign and domestic investment, but also small-scale agriculture
- Manufacturing industries and ICT & BPO industries in addition to commerce and service sectors in well-targeted regional cities including Bouaké, Yamoussoukro, Korhogo and Ferkessédougou along Abidjan-Ouagadougou Corridor
- Major economic sectors to be promoted for the coastal metropolitan area of Greater Abidjan: Not only manufacturing industries and ICT & BPO industries targeting at sub-regional markets, but also sub-regional business function, advanced financial services, high-end medical services, higher education services and international recreational services, in addition to existing commerce and services
- In addition to Greater Abidjan, to promote development of San-Pédro by attracting manufacturing industries and ICT & BPO industries, in addition to existing commerce/services and government administration function



Source: JICA Study Team

Figure 15.4.2 Côte d'Ivoire's Corridor Development Pattern C-CI-2, 2040

15.4.2 Comparison of Alternative Patterns for Corridor Development in Côte d'Ivoire

The two alternative corridor development patterns for the target year 2040 formulated in the previous section are compared from the following perspectives:

- Characteristics of Spatial Development
- Effect on Economic Development of Côte d'Ivoire as a whole
- Effect on Inland Development
- Social and Environmental Impacts
- Cost for Corridor Development

(1) Corridor Development Pattern C-CI-1

1) Characteristics of Spatial Development

- Primary North-South Corridor Development of Abidjan-Ouagadougou Corridor between Abidjan and Ferkessédougou, (connected by motorway and rehabilitated railway)
- Development of "Coastal Economic Belt" is extended between Greater Abidjan and Noe (connected by motorway) and between Greater Abidjan and San-Pédro
- Primary Corridor Development between Yamoussoukro and Man (connected by motorway)

2) Effect on Economic Development as a whole of Côte d'Ivoire

- Lower Cost Performance in economic development of Côte d'Ivoire as a whole in terms of effect over cost than Scenario C-CI-2 simply because the motorway development between Yamoussoukro and Man costs a lot.

3) **Effect on Inland Development**

- Effect on inland development are similar to Scenario C-CI-2.

4) **Social and Environmental Impacts**

- Social development effect is wider in terms of size of affected areas than Scenario C-CI-2
- Environmental impact is made on similar sized areas to Scenario C-CI-2.

5) **Cost for Corridor Development**

- Scenario C-CI-1 is much higher than Scenario C-CI-2

(2) **Corridor Development Pattern C-CI-2**

1) **Characteristics of Spatial Development**

- Primary North-South Corridor Development of Abidjan-Ouagadougou Corridor between Abidjan and Ferkessédougou, (connected by motorway and rehabilitated railway)
- Development of “Coastal Economic Belt” is extended between Greater Abidjan and Noe (connected by motorway) and between Greater Abidjan and San-Pédro
- Secondary Corridor Development between San-Pedro and Man and between Abidjan and Boundoukou (connected by 4-lane road)

2) **Effect on Economic Development of Côte d’Ivoire as a whole**

- Higher Performance in economic development of Côte d’Ivoire as a whole in terms of effect over cost than Scenarios C-CI-1

3) **Effect on Inland Development**

- Effect on inland development are similar to Scenario C-CI-1.

4) **Social and Environmental Impacts**

- Social development effects are similar to Scenario C-CI-1.
- Environmental impact of corridor development are made on similar sized areas to C-CI-1.

5) **Cost for Corridor Development**

- Higher than Scenario C-CI-1

15.5 **Selected Pattern of Corridor Development for Côte d’Ivoire (Corridor Development Pattern C-CI-2)**

Following the selected growth scenario for sub-regional corridor development (Growth Scenario 1) and based on the evaluation of alternative patterns of corridor development, the following corridor development pattern C-CI-2: “**Well-Targeted Inland Development along Abidjan-Ouagadougou Corridor, as well as Abidjan-San-Pédro Corridor Development**” has been selected for the long-term future (target year 2040) of Côte d’Ivoire.



Source: JICA Study Team

Figure 15.5.1 Selected Corridor Development Pattern for Côte d'Ivoire in 2040

15.6 Phased Corridor Development Plan for Côte d'Ivoire

Scenario C-CI-2 is composed of two corridor development scenarios. The one is for north-south corridor development. The other is for coastal development.

In order to achieve the selected Corridor Development Pattern C-CI-2: “Well-Targeted Inland Development along Abidjan-Ouagadougou Corridor, as well as Abidjan-San-Pédro Corridor Development” by 2040, it is necessary to implement the following actions in a phased manner:

(1) North-South Corridor Development

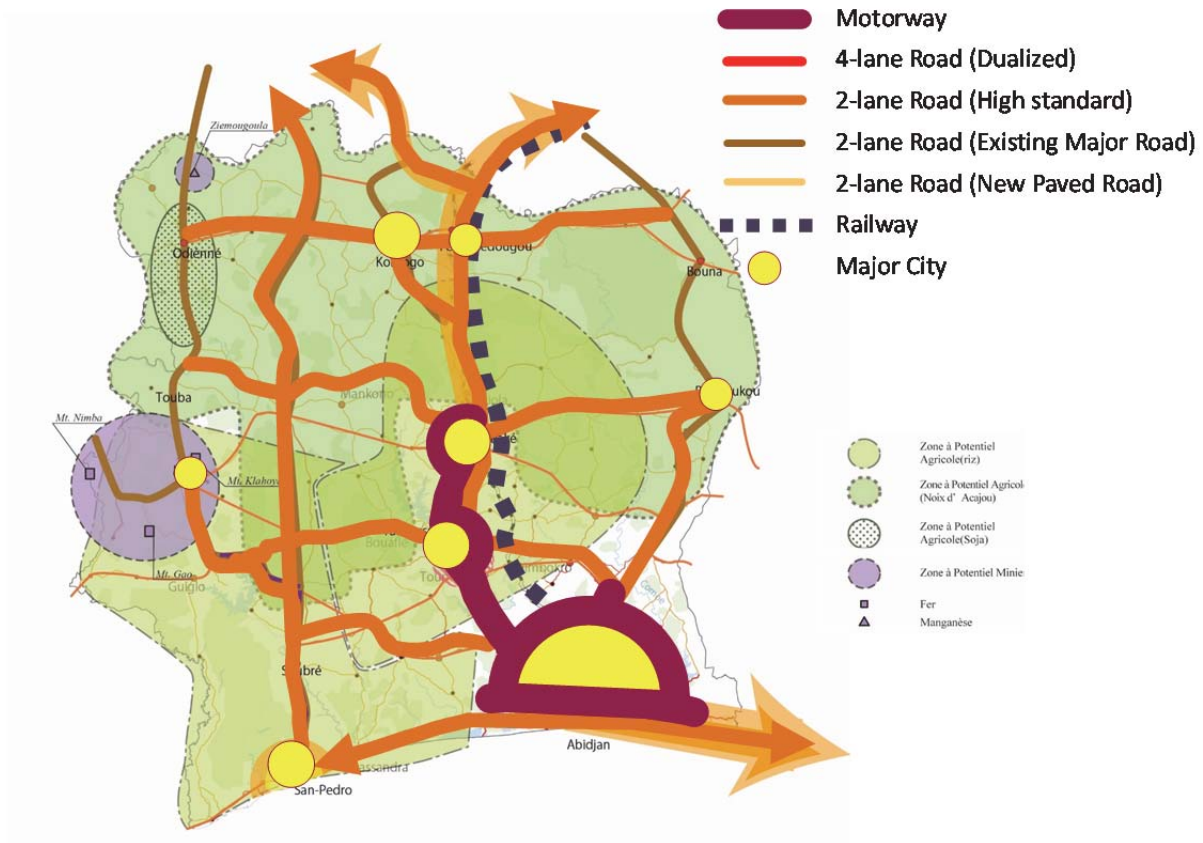
In line with the selected **growth scenario for sub-regional corridor development (Growth Scenario 1)**, the following phased development strategies for corridor transport infrastructure and economic sectors are formulated for Côte d'Ivoire's **north-south corridor development scenario**:

- **In the short term (2017~2025) and medium term (2025~2033)**, to promote economic sectors development in inland areas of Côte d'Ivoire by improving north-south corridor transport infrastructure based on the relatively-well developed Abidjan-Ouagadougou Corridor (trunk road and railway) and by providing additional necessary infrastructure and supporting measures
 - By improving the following north-south corridor transport infrastructure:
 - Replacement of old bridges and rehabilitation of poor pavement sections of the trunk road of Abidjan-Ouagadougou
 - Construction and operation of multi-modal dry port at Ferkessédougou of Abidjan-Ouagadougou Railway

- Construction and operation of multi-modal dry port at Anyama (in northern suburb of Greater Abidjan) of Abidjan-Ouagadougou Railway
- In order to induce development of potential economic sectors by the following measures:
 - Initiating of investment promotion in agricultural production, processing and marketing of crops (rice, maize, soybean and cashew) in the central and northern part of Côte d'Ivoire, while supporting out-grower schemes
 - Re-development of manufacturing industries and nurturing of ICT-BPO industries at major cities (Bouaké, Yamoussoukro, Korhogo and Ferkessédougou) along the Abidjan-Ouagadougou Corridor in the central and northern part of Côte d'Ivoire, while supporting SMEs
- So as to induce the increase of transport demand for north-south corridor transport infrastructure (roads)
- **In the medium term (2025~2033),** to promote development of economic sectors targeting domestic markets of the coastal corridor within Côte d'Ivoire by strengthening production, processing and marketing of crops (rice, maize, soybean and specialized crops that are marketable in the coastal corridor (sub-regional markets)
 - In order to induce development of economic sectors by the following measures:
 - Substantial investment in agricultural production, processing and marketing of crops in central and northern part of Côte d'Ivoire targeting at domestic markets
 - Substantial development of manufacturing industries and ICT-BPO industries at major cities (Bouaké, Yamoussoukro, Korhogo and Ferkessédougou) along the Abidjan-Ouagadougou Corridor in the central and northern part of Côte d'Ivoire, by targeting at domestic markets to be expanded in the coastal corridor
 - So as to induce the increase of transport demand not only for north-south corridor transport infrastructure, but also for east-west corridor
- **In the long term (2033~2040),** to upgrade corridor transport infrastructure in response to transport demand to be increased by implementing strategies in the short and medium terms
 - By constructing motorways up to Ferkessédougou along the Abidjan-Ouagadougou Corridor
 - By upgrading the railway section between Abidjan and Ferkessédougou of the Abidjan-Ouagadougou Corridor by increasing the number of sidings and increasing the length of sidings, as well as strengthening of the railway track
 - By widening of roads of other corridors to dualized 4-lane roads
 - Between San-Pédro and Man
 - Between Anyama and Bondoukou
- **In the long term (2033~2040),** to promote development of economic sectors targeted sub-regional markets of the sub-regional coastal corridor (Abidjan-Accra-Lomé-Cotonu-Lagos Corridor) by upgrading north-south corridor transport infrastructure
 - In order to induce development of economic sectors by the following measures:
 - Expansion of investment in agricultural production, processing and marketing of crops (rice, maize, soybean, cashew and other specialized crops) in the central and northern part of Côte d'Ivoire, by targeting sub-regional markets including Nigeria, as well as at domestic markets
 - Expansion of manufacturing industries and ICT-BPO industries in major cities along the Abidjan-Ouagadougou Corridor in central and northern part of Côte d'Ivoire, by targeting at sub-regional markets including Nigeria, as well as at domestic markets to be expanded in the coastal corridor

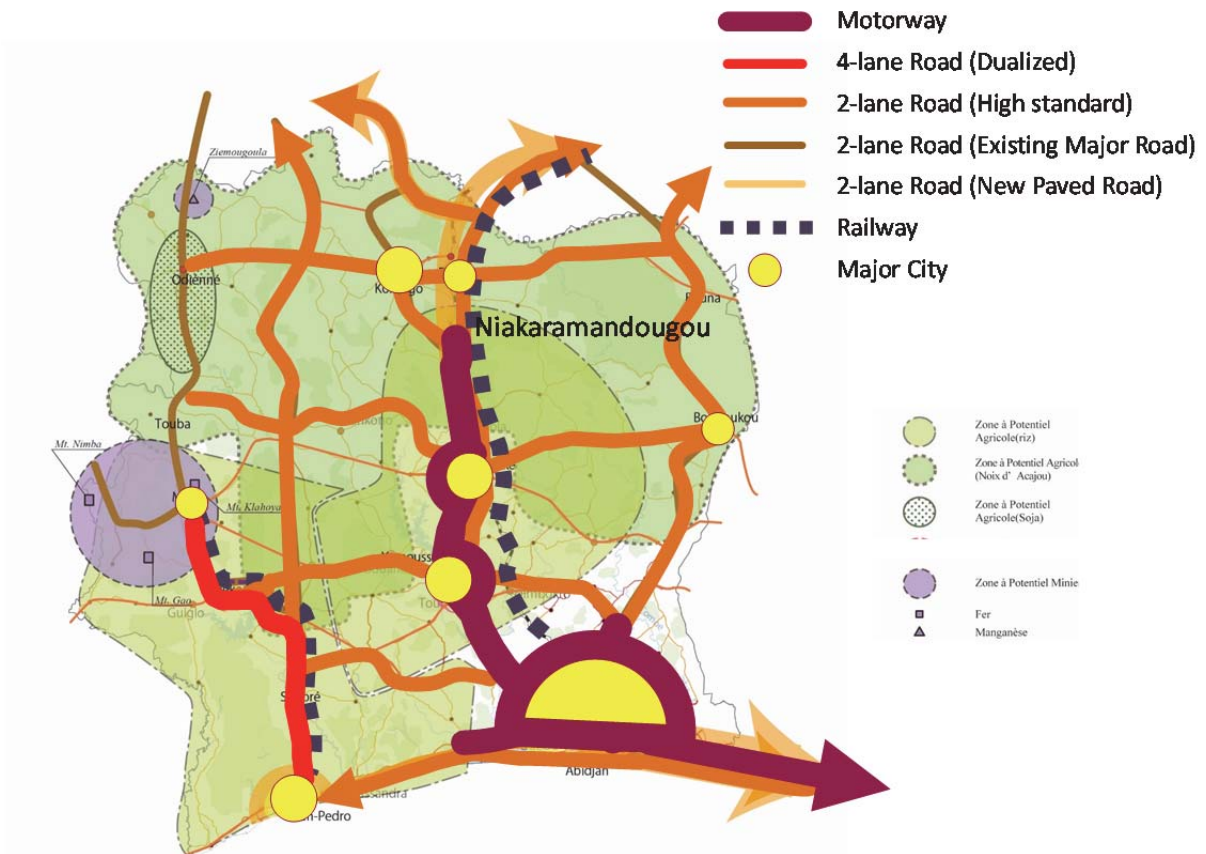
(2) Coastal Corridor Development

- **In the short term (2017~2025)**, to prepare a strategic master plan regarding how to accommodate the coastal Abidjan-Accra-Lomé-Cotonu-Lagos Motorway, including how to connect the motorway not only with the Eastern Corridor, but also with Abidjan Port
- **In the short term (2017~2025)**, to promote economic sectors development by initiating redevelopment of manufacturing industries and ICT-BPO so as to overcome underinvestment due to the prolonged socio-political crisis
- **In the medium term (2025~2033)**, to promote strengthening of corridor transport infrastructure including the following:
 - East Exit Motorway from Greater Abidjan to Bonoua (to the east)
 - West Exit Motorway from Greater Abidjan to Dabou (to the west)
 - Upgraded Access to Abidjan Port, including rehabilitation or replacement of the bridges to the port
- **In the medium term (2025~2033)**, furthermore, to strengthen transmission lines and bulk power points for power supply in the coastal corridor including the following inland regional cities:
 - Bouaké
 - Yamousoukrou
 - Korhogo
 - Ferkessédougou
- **In the medium term (2025~2033)**, to promote economic sectors development by revamping of manufacturing industries targeting the WAGRIC sub-regional market, as well as the domestic market (by attracting foreign investment in such manufacturing industries and ICT-BPO)
- **In the long term (2033~2040)**, to promote strengthening of corridor transport infrastructure in the Abidjan-Lagos Corridor including the following:
 - Bounoa- Noé Motorway, part of Abidjan-Accra-Lomé-Cotonu-Lagos Motorway
 - North Exit Motorway connected with the Eastern Corridor
- **In the long term**, to promote economic sectors development in Abidjan-Lagos Corridor including the following:
 - Development of manufacturing industries targeting at Nigeria, as well as at the WAGRIC four Countries (by continuing and expanding attraction of foreign investment in such manufacturing industries)
- **In the long term**, eventually to develop the “Coastal Economic Belt” by promoting sub-regional economic integration among the southern parts of Côte d’Ivoire, Ghana and Togo through implementing a customs union and by promoting sub-regional spatial integration by Abidjan-Accra-Lomé-Lagos Motorway, as well as by upgrading various functions as follows:
 - Government administration function
 - Corporate headquarters function
 - Production function including manufacturing, ICT-BPO and research & development targeting not only domestic markets but also sub-regional markets
 - High-end service providing function, such as medical services and higher education not only targeting domestic markets but also sub-regional markets
 - Commercial function including high-end retail and wholesale targeting not only domestic markets but also sub-regional markets
 - Recreational function targeting not only domestic markets but also sub-regional markets



Source: JICA Study Team

Figure 15.6.1 Corridor Development in 2025



Source: JICA Study Team

Figure 15.6.2 Corridor Development in 2033



Source: JICA Study Team

Figure 15.6.3 Corridor Development in 2040

15.7 Key Points for Cote d'Ivoire's Corridor Development Plan

Côte d'Ivoire's strength in corridor development is north-south roads and railway linking Abidjan Port and its inland areas and furthermore with neighbouring landlocked countries. Those roads and railway have been built and maintained since the colonial period. Furthermore, a motorway was recently established between Abidjan and Yamoussoukro. It should be also noted that the railway from Abidjan to the landlocked country, Burkina Faso, provides transportation of cargo despite constraints in capacity and speed.

On the other hand, inland areas of the Côte d'Ivoire have not only strong potential for agricultural production of rice, maize, soya beans, vegetable and fruits, which could target coastal markets and neighbouring countries' markets, but also expansion potential of cashew and cotton, targeting outside of the sub-regional markets. Major inland regional cities, such as Bouaké and Korhogo, could offer opportunities for agro-processing industries, as well as for commercial and service centres.

By taking advantage of this relatively well developed north-south transport corridor and inland development potential, it is necessary both to extend the motorway of Abidjan-Yamoussoukro to the north and to strengthen cargo railway for attracting investment in inland areas' economic sectors oriented to growing consumer markets in the sub-region.

However, urban populations and economic activities are heavily concentrated in Grand Abidjan. Inland regional cities remain underdeveloped. Therefore, traffic demand on the north-south corridors is too low to upgrade corridor transport infrastructure.

Côte d'Ivoire lies at the west end of WAGRIC Sub-Region, meaning that it is located the farthest from a large growth potential market of Lagos of Nigeria. To mitigate this disadvantage, Côte

d'Ivoire should start developing Abidjan-Lagos Corridor Motorway, as early as possible, especially the eastern exit section from the north-eastern part of Abidjan toward the east.

Given this situation, in order to initiate and drive corridor development, Côte d'Ivoire should implement the following measures by pushing the three buttons (three sets of necessary actions):

[Button A]: Development of economic sectors oriented to sub-regional markets should be promoted not only in coastal areas, but also in inland areas by taking the following actions:

- Investment promotion to economic sectors in both coastal areas and inland areas, by emphasizing the importance of integrated and expanded markets within the sub-region
- Promote the agricultural production of rice, maize, soy bean, fresh vegetable and fresh fruits targeting coastal markets of the sub-region by improvement of access roads to potential agricultural areas from Abidjan-Ouagadougou Corridor and by providing infrastructure including irrigation facilities
- Provision of economic infrastructure, such as electricity, water and industrial parks, for agro-processing industries in Bouaké and Korhogo

[Button B]: Sub-regional markets should be integrated and expanded for creating the enabling environment to attract investment to economic sectors oriented to sub-regional markets by taking the following actions:

- Strengthening of implementation of the Customs Union at the national border with Ghana for integrating Cote d'Ivoire's coastal markets with Ghanaian and other coastal markets
- Construction of East Exit Line of Motorway connecting Cocody with Bonoua, which could contribute to the strong connectivity of Greater Abidjan with Abidjan-Lagos Corridor

[Button C]: North-south Connectivity should be strengthened for reducing transport costs and transport time between inland areas and coastal areas, for creating the enabling environment for developing economic sectors in inland areas by taking the following actions:

- Extension of the motorway further north up to Niakaramandougou from Yamoussoukro for reducing transport time between inland areas and coastal areas
- Development of multi-modal dry ports at Suburban Abidjan and Ferkessédougou by combining rail transport and truck transport for expanding service areas of the railway both in coastal areas and inland areas, and for reducing transport costs between inland areas and coastal areas

15.8 Priority Projects and High Priority Projects for Côte d'Ivoire's Corridor Development

15.8.1 Priority Projects

A total of 93 projects were selected as the priority projects to be implemented between 2018 and 2040 for Côte d'Ivoire.

Priority projects to achieve the selected scenario by phases are listed in Table 15.8.1 through Table 15.8.3.

These priority projects are selected by using the following criteria:

- Those projects which are required for implementing the ten essential strategies
- Those projects which could initiate and drive corridor development in line with the selected growth scenario
- Those projects which needs proactive implementation, ahead of increased demand for infrastructure or production of economic sectors
- Those projects which are technically and institutionally implementable

By using these criteria, the priority projects are selected not only from newly formulated projects by WAGRIC Project, but also from existing prioritized projects by individual countries' governments.

Table 15.8.1 Short-Term Priority Projects for Côte d'Ivoire (2018-2025)

Sector	Priority Project for Côte d'Ivoire
Agriculture	Programme for Development and Effective Use of Agricultural Infrastructure and Bas-fonds
	Support for Agro-industrial Pole of Béliér Region (including Yamoussoukro)
	Project for Acceleration of Cashew Nuts Processing (14 regions - Bafing, Eirb Hambol, Worodougou, Boukani, Gontougo, Bagoue, Kabadougou, Marahoué, Poro, Folon, Tchologo, Iffou, Hauts Sassandra)
	Project for Development of Soybean Cultivation in the North and North-west of Côte d'Ivoire (Bafing and Kabadougou Region including the Towns of Touba and Odienné)
Livestock	Construction of Cattle Market and Slaughterhouse Complex in Anyama
	Strengthening of Cattle Loading Facility to Railway at Ferkessédougou Station or at a Station in a Suburban Area of Ferkessédougou
	Rehabilitation of Ranches and Breeding Stations
Mining	Development of Iron Ore Mines in Tonkpi Region (Mt. Nimba, Mt. Klahoyo and Mt. Gao) by Construction of Railway between San-Pédro and Iron Ore Mines near Man
Manufacturing	Establishment of Industrial Park including Industrial Free Zone at Bonoua along motorway from Abidjan to Bonoua
	Establishment of Industrial Park including Industrial Free Zone in Bouaké (along a prospective bypass road)
	Establishment of Industrial Park including Industrial Free Zone in Yamoussoukro (along a prospective bypass road)
ICT	Project for Human Resources Development for ICT Specialists
	Construction and Management of Data Centre in Grand-Bassam
	Construction and Management of Public Cyber Centres (5,000 sites)
Oil & Gas	Master Plan Study on Oil and Gas Sectors in relation to Power Generation
Investment Promotion	Project for Promotion of Utilization of Principles of Responsible Investments to Agriculture, Livestock and Fisheries Sectors
	Promotion of Foreign and Domestic Investment for Agriculture in the Northern Zone of Côte d'Ivoire by Providing Support Services, such as Investment Target Search and Land Search
	Investment Promotion for the existing Grand-Bassam Free Zone for ICT and Biotechnology
	Investment Promotion for Manufacturing Sector in Industrial Parks
	Investment Promotion for Exploration and Exploitation of Oil and Gas
Road	Projects for Improvement of East-West Roads for Providing Better Access to Agricultural Potential Areas from Central Corridor <ul style="list-style-type: none"> Improvement of Road between Ferkessédougou and Bouna Improvement of Road between Bouaké and Bondoukou Improvement of Road between Boundiali and Odienné Improvement of Road between Tieningboué and Séguéla Improvement of Road between Séguéla and Man
	Projects for Construction of Motorways and Urban Roads for Greater Abidjan <ul style="list-style-type: none"> Improvement of Three Intersections by Construction of Flyovers in Greater Abidjan Construction of 4-lane Motorway of the East Exit Line Cocody-Bonoua Construction of 4-lane Motorway of Y4 Ring Road: Anyama - Cocody Section Construction of 4-lane Motorway of Y4 Ring Road: Anyama - Attinguié Section Construction of 4-lane Motorway of Y4 Ring Road: Cocody - Riviéra 6 Section Construction of 6th Bridge (part of Y4 Ring Road) Construction of 4-lane Motorway of Y4 Ring Road: Aerocité Section Construction of 4-lane Motorway of the West Exit Line (Songon)
	Rehabilitation of National Road between Songon and San-Pédro
	Projects for Construction of Motorways and Urban Roads for Greater Abidjan <ul style="list-style-type: none"> Improvement of Solibra Intersection by Construction of Flyovers in Greater Abidjan Construction of 4-lane Motorway of the North Exit Line (Anyama) Construction of Vridi-Bietry Bridge (for Better Access to Abidjan Port)
	Projects for Construction of North-South Motorway of Abidjan-Ouagadougou Corridor <ul style="list-style-type: none"> Construction of Bypass Road for Yamoussoukro (part of Motorway) Construction of 4-lane Motorway between Yamoussoukro and Bouaké Construction of Western Section for Bouaké Outer Ring Road (part of Motorway)
	Upgrading of Road between Anyama and Abengourou
	Upgrading of Road between Boundiali - Tingréla

Sector	Priority Project for Côte d'Ivoire
Railway	Construction of Off-Loading Facility of Cattle for Railway at Anyama Railway Station
	Construction of Loading and Off-Loading Facility of Cattle for Railway at Ferkessédougou Railway Station or at a Suburban Railway Station near Ferkessédougou
	Project for Construction of Railway from San-Pédro to Man among Three Iron Ore Companies and Government (with Technical Studies for Railway Construction)
	Construction of Railway from San-Pédro to Iron Ore Mines in Tonkpi Region <ul style="list-style-type: none"> • Railway between San-Pédro – Man • Railway between Man – Mt. Nimba • Railway between Man – Mt. Klahoyo • Railway between Man – Mt. Gao
Sea Port	Project for Construction of Cereal Berth at Abidjan Port
	Expansion of San-Pedro Port
Pipeline	East Pipeline Development Project (with a total length of about 132 km from Abatta to Assinie)
	Operationalization of Yamoussoukro – Bouaké Section including Rehabilitation of Oil Storage in Bouaké (Abidjan - Ferkessédougou Oil Multi-Product Pipeline Project Phase 2)
Logistics	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders
	Project for Construction and Operation of One-Stop-Border Post (OSBP) at Elubo-Noé (National Border between Côte d'Ivoire and Ghana)
	Project for Construction and Operation of One-Stop-Border Post (OSBP) at Laleraba (National Border between Côte d'Ivoire and Burkina Faso)
	Construction and Operation of Multi-Modal Dry Port integrating Truck Terminal, Railway Cargo Station and Warehouses at PK 26
Electricity	Construction and Operation of Ferkessédougou Multi-Modal Dry Port
	Project of Construction of 330kV Interconnection Line with Ghana
	Project of Development of Lougah Hydro Power Plant
Water Resource	Project for Improvement of Transmission and Distribution Networks including Construction and Upgrading of Substations in Greater Abidjan
	Project for Surface Water Development of the Me River for Greater Abidjan
	Project for Surface Water Development of the Bandama River
	Project for Dabou-Nieki Groundwater Development for Greater Abidjan
	Expansion of Intake (28,000m ³ /day) and Water Treatment Plant from Bandama River for Yamoussoukro
	Expansion of Water Treatment Plant in Loca Dam for Bouaké (Total capacity = 30,000m ³ /day)
	Expansion of Intake (52,000m ³ /day) and WTP from Bandama River for Korhogo
Expansion of Water Treatment Plant from Fare Dam for San-Pédro	

Source: JICA Study Team

Table 15.8.2 Medium-Term Priority Projects for Côte d'Ivoire (2026-2033)

Sector	Priority Project for Côte d'Ivoire
Agriculture	Continued Implementation of Programme for Development and Effective Use of Agricultural Infrastructure and Bas-fonds
	Continued Implementation of Project for Acceleration of Cashew Nuts Processing (14 regions - Bafing, Eirb Hambol, Worodougou, Boukani, Gontougo, Bagoue, Kabadougou, Marahoué, Poro, Folon, Tchologo, Iffou, Hauts Sassandra)
	Continued Implementation of Project for Development of Soybean Cultivation in the North and North-west of Côte d'Ivoire (Bafing and Kabadougou Region including the towns of Touba and Odienné)
Livestock	Expansion of Cattle Market and Slaughterhouse Complex in Anyama
	Construction of Slaughterhouses in the Country (Yamoussoukro, Daloa, Bouaké, Ferkessédougou, Korhogo)
Mining	Continued Development of Iron Ore Mines in Tonkpi Region (Mt. Nimba, Mt. Klahoyo and Mt. Gao) by Construction of Railway between San-Pédro and Iron Ore Mines near Man
Manufacturing	Establishment of Industrial Park including Industrial Free Zone in Man
	Establishment of Industrial Park including Industrial Free Zone in Korhogo
	Establishment of Industrial Park including Industrial Free Zone in San-Pédro
ICT	Project for Continued Human Resources Development for ICT Specialists
	Project for Continued Construction and Management of Public Cyber Centres (5,000 sites)
Investment Promotion	Continued Promotion of Investment for Agriculture in the Northern Zone of Côte d'Ivoire by Providing Support Services, such as Investment Target Search and Land Search
	Continued Promotion of Investment for Manufacturing Sector in Industrial Parks
	Investment Promotion for Development of Manganese Mines in Kabadougou Region by Extending the Railway from Man to Odienné
	Continued Investment Promotion for Exploration and Exploitation of Oil and Gas
Road	Project for Construction of 6-Lane Motorway between Bonoua and the border of Ghana
	Project for Construction of Motorway between Bouaké and Niakaramandougou
	Project for Upgrading of Road between Bondoukou and Bouna
	Project for Upgrading of Road between San-Pédro and Man to 4-Lane Road
Sea Port	Project for Construction and Operation of New Mineral Terminal at San-Pédro Port
Pipeline	Construction and Operation of Bouaké - Ferkessédougou Section (Abidjan - Ferkessédougou Oil Multi-Product Pipeline Project Phase 3)
	Construction and Operation of Oil Multi-Product Pipeline for Section between Ferkessédougou – National Border with Burkina Faso
Logistics	Strengthening of Operation of Elubo-Noé OSBP (National Border between Côte d'Ivoire and Ghana)
	Strengthening of Operation of Laleraba OSBP (National Border between Côte d'Ivoire and Burkina Faso)
	Project for Construction and Operation of Multi Modal Dry Port at Man

Source: JICA Study Team

Table 15.8.3 Long-Term Priority Projects for Côte d'Ivoire (2034-2040)

Sector	Priority Project for Côte d'Ivoire
Mining	Continued Development of Iron Ore Mines in Tonkpi Region (Mt. Nimba, Mt. Klahoyo and Mt. Gao) by Construction of Railway between San-Pédro and Man
	Development of Manganese Mines in Kabadougou Region by Extending the Railway from Man to Odienné
Manufacturing	Establishment of Industrial Park including Industrial Free Zone in Bondoukou
Investment Promotion	Continued Promotion of Investment for Agriculture in the Northern Zone of Côte d'Ivoire by Providing Support Services, such as Investment Target Search and Land Search
	Continued Promotion of Investment for Manufacturing Sector in Industrial Parks
	Investment Promotion for Exploration and Exploitation of Minerals
	Continued Investment Promotion for Exploration and Exploitation of Oil and Gas
Road	Construction of 4th bridge (Île Boulay) of Greater Abidjan
	Construction of Motorway between Abidjan and San-Pédro
	Construction of 4-Lane Motorway between Niakaramandougou and Ouangolodougou
	Upgrading of Road between Man – Odienné – the border of Mali
	Upgrading Road between Anyama and Bondoukou to 4-Lane Road
Railway	Construction of Railway from Man to Odienné
	Construction of Railway to New Port in Île Boulay
Sea Port	Construction of New Port in Île Boulay
Logistics	Project for Construction and Operation of Multi Modal Dry Port at Odienné

Source: JICA Study Team

15.8.2 High Priority Projects

Out of 82 priority projects formulated and shown in the above sections, the twenty-two priority projects are selected as “High Priority Projects” for achieving the selected Scenario **C-CI-2: “Well-Targeted Inland Development along Abidjan-Ouagadougou Corridor, as well as Abidjan-San-Pédro Corridor Development.”**

Outlines, funding schemes and estimated project costs of the high priority projects are shown in Table 15.8.4.

Table 15.8.4 Outlines of High Priority Projects for Côte d’Ivoire

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
1	A	1	Project for Development and Effective Use of Agricultural Infrastructure and Bas-fonds	ODA Loan	US\$ 275 million
<p><u>Project Outline</u></p> <p>Demand for agricultural products from coastal markets is expected to grow at higher rates due to economic growth and increasing middle-income populations. Coastal corridor development and north-south corridor development could create an enabling environment for development of economic sectors, especially the agricultural sector, in inland areas. In this context, the project aims to sustainably improve food security, reduce poverty levels, to significantly increase the income of small producers in inland areas and contribute to the revival of the national economy by seeking the following specific objectives:</p> <ul style="list-style-type: none"> • To improve product production potential through development of agricultural infrastructure, such as irrigation facilities and access roads, and development of Bas-fonds • To improve access of small farmers to markets and technologies 					
2	A	1	Project for Human Resources Development for ICT Specialists	ODA Technical Assistance	US\$ 6 million
<p><u>Project Outline</u></p> <p>The ICT industry is one of the economic sectors not only for driving the national economy, but also for supporting a variety of basic functions required for other economic sectors. ICT infrastructure is one of the important corridor infrastructures when it comes to the importance of high speed of transport and services. It is essential to attract investments to economic sectors in inland areas, as well as in coastal areas.</p> <p>Therefore, human resources for ICT are recognized as a key not only for the growing ICT, but also for the supporting economic sectors both in inland areas and coastal areas.</p> <p>In Côte d’Ivoire, the Ministry of Digital Economy and Post (Ministère de l’Economie Numérique et de la Poste) manages an ICT oriented university, namely, the African School of Information Technology and Communication (ESATIC: Ecole Supérieure Africaine des Technologies de l’Information et de la Communication). In this university and other private schools, a programming-level of ICT education is currently provided. However, there are no training institutions to train IT specialists with high-level skills including design skills, project management skills and systems operation skills.</p> <p>The project aims to provide this high-level training so that more ICT personnel could be trained to attain high-level knowledge and skills on ICT.</p> <p>Not only for training for high-level ICT specialists, but also for retaining them within Cote d’Ivoire, it is necessary to implement more actual projects for ICT and generate ICT jobs in Côte d’Ivoire. Moreover, it is necessary to expand and upgrade ICT infrastructure for improving internet and ICT accessibility in Côte d’Ivoire.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
3	A	1	Project for Construction of Cattle Market and Slaughterhouse Complex in Anyama	PPP	US\$ 39 million
<p><u>Project Outline</u></p> <p>Since the middle-income populations are increasing in coastal areas in Côte d'Ivoire and neighbouring countries, the consumption of beef and other meat is expected to increase more in the future.</p> <p>The project aims to build a complex facility which is composed of a market place and a slaughterhouse for cattle and small ruminants in Anyama, suburban area of Greater Abidjan, in order to enhance the quantity and quality of fresh meat production.</p> <p>This project was designed originally for the purpose of supplying fresh meat to Côte d'Ivoire's domestic markets. However, it is strongly recommended to pay attention to the potentiality to supply fresh meat not only to Greater Abidjan, but also to neighbouring countries' markets, especially to Ghana's coastal markets. In fact, Ghana consumes more beef than Côte d'Ivoire at present.</p> <p>In order to increase the volume of meat production, it is important to utilize the Abidjan-Ouagadougou railway (Sitarail) for transporting live cattle to Anyama from inland countries, such as Burkina Faso, Mali and Niger. Anyama is selected as a site for this complex because it is connected with the Abidjan-Ouagadougou Railway (Sitarail). The transport of fresh meat from the Anyama complex to Ghana will utilize a coastal motorway, which is to be constructed in the Abidjan-Lagos Corridor.</p> <p>This project should be implemented in parallel with the following projects recommended by the WAGRIC Master Plan:</p> <ul style="list-style-type: none"> • Construction of Off-Loading Facility for Live Cattle for the Railway at Anyama Railway Station (Project in Côte d'Ivoire) • Projects for Expansion of Livestock Production (Project in Burkina Faso) • Project for Development of Loading and Off-Loading Facilities for Cattle and Cattle Waiting Pens at Railway Stations (Suburban Ouagadougou, Suburban Bobo-Dioulass and Kaya) (Project in Burkina Faso) 					
4	A	1	Projects for Establishment of Industrial Parks in Bonoua, Bouake, Yamoussoukro and Korhogo	ODA Grant and Loan, or PPP	US\$ 111 million
<p><u>Project Outline</u></p> <p>One of the strategic axes of the industrial policy of Côte d'Ivoire's Ministry of Industry and Mines is to enhance accessibility to industrial areas or to provide industrial zones with qualified infrastructure in urban centres by PPP schemes. The ministry has sought to develop industrial zones in Bonoua, Bouaké, Yamoussoukro, Korhogo, Man and San-Pédro.</p> <p>The project aims to establish new industrial parks which are equipped with adequate infrastructure for the purpose of attracting investment to manufacturing sectors in the selected cities in inland areas, including Bonoua, Bouake, Yamoussoukro and Korhogo along the Abidjan-Ouagadougou Corridor.</p> <p>The approximate areas of the industrial parks for Bonoua, Yamoussoukro and Bouaké are 50 ha, 700 ha and 500 ha, respectively. The size of Korhogo industrial park is between 100 and 200 ha.</p> <p>The project is to provide divided lots with adequate infrastructures including electricity, water drainage and telecommunications. At the same time, the project is to provide management services for enterprises in cooperation with the Ministry of Industry and Mines and the Agency for Development of Infrastructure for industries (AGEDI).</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
5	A	2	Investment Promotion for Economic Sectors targeting Sub-Regional Markets	ODA Technical Assistance	US\$ 4 million
<p><u>Project Outline</u></p> <p>In 1995, the Investment Promotion Centre (Centre de promotion des investissements en Côte d'Ivoire, CEPICI) was established. It has tried to attract investment to infrastructure development as well as to the mining sector. However, it has not paid much attention to the growth potential of Côte d'Ivoire's economic sectors targeting coastal markets in the sub-region.</p> <p>It is possible to strengthen the implementation of the customs union, which has been institutionalized by UEMOA and ECOWAS. By emphasizing the possibility to integrate and expand sub-regional consumers' markets through the customs union, it is possible for CEPICI to attract more investment to economic sectors targeting sub-regional consumers' markets. Such target economic sectors include those of agriculture, fisheries and agro-processing.</p> <p>The project aims to make a clear shift of investment promotion toward economic sectors orientated to sub-regional markets. For this purpose, the project will prepare new promotion materials, provide training to related agencies and personnel and implement actual activities for investment promotion.</p>					
6	A	3	Projects for Construction of Railway from San-Pédro to Iron Ore Mines in Tonkpi Region (Mt. Nimba, Mt. Klahoyo and Mt. Gao)	ODA Technical Assistance and Private Investment	US\$ 1,804 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan points out the importance of economic sectors targeting sub-regional markets for seeking balanced development between inland areas and coastal areas. However, at the same time, it is important for individual countries of the WAGRIC Sub-Region to expand the production of primary commodities, such as minerals and agricultural products.</p> <p>In the western area of Côte d'Ivoire, there are three promising rich iron deposits including Mount Klahoyo, Mount, Nimba and Mount Gao. These three iron deposits are located near Man and they are close each other.</p> <p><u>Mount Klahoyo:</u> The iron deposit in Mount Klahoyo is owned by a joint venture between Pan African Minerals Ltd. and SODEMI. It is estimated to have 700 million tons of iron ore, and is planned to produce 11 million tons per annum. Exploratory activity has already begun and plans to build a new rail link to the iron ore are also under consideration.</p> <p><u>Mount Nimba:</u> Although Mount Nimba has enormous iron deposits of more than 1 billion tons, it is forbidden to exploit the iron deposit at Mt. Nimba since this area is covered by a nature reserve.</p> <p><u>Mount Gao:</u> The iron deposit at Mount Gao is estimated to have 500 million tons of resources. Geophysical surveys were conducted over the last several years, and there has been good progress in the survey conducted by Tata Steel. However, Tata Steel announced its withdrawal from the Mt. Gao project.</p> <p>In order to exploit iron deposits commercially, it is necessary to build a railway line from San-Pédro Port to Man and thence to the three mines.</p> <p>The projects of constructing the railway lines for iron exploitation and transportation should be funded by private mining concessioners. However, it is important for the government to be involved in the planning of the railway line for the following purposes:</p> <ul style="list-style-type: none"> • To secure timely construction of the railway • To get adequate access to San-Pédro Port • To promote coordination with local communities along the railway line to be constructed 					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
7	A	3	East Pipeline Development Project (with a total length of about 132 km from Abatta to Assinie)	ODA Loan	US\$ 106 million
<p><u>Project Outline</u></p> <p>Côte d'Ivoire is endowed with off-shore natural gas reserves. However its natural gas reserves are not large enough to develop chemical industries using the gas from its own territory, but it is possible to use the natural gas for power generation. It is important for Côte d'Ivoire to continue to attract investment to exploration and exploitation of natural gas for power generation to satisfy the increasing demand for electricity not only by its own country's people and economies, but also by neighbouring countries of the West African Power Pool (WAPP).</p> <p>Natural gas pipelines are required for sending natural gas from natural gas supply sources which are domestic gas fields, WAGP gas and LNG import facilities to gas-fired power generation plants (existing or planned). Gas pipelines must be developed to transport the natural gas from different sources. At the same time, the provision of natural gas pipelines is important to attract and encourage investors to develop marginal oil and natural gas fields.</p> <p>The project aims to construct the East Gas Pipeline for the following purposes:</p> <ul style="list-style-type: none"> • To collect natural gas from the eastern Ivorian sedimentary basin; • To make it profitable to develop marginal gas deposits (Gazelle, Kudu, Eland and Ibex) in the East • To increase natural gas production at lower prices for power generation <p>The East Gas Pipeline is planned for development of marginal gas fields, Gazelle (Block CI-202) and Kudu (Block CI-525), and the development of future deposits in the east area of the sedimentary basin. The East Gas Pipeline is an extension of the existing network for FOXTROT and PETROCI CI-11. It has a diameter of 24 inches and a total length of about 132 km from Abatta to Assinie. Its transport capacity can reach 400 million cubic feet / day.</p> <p>In accordance with MPE, PETROCI and private partners will establish a joint venture company to construct, operate and maintain the East Gas Pipeline.</p>					
8	A	3	Project for Construction and Management of Data Centre in Grand-Bassam	ODA Technical Assistance & ODA Grant	US\$ 15 million
<p><u>Project Outline</u></p> <p>Information and Communication Technology (ICT) is an important growth driver among the economic sectors to promote economic development, as well as to support various other sectors. Cote d'Ivoire's National Development Plan (PND) aims to ensure that 1) people have access to quality telecommunications at the lowest possible cost and 2) people enjoy quality ICT infrastructure and e-Government tools.</p> <p>ICT infrastructure is one of the important corridor infrastructures when it comes to the importance of high speed transport and services. It is essential to attract investments to economic sectors in inland areas, as well as in coastal areas.</p> <p>The project aims to establish a data centre located in the Village of Information Technology and Bio-technology" in Grand Bassam in Greater Abidjan. The data centre will provide various types of ICT services not only to the public sector, but also to private sector entities.</p> <p>The data centre will be the nerve centre of the government intranet, especially in the context of prospective development of e-Government. The data centre is to provide a back-up of international standards of security and to accommodate a large volume of data and computer applications in the environment with strict standards.</p> <p>This type of ICT-related facilities is also important for providing job opportunities for ICT specialists.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
9	A	3	Construction of Cattle Off-Loading Facility for Railway at Anyama Railway Station	ODA Technical Assistance & ODA Loan	US\$ 30 million
<p><u>Project Outline</u></p> <p>In response to the increasing middle-income populations in the coastal areas of WAGRIC Sub-Region, the consumption of beef is expected to increase largely not only in Côte d'Ivoire but also in neighbouring countries.</p> <p>The Ivorian Government has a plan to establish a cattle market and slaughterhouse complex in Anyama. The WAGRIC Master Plan recommends paying attention to the expanding sub-regional markets for beef by considering the sub-regional economic integration through the customs union and the prospective construction of Abidjan-Lagos Motorway.</p> <p>The project aims to construct cattle off-loading facilities for the Abidjan-Ouagadougou Railway (Sitarail) at Anyama Railway Station. This off-loading facility should be well connected to the recommended Cattle Market and Slaughterhouse Complex to be constructed in Anyama.</p> <p>This project should be implemented by the government for supporting private sectors which are to be engaged in the project for establishment of the cattle market and slaughterhouse complex in Anyama.</p>					
10	A	3	Project for Development of 330kV Interconnection Line with Ghana (150 km)	ODA Loan	US\$ 180 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of the manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks. Currently, the power demand of Ghana is growing and Ghana is increasing power production in an attempt to keep place; however, Ghana needs to continue to import electricity through the West African Power Pool (WAPP).</p> <p>The project aims to construct another 330kV interconnection line with Ghana for the following purposes:</p> <ul style="list-style-type: none"> • Improvement of reliability of the outward power supply from Côte d'Ivoire • For Côte d'Ivoire to transfer its power to Togo through Ghana. • Mutual power trading between Côte d'Ivoire and Ghana in the near future <p>The total length of the interconnection line proposed is 296km, the Ivorian section of which accounts for 177km.</p> <p>This project was proposed in 2004 and revised in 2011 in order to ensure stable integration of the national electricity network in the ECOWAS sub-region and facilitate optimal power exchanges and trading among ECOWAS countries.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
11	A	3	Project for Improvement of Transmission and Distribution Networks including Construction and Upgrading of Substations in Greater Abidjan	ODA Loan or ODA Grant	41 US\$ million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of the manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>Greater Abidjan is the most important economic centre to accommodate manufacturing industries by attracting investment. At the same time, it is the most populous urban area (5 million in 2015) in the country. By 2040, it is forecast that Greater Abidjan is to have nearly 10 million population.</p> <p>It is necessary for Greater Abidjan to keep strengthening the distribution system of power not only to residential areas, but also to industrial areas.</p> <p>The project aims to establish a new substation or rehabilitate an existing substation, as well as installing distribution lines in selected areas of Greater Abidjan.</p>					
12	A	3	Project for Development of Surface Water of the Me River and Groundwater of Dabou for Greater Abidjan	PPP	US\$ 200 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract investment to manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>Greater Abidjan is the capital city and economic centre of Côte d'Ivoire with 5 million population. It is forecast that the population of Greater Abidjan is to be 9.8 million by 2040. Furthermore, Greater Abidjan is expected to grow as the most important production centre by attracting investment to the manufacturing sector. It is forecast that the demand for water is to increase at a high speed in Greater Abidjan. Therefore, it is necessary to continue to develop water resources for water supply to the population and economic activities of Greater Abidjan.</p> <p>The available groundwater resources and surface water sources around Abidjan should be developed before starting to abstract water from other river basins far from Abidjan. There are two water sources just outside of Greater Abidjan, namely groundwater in Dabou to the west of Greater Abidjan and surface water of the Me River to the east of Greater Abidjan.</p> <p>The project aims at water resources development utilizing the groundwater of Dabou and the surface water of the Me River in order to increase the volume of water supply to Greater Abidjan. This project will construct 1) boreholes for abstracting 70,000m³/day of water in Dabou and 2) a water treatment plant for 70,000m³/day of water from the Me River.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
13	A	3	Project for Expansion of Intake and Water Treatment Plant from Bandama River for Yamoussoukro	ODA Loan	US\$ 30 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of the manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>Yamoussoukro' population was about 360,000 in 2015. It is forecast that the population of Yamoussoukro would become 670,000 by 2040. It is on the Abidjan-Ouagadougou Corridor, located 236 km from Abidjan, and connected to the motorway from Abidjan. Due to this well connected situation with Abidjan, Yamoussoukro will provide a very strategic location for the manufacturing sector which can attract investment in the near future.</p> <p>Yamoussoukro currently utilizes water from Kossou hydropower dam. A regulation on Kossou hydropower dam enables stable abstraction of water in the Bandama River, except for the case of extremely dry condition. The regulated water can be further utilized for urban water supply in the surrounding areas, including Yamoussoukro.</p> <p>The project aims to expand the intake facility, a conveyance pipeline and a water treatment plant from the Bandama River in order to increase the water volume to supply to Yamoussoukro. The expansion capacity for these water facilities is 28,000m³/day.</p>					
14	A	3	Project for Expansion of Water Treatment Plant in Loca Dam for Bouaké	ODA Loan	US\$ 50 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>Bouaké' population was about 480,000 in 2015. It is on the Abidjan-Ouagadougou Corridor, located 342 km from Abidjan. It is connected to Abidjan, through the motorway between Abidjan and Yamoussoukro and National Road between Yamoussoukro and Bouaké.</p> <p>There are two dams to supply water to Bouake, namely, Kan Dam and Loca Dam. There is one treatment plant of 5,400 m³/day for Kan Dam, and there is another treatment plant of 31,000m³/day for Loca Dam. The capacity of Loca Dam has not yet been fully utilized.</p> <p>The project aims to construct a new water treatment plant with 30,000m³/day capacity for using water of Loca Dam and a conveyance pipeline in order to increase the water volume to supply to increasing populations and economic activities in Bouaké.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
15	A	3	Project for Expansion of Intake and Water Treatment Plant from Bandama River for Korhogo	ODA Loan	US\$ 25 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>Korhogo's population was about 235,000 in 2015. It is on the Abidjan-Ouagadougou Corridor, located 569 km from Abidjan. It is forecast that the population of Korhogo will become over 1 million by 2040. It is expected to become a major regional centre with manufacturing capacities by attracting investment.</p> <p>The existing capacity of the intake and WTP at Bandama River for Korhogo is not adequate for the future water demand in Korhogo. It is necessary to expand the capacities of the intake and WTP.</p> <p>The project aims to construct an intake (52,000 m³/day) from the Bandama River, a water treatment plant and water conveyance pipeline in order to increase the water volume to supply to the increasing population and economic activities in Korhogo.</p>					
16	B	4	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders	ODA Technical Assistance	US\$ 4 million
<p><u>Project Outline</u></p> <p>In addition to export of primary commodities, such as minerals and agricultural products, it is necessary for Côte d'Ivoire to diversify economic sectors. The WAGRIC Master Plan recommends paying attention to the potentiality of economic sectors both in coastal areas and inland areas, by targeting growing sub-regional markets and taking advantage of the customs union which has been institutionalized by UEMOA and ECOWAS. For this purpose, it is necessary to strengthen the implementation of the customs union by taking advantage of the customs union, which has been institutionalized by the member countries of UEMOA and ECOWAS.</p> <p>The project aims at enforcement of implementation of the customs union and trade facilitating for sub-regional products with neighbouring countries of the sub-region, especially with Ghana, along Abidjan-Lagos Corridor. The project will also be applied to the national border with Burkina Faso on Abidjan-Ouagadougou Corridor.</p> <p>The project will establish new materials for training and also train related agencies and personnel. Campaigns for customs union trade facilitation of sub-regional products will also be implemented together with WAGRIC countries and its surrounding countries under this project.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
17	B	5	Construction of 4-Lane Motorway of the East Exit Line Cocody-Bonoua (45km)	ODA Loan or PPP	US\$ 307 million
<p><u>Project Outline</u></p> <p>Cote d'Ivoire's potentiality to develop economic sectors is limited in the case of targeting its own domestic consumers' markets. However, such potentiality would be enhanced largely by targeting the sub-regional markets through integration with neighbouring countries' markets. This market integration will become possible by upgrading transportation along the coastal east-west corridor (Abidjan-Lagos Corridor), as well as strengthening of implementation of the customs union.</p> <p>The upgrading of transportation along Abidjan-Lagos Corridor would become possible by construction of strategically selected sections of the Abidjan-Lagos Motorway. The most important section is the motorway connecting the central area of Greater Abidjan with the eastern coastal area of Côte d'Ivoire.</p> <p>The existing road from the Abidjan International Airport to Grand Bassam is the only exit road from the central area of Greater Abidjan to the eastern coastal area of Côte d'Ivoire. However, it will become congested by traffic in the near future. Therefore, it is necessary to construct another exit motorway to the eastern coastal area of Côte d'Ivoire for the purpose of strongly integrating the coastal markets along the Abidjan-Lagos Corridor.</p> <p>The project aims to construct a 4-lane motorway between Cocody and Bonoua, of which distance is about 45 km. It would be called "East Exit Line Cocody-Bonoua."</p>					
18	B	5	Project for Construction of 6-Lane Motorway between Bonoua and the border of Ghana (115km)	ODA Loan	US\$ 1,127 million
<p><u>Project Outline</u></p> <p>Cote d'Ivoire's potentiality to develop economic sectors is limited in the case of targeting its own domestic consumers' markets. However, such potentiality would be enhanced largely by targeting the sub-regional markets through integration with neighbouring countries' markets. This market integration will become possible by upgrading transportation along the coastal east-west corridor (Abidjan-Lagos Corridor), as well as strengthening of implementation of the customs union.</p> <p>The upgrading of transportation along Abidjan-Lagos Corridor would become possible by construction of strategically selected sections of the Abidjan-Lagos Motorway. The most important section is the motorway connecting the central area of Greater Abidjan with the eastern coastal area of Côte d'Ivoire. The second most important section is the motorway between Bonoua and Noé, national border with Ghana. Its length is about 115 km.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
19	C	6	Project for Construction and Operation of Multi-Modal Dry Port in the Suburban Area of Greater Abidjan	ODA Technical Assistance & ODA Loan	US\$ 100 million
<p><u>Project Outline</u></p> <p>The Abidjan-Ouagadougou Railway (Sitarail) connects Abidjan Port with Bobo-Dioulasso and Ouagadougou in Burkina Faso. However, the service areas (catchment areas) of the railway are limited to the areas closer to Ouagadougou and Bobo-Dioulasso. Therefore, it is necessary to expand the service areas of the railway and increase cargo demand for the railway by combining rail transport and truck transport.</p> <p>The railway receives cargo from Abidjan Port and it transports cargo to the port. However, except for Abidjan Port, there are no active cargo railway stations which receive cargo from Greater Abidjan by truck transport.</p> <p>The project aims to construct a multi-modal dry port in Anyama, which is a suburb in the northern area of Greater Abidjan. Anyama has a railway station and marshalling yards. The multi-modal dry port will have the following facilities/functions:</p> <ul style="list-style-type: none"> • Cargo railway station • On-loading and off-loading machine • Truck Parking Lots • Bonded customs office warehouses • Private companies' warehouses • Container yards • Customs offices • Private companies' offices <p>The government of Cote d'Ivoire should construct most parts of the project, while some facilities should be provided by the private sector. Then a concession to manage the multi-modal dry port should be given to a private group.</p> <p>The objectives of the project are as follows:</p> <ul style="list-style-type: none"> • To efficiently connect railway transport and truck transport thus allowing uninterrupted transfer of cargo from one mode to another. • To create a logistics hub within the Greater Abidjan through integration of rail freight and road freight transport. <p>The proposed Cattle Market and Slaughterhouse Complex by the government is also situated in the same area and thus close coordination among the agencies involved in the two projects is necessary.</p>					
20	C	6	Project for Construction and Operation of Multi-Modal Dry Port in Ferkessédougou	ODA Technical Assistance & ODA Loan	US\$ 42 million
<p><u>Project Outline</u></p> <p>The Abidjan-Ouagadougou Railway (Sitarail) connects Abidjan Port with Bobo-Dioulasso and Ouagadougou in Burkina Faso. About 50% of the transport volume between Ouagadougou and Abidjan Port is transported by railway. However, the service areas (catchment areas) of the railway are limited to the areas closer to Ouagadougou and Bobo-Dioulasso.</p> <p>Ferkessédougou is located 570 km from Abidjan in the inland area of Côte d'Ivoire. Although there is a railway station in Ferkessédougou, it is not used much for cargo. That is, most cargo demand between inland areas and coastal areas in Cote d'Ivoire has been handled by truck. Moreover, the cargo demand between Mali and Abidjan Port has been mostly transported by truck.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
<p>The project aims to establish a multi-modal dry port at the railway station of Ferkessédougou. This project will facilitate cargo from Abidjan Port or Greater Abidjan to inland areas of Cote d'Ivoire or toward Mali, through the multi-modal dry port in Ferkessédougou. The multi-modal dry port will have the following facilities/functions:</p> <ul style="list-style-type: none"> • Cargo railway station • On-loading and off-loading machine • Truck Parking Lots • Bonded customs office warehouses • Private companies' warehouses • Container yards • Customs offices • Private companies' offices <p>By establishment of this multi-modal dry port, it will be possible to expand the service areas of the railway and increase cargo demand for the railway by combining rail transport and truck transport. The promotion of the utilization of the combined rail and truck transport through the multi-modal dry port could reduce the number of over-loaded trucks so that they can choose the combined rail and truck transport at lower prices.</p> <p>The government of Cote d'Ivoire should construct most parts of the project, while some facilities should be provided by the private sector. Then a concession to manage the multi-modal dry port should be given to a private group.</p>					
21	C	7	Projects for Construction of Motorway between Yamoussoukro and Bouaké (including Yamoussoukro Bypass Road and part of Bouaké Outer Ring Road) and Motorway between Bouaké and Niakaramandougou	ODA Loan	US\$ 724 million US\$ 847 million
<p><u>Project Outline</u></p> <p>In order to shorten the travel time between inland areas and coastal areas, the projects aims to extend the motorway up to Bouaké and furthermore to Niakaramandougou, by taking advantage of the existing motorway between Abidjan and Yamoussoukro. This kind of high-speed transportation is necessary to attract investment for the economic sectors in inland areas, especially those targeting coastal markets. In addition to reduction of travel time, the motorway is to be a high-standard road which could reduce vehicle costs. Together with Abidjan-Ouagadougou railway (Sitarail), this extension of the north-south motorway could contribute to help inland areas to attract investment in the agriculture and agro-processing sectors.</p> <p>The projects include the construction of Yamoussoukro Bypass Road and part of Bouaké Outer Ring Road, along which land development is possible for industrial and logistics land use.</p>					
22	D	10	Project for Strengthening of Airport Security by Installing Security Equipment	ODA Grant	US\$ 20 million
<p><u>Project Outline</u></p> <p>More movements of goods and people will be generated within the sub-region and between the sub-region and outside the sub-region, due to development of the north-south corridors and the coastal corridor in the sub-region. To correspond with such increase in movements, it is necessary to install equipment and providing training to strengthen security at national borders, including airports.</p>					
			Total		US\$ 6,087 million

Chapter 16 Development Strategies for Economic Sectors of Côte d'Ivoire

16.1 Agriculture Sector of Côte d'Ivoire

16.1.1 Present Situation and Future Prospects of Agriculture Sector of Côte d'Ivoire

The agricultural sector plays leading roles in the economy of Côte d'Ivoire and reducing social inequalities. The value added by the agriculture, forestry and fisheries subsector accounted for 27% of total GDP. In addition, many in the manufacturing and transport sectors also depend on agriculture. Cotton ginneries, and rubber, palm oil, and sugar factories provide the base for rural industry, while an important component of urban industry is made up of cocoa processing plants, textile and cottonseed oil operations, an instant coffee factory, packaging materials, and second stage transformation of palm oil into soaps, cosmetics, etc.

Côte d'Ivoire has favourable natural conditions in the whole country for most food crops such as soil, precipitation and temperature. Farmers are able to produce any food crops in their fields. In the country, Yams have the largest amount of production and cassava stays in the second place. Cassava is cultivated all over the country and yams are cultivated mainly in the northern part of the country. Côte d'Ivoire produces food crops in amounts that provide for self-sufficiency except for rice, maize and wheat. Rice production increased rapidly due to the increase of domestic needs, which barely covers 50% of national consumption requirements of milled rice. To fill this gap, Côte d'Ivoire resorts to massive imports of milled rice.

Besides the traditional cash crops such as coffee, cacao, cotton and sugarcane, non-traditional cash crops such as rubber, oil palm, and cashew nuts have increased. Among the non-traditional cash crops, the increase of cashew nuts production is remarkable.

16.1.2 Issues regarding the Agriculture Sector of Côte d'Ivoire

In agricultural sector, the following development issues are defined:

(1) Food Crops

The following are considered as key issues to increase productivity and production of food crops:

- Irrigation development for dry season cultivation
- Reduction of post-harvest loss through applying modern and appropriate post-harvest technology and development of storage facilities
- Application of processing technology which can increase added value of agricultural products
- Improvement of market access and distribution network
- Access of producers to finance
- Access of producers to quality seed
- Increase of agricultural machinery use
- Reduction of input cost such as fertilizer

(2) Rice

Constraints on the development of rice production are:

- Production of rice of Côte d'Ivoire cannot cover the domestic consumption needs.

- Côte d'Ivoire is in a situation of needing massive imports to meet growing domestic rice consumption.
- Productivity of local rice is low
- Marketing and processing infrastructure including road network, dryer, mill and storage are not sufficient.
- Actors of rice value chain are not sufficiently organized and involved in the development of the sector.
- Development of irrigation and water management in rice cultivation
- Access of producers to finance
- Access of producers to quality seed
- Increase of agricultural machinery use
- Reduction of input cost such as fertilizer

16.1.3 Objectives for Agriculture Sector of Côte d'Ivoire

In order to achieve the development goals, the objectives of the agricultural sector are defined as:

- Improving the productivity and competitiveness of crop productions in order to contribute to the transformation the livelihood of family farms so that they become relatively modern farms using production factors rationally and most of the production would be for the market, through:
 - The accessibility and use of agricultural inputs and veterinary are improved.
 - The mechanization of farms and small processing units is strengthened.
 - Agricultural advisory services, research, research and development and training are strengthened.
 - The water control is improved.
 - The lands are sustainably managed.
- To establish a framework for improving performance of the agricultural sector, such as food production and industrial crop production, through
 - Preparing a business environment for enhanced agricultural sectors
 - Utilizing production potential to meet domestic demand and increasing exports
 - Promotion of processing and storage of agricultural products

16.1.4 Strategies for Agriculture Sector of Côte d'Ivoire

The strategies for the agriculture sector development in Côte d'Ivoire are the following:

(1) Basic Strategy related to Rice Production

- Steady implementation of the National Strategy for the Development of the Rice Sector (SNDR)
- Promotion of private investment for agro-businesses, such as rice milling and distribution, through supporting agro-industrial pole development
- Development of a seed sector with the creation of six seed production centres
- Rehabilitation of all the sites developed for irrigated rice and realization of facilities for bas-fonds, water management in rice cultivation shall be improved too
- Strengthening of agricultural advice, support for mechanization of production, and technology transfer including providing and use of climate information
- Support to the processing and access to updates regarding local rice market prices and demands;
- Improving access of producers to markets, including roads, market infrastructure, market information, storage, etc.
- Strengthening the producers' organizations

- Improving access of farmers and producers' organizations to finance

(2) Basic Strategy related to Root Crops and Soybeans

- Steady implementation of the National Development Strategy for Food Crops Other than Rice (SNDCV)
- Promotion of private investment for agro-businesses and value chain development, such as yam/cassava processing and edible oil processing with soybeans, through supporting agro-industrial pole development
- Modernization of family farming including use of agricultural machinery
- Developing irrigation for dry season cultivation, and applying improved water management
- Improving access of producers to markets, including roads, market infrastructure, market information, storage, etc.
- Strengthening the producers' organizations
- Improving access of farmers and producers' organizations to finance

(3) Basic Strategy related to Cashew Production and Processing

- Increase cashew nuts through strengthening research of improved species, support to farmers such as technical extension and renewal of the orchards
- To provide quality nursery to producers
- To improve quality of raw product and processed product
- To facilitate access to finance (state guarantee, soft loan, etc.) and attracting local and foreign investors in cashew processing to achieve a conversion rate of 100% in 2020
- To increase the share of local processing of cashew

16.1.5 Programmes and Projects for the Agriculture Sector in Côte d'Ivoire

The following programmes, projects and measures were planned:

- Programme for Development and Effective Use of Agricultural Infrastructure and Bas-fonds
 - Project for Support of the Rehabilitation and Construction of Irrigation Facilities
 - Rice Development Programme (SNDR)
 - Food Crop Development Programme (SNDCV)
 - Peri-Urban Agriculture Project
- Project for Improvement of Agricultural Productivity and Production
- Project for Valuation and Development of Market for Agricultural Production
- Construction of Storage for Agricultural Product and Seed
- Support for Agro-industrial Pole of Bélier Region (including Yamoussoukro)
- Project for Acceleration of Cashew Nuts Processing
- Project for Development of Soybean Cultivation in the North and North-west of Côte d'Ivoire
- Support for Cotton Sector and Promotion of Cashew Processing in the Central and Northern Côte d'Ivoire (on-going, 3rd Component of PSAC)3rd Palm Oil Development Plan (Etude de Faisabilite du 3eme Plan Palmier, 2013)
- 7th Rubber Development Project (Etude de Faisabilite du Septieme Projet Hevea, 2012)

16.1.6 Priority Projects for Agriculture Sector of Côte d'Ivoire

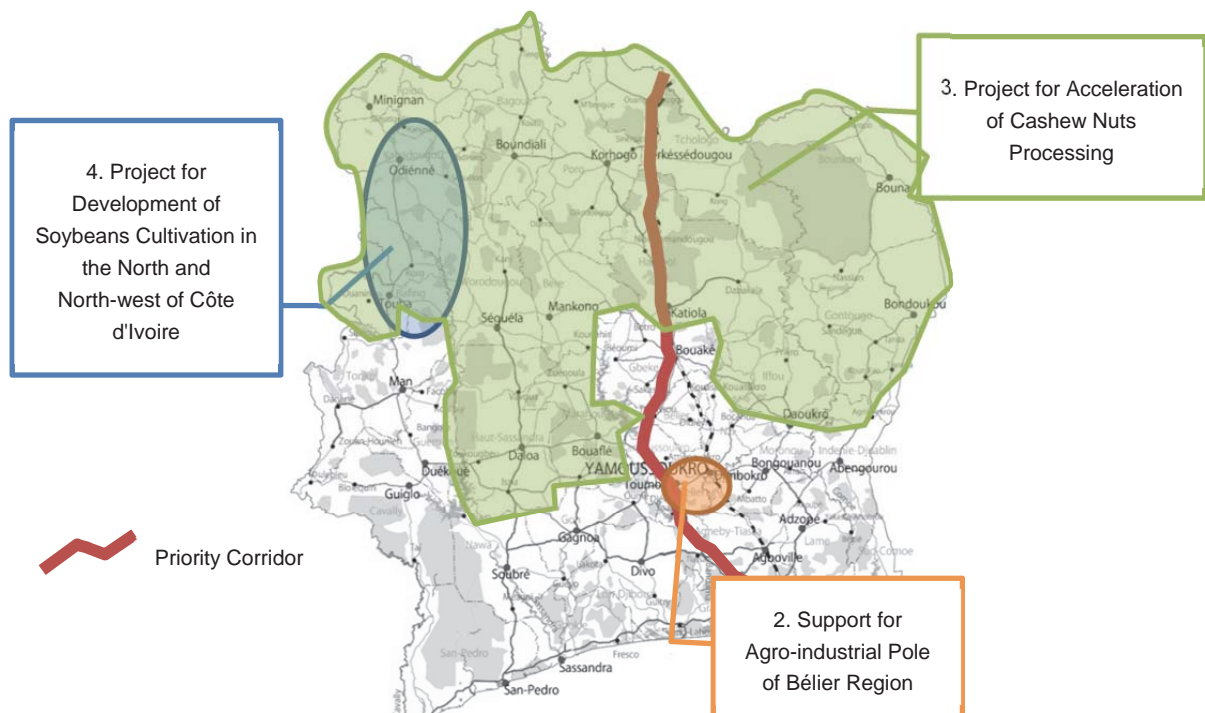
The agriculture sector is a key to overall economic growth and development of Côte d'Ivoire. At the same time, the sector supports livelihood of rural inhabitants as well as supports food security of the country.

Because Côte d'Ivoire imports massive amounts of rice to meet the increasing domestic demand, increase of rice production is an urgent issue of the agricultural sector. Stable and easy transportation to the big markets such as Abidjan will contribute to accelerate development of the network of production area, processing and storage facilities and large consumption area. The corridor development is expected to boost such development through providing advantage in road access and energy supply.

Cashew nuts are one of the promising commodities which has increased production remarkably in the recent year. Because the production area spreads across the northern part of the country, cashew nuts can receive much benefit from the corridor development. The advantage of road networks and electricity supply will attract private investors for renovating or new construction of processing facilities. It will contribute to increase added value of the cashew nuts value chain.

The priority projects shown below were selected considering above aspects.

- Programme for Development and Effective Use of Agricultural Infrastructure and Bas-fonds
 - Project for Support of the Rehabilitation and Construction of Irrigation Facilities
 - Rice Development Programme (SNDR)
 - Food Crop Development Programme (SNDCV)
- Support for Agro-industrial Pole of Bélier Region (including Yamoussoukro)
- Project for Acceleration of Cashew Nuts Processing
- Project for Development of Soybean Cultivation in the North and North-west of Côte d'Ivoire



Source: JICA Study Team

Figure 16.1.1 Locations of Priority Projects of Agriculture Sector of Côte d'Ivoire

16.1.7 Profiles of Priority Projects for Agriculture Sector in Côte d'Ivoire

(1) Programme for Development and Effective Use of Agricultural Infrastructure and Bas-fonds

1) Objectives

Demand for agricultural products from coastal markets is expected to grow at higher rates due to economic growth and increasing middle-income populations. Coastal corridor development and north-south corridor development could create the enabling environment for development of economic sectors, especially agricultural sector, in inland areas.

In this context, the project aims to sustainably improve food security, reduce poverty levels, to significantly increase the income of small producers in inland areas and contribute to the revival of the national economy by seeking the following specific objectives:

- Improve product production potential through development of agricultural infrastructure and Bas-fonds
- Improve access of small farmers to markets and technologies

2) Project Description

The project specifications are as below.

- Component 1: Formulation of implementation plan
 - activity 1 : Carry out technical studies
 - activity 2 : Carry out rehabilitation and development of necessary agricultural infrastructure
- Component 2 : Production Support
 - activity 1: Train farmers
 - activity 2: To provide quality seeds, fertilizers, and pesticides
 - activity 3: Provide small equipment production
- Component 3 : Marketing Support
 - activity 1: Development of an information system regarding production and marketing
 - activity 2: Train processors and traders
 - activity 3: Establish a funding mechanism
- Component 4: Project management
 - activity 1: Follow up evaluation of project activities
 - activity 2: Ensure the functioning of the coordination unit

Project to support the rehabilitation and construction of irrigation works

- Components 1: Technical studies
 - activity 1: Preparing Master Plan
 - activity 2: Proposed Draft Detailed Studies
- Component 2: Rehabilitation and construction of irrigation works
 - activity 1 : Agricultural infrastructure rehabilitation works
 - activity 2 : Construction of agricultural structures
 - activity 3: Specific land management
 - activity 4: Job Control
 - activity 5: Upgrade works
- Component 3: Support for the Development of infrastructures
 - activity 1: Insurance for the purchase of inputs and small tools
 - activity 2: Recruitment of a provider for support and advice
- Component 4: Project implementation
 - activity 1: Operation and Project Management

3) Expected Benefits

The following impacts and benefits are expected in this project:

- The rehabilitation and development are implemented
- The small production equipment is made available
- A funding mechanism is established
- An information system on the production and marketing is set up
- The capacity of producers, processors and traders are reinforced
- Rehabilitation and construction of irrigation works are effective
- Increased agricultural production is assured
- The capacities of producers are strengthened
- Producers' incomes have increased

4) Executing Agency and Related Institutes

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Agriculture and Rural Development (MINADER)
 - Project Management Unit (PMU) (to be established)
 - National Office for Rice Development (ONDR)
 - Directorate for Control of Water and Modernization of Farms (DMEME)
 - Directorate for Plant Production and Food Security (DPVSA)

5) Estimated Project Cost

The estimated total cost is counted 56,000 million FCFA for Development and Effective Use of Agricultural Infrastructure and Bas-fonds (3-years) and 109,210 million FCFA for Support the Rehabilitation and Construction of Irrigation Works (5-years) (estimated by MINADER).

6) Related Projects

Related projects are listed as follows:

- Rice Development Program (SNDR)
- Food Crop Development Program (SNDCV)

7) Social and Environmental Impacts

The Programme includes development of irrigation facilities and rural tracks. It is necessary to assess the social and environmental impacts when the feasibility study is conducted.

(2) Support for Agro-industrial Pole of Bélier Region (including Yamoussoukro)

1) Rationale

The project is to operationalize a global approach to agricultural development strategies that arise in the region for inclusive economic growth and strength. This is to ensure consistency and compatibility of interventions both private and public, in order to effectively address the need for development of the region and concerns of producers and other players in the agricultural sector. The proposed initiatives will also be to develop actions to promote agribusiness in order to ensure a lasting bond between producers and existing and future industrial units. The project will contribute to the emergence of a growth pole in connection with the private sector, according to the guidelines of the National Development Plan.

2) Objectives

The objectives of the project are:

- To increase sustainable productivity and crop production through the promotion of the agricultural sectors

- Development of agricultural infrastructure, market access, and processing
- Structuring of the actors of the agricultural sector for their professionalism and their closer involvement with various segments of the private sector
- Promotion of agribusiness through the stimulation of value chains and the emergence of partnerships between stakeholders
- Strengthening the resilience of beneficiaries to climate change

3) Project Description

The Feasibility Study on part of the irrigation rehabilitation/development and rural road development has been done by MINAGRI in 2016.

The expected components to be included are as below.

Agriculture Sector

- Irrigation development (irrigated areas, lowlands, floodplains) essential for good production
- Development of processing infrastructure, storage / preservation, marketing and transportation (rural roads)
- Acquisition of agricultural equipment production and processing
- Introduction of measures to encourage private initiatives and improve the factors of production (inputs, seeds, mechanization)
- Infrastructure development:
 - Irrigation facilities (rehabilitation and development) : 1,266 ha (target crops are rice and vegetables)
 - Rural road development: 828 km

Livestock and Fisheries Sector

- Development of basic infrastructure for livestock and aquaculture
 - Construction / rehabilitation of basic infrastructure
 - Conducting a study to identify potential grazing land and transhumance infrastructure
 - Developing at least two pilot pastoral zones (based on the results of the study)
 - Developing water points for animals (based on the results of the study)
 - Upgrade two fish farms (Yamoussoukro and Tiébissou) for the juvenile fish production
 - Construction / rehabilitation of post-harvest infrastructure.
 - Build and rehabilitate slaughterhouses at Didiévi, Yamoussoukro, Tiébissou and Toumodi
 - Build a cattle market at each abattoir or rehabilitated livestock market
 - Build modern butcheries
 - Construction / rehabilitation of health infrastructure
 - Organization of and strengthening the capacity of the actors
- Value chain for aquaculture, swine, poultry sub-sector

4) Executing Agency

Expected executing agency is listed below.

- MINADER
- MIRAH

5) Estimated Project Cost

The estimated total cost is counted 9,992 million FCFA for Irrigation Development and 7,637 million FCFA for Rural Road Development (5 years) (estimated by MINADER)

(3) Project for Acceleration of Cashew Nuts Processing

1) Objectives

The main objective of the project is to reduce poverty in rural areas through the processing of 100% of the cashew nuts produced locally in 2020.

Specific objectives are:

- To increase the share of local processing of cashew
- To increase investment in processing cashew
- To develop a range of products derived from cashew
- To include creating jobs for many young people and women
- To create rural wealth, particularly for producers

2) Project Description

Intervention zone

14 regions (Bafing, Eirb Hambol, Worodougou, Boukani, Gontougo, Bagoue, Kabadougou, Marahoué, Poro, Folon, Tchologo, Iffou, Hautou Sassandra)

Beneficiaries

The cooperatives, processors, exporters, buyers, producers, local authorities, the population (youth and women), and commercial companies

The project specifications are as below.

- Component 1: Business Climate Improvement in the field of processing cashew
 - activity 1: Implement incentive to provide fiscal and financial measures
 - activity 2: Securing land identified for the implementation of units
 - activity 3: Secure units that are viable for implantation sites
 - activity 4: Development and maintenance of the access roads to processing units
 - activity 5: Raising awareness
- Component 2 : Development of processing facilities for raw cashews
 - activity 1: Implement cashew processing units
 - activity 2: Select private operators for the management units
 - activity 3: Support existing processing units
 - activity 4: Promote local product processing
 - activity 5: Establish a contractual framework between key players
 - activity 6: Search for business opportunities in the international market
- Component 3: Project Coordination and Management
 - activity 1: Provide project management
 - activity 2: Set up a monitoring unit or regulatory agreements between the main and satellite units

3) Expected Benefits

The following impacts and benefits are expected in this project:

- National capacity for raw cashew nut processing increased by 145,000 tonnes
- 12 main units of capacity from 5,000 tonnes to 15,000 tonnes implanted in 12 project areas
- 33 satellite units installed by cashew growing areas
- 150,000 jobs, in particular for youth and women

4) Executing Agency and Related Institute

Expected executing agencies and related institutions for this project are listed below.

- MINADER
- Council for Cotton and Cashew

5) Estimated Project Cost

The estimated total cost is counted 101,750 million FCFA for 5-years. (estimated by MINADER)

(4) Project for Development of Soybean Cultivation in the North and North-west of Côte d'Ivoire

1) Objectives

The main objective of the project is to reduce poverty in the rural area through development of soybeans and other food crops.

Specific objectives are:

- To modernize farming systems by creating mechanized exploitation and encourage an increase in labour productivity and improved incomes
- To ensure a regional balance and reduce rural population drain
- To contribute to food self-sufficiency through the development of food crops (upland rice, maize, yams, etc.)

2) Project Description

Intervention zone

Bafing Region and Kabadougou Region including the towns of Touba and Odienné

Beneficiaries

The cooperatives, processors, exporters, buyers, producers, local authorities, the population (youth and women), and commercial companies

The project specifications are as below.

- Component 1: Creation of operating modules
 - activity 1: Land improvements (land clearing, connecting feeder roads etc.)
 - activity 2: Establishment of seed farms
 - activity 3: Construction of infrastructure (warehouses, hangars, multipurpose stores, repair shops for agricultural equipment ...)
 - activity 4: Agricultural equipment (tractors, combine harvesters, grader blades, subsoilers, water tanks 10,000 L etc.)
- Component 2: Training and Maintenance
 - activity 1: Training of farmers in good agricultural practices and crop management
 - activity 2: Training in equipment maintenance
- Component 3 : Development of agricultural production
 - activity 1: Organization of producers
 - activity 2: Provision of inputs to farmers through a credit line
 - activity 3: Establishment of a system of management and maintenance of equipment
- Component 4 : Logistic and institutional support to farms
 - activity 1: Support for the legal formalization of producer groups
 - activity 2: Marketing Support
- Component 5: Coordination and Project Management

3) Expected Benefits

The following impacts and benefits are expected in this project:

- Modern and mechanized farms are created in the subject areas

- Population drain in the rural area is slowed by the settling of populations in areas north and northeast
- Many jobs are created in this part of the country especially for the youth and women

4) Executing Agency

Expected executing agency for this project is listed below.

- MINADER

5) Estimated Project Cost

The estimated total cost is counted 26,450 million FCFA for 5-years. (estimated by MINADER)

16.2 Livestock Sector of Côte d'Ivoire

16.2.1 Present Situation of Livestock Sector in Côte d'Ivoire

The livestock sector is still developing economic activities in Côte d'Ivoire, with respective contributions of approximately 2% of total GDP and 4.5% of agricultural GDP for livestock breeding. Even though the ratio that the livestock sector occupies in GDP is low, they are important activities that affect a large number of farmers (more than 360,000 farmers), and contribute to: (i) strengthening food security with 60% of animal protein intake for food of the people; (ii) diversification and higher incomes for livestock farmers; and (iii) the preservation and improvement of the environment, in particular through the development of agriculture livestock associations.

Cattle breeding is over 95% traditional. The livestock farming system is the extensive type, sedentary or semi-transhumant. Approximately 85% of cattle population is concentrated in the country's northern region. The rest of the herd is divided between the Centre (10%) and South (5%). Livestock productivity is still low and Côte d'Ivoire imports more than half of its beef consumed and 88% of its milk.

The traditional poultry farming is an important source of animal protein and income in the rural areas. In general, traditional poultry accounted for 70% of total production, and modern poultry accounted for 30%. Modern poultry producing units are concentrated around major urban centres. At the national level, it is noted that there has been a remarkable growth in the production of day-old chicks set up by the industry in order to meet the demand. However, the output does not always meet the demands of some producers.

16.2.2 Issues regarding the Livestock Sector of Côte d'Ivoire

Limiting factors in animal products of Côte d'Ivoire are in the irrational management of pastoral areas, difficult access to specific inputs and the cost of animal feed, the persistence of certain animal diseases, destroyed or obsolete infrastructure to support production, difficult access to funding, and the unsuitability of the current institutional framework.

(1) Limitation of Pastoral Areas

Increased annual demographic and population shifts following the successive crises in the country have caused strong pressure on land and recurrent land disputes across the country. This situation reinforces land insecurity for farmers and is a major handicap to the extensive exploitation of livestock.

(2) High cost of Livestock Feed

There is a difficulty for farmers to supply raw materials in the feed mills, given the high cost of inputs and the seasonal variability of raw materials, which created a distortion in the prices. This increases production cost of livestock and limits the expansion of animal production.

(3) Animal Health and Public Veterinary Service

The persistence of certain animal diseases is an obstacle to the development of the sector. Outdated or non-functional border control infrastructure and weak networks of epidemiological surveillance of animal diseases are impediments in the efforts to contain the spread of serious risks to animal and human health in the context of growing international trade in livestock and livestock products.

(4) Lack of Infrastructure for Livestock

The infrastructure to support the livestock is still suffering the effects of a decade of socio-political crisis and the lack of adequate investment. Ranches, breeding stations, and stockyards are now destroyed or abandoned. This destruction has led to the relocation of several activities that are now conducted on other sites in the country, contributing to the abandonment of hydraulic systems, accommodation and pastoral tracks, the majority of which have degraded, and there has been widespread destruction of facilities for breeding of livestock, including cattle and small ruminants.

Slaughter facilities are degraded, and highlight the obsolescence of equipment. In most cities, these facilities are very outdated and do not meet basic hygiene standards.

16.2.3 Objectives for Livestock Sector of Côte d'Ivoire

The overall objective of the livestock development is to contribute to improving food security in terms of the quality of animal protein in the general framework of the fight against poverty and hunger as well as job creation as defined in the PSDPA.

Specifically, it is to contribute to:

- To increase the coverage of the national demand for animal protein by improving the productivity and competitiveness of the animal and fishery sectors
- To support the professionalization of farmers and entities of operators of livestock sectors

16.2.4 Strategies for Livestock Sector of Côte d'Ivoire

The strategies for the agriculture sector development in Ghana are the following:

(1) Basic Strategy related to Improving the Productivity and Competitiveness of the Livestock Sector

- Infrastructure provides for the development of animal production quality is increased taking into account the standards
- Growth and modernization of supply infrastructure for productivity and competitiveness in animal breeding
- To cover domestic demand for animal protein quality. It aims to improve the performance of the national herd
- Animal diseases and emerging and re-emerging zoonosis are reduced permanently

(2) Basic Strategy related to Development of the Livestock Sector

- Farmers and livestock professional organizations have access to financing and the necessary state services easily.
- Livestock production and animal quality are revitalized.
- Processing of livestock products quality and the business environment of the animal sector are strengthened.

(3) Basic Strategy related to Strengthening Capacities of Stakeholders in the Development of the Livestock Sector

- The animal industries are structured and capabilities of professional organizations of animal breeding are strengthened.
- The capacity of extension services, support and advice, research and development and training are revitalized and strengthened.

16.2.5 Programmes and Projects for the Livestock Sector of Côte d'Ivoire

The following programmes, projects and measures were planned:

- Integration of Youth and Women in Poultry in Côte d'Ivoire
- Construction of Cattle Market and Slaughterhouse Complex in Anyama
- Construction of Slaughterhouses within the Country (Yamoussoukro, Daloa, Bouaké, Ferkessédougou and Korhogo)
- Rehabilitation of Ranches and Breeding Stations
 - Rehabilitation of Seed Farm in Badikaha (FSB)
 - Meat Production in the Nioroungue Station (PBSN)
 - Meat Production in the Panya Station (PBSP)
- Support for Rehabilitation of Slaughterhouse of SIVAC "PRA-SIVAC"
- Support for Rehabilitation of Sales Outlets "GABY" (PARPG)
- Rehabilitation of Production Plant for Pork in Bingerville (RUPAB)
- Construction of Dairy Agro-industrial Complex in Toumodi

16.2.6 Priority Projects for Livestock Sector of Côte d'Ivoire

The livestock sector of Côte d'Ivoire has an important role in the fight against poverty and hunger, given the underutilization of the potential. The productive potential of the sector directly involved in the process of socioeconomic transformation and enters the food and nutrition security of populations.

The corridor development will contribute to increase productivity through reducing transportation cost of inputs such as animal feed and the shipping of the produce, and to develop the value chain of livestock through bringing in the investment to production and market related facilities.

In order to enjoy the impact of corridor infrastructure, various effort is required to improve the productivity and quality of the sector, such as providing appropriate support service for livestock producers, providing meat processing services for supplying safe and quality meat production to inhabitants, etc.

By developing feed crop production areas in collaboration with animal production areas and connecting them by the corridor and related trunk networks, it is possible to provide low cost feed stably so that effective value chains for livestock will be established.

The priority projects shown below were selected considering above aspects.

(1) Construction of Cattle Market and Slaughterhouse Complex in Anyama

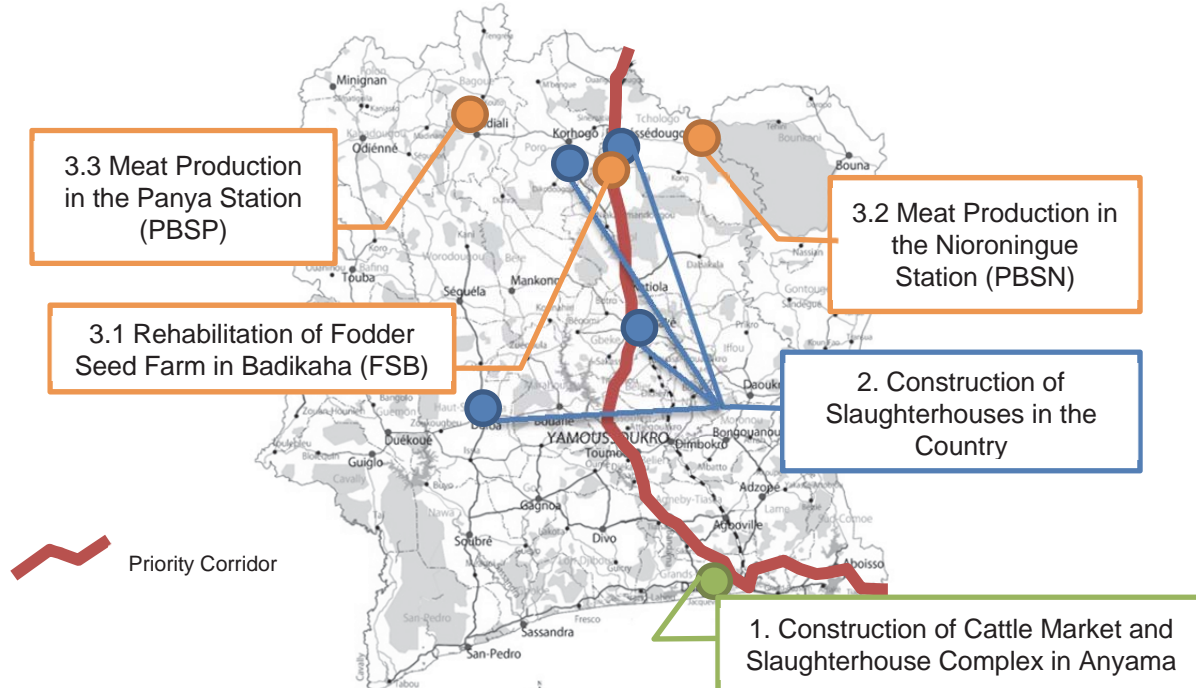
The project objective is to build a complex including a market and slaughterhouse for cattle and small ruminants in Anyama, Abidjan, in order to enhance marketing activities and meat production to provide meet products to Abidjan and its suburb areas with quality standards safeguarding the health of the population.

(2) Construction of Slaughterhouses in the Country (Yamoussoukro, Daloa, Bouaké, Ferkessédougou, Korhogo)

To improve the existing infrastructure of major cities (slaughterhouses Bouake and Daloa) and to construct appropriate infrastructure in cities (Yamoussoukro and Korhogo) in order to solve the constraints related to the provision of quality meat for the people of these cities .

(3) Rehabilitation of Ranches and Breeding Stations

- Rehabilitation of Fodder Seed Farm in Badikaha (FSB)
- Meat Production in the Nioroningue Station (PBSN)
- Meat Production in the Panya Station (PBSP)



Source: JICA Study Team

Figure 16.2.1 Locations of Priority Projects of Livestock Sector of Côte d'Ivoire

(4) Support to the Agro-Industrial Pole in the Bélier Region

Some components related to the livestock and fisheries sectors are included in the project for Agro-industrial Pole of Bélier Region, described in the agriculture sector section (16.1 7 (2)).

16.2.7 Project Profile of the Priority Projects for the Livestock Sector of Côte d'Ivoire

(1) Construction of Cattle Market and Slaughterhouse Complex in Anyama

1) Rationale

The existing slaughterhouse of Abidjan is obsolete and does not meet the health requirements, or the technical and environmental requirements inherent in its function. The project aims to consolidate marketing activities and slaughtering in Abidjan and its suburbs at a single centre well located in the urban periphery (in the town of Anyama, 28 km north of Abidjan) and meet the quality standards safeguarding the health of the population.

2) Objectives

The project objective is to build a complex of slaughterhouse and market for cattle and small ruminants with a slaughter capacity of 745 cattle / day and 425 small ruminants / day over an area of 41 hectares (ha) and the development of an area of 187 ha of pasture for animals in transit.

Specifically, this will involve:

- Equipping a modern slaughterhouse
- Increase slaughter capacity
- Ensuring the regularity of market supply
- Improving the quality of products
- Reorganize the sectors of livestock marketing and distribution of meat and better integrate national networks
- Create a meat industry and professionalization of the sector

3) Project Description

The complex of slaughterhouse and meat product market of Abidjan-Anyama include:

- Pasture built on 170 ha for cattle waiting to be sold
- A landscaped 2ha cattle market with facilities to receive a thousand cattle and small ruminants per day
- A cattle slaughterhouse
- A slaughterhouse for small ruminants (sheep and goats)
- A separate hall for processing offal, heads, feet, tails and leathers
- A separate sales market for wholesale meat and calf

4) Expected Benefit

The following impacts and benefits are expected in this project:

- The hygienic quality of the meat sold in the District of Abidjan is improved.
- Reducing the cost of meat
- Slaughter capacity increases to more than 700 cattle per day and over 400 heads of small ruminants per day
- The regularity of market supply is ensured
- Expert teams are formed
- A meat industry is operational

5) Executing Agency and Related Institute

Expected executing agencies and related institutions for this project are listed below.

- MIRAH

This project is expected to be implemented under a Public Private Partnership (PPP) scheme under the approval of the National PPP Committee.

6) Estimated Project Cost

The estimated total cost is counted 21,160 million FCFA. (estimated by MIRAH)

7) Necessary Actions for Implementation/Critical Factor

Necessary actions for implementing this priority project are as follows:

- To be approved by the National PPP Committee.
- Starting the tendering process of PPP scheme.

8) Social and Environmental Impact

During the construction of slaughterhouse buildings and their operation, some impact on the natural environment is expected. Thus, it is necessary to conduct the environmental impact assessment before starting the project.

(2) Construction of Slaughterhouses in the Country (Yamoussoukro, Daloa, Bouaké, Ferkessédougou and Korhogo)

1) Rationale

Because of the lack of appropriate infrastructure for processing and marketing of animals and meat production, there is a difficulty to provide safe and quality meat production to regional inhabitants.

In addition, nutritional insecurity created by animals illegally slaughtered in informal killing is a major risk to health and public hygiene. With this project, slaughterhouses and related facilities will be prepared and they will supply safe and good quality meat products to the people.

2) Objectives

The project objective is to improve the environment of animal and meat production and marketing through providing appropriate facilities for processing and marketing of livestock and meat in major cities, which has high potential for production and marketing in the country.

- To meet the needs in equipment and reorganize the marketing of livestock and meat
- Stimulate local livestock marketing (both cattle and small ruminants) and address the inadequate integration of livestock into the national economy
- Improve the health control for meat presented for human consumption
- Get sound economic management of the industrial slaughter units
- Reduce the risk of urban pollution and nuisance in the surrounding natural environment
- Promote local economic activity

3) Project Description

- Improvement of existing infrastructure (slaughterhouse) in Bouake and Daloa
- Construction of appropriate infrastructure in cities (Yamoussoukro and Korhogo)
- The detailed components and specifications will be designed in the national master plan of slaughterhouse in the country, which is currently under study by BNEDT.

4) Expected Benefits

The following benefits are expected in this project:

- Infrastructure for controlling transiting livestock is developed.
- The capacities of municipalities, rural communities and beneficiaries as key players in local development are reinforced.
- The organizational capacities of stakeholders in the sector of processing and marketing of livestock products are reinforced

5) Executing Agency and Related Institute

Expected executing agency and related institutions for this project are listed below.

- MIRAH

This project is expected to be implemented under a Public Private Partnership (PPP) scheme under the approval of the National PPP Committee.

6) Estimated Project Cost

The estimated total cost is counted 16,690 million FCFA for 5-years. (estimated by MIRAH)

7) Necessary Actions for Implementation/Critical Factor

Necessary actions for implementing this priority project are as follows:

- National master plan of slaughterhouses in the country must be formulated
- To be approved by the National PPP Committee.

8) Related Project

BNETD is currently conducting the study for preparing the national master plan of slaughterhouse in the country under the contact with MIRAH. The details of the project will be decided based on the Plan.

9) Social and Environmental Impact

During the construction of slaughterhouse buildings and their operation, some impact to natural environment is expected. Thus, it is necessary to conduct the environmental impact assessment before starting the project.

(3) Rehabilitation of Ranches and Breeding Stations

1) Rationale

Ranches and breeding stations are essential infrastructure for promoting animal production through supporting private producers by providing various technical support as well as supplying the quality breeding companies. The function of the existing national ranches and breeding stations are weak and inadequate. In fact, most are working at minimum standards, with skimpy budgets, not to achieve the food security objectives in animal protein, or in outdated, dilapidated or abandoned facilities. Thus it is necessary to rehabilitate those facilities urgently.

2) Objectives

The main objective of the project is to improve the productivity of farms and conservation of local breeds, through:

- Rehabilitating and creating breeding stations
- Keeping local breeds and improve the genetic potential;
- Improving availability of fodder for animal feed
- Strengthening the professional capacity of producers (developers and breeders) and technicians.

3) Project Description

The project consists of six main components:

- Rehabilitation of stations and livestock ranches;
- Production and distribution of seeds and fodder for animal feed;
- Conservation of local animal breeds and genetic improvement of livestock for introducing dairy germs and increased carcass weight of animal premises;
- Multiplication and distribution of improved animals;
- Sustainable management of the biodiversity of forage from the exploration and identification of fodder plants;
- Trainings.

Priority ranches and breeding stations to be improved are:

- Rehabilitation of Seed Farm in Badikaha (FSB): This project will effectively exploit an area of 55,000 hectares to produce animal feed and produce forage and forage seed for sale. It is necessary to rehabilitate farm infrastructures and renew equipment for production.
- Meat Production in the Nioroningue Station (PBSN): The project on Nioroningué station aims to establish intensive breeding of beef cattle and cattle fattening over an area of 2200 hectares.
- Meat Production in the Panya Station (PBSP): The project on Panya Station aims to establish an intensive breeding of beef cattle and cattle fattening over an area of 10,000 hectares.

4) Expected Benefits

The following benefits are expected in this project:

- Panya and Nioroningué Stations are functional: The operation of these station will help fulfil the meat products needs of the domestic population and provide quality animals to slaughterhouses.
- Seed Farm in Badikaha is functional: The seed farm will substantially fill the feed and fodder seed needs both for the animals of Côte d'Ivoire and the neighbouring countries, which often confronted with fodder shortages during the long dry seasons.

5) Executing Agency and Related Institute

Expected executing agency and related institutions for this project are listed below.

- MIRAHA

This project is expected to be implemented under a Public Private Partnership (PPP) scheme under the approval of the National PPP Committee.

6) Necessary Actions for Implementation/Critical Factor

Necessary actions for implementing this priority project are as follows:

- To be approved by the National PPP Committee.
- Starting the tendering process of the PPP scheme.

7) Social and Environmental Impact

The project includes development and operation of building facilities, ranch paddocks and forage fields. Because they are rehabilitations of existing facilities, major social and environmental impact will not be expected.

16.3 Fisheries Sector in Côte d'Ivoire

16.3.1 Present Situation of Fisheries Sector in Côte d'Ivoire

(1) Fishing Industries

The practice of fishing in Côte d'Ivoire is characterized by industrial fishing and artisanal fishing. The trawl fishing industry is the type of fishery in which the Ivorian have been mainly engaged. However, in the recent years, Ivorian trawl fishers are decreasing in number and are being taken over by Chinese trawlers. In comparison, the industrial trawler for sardine fishing seems more resilient. However, the Chinese sardine fleets have also started to appear since 2012. The volume of catch by the fisheries industry in Côte d'Ivoire is unstable and has decreased by almost half between the year 2010 and 2011 from 10,607 ton to 5,154 ton due to the increase in fuel price etc. There are also Spanish and French vessels tuna fishing in the Exclusive Economic Zone (EEZ) of Côte d'Ivoire. Unfortunately, the industrial segment of the capture activity did not create many jobs for the Ivorians.

Compared to the industrial fishing, artisanal fishing contributes more to the fishing sector in Côte d'Ivoire. Artisanal fishing produced almost 50,000 ton of fish in 2011, which is 10 times the amount of the industrial fishing.

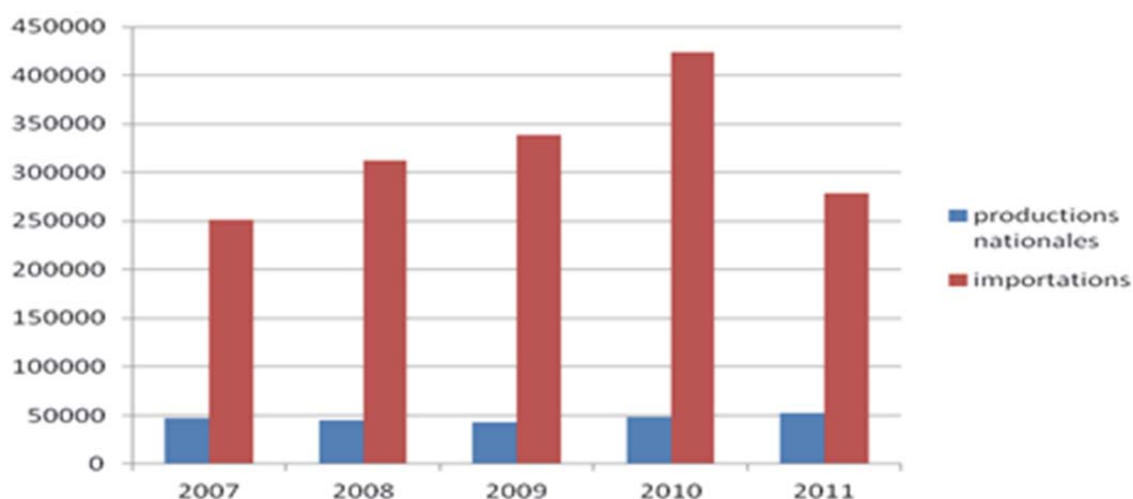
Artisanal marine fisheries in Côte d'Ivoire take place at the coast of Abidjan (Grand-Bassam and Jacqueville), San-Pedro, Sassandra, Grand Bereby and Taboo. Over 90% of such fishermen are Ghanaians. Their migration along the coast is part of their fishing strategy. They withdraw from the Côte d'Ivoire's sea to Ghana when yields are not sufficient or if there is a security threat. The number of large canoes continues to grow with a motorization rate of 22%. This could generate a substantial number of jobs and play an important role to supply the local markets sustainably and satisfy the growing demand for fish. The lagoon artisanal fisheries use gear which is unsophisticated and inexpensive. Main species they catch include bonga, catfish, tilapia, shrimp and crab.

(2) Fish Products

The important fish trade in Côte d'Ivoire is those related to the domestic fishing, imported frozen fish for the domestic market, imported tuna for canning and export tuna to foreign markets.

Fresh products sold in the market come from Abidjan Port, San Pedro Port, lagoons and lakes and imports. Retailers and wholesalers are supplied with small frozen pelagic from importers directly to warehouses. The imported fish is sold in market places and is mixed with fish from domestic fisheries. Therefore, it is impossible to distinguish the two categories of fish, once it is in the market places. It is a notable issue in Côte d'Ivoire that some fish in the market places are caught in lakes using chemicals. Since it is not possible to distinguish where the fish comes from, this creates a risk of toxic poisoning. Using chemical products in lakes for fishing will also cause ecological destruction.

The net supply of fish to Côte d'Ivoire was 280,000 tons in 2009. This volume is the sum of the volume of domestic production and that of imports, excluding exports. It has been relatively constant over the past decade, fluctuating between 220,000 and 280,000 tons. The amount of fish consumption per capita is around 13 kg (live weight) per year. Despite Côte d'Ivoire's efforts at nurturing the fisheries sector, it is necessary to do more in order to satisfy household needs without depending on imported fishery products.



Source: Ministry of Animal and Fishery Resources, 2014, Strategic Plan for the Development of Livestock Fisheries and Aquaculture in Côte d'Ivoire (PSDEPA-CI, 2014-2020)

Figure 16.3.1 Evolution of National Production and Imports of Fishery Products and Derivatives in Côte d'Ivoire, 2007-2011

(3) Scientific Research Activities

Research activities on the fisheries sector are supported by several institutions including the Centre for Oceanological Research Centre (CRO), the National Agricultural Research Centre (CNRA), the Ivorian Centre for Economic and Social Research (CIRES), and academic structures.

(4) Fisheries Infrastructure

The current level of infrastructure at the Abidjan Port is viable for accommodating ships with deep draught. These facilities are designed to increase the competitiveness of the Abidjan Port. In San Pedro, the Port Authority aims to improve the capacity of the fishing port to support the development of fishing activities in the western part of Côte d'Ivoire.

However, artisanal fishing suffers from an almost total lack of appropriate infrastructure, including docks, markets, production and supply facilities for ice.

16.3.2 Issues on the Fisheries Sector in Côte d'Ivoire

The following issues are identified in the fisheries sector in Côte d'Ivoire:

- Increasing demand for fish products with the growth of population
- Fish stock in the Gulf of Guinea can decline due to heavy exploitation by the fisheries sector and lack of information on stock assessment
- Lack of infrastructure for artisanal fishing
- Lack of linkage between scientific research institutions on fisheries and the institution in charge of fisheries development
- Lack of understanding about environmental protection and overfishing by people engaged in inland water fisheries

16.3.3 Objectives for the Fisheries Sector in Côte d'Ivoire

The objectives for the fisheries sector development in Côte d'Ivoire are defined as:

- To develop inland water fisheries to increase the amount of fish products to satisfy the demands of the growing population in a sustainable manner
- To develop marine fisheries by utilizing Abidjan Port and San Pédro Port, as well as, construction of necessary infrastructure for marine fisheries in fishing villages along the coast
- To strengthen the capacity of people engaged in the fisheries sector

16.3.4 Strategies for the Fisheries Sector in Côte d'Ivoire

The strategies for the fisheries sector development in Côte d'Ivoire are the following:

- To improve the monitoring and management systems of the fisheries, as well as, to protect the environment for inland water fisheries
- To increase the production of artisanal fisheries
- To develop the fishing industry for canning near Abidjan Port and San Pédro Port
- To provide opportunities for training at vocational schools to people engaged in the fisheries sector

16.3.5 Programmes and Projects for the Fisheries Sector in Côte d'Ivoire

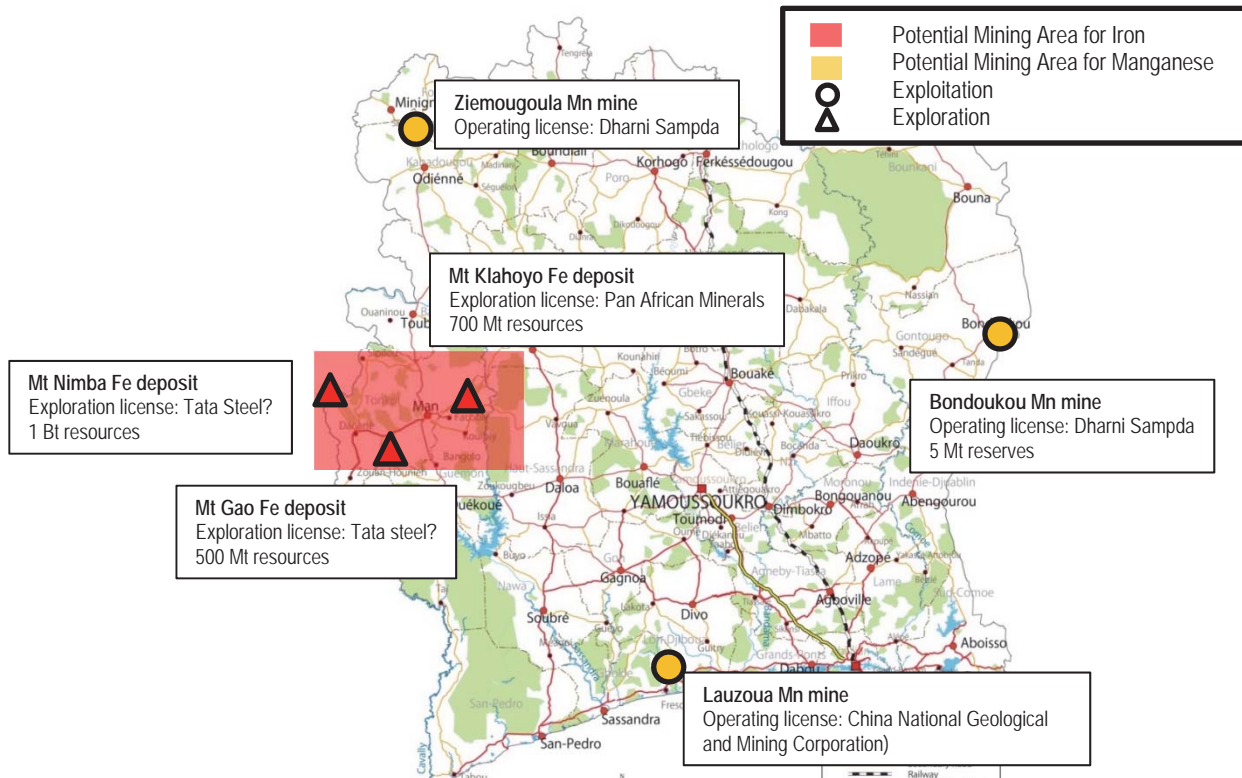
The following programmes, projects and measures are proposed:

- Project for Construction of Landing Facilities in Sassandra
- Project for Promoting Fisheries Industry in export processing zones
- Establishment of Vocational Training Schools for Fisheries Industry
- Project for Construction of Barges for Fisheries in Inland Côte d'Ivoire

16.4 Mining Sector of Côte d'Ivoire

16.4.1 Present Situation of Mining Sector of Côte d'Ivoire

There are five producing gold mines in Côte d'Ivoire, and gold is the most important in terms of government revenues. Besides gold mining, there are also manganese mines in Côte d'Ivoire.



Source: JICA Study Team

Figure 16.4.1 Existing and Potential Mining Sites in Côte d'Ivoire

Table 16.4.1 Mineral Reserves and Resources and Production Forecast of Main Mines

Ore Deposit	Reserves and Resources	Production forecast
Bondoukou Mn mine (Suspended)	3.2 million tons of proven reserves*	Total 1million tons/ year with three mines in operation at Bondoukou, Ziemougoula, Lauzoua mines within the next 2-3 years**
Ziemougoula Mn mine (Suspended)	3.3 million tons proven reserves with an additional 3 million tons of probable reserves*	
Lauzoua Mn mine (Suspended)	—	2016: 300 thousand tons/ year, 2017: 500 thousand tons/ year**
Mt Nimba Fe deposit (Not developed)	1 billion tons of resources***	—
Mt Gao Fe deposit (Not developed)	500 million tons of resources***	—
Mt Klahoyo Fe deposit (Not developed)	700 million tons of resources	11 million tons/year**

Source*: REUTERS

Source**: SODEMI, 2015

Source***: Ministry of Industry and Mines, 2015

(1) Manganese Mines

The Côte d'Ivoire government announced that manganese production of Bondoukou Manganese Mine, Ziemougoula Manganese Mine and Lauzoua Manganese Mine will reach 1 million tons within the next 2-3 years before interruption of those mines. However, at this current low metal price, this does not seem realistic.

1) Bondoukou Mn Mine and Ziemougoula Mn mine

Two manganese mines at Bondoukou and Ziemougoula are owned by Dharni Sampda. These two mines are now suspended due to the low price of manganese.

The Bondoukou Mine produced over 300,000 tons in 2014. Ore reserves in the Bondoukou Mine are estimated to be around 3 million tons. Ziemougoula manganese mine is estimated to have 6 million tons of reserves.

2) Lauzoua Mn Mine

The Lauzoua Mine, is operated by SODEMI (51% share), and China National Geological and Mining Corporation (49% share). The mine is also suspended due to the low metal price.

SODEMI, and China National Geological and Mining Corporation signed an agreement in 2009, and ore has been produced since 2013. Annual production of the Lauzoua Mine is 300,000 tons. The ore is transported by truck to the port at Abidjan.

(2) Iron Deposits

There are no producing iron deposits in Côte d'Ivoire at this moment, but there are some promising iron deposits in the western area of Côte d'Ivoire.

1) Mount Nimba and Mount Gao Iron Deposits

It is forbidden to exploit the iron deposit at Mt. Nimba since this area is a Nature Reserve and is protected due to environmental concerns. However, its resources are enormous with more than 1 billion tons. The iron deposit at Mt. Gao is estimated to have 500 million tons of resources. Drilling and geophysical surveys were conducted for several years, and there has been good progress in the survey conducted by Tata Steel. However, Tata Steel announced its withdrawal from the Mt. Gao project.

2) Mount Klahoyo Iron Deposit

The iron deposit at Mt. Klahoyo is owned by a joint venture between Pan African Minerals Ltd. and SODEMI. It is assumed to contain 700 million tons of iron ore, and is planned to produce 11 million tons per annum. Exploratory activity has already been under way and plans to build a new rail link to the iron ore are also under consideration.

16.4.2 Issues regarding the Mining Sector in Côte d'Ivoire

The following issues are identified for the mining sector in Côte d'Ivoire:

- Stagnant mining activities in mineral recession periods
- Lack of transport infrastructure for transporting extracted minerals, as well as for transporting fuel and equipment for mining activities
- Lack of foreign investments in exploration and extraction of the mining sector
- Shortage of information on mineral resources provided to private sectors
- Underdevelopment of downstream sectors of mining including processing of mineral resources within the country
- Unsafe condition of mine workers
- Negative impacts of mining projects on surrounding natural and social environments
- Lack of utilization of local people, including women from local communities, as labour force in mineral resource development in their country.
- Improper mining activities by artisanal small-scale mining

16.4.3 Objectives for Mining Sector of Côte d'Ivoire

The objectives for development of the mining sector in Côte d'Ivoire are defined as follows:

- To sustain mining activities so that the mining sector could continue to contribute to the national economy and employment
- To develop transport infrastructure for transporting extracted minerals, as well as bringing in fuel and equipment for mining activities
- To attract foreign investments in exploration and extraction of the mining sector by providing information on mineral resources
- To create an industrial structure which focuses not only on upstream industries but also downstream sectors including processing of mineral resources within the country
- To ensure the safety of mine workers, and to mitigate the impacts of mining projects on the surrounding natural and social environments
- To utilize local people, including women from local communities, as labour force in mineral resource development in their country.
- To enable artisanal small-scale mining to engage in proper mining activities in full consideration for the environment and local community.

16.4.4 Strategies for Mining Sector of Côte d'Ivoire

The following strategies are formulated for development of the mining sector in Côte d'Ivoire:

- To select target potential mines, formulate and implement an integrated programme for promoting sustainable mining activities by involving government organizations in charge of mining, railway and road, as well as investment promotion
- To establish a mineral information data base and open it to private sectors for supporting investment promotion to the mining sector
- To raise the level of mining policies and laws to the same standards as those in advanced countries and develop mining businesses.
- To distribute taxes and royalties derived from mining activities to local communities and create a funding system that can contribute to community development, in addition to Corporate Social Responsibility (CSR) activities
- To enhance the capacity of the monitoring system of artisanal small-scale mining

16.4.5 Programmes and Projects for Mining Sector of Côte d'Ivoire

The mines to be targeted for development of the mining sector in Côte d'Ivoire are as follows:

- Mount Gao Iron Deposits
- Mount Klahoyo Iron Deposit
- Bondoukou Mn Mine

Necessary intervention to promote sustainable development of Iron Deposits at Mt. Gao and Mt. Klahoyo is as follows:

- To organize a group of investors for construction and operation of the railway from San-Pedro Port through Man up to the iron ore mines

Necessary intervention to promote sustainable development of Ziemougoula manganese mine in the north-western part of the country is as follows:

- To construct the railway from Man through Odiénné up to the manganese mine by attracting private investment and facilitating the expansion of the railway to the manganese mine

16.5 Manufacturing Sector of Côte d'Ivoire

16.5.1 Present Situation of Manufacturing Sector in Côte d'Ivoire

The current Industrial Policy was released from the Ministry of Industry and Mines (MIM: *Ministère de l'Industrie et des Mines*) in 2014. This policy is partially derived from the Industrial Vision formulated with the assistance of UNIDO (United Nations Industrial Development Organization). UNIDO's vision stresses (a) exploitation of strategic natural resources; (b) repositioning and revolution of productivity in the agro-industry in terms of value added, export, and value chains; (c) optimization of flow of foreign direct investment to boost local SMEs; and (d) upgrading of the positioning of the country as the production base.

Also, the following are discussed through strategic axes such as (i) increase of private sector contribution, (ii) use of comparative advantages and (iii) support of quality standards, access to credit and industrial areas, and tax benefits.

As for key sectors for industries, the following are designated. To revive the textile industry for cotton, restructuring and development of textile companies and creation of a free zone for textile industries in Bouake are being considered.

- Agribusiness (Oil Palm, Cashew, Cotton Textiles, Cocoa, Hévéa, Fruits and Vegetables, etc.);
- Non-agricultural Natural Resources (Mining, Oil, Gas);
- Structuring Industries (Metallurgy and Steel Plant, Cement, Chemicals, etc.);
- Consumer Products (Textiles, Packaging, Generic Drugs, etc.);
- Light Manufacturing (Assembly and Installation, Equipment)

Moreover, for strengthening the competitiveness of industrial enterprises, the National Programme for Restructuring and Upgrading (PNRMN: *Programme National de Restructuration et de Mise à Niveau*) takes into account the facilitation of access to finance and other business support through the Agency for Development and Competitiveness of industries in Côte d'Ivoire (ADCI: *Association des Démobilisés de Côte d'Ivoire*), the Ivorian Agency for the Management and Development of Industrial Infrastructure (AGEDI: *Agence pour la Gestion et le Développement des Infrastructures Industrielles*), especially for industrial zone development, and so on.

16.5.2 Issues regarding the Manufacturing Sector in Côte d'Ivoire

Especially from the viewpoint of the corridor development, the following are recognized as issues or constraints for industrial development.

- Deterioration of infrastructure of the existing industrial zones
- Lack of industrial zones with qualified infrastructure in Abidjan and other urban centres
- Insufficient capacity of industrial supporting agencies or organisations

16.5.3 Objectives for Manufacturing Sector of Côte d'Ivoire

The main objectives of the manufacturing sector are:

- To revitalize the existing industrial zones to boost the economy along the East-West (or Coastal) and North-South Corridor areas,
- To develop new industrial zones to strengthen private sector activities in accordance with the appropriate type of industrial subsector,
- To strengthen the capacity of industrial supporting agencies or organisations

16.5.4 Strategies for Manufacturing Sector of Côte d'Ivoire

The strategies for the manufacturing sector are determined as follows:

- To rehabilitate the existing industrial zones and economic infrastructure

- To secure new production space for manufacturers especially along the Central North-South Corridor, particularly in relation to bypass roads or ring roads to be constructed for the Central North-South Corridor
- To strengthen the capacity of agencies and organizations to develop and manage the industrial zones
- To introduce the following expected types of industrial sub-sectors such as food, beverage, and plastics for industrial zones along the Coastal and North-South Corridors as shown in Table 16.5.1 which can be consumed by the emerging middle income population not only within Côte d'Ivoire but also in the sub-region
- To develop parts and intermediate goods manufacturing for motor vehicles and electrical and electronics industries on a long-term basis along the Coastal Corridor aiming at the large market of Nigeria

Table 16.5.1 Expected Types of Industries in Côte d'Ivoire

Classification of sub-sector/ISIC	Prioritized types of sub-sector by Ministry of Industry and Mines in the whole country	Typical types of industries in major cities along the East-West Corridor	Existing types of industries in major cities along the East-West Corridor	Expected Types of Industries in major cities along the Coastal Corridor	Typical types of industries along North-South Corridor	Existing types of industries along North-South Corridor	Expected Types of Industries along North-South Corridor
1 - Manufacture of food products (Based on cocoa, cashew, oil palm, fruits and vegetables, etc.)	V	V	V	X	V	V	X
2 - Manufacture of beverages	V	V	V	X		V	X
3 - Manufacture of tobacco products							
4 - Manufacture of textiles (cotton)	V	V		X	V	V	X
5 - Manufacture of wearing apparel		V		X	V	V	X
6 - Manufacture of leather and related products							
7 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials		V	V	X		V	X
8 - Manufacture of paper and paper products		V					
9 - Printing and reproduction of recorded media		V	V	X			
10 - Manufacture of coke and refined petroleum products	V	V	V	X			
11 - Manufacture of chemicals and chemical products	V	V		X		V	X
12 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	V	V	V	X		V	
13 - Manufacture of rubber and plastics products		V	V	X	V	V	X
14 - Manufacture of other non-metallic mineral products	V	V	V	X			
15 - Manufacture of basic metals	V	V		X			
16 - Manufacture of fabricated metal products, except machinery and equipment	V	V		X		V	X
17 - Manufacture of computer, electronic and optical products		V					
18 - Manufacture of electrical equipment	V	V		X			
19 - Manufacture of machinery and equipment	V	V		X		V	X
20 - Manufacture of motor vehicles, trailers and semi-trailers		V					
21 - Manufacture of other transport equipment		V					
22 - Manufacture of furniture		V	V	X		V	X
23 - Other manufacturing						V	
24 - Repair and installation of machinery and equipment			V	X		V	X

Source: JICA Study Team based on the Industrial Policy from the Ministry of Industry and Mines (MIM) and various documents on industrial location factor by Industrial Location Center of Japan

16.5.5 Programmes and Projects for Manufacturing Sector of Côte d'Ivoire

The following programmes and projects are proposed:

- Rehabilitation of the infrastructure (roads, electricity, water supply and sewerage) of the existing industrial zones such as Yopugon, Koumassi and Vridy in Abidjan;
- Development of new industrial zones in urban centres through PPP along the Corridors such as Bonoua, Yamoussoukro, Bouaké, Korhogo, Man and San Pedro with introduction of expected or prioritized types of subsectors;
- Development of new industrial zones and free zones through PPP schemes such as PK24 with 940 ha in Abidjan, Biotechnological and ICT free zone in Grand Bassam, and Songon free zone in Abidjan;
- Strengthening of the Agency for Development of Infrastructure for Industries (AGEDI), which was established in 2015, for smooth implementation of the industrial zone development through the managerial and technical training based on lessons learnt in other countries.

16.5.6 Profiles of Priority Projects for Manufacturing Sector of Côte d'Ivoire

(1) Packaged Development Project of New Industrial Zones in Bonoua, Yamoussoukro, Bouaké, Korhogo, Man and San-Pédro

1) Rationale

As discussed in the preceding section, one of the strategic axes of the industrial policy of the Ministry of Industry and Mines is access to industrial areas or provision of industrial zones with qualified infrastructure in urban centres by PPP scheme. The candidate locations of sites are designated in Bonoua, Yamoussoukro, Bouaké, Korhogo, Man and San-Pédro. By taking advantage of the upgrading of the corridors in the country, these industrial zones should be developed efficiently and effectively.

2) Objectives of the Project

- To provide industrial enterprises with industrial space in which qualified infrastructure and management services are available in selected urban centres
 - By constructing new industrial zones which are equipped with qualified infrastructure in selected urban centres
 - By developing necessary infrastructure in order to make the new industrial zones functional

3) Project Description

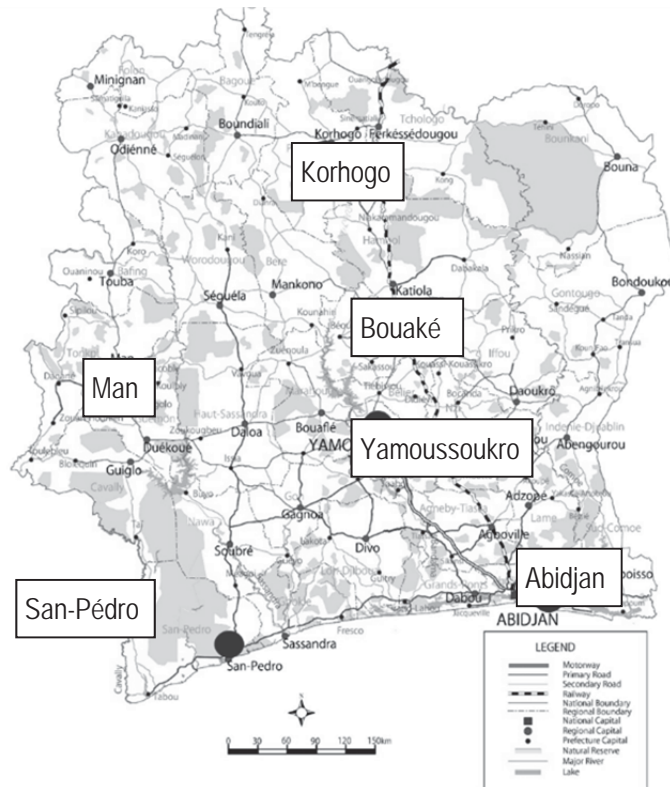
The Project is to conduct land development of six industrial zones by phase. Additional studies on investment demand analysis, expected type of manufacturers to be encouraged to invest, land use, lot allocation, traffic network analysis, roads, water supply, sewerage, power supply, telecommunication, solid waste management, project implementation schedule, cost estimate, and environmental and social considerations may be needed for some of the zones.

Also, legal arrangements including incentives and one stop services for investment, land acquisition and resettlement, setting up of the implementation agency, funding, procurement of consultants and contractors or developers, agreement for external (off-site) infrastructure, should be taken into consideration.

The approximate area of the three zones, Bonoua, Yamoussoukro and Bouaké are 50 ha, 700 ha and 500 ha, respectively. Other zones are between 100 and 200 ha.

The Project is to provide divided lots with adequate infrastructures including electricity, water drainage and telecommunications. Also, the Project is to provide management services for enterprises in cooperation with the Ministry of Industry and Mines and the Agency for Development of Infrastructure for industries (AGEDI).

Based on the list of innovative, high-impact socio-economic projects for a Country Emergent 2020 by the government, the total investment amount for six zones is estimated at CFA 100.5 billion.



Source: JICA Study Team based on the information from the Ministry of Industry and Mines (MIM)
Figure 16.5.1 Project Locations for the Project of New Industrial Zones in Côte d'Ivoire

4) Expected Benefits

The following impacts and benefits are expected in this project:

- More local people are employed.
- More local products are utilized for processing.
 - As a result, the development of manufacturing activities is promoted by utilizing local products and employing local people.
 - As a result, value chains utilizing local products in the surrounding areas are created.

5) Executing Agency and Related Institutions

The Agency for Development of Infrastructure for industries (AGEDI) under the Ministry of Industry and Mines would be the executing agency for the Project with private sector participation through PPP schemes. AGEDI and a private developer will be responsible for the basic design and detailed design of the industrial zone, preparation of management plans for the industrial zone and implementation of EIA in cooperation with the local administration. Also, coordination with the related agencies in terms of the external infrastructure development of the industrial zone is indispensable.

6) Implementation Schedule

The implementation schedule for this packaged project is shown in the table below. The schedule of implementation will be varied for each industrial zone. The implementation schedule for a single industrial zone is generally around 4 years.

Table 16.5.2 Implementation Schedule for the Packaged Development Project of New Industrial Zones

Item/Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Note
Component 1 Planning & Promotion											Technical & Financial Support will be necessary.
Component 2 Design Works											
Preparatory Works											
Construction											

Source: JICA Study Team

7) Necessary Action for Implementation / Critical Factor

Necessary action for implementing this priority project is as follows:

- Planning and investment promotion activities to introduce investors and developers

8) Related Projects

Related projects are listed as follows:

- Projects for developing infrastructure, such as roads, electricity supply and water supply, for supporting industrial zones, as well as for city services, are related to this industrial zone project.

9) Social and Environmental Impacts

The following social and environmental impacts should be taken into account:

- Relocation of existing people and houses, as well as other environmental impacts are to be studied for each specific location of new industrial zones

(2) Agency for Development of Infrastructure for Industries (AGEDI) Strengthening Project

1) Rationale

The Agency for Development of Infrastructure for Industries (AGEDI) was newly established in 2015 for smooth implementation of the industrial zone development by PPP scheme.

To promote foreign and domestic investment, especially in industrial zones, it is important to increase the capacity of AGEDI through managerial and technical training based on lessons learnt in other countries.

2) Objectives of the Project

- To strengthen the capacity of organization and personnel of AGEDI for investment promotion for industrial zones
- To strengthen the technical capacity of organization and personnel of AGEDI for industrial zone development

3) Project Description

The project descriptions are as below.

- Capacity Development of AGEDI
 - Strengthening of planning capability on industrial zones development
 - Intensive training on investment promotion activities including marketing and public relations
 - Enhancement of overseas network of AGEDI with associations of industrial and free zones in Africa and the Middle East.

- Enhancement of management and monitoring of developers/tenants of industrial zones
- Formulation of the evaluation criteria for the selection of the applications by developers and tenants of industrial zones.
- Preparation of a guideline for industrial zone developers to ensure the quality of the infrastructure and facilities.
- Legal & Institutional Arrangements
 - Strengthening of the legal section of AGEDI in order for them to hold seminars to disseminate the information on laws and regulations for investors and to review incentives, and non-fiscal incentives in particular, to compete with other countries.
- Strengthening of One-stop Service Window
 - Enabling AGEDI to function as the real one stop service office for manufacturers/tenants in the industrial zones in cooperation with the customs office and other agencies.
 - Tighter coordination with the related agencies and local governments
 - Strong coordination with the related agencies in terms of the external infrastructure development of industrial zones
 - Promotion of coordination on securing of industrial land in cooperation with local governments

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Effective and efficient development of industrial sectors in regional cities, as well as in Greater Abidjan
- Effective utilization of private sector financial and management capacity to develop and manage industrial zones in regional cities, as well as in Greater Abidjan

5) Executing Agency and Related Institutions

The related institutions for this project are listed below.

- AGEDI
- Ministry of Industry and Mines

6) Implementation Schedule

The implementation schedule for this project is from 2016 to 2019 (three years)

7) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Allocation of qualified human resources
- Allocation of the necessary budget

16.6 Information and Communication Technology (ICT) Sector of Côte d'Ivoire

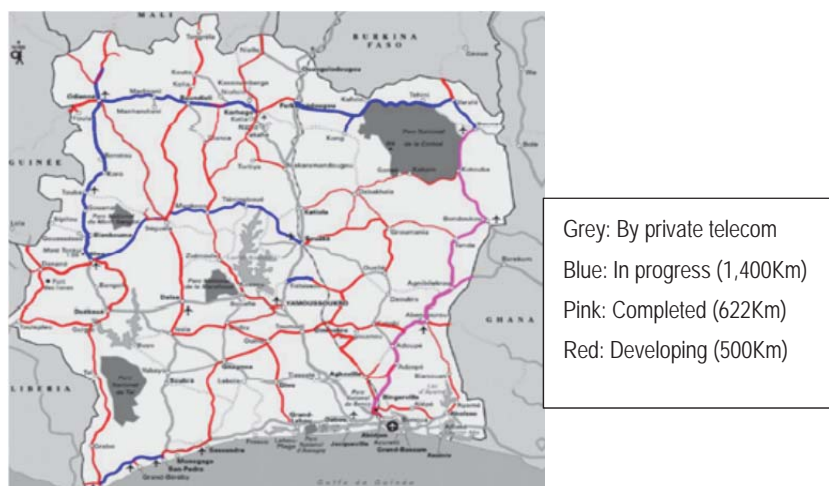
16.6.1 Present Situation and Future Prospects of ICT Sector of Côte d'Ivoire

(1) ICT Policy of Côte d'Ivoire

The National Development Plan (PND: *Plan National de Développement*) lists ICT related priority projects and ICT utilization in other sectors.

(2) Telecommunication Network

Backbone optic fibre cables are implemented and operated by private telecommunication operators. But the private sectors cannot invest much in the unprofitable areas. Therefore, these infrastructures cannot be expanded into rural areas. The government continues to make an effort to construct more backbones. In a few years, government owned optic fibre backbones will reach 8,000km. Along with the continuous effort to implement more trunk lines or branch lines and to upgrade them, accessibility for end-users must be improved. Last mile connection, especially in the rural areas, is still being challenged although the mobile network is penetrating well and in some places mobile phone penetration rate reaches 100%. This connection can be by land lines or wireless broadband. In this matter, several potential projects are seen in the list of potential projects in 16.6.5.



Source: ANSUT

Figure 16.6.1 Telecommunication Network in Côte d'Ivoire

(3) ICT Park/Data Centre

The government owns three data centres, two of them in the central area in Abidjan and one in Grand Bassam, However all of them are too small and the facilities owned are too old to accommodate new systems running.

(4) Human Resources Development

Human resources for ICT are recognized as a key for the growing ICT. The Ministry of Digital Economy and Posts (Ministère de l'Économie Numérique et de la Poste)¹ owns an ICT oriented university named the African School of Information Technology and Communication (ESATIC: *Ecole Supérieure Africaine des Technologies de l'Information et de la Communication*).

(5) Future Prospects

The table below compares the current situation and proposed future demand in the ICT sector in Côte d'Ivoire.

Table 16.6.1 Current Situation and Future Prospects of ICT Sector in Côte d'Ivoire

	Now	2025	2040
Individual usage of Internet	14.6% (2014)	50%	70%
Individuals using Internet	2.60% (2013)	40% (World Ave. 2014)	60%
Broadband subscription	0.26% (2013)	10%	30%
ICT HRs		15,000	40,000

Source: JICA Study Team based on TIU statistics and estimations

¹ Former Ministry of Communication and Posts was renamed at the end of 2015

The ICT improvement can support other infrastructures which constitute corridors and industries that will be established along those corridors. Necessary measures have to be ready earlier than implementing new corridor infrastructures. In this sense, ICT infrastructure development must be prioritized. However, ICT services must be grown at the same time. It is because infrastructure development may cause easier access to foreign countries, and more procurement of services, software and contents will be possible.

16.6.2 Issues on ICT Sector of Côte d'Ivoire

The following issues related to the ICT industry and human resources development of ICT sector are identified:

(1) Infrastructure

- There are still not enough optic fibre backbones, especially in rural areas. Even where backbones are implemented, continuous effort for upgrading is required.
- Urban area landline connectivity (optic fibre) is poor even though it is focusing on wireless connectivity. The stronger connectivity inside cities or rural areas must be implemented by optic fibre connections or broadband wireless for more utilization of IT applications with internet connections and the facilities to access them.
- There are no well facilitated data centres where valuable data are stored in a secure way and also many types of ICT services can serve various types of users.

(2) Human Resources Development

- Although programming level education is currently being provided, high level IT resources must be developed. This includes systems design skills, project management skills, requirements, systems operation skills, etc.
- More opportunities to participate in actual projects are expected.

(3) ICT Services

- ICT industry in Côte d'Ivoire is weak. More involvement of private companies in government projects is necessary.
- Skilled persons need to be gathered for the development of ICT services.

16.6.3 Goals of ICT Sector of Côte d'Ivoire

The objectives for ICT industry of Côte d'Ivoire are as follows:

- ICT will be reachable by all the citizens of Côte d'Ivoire
- Businesses are supported by ICT.

16.6.4 Objectives for Development of ICT Sector of Côte d'Ivoire

The strategies for the development of ICT industry of Côte d'Ivoire are determined as follows:

- To make any industries competitive by ICT
- To provide more opportunity to use ICT to all of citizens not only telecommunication, but also by providing equipment to access the ICT and also user-friendly applications
- To prepare facilitation and develop the human resources necessary to expand ICT infrastructure and ICT accessibility to avoid procurement by foreign companies
- To grow the ICT industry in order to develop domestic needs by domestic resources as well as

16.6.5 Strategies for ICT Sector of Côte d'Ivoire

The strategies for the development of the ICT industry of Côte d'Ivoire are determined as follows:

- To expand and upgrade existing telecommunications infrastructure
- To penetrate public ICT access places especially in the rural areas
- To improve facilitation and develop human resources necessary to expand the ICT infrastructure and ICT accessibility
 - * Above three strategies must be executed as public projects at this moment except upgrading existing private telecommunication operators. Thus, initially those are built and owned by a public body, but after a certain term, they will be transferred to private operators.
- To build secure facilities where important data, equipment and other resources are accommodated.
 - * They should be developed by private enterprises with some public supports like joint investment and base-cargo user.
- To create domestic ICT industry with the assistance of foreign investment
 - * The Government should support private ICT industry in providing them government projects and in supporting in facilitations, regulations, promotion methods to attract foreign investment.

16.6.6 Programmes and Projects for ICT Sector of Côte d'Ivoire

The required achievements shown below have been raised by a few public organizations of the countries and they are valid for addressing the issues.

- New Data Centre construction in Grand Bassam (VITIB)
- Cyber Centre Construction
- Last Miles Construction
- Converged Communication (Telephony system replacement in the administrative offices)
- IP MPLS (New IP level Communication system on the network for government offices)
- CDMA-LTE Migration
- e-Agriculture Programmes which consists of 14 projects (related to Agriculture sector)
- e-Health Project
- Construction of Graduate School for ESATIC
- Integrated Education Management System
- Network Connection among Educational Organization

16.6.7 Profiles of Priority Projects for ICT Sector of Côte d'Ivoire

(1) Project for Human Resources Development for ICT Specialists

1) Project Outline

The ICT industry is one of the economic sectors not only for driving the national economy, but also for supporting a variety of basic functions required for other economic sectors. ICT infrastructure is one of the important corridor infrastructures when it comes to the importance of high speed of transport and services. It is essential to attract investments to economic sectors in inland areas, as well as in coastal areas.

Therefore, human resources for ICT are recognized as a key not only for the growing ICT, but also for the supporting economic sectors both in inland areas and coastal areas.

In Côte d'Ivoire, the Ministry of Digital Economy and Post (Ministère de l'Economie Numérique et de la Poste) manages an ICT oriented university, namely, the African School of Information Technology and Communication (ESATIC: Ecole Supérieure Africaine des Technologies de l'Information et de la Communication). In this university and other private schools, a

programming-level of ICT education is currently provided. However, there are no training institutions to train IT specialists with high-level skills including design skills, project management skills and systems operation skills.

The project aims to provide this high-level training so that more ICT personnel could be trained to attain high-level knowledge and skills on ICT.

Not only for training for high-level ICT specialists, but also for retaining them within Cote d'Ivoire, it is necessary to implement more actual projects for ICT and generate ICT jobs in Côte d'Ivoire. Moreover, it is necessary to expand and upgrade ICT infrastructure for improving internet and ICT accessibility in Côte d'Ivoire.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

US\$ 6 million

(2) Construction and Management of Data Centre in Grand-Bassam

1) Rationale

Relationship with National Plan

PND aims that 1) People have access to quality telecommunication at the lowest possible cost and 2) People enjoy quality ICT infrastructure and e-Government tools

Relationship with Corridor Development

The candidate location, Grand Bassam, is located along the main corridor ie. Abidjan-Lagos, where the data centre can easily provide ICT services to any entity on the corridor.

2) Objective

The objectives of the project are as below.

- Modern infrastructure and reference, including two government DC - The modernization of services provided to the administration through making such resources serviceable (PAAS, IAAS, SAAS)
- This centre will also provide various types of ICT services to the corridor's infrastructure, and public sector.
- ICT human resources are to be gathered and to be developed well by training and OJT.

3) Project Description

The project specifications are as below.

- New data centre construction in the "Village of Information Technology and Bio-technology" where partial operation has already been started
- Necessary facilities such as redundant electricity, telecommunication lines, generators, air-conditioners, UPSs, etc
- Network operation centre will be furnished with necessary equipment
- Prepare office spaces where ICT human resources can be accommodated
- Technical Assistance to implement efficient and secure System Operation



Source: The JICA Study Team

Figure 16.6.2 Project Location for Data Centre Construction Project in Côte d'Ivoire

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Contribute to other sectors in utilizing ICT to grow those other sectors and to attract foreign investment.
- Support to improve governance of administration offices.
- Usage of domestic services rather than foreign services. This contributes to the improvement of the national economy

5) Executing Agency and Related Institutions

- Expected executing agencies and related institutions for this project are listed below.
- Ministry of Digital Economy and Posts
- National Agency for Telecommunications/ICT Universal Services (ANSUT: Agence de Nationale du Service Universel des Telecommunications)
- Computer Development National Company (SNDI: Société Nationale de Développement Informatique)

6) Estimated Project Cost

Estimated project cost is US\$ 10-15mil.

7) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 16.6.2 Implementation Schedule for Data Centre Construction Project in Côte d'Ivoire

Item/Activity	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Note
Design	■						
Construction		■	■	■	■		
HR development for System Operation		■	■				

Source: JICA Study Team

8) Necessary Action for Implementation / Critical Factor

Operational organization must be considered.

9) Related Project

Related project is as follows:

- Trunk Line Optic Fibre Cable Construction

10) Social and Environmental Impacts

The assessment of social and environment impacts must have been conducted at the construction of VITIB.

(3) Construction and Management of Public Cyber Centres (5,000 sites)

1) Rationale

Relationship with National Plan

PND aims that 1) People have access to quality telecommunication at the lowest possible cost, 2) People enjoy quality ICT infrastructure and e-Government tools

2) Objectives

The objectives of the project are as follows:

- Provide public access facilities to rural areas as well as application systems which motivate citizens to utilize the internet
- Support internet access opportunities to citizens especially in rural areas

3) Project Description

The details of the project are as follows:

- 5,000 (Final target) centres will be constructed starting from a few pilot centres.
- Centres will have PCs, printers, scanners, cameras, internet connections, vital sensors connected with the internet, electric generators, etc.
- Internet access will be established by suitable measure from cable connection wireless connection, UPSs, etc.
- Application systems and contents will be developed to attract citizens, such as vital checks, remote medical examination, e-learning, etc.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- More citizens can access the internet.
- Provides citizens in rural areas health-care opportunities and educational opportunities,

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Digital Economy and Posts
- ANSUT(National Agency for Telecommunication/ICT Universal Services)

6) Estimated Project Cost

The estimated project cost is US\$ 10-15mil.

7) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 16.6.3 Implementation Schedule for Cyber Centre Construction Project in Côte d'Ivoire

Item/Activity	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Note
Design	■						
Development		■					
Pilot		■					
Lot 1- n			■	■	■		

Source: JICA Study Team

8) Necessary Action for Implementation / Critical Factor

Operational organization must be considered.

9) Related Project

Related project is as follows:

- Trunk Line Optic Fibre cable construction

10) Social and Environmental Impacts

To be studied.

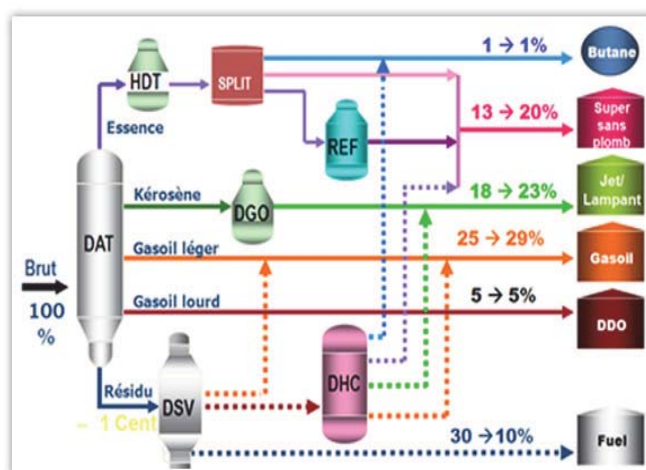
16.7 Oil Sector of Côte d'Ivoire

16.7.1 Present Situation and Future Prospects of Oil Sector of Côte d'Ivoire

(1) Refinery

Société Ivoirienne de Raffinage (SIR) is a refinery to produce fuel oils, while Société Multinationale de Bitumes (SMB) is a subsidiary of the SIR to produce bitumen.

SIR is a refinery with a capacity of 3.8 million tons per year. It has a hydrocracking unit (DHC) which upgrades the distillate from the DSV as shown in Figure 16.7.1.



Source: SIR

Figure 16.7.1 Block Flow Diagram of SIR

Shareholders of SIR are PETROCI and international oil companies and the Governments of Burkina Faso, and Côte d'Ivoire as shown in Table 16.7.1.

SIR has concluded a technical assistance contract with TOTAL.

Table 16.7.1 Shareholders of SIR

Shareholder	%
PETROCI	45.74
TOTAL	25.35
SONANGOL	20.00
Burkina Faso	5.39
Sahara Limit.	1.98
Côte d'Ivoire	1.54
Total	100.00

Source: SIR

SIR has an excess capacity over the domestic demand for petroleum products. Surplus supply is exported to West / Central Africa, USA, and Europe by sea, and neighbouring landlocked countries such as Burkina Faso and Mali by land. Among these regions, Nigeria is the largest export destination.

Table 16.7.2 Market of SIR (2012)

Market	Supply (k tons/year)	%
Côte d'Ivoire	1,341	43
Landlocked countries such as Burkina Faso and Mali	163	5
Export by sea in West/Central Africa, Europe, and USA	1,608	52
Total	3,112	100

Source: SIR

It is forecast that in the markets of West and Central Africa imports of petroleum products will reach 74 million tons per year by 2031, according to the Strategic Development Plan 2011-2030. The Government of Côte d'Ivoire has a vision to become the petroleum product hub in Africa.

(2) Storage and Distribution of Petroleum Products

Société de Gestion des Stocks Pétroliers de Côte d'Ivoire (GESTOCI) is a storage company of refined petroleum products for consumption in Côte d'Ivoire and neighbouring countries. The shareholders of GESTOCI are PETROCI and international oil companies.

Table 16.7.3 Shareholders of GESTOCI

Shareholder	%
PETROCI	12.5
Vivo Energy	25.0
Libya Oil - CI	12.5
Corlay -CI	12.5
TOTAL - CI	37.5
Total	100.0

Note: The vast majority of assets belong to PETROCI

Source: Website of GESTOCI

GESTOCI has three storage terminals for petroleum products. Among these terminals, the Bouaké terminal was destroyed during the socio-political crisis of 2002. Besides the deposits of GESTOCI, the companies TOTAL-CI, VIVO Energy, ORYX, Libya Oil and PETRO IVOIRE have two storage depots with an overall capacity of 73,290 m³, located in Abidjan. These deposits make it possible to refuel the entire national market. However, the GESTOCI Abidjan oil depot also provides supplies to the countries of the hinterland (Burkina Faso and Mali).

Table 16.7.4 Storage of GESTOCI

Location	Storage Capacity (m ³)	Inflow from	Outflow to
Abidjan	324,400	Pipeline connection with SIR Reception by ship Reception by FSIR	Pipeline to Yamoussoukro, Burkina Faso Railways to Burkina Faso Lorry tanker to CI and Mali
Yamoussoukro	60,000	Pipeline and lorry tanker from Abidjan	Lorry tanker to CI, Mali and Burkina Faso*, (* Burkina Faso will procure petroleum products from Yamoussoukro storage soon.
Bouaké	48,000 (Destroyed during the socio-political crisis)	(*)Pipeline from Abidjan has already been built, but not yet working.	(*) After rehabilitation of depot: lorry tanker, tank wagon and pipeline to CI, Mali and Burkina Faso

Source: JICA Study Team based on the interview to GESTOCI

It is planned to extend the Abidjan-Bouake pipeline to Ferkessédougou where a deposit of petroleum products will be built.

16.7.2 Issues on Oil Sector of Côte d'Ivoire

The issues on the oil sector of Côte d'Ivoire are as follows:

(1) Refinery

- Petroleum product specifications in Africa, AFRI 4 & AFRI 5, will become more stringent. However, for now, the SIR units aren't producing fuels which consistent with these standards.
- According to the Strategic Development Plan 2011-2030, studies indicate that the petroleum products market in West Africa will reach about 60 million tons per annum by 2030. However, the current refining capacity in the region is 35 million tons per annum. The SIR could position itself meet the needs of countries that do not have refineries, and partially fill the insufficiency for some countries that presently have refineries.

(2) Storage and Distribution of Petroleum Products

- Deterioration of the road and rail traffic network is an obstacle to transporting petroleum products and increases the risk of accidents.
- Bouaké Storage of GESTOCI is unable to function, since it was destroyed during the 2002 socio-political crisis.

16.7.3 Objectives for Oil Sector of Côte d'Ivoire

The objectives for the oil sector of Côte d'Ivoire are as follows:

- To modify the SIR units to be able to produce petroleum products that meet the more stringent AFRI4 & AFRI5 specifications in 2020.
- To establish a storage and distribution network for petroleum products from Abidjan to the northern part of Côte d'Ivoire and the landlocked countries, Burkina Faso and Mali.
- Improve supply to shaded areas.

16.7.4 Strategies for Oil Sector of Côte d'Ivoire

(1) Refinery

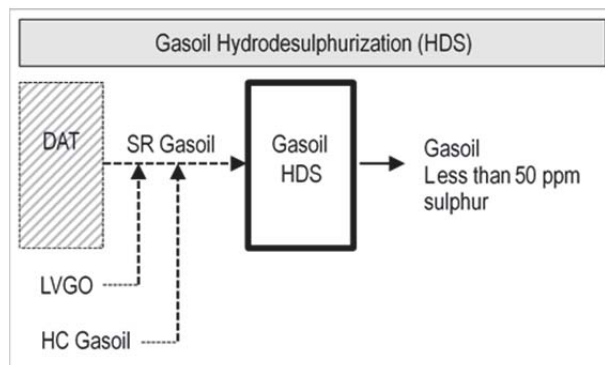
1) Construct the Gasoil Hydrodesulphurization (HDS) Unit

The African Refiners Association (ARA) recommended in 2010 that;

- The government should assure that official fuel specifications reflect AFRI-4 or better by 2020; and
- Members of ARA should develop investment plans with their shareholders to the AFRI-4 specifications by the 2020 deadline.

The AFRI-4 specification limits the sulphur content of gasoil to 50 ppm at maximum. Since the process units of SIR are unable to produce gasoil that meets this sulphur level at present, it is necessary to take measures to do so. The Gasoil HDS unit is the most practical measure to reduce sulphur content of gasoil.

The SIR needs to construct the Gasoil HDS unit by 2020. As shown in Figure 16.7.2, the Gasoil HDS unit is installed downstream of the Atmospheric Crude Distillation unit (DAT) to reduce sulphur contents from straight run gasoil (SR Gasoil), light vacuum gasoil (LVGO), and hydrocracked gasoil (HC Gasoil).



Source: JICA Study Team

Figure 16.7.2 Construct Gasoil HDS in SIR

2) Modify Hydrocracking Unit to Convert Fuel Oil into Gasoil

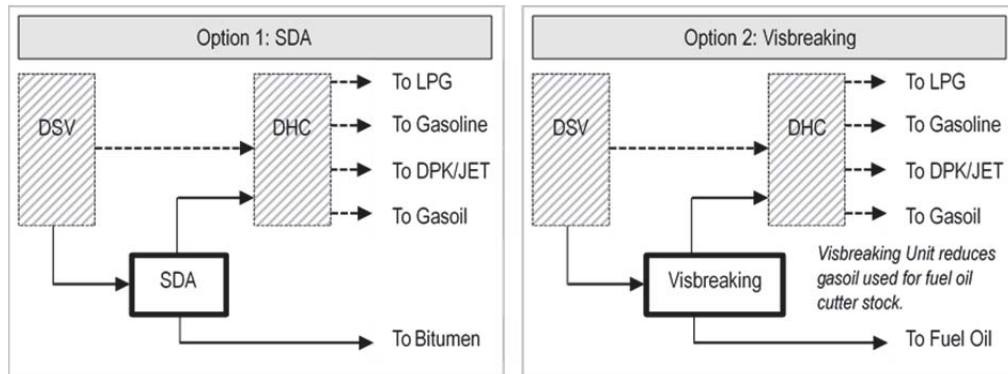
Demand for gasoil is getting higher and higher in the market of Côte d'Ivoire and West/Central Africa. SIR is producing more fuel oil than demanded in the market as is the case with most refineries in the less industrialized countries. Accordingly, SIR needs to modify its process units to convert fuel oil into gasoil.

SIR has already had the Hydrocracking unit that is a residue conversion process widely used in the world refineries. Modification of the Hydrocracking unit for raising the conversion rate of residue will increase gasoil production and decrease fuel oil production.

Two options are considered for preparing additional feedstock for the Hydrocracking unit as illustrated by Figure 16.7.3.

In the Option-1, the solvent de-asphalting unit (SDA) is added to make de-asphalted oil to feed to the Hydrocracking unit (DHC) by removing asphalt from vacuum residue coming from the vacuum distillation unit (DSV). Asphalt from the SDA is used for bitumen production.

In the Option-2, the Visbreaking unit, which treats vacuum residue from the Vacuum Distillation unit (DSV), is added aimed at reducing the viscosity of the fuel oil to decrease gasoil consumption as fuel oil cutter stock, and preparing vis-broken vacuum gasoil as feedstock for the Hydrocracking unit.



Source: JICA Study Team

Figure 16.7.3 Feedstock Preparation for the Hydrocracking Unit

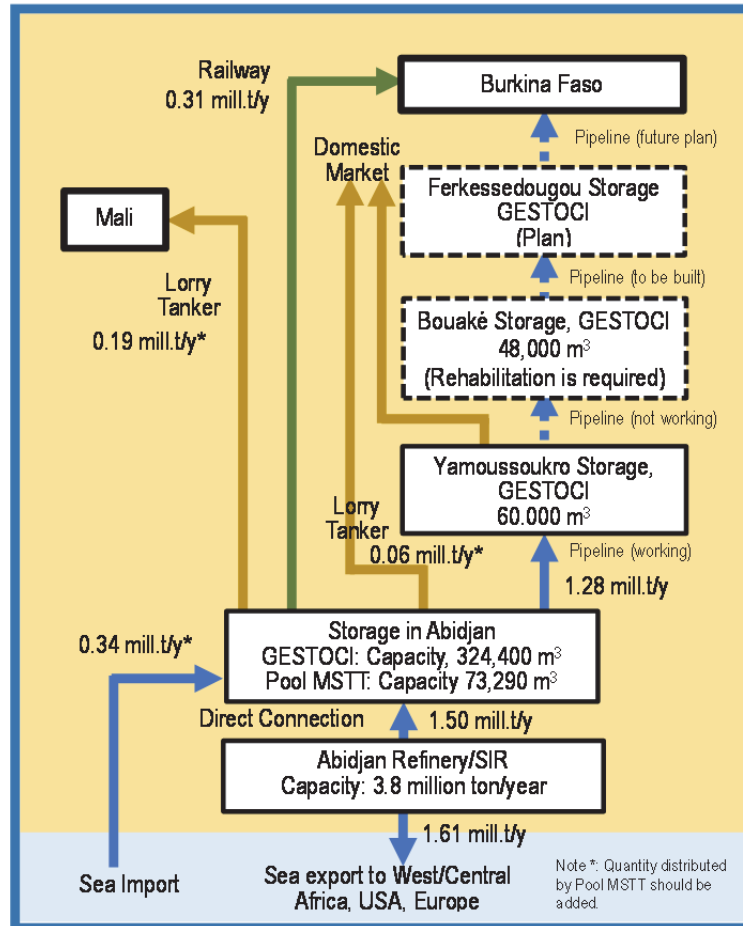
3) Give Careful Consideration to Increasing the Capacity of SIR to 10 million tons/year.

This project is presented, as a long term project, in the Strategic Development Plan 2011-2030, project sheets. Since the required investment is as high as CFAF 2,630 Billion as indicated in the project sheet, SIR will have a large risk. Careful consideration is required for increasing the capacity of SIR from 3.8 million tons per annum to 10 million tons per annum,

(2) Storage and Distribution

1) Construction of the Multi-Product Pipeline between Abidjan-Ferkessédougou

It is recommended that the Government of Côte d'Ivoire complete the construction of the multiproduct pipeline between Abidjan and Ferkessédougou. This pipeline will be used for transporting gasoline and gasoil which account for a large share of petroleum products in Côte d'Ivoire. Thus, its service will significantly reduce the transport volume of petroleum products by road. It is necessary to ensure the development of petroleum product storage that is required for operating the pipeline system.



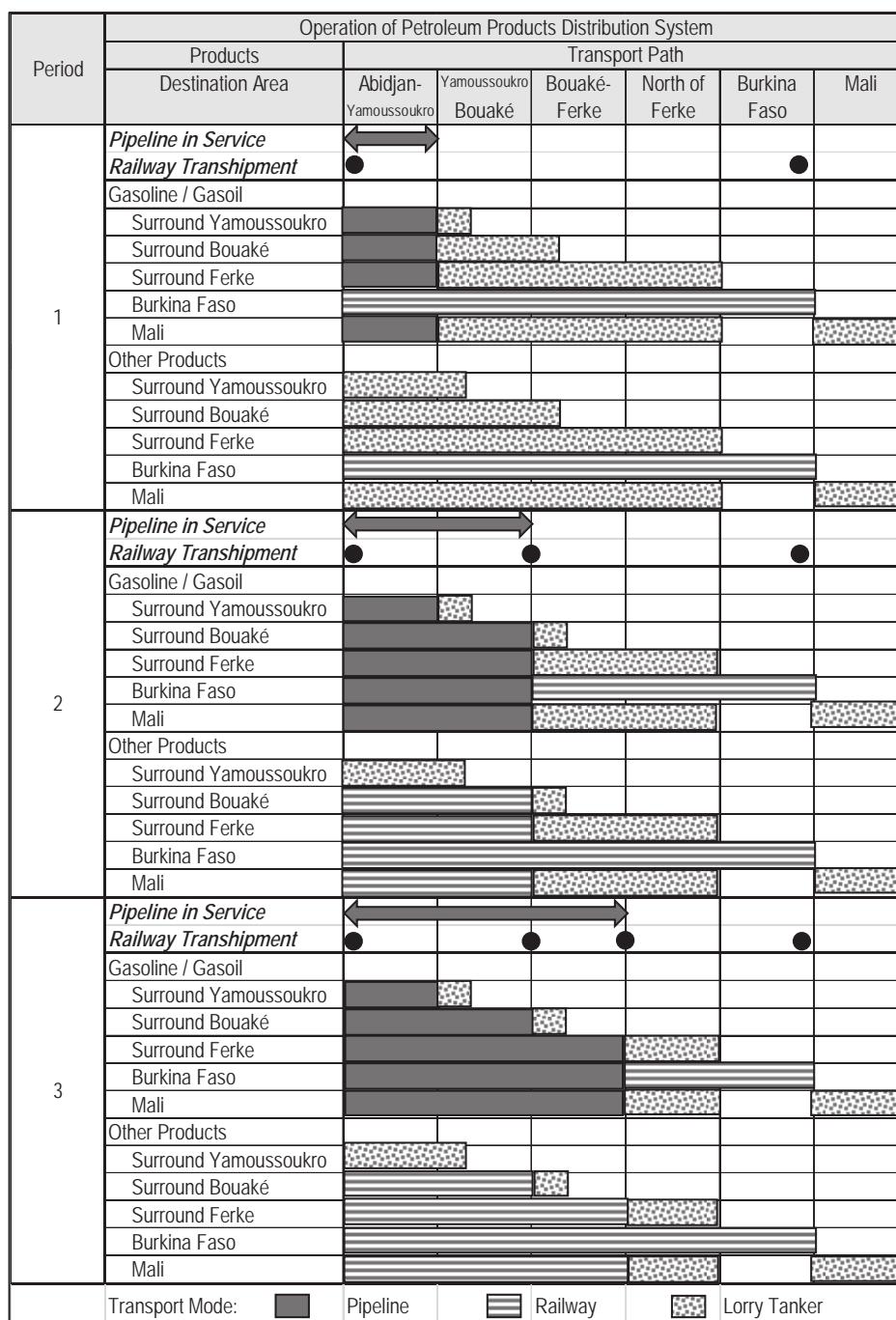
Source: JICA Study Team based on the data in 2012-2014

Figure 16.7.4 Storage and Distribution Network

2) Select the Transport Mode depending on the Situation

The existing railway is running through Abidjan, Bouaké and Ferkessédougou in Côte d'Ivoire. If facilities for loading and unloading facilities from railway tankers are installed in the storage facilities in Bouaké and Ferkessédougou, such petroleum products as Jet-A1, DDO, fuel oil and butane can be transported by railway. The multi-product pipeline is not suitable for transporting such petroleum products due to the relatively small transport volume or the nature of the products. Therefore, railway is the best mode of mass transport for these petroleum products.

It is necessary to select the mode of transport depending on the situation of the pipeline and loading/unloading facilities for railway transshipment. Figure 16.7.5 presents the proposed transport mode for gasoline/gasoil and other petroleum products in line with the development of the pipeline and loading/unloading facilities for railway transshipment.



Source: JICA Study Team

Figure 16.7.5 Proposed Transport Mode

The following actions need to be taken in each period:

Period 1

- Construct the pipeline between Abidjan and Yamoussoukro and the depot at Yamoussoukro (already completed and in operation).
- Change the origin of lorry tanker transport of gasoline and gasoil to the domestic markets surrounding and in the north of Yamoussoukro including Mali and Burkina Faso from the depot at Abidjan to that at Yamoussoukro.

Period 2

- Construct the pipeline between Yamoussoukro and Bouaké (already completed).
- Rehabilitate the storage at Bouaké (GESTOCI waiting authorization of guardianship).

- Start services of the pipeline between Yamoussoukro and Bouaké.
- Change the origin of lorry tanker transport of gasoline and gasoil to the domestic market surrounding and in the north of Bouaké including Mali and Burkina Faso from the depot at Yamoussoukro to that at Bouaké.
- For gasoline and gasoil for the markets in Burkina Faso, change the transport mode: from railway transport from the depot in Abidjan to the final destinations; to a combination of pipeline transport from the depot in Abidjan to that at Bouaké and railway transport from the depot at Bouaké to the final destinations.
- For other petroleum products for the domestic market surrounding and in the north of Bouaké including Mali, change the transport mode: from lorry tanker transport from the depot in Abidjan to the final destinations; to a combination of the railway transport from the depot in Abidjan to that at Bouaké and the lorry tanker transport from the depot at Bouaké to the final destinations.

Period 3

- Construct the pipeline between Bouaké and Ferkessédougou.
- Construct the depot at Ferkessédougou (GESTOCI waiting authorization of guardianship).
- Start services of the pipeline between Bouaké and Ferkessédougou
- Change the origin of lorry tanker transport of gasoline and gasoil to the markets surrounding and in the north of Ferkessédougou including Mali and Burkina Faso from the depot at Bouaké to that at Ferkessédougou
- The petroleum storage yard at which gasoline and gasoil are transhipped from the pipeline to the railway for the markets in Burkina Faso is changed from Bouaké to Ferkessédougou
- The petroleum storage yard at which other petroleum products are transhipped from the railway to lorry tankers for the domestic market surrounding and in the north of Ferkessédougou including Mali is changed from Bouaké to Ferkessédougou.

16.7.5 Programmes and Projects for Oil Sector of Côte d'Ivoire

(1) Projects for the Refinery

SIR undertakes the following projects for modifying its refinery, according to “Reflexion SIR 2020”.

Table 16.7.5 Refinery Modification Projects by SIR

Project	Description
Add sea line for white products export	<ul style="list-style-type: none"> • Increasing capacity of sea line for white products loading to tankers from 30,000 to 50,000 tons.
Add Gasoil HDS with target of 10 ppm sulphur	<ul style="list-style-type: none"> • The SIR must be able to supply products that comply with environmental standards. Gasoil specifications will become all the more stringent (AFRI-4). • Build Gasoil HDS unit, which may have the target sulphur level 10 ppm with a future margin, and related units in compliance with the petroleum product specification trend.
Increase in the capacity of Hydrocracker	<ul style="list-style-type: none"> • Demand for gasoil will get increasingly higher. Refineries with high rates of returns trend to convert oil residues into light products. The SIR must meet gasoil needs by increasing its level of conversion. • Increase the capacity of its Hydrocracking unit and build a new and full conversion refinery.
Increase in conversion by de-asphalting or viscosity reduction	<ul style="list-style-type: none"> • Increasing feedstock of Hydrocracker unit by adding SDA or Visbreaking unit.
Improvement of Energy Index by energy saving	<ul style="list-style-type: none"> • Improve the energy efficiency of SIR.

Source: Reflexion SIR 2020

(2) Project for Petroleum Product Distribution

The Strategic Development Plan 2011-2030 indicates the projects for petroleum product distribution in Table 16.7.6.

Table 16.7.6 Projects for Petroleum Product Distribution

Project
Storage Terminal 1st Phase: 1,100,000 tons
2 nd Phase: increase to 2,000,000 tons
Construction of a Sphere, Filling plant and 12" Butane Line
Upcountry Pipeline: Bouaké- Ferkessédougou
Construction of a depot at Ferkessédougou
Construction of the San Pedro Depot
Construction of the Abidjan – Yamoussoukro – Ferkessédougou butane gas pipeline

Source: Strategic Development Plan 2011-2030 Project Sheets

16.7.6 Profiles of Priority Projects for Oil Sector of Côte d'Ivoire

Among projects for the oil sector, the section of Bouaké-Ferkessédougou of the petroleum products pipeline project between Abidjan and Ferkessédougou is selected as the priority project for corridor development, taking the following points into consideration:

- View of the Ministry of Petroleum and Energy
- Gasoline and gasoil which will be transported via this pipeline are the major products accounting for more than 70% of petroleum products used in the market in Côte d'Ivoire, Burkina Faso and Mali. Therefore, it is expected that this pipeline will contribute to improvement in the efficiency of distribution system of petroleum products.
- This pipeline will contribute to massive transport of petroleum products to landlocked countries such as Burkina Faso and Mali.
- Since this pipeline is along the Abidjan – Ouagadougou route, the project would aid the growth ring corridor development.

PETROCI and private partners will establish a joint venture company to construct, operate and maintain the Abidjan - Ferkessédougou pipeline.

GESTOCI needs to rehabilitate the depot in Bouaké, since it was destroyed during the socio-political crisis. After the rehabilitation project of the Bouaké depot is completed, the Yamoussoukro- Bouaké section with a length of 127 km will be able to work.

Then, construction of the Bouaké- Ferkessédougou section with a length of 300 km will be able to start

(1) Abidjan - Ferkessédougou Pipeline Project (Project Profile DGH/13, MPE)

The following description is a copy of the project profile made by the Ministry of Petroleum and Energy (DGH/13, MPE).

1) Rationale

The pipeline between Abidjan and Bouake with a length of 385 km and a diameter of 12 inches is buried one meter deep at a minimum. Of the pipeline, the Abidjan – Yamoussoukro section with a length of 258 km has been working since 2013. It is used for multiproduct transport (gasoil and super gasoline) with a maximum capacity of 4,000 m³/ day or about 1,600,000 m³/year.

2) Objective

The objective of this project is to ensure the best possible distribution of petroleum products at a lower cost at the national level and to increase transport efficiency for export to neighbouring countries. And also the multiproduct pipeline will allow:

- Restore distribution of petroleum products in Côte d'Ivoire
- Reduce theft of petroleum products
- Improve the security network of the road in Côte d'Ivoire
- Mitigate air pollution

3) Project Description

This project consists of the construction and exploitation of a multiproduct pipeline for the massive transport of several petroleum products (super gasoline and gasoil) from Abidjan to Yamoussoukro and Ferkessédougou storage.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Reduce the transport cost of petroleum products from Abidjan to the GESTOCI storage of Yamoussoukro to 11 F CFA/ litter compared with 15 F CFA/ litter for lorry tanker transport
- Reduce lorry tanker traffic on roads in Abidjan and Côte d'Ivoire
- Lower maintenance expenses of roads
- Reduce CO2 emissions

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- MPE
- Ministry of Finance and Economy
- GESTOCI

6) Estimated Project Cost

The project started in 2006 for an initial period of five years. The cost of the project is as follows:

- Section 1: Abidjan-Yamoussoukro-Bouaké: 140 Billion F CFA
- Section 2: Bouaké-Ferkessédougou (300 km): 90 Billion F CFA

Total Cost: 230 Billion F CFA

7) Future Prospects

With establishment of a pipeline company, regional and international finance will be sought for the development of the section of Bouaké-Ferkessedougou, This project will also provide a secure supply for Mali and Burkina Faso.

16.8 Gas Sector of Côte d'Ivoire

16.8.1 Present Situation and Future Prospects of Gas Sector of Côte d'Ivoire

In Côte d'Ivoire, total installed capacity of power generation is 1,772MW, of which 1,168MW is thermal power. According to the Strategic Development Plan 2011-2030, additional combined cycle thermal plants with a total installed capacity of 2,580MW are planned to be installed during the period of this plan. It is estimated that these plants will require 404mmscf of natural gas.

In 2014, production of natural gas was 77 BCF or 211mmscf, and consumption was 70 BCF or 192 mmscf. If all the additional combined cycle plants begin to operate, consumption of natural gas will be more than three times that in 2014.

Table 16.8.1 Growth in Gas Demand for New Thermal Plant Projects

New Thermal Plant Projects	Location	Estimated Gas Demand
330MW Combined Cycle Thermal Plant of Treichville	Treichville	54 mmscfd
450MW Combined Cycle Thermal Plant of Abatta (Bingeville)	Abatta (Bingeville)	70 mmscfd
450MW Combined Cycle Thermal Plant (CT1)	Not decided yet	70 mmscfd
450MW Combined Cycle Thermal Plant (CT2)	Not decided yet	70 mmscfd
450MW Combined Cycle Thermal Plant (CT3)	Not decided yet	70 mmscfd
450MW Combined Cycle Thermal Plant (CT4)	Not decided yet	70 mmscfd
Total Generation Capacity to be increased: 2,580 MW	-	404 mmscfd

Source: Strategic Development Plan 2011-2030 Project Sheets, and gas demand estimation by JICA Study Team

The Ministry of Petroleum and Energy (MPE) formulated the Strategic Development Plan 2011-2030 in June 2011, and will review it in 2016. After the review of the plan, the above demand for natural gas must be revised based on the data to be obtained from MPE.

16.8.2 Issues on Gas Sector of Côte d'Ivoire

Côte d'Ivoire is going to regain its position as a regional hub for electricity supply as a member of the West Africa Power Pool (WAPP). Côte d'Ivoire has been increasing its exports of electricity to neighbouring countries such as Burkina Faso, Togo, Ghana, Benin and Mali through interconnected electrical grids with such neighbouring countries.

After the period of political instability was finished, electricity demand increased along with the accelerated economic growth. Therefore, it is necessary to increase the installed capacity of thermal power plants and natural gas supply in Côte d'Ivoire to maintain the position of a regional hub for electricity supply.

16.8.3 Objectives for Gas Sector of Côte d'Ivoire

The objective is to ensure that sufficient volume of natural gas is supplied for the power generation sector which supplies electricity to Côte d'Ivoire and the regional export market.

16.8.4 Strategies for Gas Sector of Côte d'Ivoire

(1) To Increase the Supply of Natural Gas

First, examine which source of natural gas is to be developed to increase the supply of natural gas. Taking into account the status of natural gas sources and the current plan of the Ministry of Petroleum and Energy, the following sources of natural gas supply are expected in addition to the gas producing blocks:

- 2016-2020: Small fields in the east, and LNG import through FSRU
- 2021-2025: Blocks under appraisal operation
- 2026-2040: Gas import through WAGP

1) Gas Producing Blocks

Current major gas producing blocks are C-11 Lion and Panthere, CI-27 Foxtrot, CI-26 Espoir, and CI-40 Baobab fields. Associated gas is produced in these fields. CI-27 Foxtrot produces only a small quantity of oil, therefore it is practically considered a non-associated gas field. CI-27 has 711 billion standard cubic feet (BSCF) remaining and recoverable reserves, followed by CI-26 (193 BSCF) and CI-40 (160 BSCF) as of 30th June 2015. There appears to be little potential for raising production from these gas producing blocks.

Table 16.8.2 Proved Reserves of Natural Gas in Côte d'Ivoire, 2015

Unit: Billion Standard Cubic Feet (BSCF)

Block	Initial and Recoverable Proved Reserves	Cumulative Production by 30 June 2015	Remaining and Recoverable Reserves as of 30 June 2015	Percentage of the Remaining Reserves as of 30 June 2015
CI-11	395	380	15	4%
CI-26	399	206	193	48%
CI-40	200	40	160	80%
CI-27	1,232	521	711	58%
CI-202	47	0	47	100%
CI-525	100	0	100	100%
Total	2,373	1,147	1,226	52%

Source: Ministry of Petroleum and Energy

2) Small Fields in the East of Côte d'Ivoire

There are prospects of developing small fields in the east such as Kudu and Eland (CI-525), Ibex (CI-523) and Gazelle (CI-202). Production of these fields is uncertain, since they are marginal fields. The Government of Côte d'Ivoire plans to encourage development of these marginal fields.

3) Blocks under Appraisal Operation

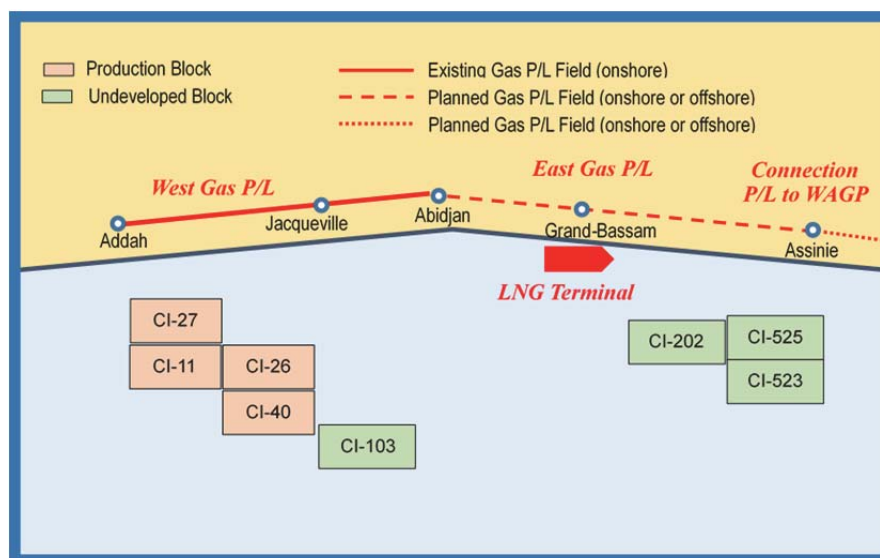
Anadarko have confirmed oil and gas deposits at an exploratory well in the block CI-103 in 2012. It is largely expected that a declaration of commercial discovery will be issued. Appraisal operation has been continued after confirmation of the deposit. So far, the FID (final investment decision) has not been made. Several years of lead time may be required for gas supply after the FID is issued.

4) LNG Import through FSRU

The Ministry of Petroleum and Energy has studied liquefied natural gas (LNG) imports to cover the deficit in domestic gas through a floating storage and regasification unit (FSRU). An FSRU may be located offshore near Grand-Bassam, according to the Ministry of Petroleum and Energy.

(2) To Develop a Gas Pipeline Network

Development of gas pipelines is necessary to meet the growing gas demand for power generation so as to export electricity to neighbouring countries. Such gas pipelines are for sending gas; from the supply sources that are domestic gas fields, WAGP gas, and LNG imports; to the gas-fired power generation plants that are existing or planned. Gas pipelines must be developed to cover the natural gas from each source.



Source: JICA Study Team

Figure 16.8.1 Locations of Source of Gas Supply and Pipeline

16.8.5 Programmes and Projects for Gas Sector of Côte d'Ivoire

(1) Projects for Increasing Production of Natural Gas

The Strategic Development Plan 2011-2030 indicates the projects to increase production of natural gas as shown in Table 16.8.3.

Table 16.8.3 Projects for Increasing Production of Natural Gas

Project	Description	Contracting Authority
Development of Kudu and Eland fields in Block CI-525	<ul style="list-style-type: none"> • Drilling of development wells • Construction and installation of platforms • Laying of pipelines for sending hydrocarbons to onshore 	Operator: AFREN
Development of Mahi, Foxtrot, Marlin and Manta fields in Block CI-27	<ul style="list-style-type: none"> • Drilling of development wells • Construction and installation of platforms • Laying of pipelines for sending hydrocarbons to onshore 	Operator: FOXTROT International
Development of Gazelle and Hippo fields in Block CI-202	<ul style="list-style-type: none"> • Drilling of development wells • Construction and installation of platforms • Laying of pipelines for sending hydrocarbons to onshore 	Operator: VIOCO
Installation of a Floating Gas Terminal – FSRU in Abidjan	<ul style="list-style-type: none"> • Secure natural gas supplies at affordable prices for the domestic market 	CI-GNL

Source: Strategic Development Plan 2011-2030 Project Sheets

(2) Gas Pipeline Projects

The Strategic Development Plan 2011-2030 indicates the two gas pipeline projects as shown in Table 16.8.4.

Table 16.8.4 Projects for Gas Pipelines

Project	Description	Contracting Authority
Construction and Operation of the East Gas Pipeline	<ul style="list-style-type: none"> • Construct an onshore gas pipeline between Abidjan and Assinie 	PETROCI and partners
Connection to the West Africa Gas Pipeline (WAGP)	<ul style="list-style-type: none"> • WAGP is the offshore pipeline of about 700km from Nigeria to Takoradi in Ghana. • To extend WAGP to Côte d'Ivoire which will be about 300km long 	WAPCO

Source: Strategic Development Plan 2011-2030 Project Sheets

16.8.6 Profiles of Priority Projects for Gas Sector of Côte d'Ivoire

(1) East Pipeline Development Project (Project Profile DGH/10, MPE)

The following description is a copy of the project profile made by the Ministry of Petroleum and Energy (DGH/10, MPE).

1) Rationale

Gas pipeline projects are suitable for corridor development along the coastal area. Among gas pipeline projects, the Ministry of Petroleum and Energy (MPE) has selected the East Gas Pipeline project as the priority project. Profile of this project has been given by MPE as follows.

According to MPE, PETROCI and private partners will establish a joint venture company to construct, operate and maintain the East gas pipeline.

The following progress is already achieved:

- Feasibility study for onshore option was completed.
- Evaluation of other options, namely the option running through the lagoon and onshore; and the option of running onshore and offshore, are ongoing.
- A call for expressions of interest was launched in September 2014.

2) Objectives

The objectives of this project are as follows:

- Collect deposits of gas in the eastern Ivorian sedimentary basin;
- Make the project of development of marginal deposits (Gazelle, Kudu, Eland and Ibex) at the East profitable;
- Increase natural gas production at lower prices for the electricity sector.

3) Project Description

The construction of the "East pipeline" is a part of the development of marginal gas fields, Gazelle (Block CI-202) and Kudu (Block CI- 525), and the development of future deposits in the east area of the sedimentary basin. The East pipeline is an extension of the existing network for FOXTROT and PETROCI CI-11. It has a diameter of 24 inches and a total length of about 132 km from Abatta to Assinie. Transport capacity can reach 400 million cubic feet / day.

4) Expected Benefits

The following benefits are expected in this project:

- Natural gas is collected and transported from the East basin fields (CI-202, CI-523, CI-525, etc.) of Côte d'Ivoire towards consumption points;
- LNG imported into Côte d'Ivoire is, after storage and regasification on the FSRU, transported as gas at 200 million cubic feet/day;
- The development of marginal oil and gas fields is encouraged;
- During construction and exploitation phases, direct employment opportunities will be created and indirect opportunities will be afforded to the secondary and tertiary industries

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are PETROCI and partners.

6) Estimated Project Cost

The estimated project cost is approximately US\$105.6 million on the basis of +/- US\$ 800,000/km (AMI).

7) Implementation Schedule

The construction period is nineteen months until completion of laying the pipeline (based on the study of FEED).

8) Future Prospect

- Finalize the route selection of the East pipeline.
- Mobilize the necessary funding.
- Build the East pipeline.
- Possibility of connecting to the West African Gas Pipeline (WAGP) in the long term.
- Stimulate the installation of power stations along the route.

16.9 Investment Promotion of Côte d'Ivoire

16.9.1 Present Situation of Investment Promotion of Côte d'Ivoire

The Côte d'Ivoire Investment Code is designed to encourage additional private sector investment in the economy. For all practical purposes, there are no differences in the treatment of foreign and national investors, either in terms of the level of foreign ownership or sector of investment. The Code offers incentives, including tax reductions and in some cases exemptions from value added taxes (VAT) on equipment for private investors. This code also provides incentives for enterprises which will be located in the planned industrial zones such as special tax treatment for periods ranging from 8 to 15 years depending on the location of the investment. There are also incentives to

promote individual sectors (low-cost housing construction, factories, and infrastructure development) that are key to the country's economic development.

Beginning in 1995, the Government of Côte d'Ivoire stepped up its investment promotion campaign through the establishment of an Investment Promotion Centre (CEPICI: *Centre de promotion des investissements en Côte d'Ivoire*). This provides investment information and assistance for entrepreneurs interested in starting a business or foreign enterprises interested in investing in the country. The CEPICI operates three basic programs: a "one-stop-shop" for investors; an outreach programme, designed to match opportunities with potential investors; and a liaison program between the public and private sectors. At the one-stop-shop launched in 2012, entrepreneurs are allowed to register with the commercial register, the tax authority and the social security institute. The CEPICI also maintains a file of projects seeking foreign investment and is the one-stop service desk for investments in Côte d'Ivoire. It amalgamates, coordinates and rationalizes the initiatives and government actions in terms of investment promotion and private sector development.

16.9.2 Issues on Investment Promotion of Côte d'Ivoire

The following points are determined as issues for investment promotion in Côte d'Ivoire:

- Operational problems, partly because of ambiguous rules
- Complicated institutional framework (e.g. several permits are required, numerous kinds of taxes)
- Limited expertise of investment-related sectors in CEPICI
- Difficulty of deciding priority projects which should be introduced to attract foreign investment
- Difficulty of attracting FDI because of limited market size in Côte d'Ivoire

16.9.3 Objectives for Investment Promotion of Côte d'Ivoire

The objectives of the investment promotion for Côte d'Ivoire are as follows:

- To create more favourable investment environment for Côte d'Ivoire and WAGRIC Sub-Region
- To take advantage of the integrated and expanded sub-regional markets, especially coastal markets for attracting investment to economic sectors of Côte d'Ivoire targeting the growing coastal markets
- To attract investment to the mining sector

16.9.4 Strategies for Investment Promotion of Côte d'Ivoire

The basic strategies for the investment promotion are the following:

- To remove restrictions on investment for improving the business climate
- To offer more appropriate services to potential investors by capacity building of CEPICI
- To promote private investment with strategic focuses on specific economic sectors, which are agriculture, livestock and agro-processing sectors targeting growing sub-regional markets
- To attract FDI to economic sectors oriented to sub-regional markets by utilizing the merit of customs union under UEMOA and ECOWAS, which is establishment of integrated and expanded sub-regional markets
- To attract investment to the mining sector, at the same time attracting investment to necessary transport development for mining development

16.9.5 Possible Measures for the Investment Promotion

The following measures are proposed:

- Policy arrangement for a stable business climate
- Strengthening of the institutional capacity of the CEPICI and other public agencies in charge of investment promotion and business climate policy

- Promotion of investment to priority projects for Côte d’Ivoire, such as Agriculture in the Northern Zone of Côte d’Ivoire, the Existing Grand-Bassam Free Zone for ICT and Biotechnology, Manufacturing Sector in Industrial Parks, and Exploration and Exploitation of Oil and Gas

16.9.6 Programmes and Projects for Investment Promotion of Côte d’Ivoire

(1) Projects for Investment Promotion for Growth Economic Sectors

Investment promotion projects in the table below should be implemented in Côte d’Ivoire to take advantage of integration and expansion of sub-regional markets as well as to increase the number of middle income population.

Table 16.9.1 Priority Projects for Investment Promotion for Growth Economic Sectors in Côte d’Ivoire

Sector	Project	Short Term (2018-25)	Mid Term (2026-33)	Long Term (2034-40)
Agriculture	Promotion of Foreign and Domestic Investment for Agriculture in the Northern Zone of Côte d’Ivoire by Providing Support Services, such as Investment Target Search and Land Search	●	●	●
ICT	Investment Promotion for the existing Grand-Bassam Free Zone for ICT and Biotechnology	●		
Manufacturing	Investment Promotion for Manufacturing Sector in Industrial Parks	●	●	●
Oil & Gas	Investment Promotion for Exploration and Exploitation of Oil and Gas	●	●	●
	Investment Promotion for Exploration and Exploitation of Minerals			●
Mining	Investment Promotion for Development of Manganese Mines in Kabadougou Region by Extending the Railway from Man to Odienné		●	

Source: JICA Study Team

(2) Capacity development programmes for CEPICI

1) Programme for Strengthening Information Services of CEPICI for the Private Sector

- Provision of information and services regarding the investment climate
- Promotion of mutual exchanges of information regarding investment (e.g. organizing investment seminars, dispatching investment missions, creating local company database)

2) Programme for Formulation of Investment Policy and Implementation of Law Enforcement by Expanding the Capacity of Investment Promotion Institutions in Côte d’Ivoire

- Clarification of investment promotion policy (e.g. periodically assess the impact of foreign direct investment and instigate policy change, where necessary, to improve performance or deal with a changing environment)
- Strengthening the capacity of the staff of CEPICI (e.g. learning good practices to simplify the procedures for investment in developing countries which are successful for attracting foreign direct investment)
- Strengthening of cooperation among related to organizations to correspond with investors’ needs (e.g. establishing a coordinating committee to support a policy dialogue with related organizations for provision of necessary infrastructure)

16.9.7 Profiles of Priority Projects for Investment Promotion of Côte d'Ivoire

(1) Investment Promotion for Economic Sectors targeting Sub-Regional Markets

1) Project Outline

In 1995, the Investment Promotion Centre (Centre de promotion des investissements en Côte d'Ivoire, CEPICI) was established. It has tried to attract investment to infrastructure development as well as to the mining sector. However, it has not paid much attention to the growth potential of Côte d'Ivoire's economic sectors targeting coastal markets in the sub-region.

It is possible to strengthen the implementation of the customs union, which has been institutionalized by UEMOA and ECOWAS. By emphasizing the possibility to integrate and expand sub-regional consumers' markets through the customs union, it is possible for CEPICI to attract more investment to economic sectors targeting sub-regional consumers' markets. Such target economic sectors include those of agriculture, fisheries and agro-processing.

The project aims to make a clear shift of investment promotion toward economic sectors orientated to sub-regional markets. For this purpose, the project will prepare new promotion materials, provide training to related agencies and personnel and implement actual activities for investment promotion.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

US\$ 4 million

Chapter 17 Development Strategies for Infrastructure Sectors for Côte d'Ivoire

17.1 Roads and Highways of Côte d'Ivoire

17.1.1 Present Situation of Road and Highways in Côte d'Ivoire

(1) Institutional Framework of the Road Sector

The Ministry of Economic Infrastructure (MIE: *Ministère des Infrastructures Economiques*) defines and conducts the national policy on transport infrastructure. It has the responsibility of project ownership, monitoring, design and construction of road networks and their maintenance, and regulation of their management.

The Agency for Road Works and Management (AGEROUTE: *Agence de Gestion des Routes*) is a state owned-enterprise under the MIE. Its mission is to provide services for the management of construction and maintenance of road networks as entrusted by the State.

The Road Maintenance Fund (FER: *Fonds d'Entretien Routier*) is a state-owned company under the supervision of MIE and the Ministry of Finance and Economy. The purpose of the FER is to ensure the financing for road maintenance.

(2) Framework of Road Planning and Development in Côte d'Ivoire

- The Law on Internal Transport (No. 2014-812, 16 December 2014): The Law defines the basic policy about the transport infrastructure including the road infrastructure.
- National Development Plan 2016-2020 (PND: *Plan National de Développement*): The National Development Plan expresses the road development policy.
- Road Development and Maintenance Strategy 2011-2015 for Côte d'Ivoire: In order to revive the roads that have been destroyed during the crisis, the short term road rehabilitation and maintenance is proceeded based on the Road Development and Maintenance Strategy 2011-2015.
- Road Development Master Plan for Côte d'Ivoire: A mid-long term road development master was prepared by MIE and AGEROUTE with the cooperation of the government of South-Korea. The target year for the master plan is 2035.

(3) Existing Conditions of Road and Highway Network in Côte d'Ivoire

1) Existing Network of Roads and Highways

The road network system in Côte d'Ivoire is shown in Figure 17.1.1 . The roads are classified into expressways, international roads which connect to the adjacent countries, departmental roads connecting to departments and the inter-connection roads which connect between international roads and departmental roads.



Source: AGEROUTE

Figure 17.1.1 Road Network in Côte d'Ivoire

2) Existing Condition of Roads and Highways

According to the interview with the Ministry of Economic Infrastructure, the road network accounts for over 90% of the trade in the transport field. Although the importance of the road is emphasized, the road network was constantly deteriorating between 1990 and 2012 during the crisis. Since 2012, a road rehabilitation program has been underway. In the road network, the length of paved roads is only 6,590 km against the total length of 82,090 km. This corresponds to 8% of the paved roads to total road length and this ratio is very low.

Regarding the coastal corridor, the section of Abidjan-Grand Bassam is developed as an urban motorway. In addition, the creation of Abidjan-Lagos Motorway has been considered by the initiative of ECOWAS.

The road section between Abidjan and Yamoussoukro was constructed as a 4 lane expressway. MIE plans extension of this expressway from Yamoussoukro, Bouaké, Ferkessédougou to the Border of Burkina Faso. UEMOA conducted a feasibility study on the extension of the expressway up to Bouake. The Islamic Bank decided to finance the construction of the road section between Yamoussoukro and Tiebissou. The construction will start in 2017.

MIE is seeking the finance for the extension of the expressway up to Bouake to be completed by 2020. The road section from Yamoussoukro to the border of Burkina Faso is a 2 lane road except the road section in urban areas such as Bouaké and Ferkessédougou. The rehabilitation is in progress from Bouaké to the northward. The road condition between Bouaké and Ferkessédougou in 2015 is very poor due to many potholes and damaged surface.



Border-Ferkessédougou



Border-Ferkessédougou



Ferkessédougou-Bouaké



Ferkessédougou-Bouaké



Bouaké-Yamoussoukro



Bouaké-Yamoussoukro

Source: JICA Study Team

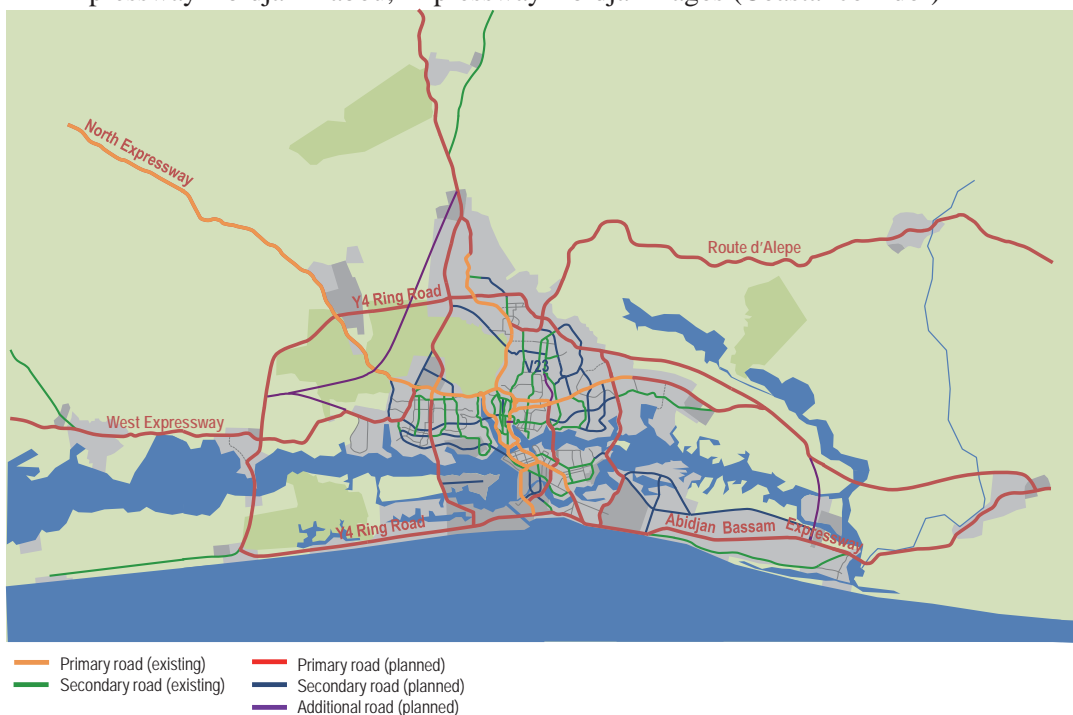
Figure 17.1.3 Road Condition of Central Corridor in Côte d'Ivoire

(4) Existing Projects and Future Plans

- Ouangolodougou-Laleraba, Border Post (37km). Asking the funds for rehabilitation and reinforcement work from AfDB. If it is impossible to get funds from AfDB, UEMOA will consider investing in this project.
- Ouangolodougou-Zegoua (92km). Seeking the funds for rehabilitation and reinforcement work. If it is impossible to get funds from AfDB, UEMOA will consider investing in this project.
- Expressway from Tiebissou to Bouaké: A feasibility study was done. Seeking the funds
- Expressway from Bouaké to the Border of Burkina Faso: F/S will be done by UEMOA.

The following projects are considered in addition to the development of general road sections of the corridors.

- Development of Bypass around the corridor cities: Abidjan, Yamoussoukro, and Bouake. The ring road in Greater Abidjan is shown in Figure 17.1.4
- Three secondary South-North Corridors that support the major South-North corridor
- Upgrading of other national roads and departmental roads
- Access road to cacao and cotton plantations (San Pédro-Mali). PR8 project is in progress with the finance of AfDB.
- National roads connected to landlocked countries, Burkina Faso and Mali
- National roads connected to neighbouring countries, Ghana, Liberia, Guinea
- The following projects are listed as presidential priority projects in PND.
- Expressway Abidjan-Bouake, Liaison Yopougon-Plateau (Central corridor)
- Expressway Abidjan-Dabou, Expressway Abidjan-Lagos (Coastal corridor)



Source: Grand Abidjan Urban development Master Plan (JICA)

Figure 17.1.4 Ring Road Plan in Greater Abidjan

17.1.2 Issues on Roads and Highways in Côte d'Ivoire

During the last socio-political crisis, insufficient road development and maintenance was carried out. Since 2012, development of the national highway network and other roads has been promoted not only in Greater Abidjan, the largest city in Côte d'Ivoire, but also in the regions, following the priority projects identified by the National Development Plan 2012-2015 (PND 2012-2015).

In Greater Abidjan, which is a central node on the international and national corridors, serious urban traffic problems have emerged due to rapidly expanding urbanization, as well as due to poor investment in the last decade. Without timely strengthening of major and skeletal roads of Greater Abidjan, it would create a serious bottleneck for both the Central Corridor (north-south direction) and the Coastal Corridor (east-west direction).

It is also necessary to pay attention to the improvement of accessibility to the Port of Abidjan, the international airport, and the international trunk roads. One of the solutions for these problems is to extend an urban motorway network within Greater Abidjan in parallel with urban railway development.

Development of roads in inland regions lags behind. In inland regions, road networks and road conditions are not sufficient to promote development by utilizing agricultural potential and mining potential. Utilization of the Central Corridor and improvement of roads of east-west directions from the Central Corridor is one of the useful methods to pursue the development of inland regions in the short term.

In addition to the above mentioned issues, the following points are identified as issues regarding roads and highways in Côte d'Ivoire:

- Traffic volumes are increasing even in rural areas, but the traffic volume increase of north-south corridors in rural areas is slow at present. Therefore, it is difficult to upgrade the corridor roads in rural areas in order to promote the development of economic sectors in inland areas.
- Through traffic in central areas of regional cities disturbs urban traffic and urban socio-economic activities. At the same time, traffic congestion in central areas of regional cities disturb through traffic on the corridors.
- Quite a few bridges on north-south corridors require replacement soon because maintenance work had been insufficient during the last socio-political crisis.

17.1.3 Objectives for Development of Roads and Highways in Côte d'Ivoire

The road network development in Côte d'Ivoire should aim at building the basic framework of the country and improving the accessibility to neighbouring countries.

The road network should also support activation not only of socio-economic exchanges within the country, but also of socio-economic exchanges within the sub-region by improving road conditions and reducing travel time and costs. The overall goal of road development is to promote socio-economic exchanges and development, to improve competitiveness of economic sectors and to expand demand (both freight and passengers) for transportation.

The following objectives for road development are defined:

- Objective 1: To contribute to the economic sector development and enhance socio-economic exchanges within the country and between countries by establishing networks of roads and motorways centring on Greater Abidjan and the Central Corridor (Abidjan - Ouagadougou Corridor)
- Objective 2: To establish a road and motorway network for sub-regional and national integration by linking San-Pédro - Abidjan – Sekondi-Takoradi - Accra in the coastal corridor and for enhancing the global gateway function of major cities and major ports in the coastal corridor, thereby contributing to the acceleration of economic growth and improvement of competitiveness of economic sectors in Côte d'Ivoire
- Objective 3: To enhance the hub function of Greater Abidjan on the international and national corridors (as the international gateway of Côte d'Ivoire)
- Objective 4: To promote development of Regions which are relatively underdeveloped by providing better accessibility from major ports and major corridors

- Objective 5: To develop the road environment for realization of smooth and safe road transportation

17.1.4 Development Strategies and Possible Measures for Development of Roads and Highways in Côte d'Ivoire

Eight strategies are identified for road development in Côte d'Ivoire as shown below. Possible measures to implement each strategy are also described in this section.

- Strategy 1: Expansion of a high-standard road and motorway network for achieving high-speed transportation service centring on Greater Abidjan, as well as on the Central Corridor (Abidjan-Yamoussoukro-Bouaké-Ferkessédougou-Ouagadougou Corridor), that could serve socio-economic exchanges not only within the country but also between countries, leading to development of economic sectors in inland areas and coastal areas.
- Strategy 2: Development of Coastal East-West Motorway for supporting the development of Coastal Mega-Region (along Abidjan-Accra-Lomé-Cotonou-Lagos Corridor)
- Strategy 3: Enhancement of the hub function of Greater Abidjan on international and national corridors (as the international gateway of Côte d'Ivoire)
- Strategy 4: Development and reinforcement of roads in the Secondary North-South Corridors
- Strategy 5: Strengthening of East-West Roads by extending them from major urban centres on the Central Corridor
- Strategy 6: Improvement of accessibility for promoting the utilization of the development potential
- Strategy 7: Capacity building for organizations in charge of road traffic safety

(1) Strategy 1: Expansion of a high-standard road and motorway network for achieving high-speed transportation service on the Central Corridor (Abidjan-Yamoussoukro-Bouaké-Ferkessédougou -Ouagadougou Corridor)

Considering that the Central Corridor that is expected to serve as the development axis of the Côte d'Ivoire, the development of high-standard roads and highways should be sought so that the transport corridor could realize high-speed transportation services. This feature of high speed of transportation is important to attract investment to economic sectors in inland areas. It is also important to create the business environment, in which economic sectors would be able to operate oriented to coastal consumers' markets.

The target corridors for Strategy 1 are as follows:

- Abidjan - Yamoussoukro - Bouaké - Ferkessédougou - Border of Burkina Faso.

Possible measures for Strategy 1 include the following:

- Construction of a motorway up to Bouaké and extension of the motorway farther to the north, by advanced investment in upgrading to the motorway than the increase of traffic demand
- Construction of bypass roads or ring roads in Yamoussoukro, Bouaké and Ferkessédougou
- Installation of bus bays and truck bays along the roads.

(2) Strategy 2: Development of Coastal East-West Motorway for supporting the development of East-West Coastal Economic Belt (part of Abidjan-Accra-Lagos Corridor)

Construction of Abidjan - Lagos Motorway should be initiated as soon as possible in order to spatially integrate coastal areas along Abidjan-Lagos Corridor, which would support the economic integration of coastal markets along Abidjan-Lagos Corridor. As it takes time to construct all the sections of the motorways within Côte d'Ivoire, it is important to maintain and reinforce existing coastal roads between San-Pédro Port and the border of Ghana for improvement of road service levels. The Abidjan-Lagos Motorway and existing coastal national roads will form a Coastal

Economic Corridor, leading to the development of a Coastal Mega-Region along Abidjan-Lagos Corridor.

The target corridors for Strategy 2 are as follows:

- San-Pédro - Abidjan,
- Abidjan - Noé (Border of Ghana).

Possible measures for Strategy 2 include the following:

- Development of 6-lane motorway (Abidjan - Lagos motorway),
- Road development with asphalt concrete pavement that can withstand the traffic of heavy vehicles,
- Reinforcement or replacement of aged bridges, introduction of double lanes,
- Introduction of double lanes to sections such as inter-city sections where transportation demands are expected.

(3) Strategy 3: Enhancement of the hub function of Greater Abidjan on international and national corridors (as the international gateway of Côte d'Ivoire)

In order to respond to increasing traffic demands and in order to provide smooth access to Abidjan Port and Abidjan International Airport, a network of radial arterial roads and ring roads should be developed in Greater Abidjan that would serve as a strategic node of the national road network in Côte d'Ivoire to promote smooth traffic and expansion of urban areas. Greater Abidjan would be a strategic node also for the West Africa Growth Ring Corridors. In addition to physical expansion of road and motorway networks, measures to utilize smart traffic systems for improvement of the functionality of the road infrastructure should be implemented.

The target area for Strategy 3 is Greater Abidjan.

Possible measures for Strategy 3 include the following:

- Expansion of an urban motorway network within Greater Abidjan,
- Construction of access roads and bridges, and improvement of bottleneck intersections for smooth connection of Abidjan Port with north-south corridors, as well as with the coastal east-west corridor
- Construction of access roads and bridges, and improvement of bottleneck intersections for smooth connection of the present international airport with the north-south corridors, as well as with the coastal east-west corridor
- Establishment of ITS system like ETC, advanced traffic signal system and road information system within cities.

(4) Strategy 4: Development and reinforcement of roads in the Secondary North-South Corridors

For the purpose of promoting regional development in underdeveloped areas, “development” and “reinforcement” of roads that compose the Secondary North-South Corridors should be promoted.

The target corridors for Strategy 4 are as follows:

- Western Corridor: San-Pédro - Man - Odienné - Border of Mali,
- The road between San-Pédro and Man should be upgraded to a high-standard 4-lane road in the medium term (by 2033).
- Western Corridor: San-Pédro - Daola - Boundiali - Border of Mali,
- Eastern Corridor: Abidjan - Adzope - Abengourou - Bouna - Border of Burkina Faso.
- The road between Abidjan and Abengourou should be upgraded to a high-standard 4-lane road in the long term (by 2040).

Possible measures for Strategy 4 include the following:

- Road development with asphalt concrete pavement that can withstand the traffic of heavy vehicles,
- Reinforcement or replacement of aged bridges together with widening of bridges for accommodating a four-lane road (two lanes each way),
- Widening of trunk roads to four-lane roads for both directions for inter-city sections where high transport demands are expected.

(5) Strategy 5: Strengthening of East-West Roads by extending them from major urban centres on the Central Corridor

Upgrading or improvement of roads should be done to connect regional core cities, such as Yamoussoukro, Bouaké, Ferkessédougou and Korhogo, on the Central Corridor, with surrounding areas, for providing basic urban services.

Target road links for Strategy 5 are as follows:

- Odienné - Boundiali - Korhogo - Ferkessédougou - Bonna
- Bouaké - Bondoukou
- Man - Yamoussoukro

Possible measures for Strategy 5 include the following:

- Pavement of roads with asphalt concrete
- Rehabilitation of roads
- Reinforcement or replacement of aged bridges
- Development of feeder roads (simple pavement, construction of bridges, application of Labour - Based Technology)

(6) Strategy 6: Improvement of accessibility for promoting the utilization of the development potential

Access roads to potential development areas from major cities, which are centres of consumers, as well as from Abidjan Port and San-Pédro Port should be provided.

Pavement of roads and construction of bridges for connecting roads to villages and farm lands should be promoted in order to provide access to major corridors.

Target development areas for Strategy 6 are as follows:

- Agricultural development potential areas in the central, northern, western and eastern parts of the country
- Mineral development areas, such as iron ore mines in the western part and manganese mines in the north-western part of the country)¹
- Tourism development areas

Possible measures for Strategy 6 include the following:

- Development of access roads (by paving and by construction of bridges),
- Development of access roads to railway cargo stations and major logistics bases (logistic centres and market places),
- Development of roads within development areas.

On the premise that access roads to potential development areas should have 2 lanes for both directions (one lane each way), the following measures should be implemented:

¹ Extracted minerals need the railway for transporting them to sea ports. On the other hand, mineral extraction needs road access for various reasons.

- Pavement of roads with asphalt concrete,
- Rehabilitation of roads,
- Reinforcement or replacement of aged bridges,
- Widening of road sections passing through regional cities or construction of bypass roads for regional cities.

(7) Strategy 7: Capacity building for organizations in charge of road traffic safety

Establishment or strengthening of organizations in charge of road traffic safety is important to ensure efficient and safe use of roads. And also it is necessary to strengthen the road administration function for this aspect.

Target roads and areas, as well as administrative organizations for Strategy 7 are as follows:

- All roads, cities, and road administrative organizations

Possible measures for Strategy 7 include the following:

- Implementation of road safety measures including enforcement of road safety rules
- Implementation of Intelligent Transportation Systems (ITS) including traffic control systems, advanced traffic signal system, and traffic information providing system
- Strengthening of administrative functions concerning road planning, design, construction and maintenance
- Strengthening of maintenance capabilities (maintenance planning capabilities, equipment, budgeting)
- Establishment of overload monitoring system of heavy vehicles and strengthening of enforcement of axle load control
- Training of trucking companies to improve safe transport capabilities and to ensure compliance with regulations
- Designation of road routes and time in which large trucks are allowed to use them
- Application of engineering design of road structures responding to weight increase of trucks
- Establishment of road management system including road inventory database

17.1.5 Programmes and Projects for Development of Roads and Highways in Côte d'Ivoire

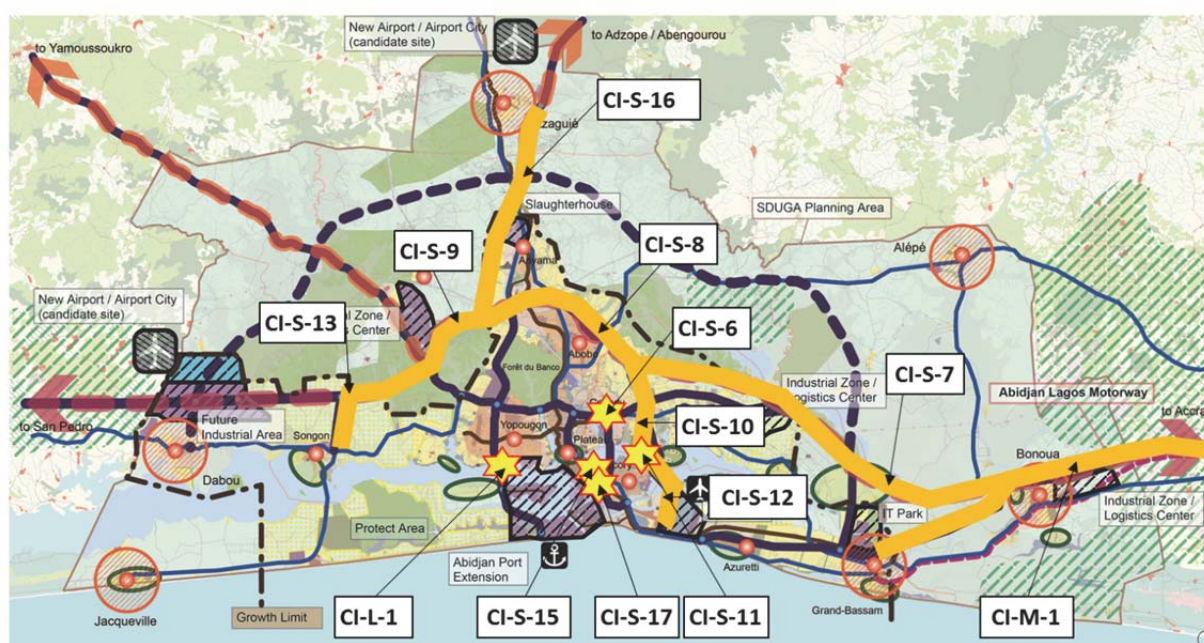
The road projects that were selected based on the development strategy are shown in Table 17.1.3, Figure 17.1.5, Figure 17.1.6, Figure 17.1.7 and Figure 17.1.8.

These projects shown here are essential road projects which should be tackled strategically for corridor development of WAGRIC-CACAO. However, there are also other road projects which should be promoted by the Government of Côte d'Ivoire for development of the country.

Table 17.1.3 Priority Projects of Road Sector in Côte d'Ivoire

Name of Priority Project		No. Lane	Length	Project Schedule		
				Short	Middle	Long
CI-S-1	Improvement of Road between Ferkessédougou and Bouna	2	287 km			
CI-S-2	Improvement of Road between Bouaké and Bondoukou	2	250 km			
CI-S-3	Improvement of Road between Boundiali and Odienné	2	134 km			
CI-S-4	Improvement of Road between Tieningboué and Séguéla	2	120 km			
CI-S-5	Improvement of Road between Séguéla and Man	2	135 km			
CI-S-6	Improvement of Three Intersections by Construction of Flyovers in Greater Abidjan	4	- km			
CI-S-7	Construction of 4- lane Motorway of the East Exit Line Cocody-Bonoua	4	35 km			
CI-S-8	Construction of 4- lane Motorway of Y4 Ring Road: Anyama - Cocody Section	4	16 km			
CI-S-9	Construction of 4-lane Motorway of Y4 Ring Road: Anyama – Attinguié Section	4	14 km			
CI-S-10	Construction of 4-lane Motorway of Y4 Ring Road: Cocody – Riviera 6 Section	4	15 km			
CI-S-11	Construction of 6th Bridge (part of Y4 Ring Road)	4	- km			
CI-S-12	Construction of 4-lane Motorway of Y4 Ring Road: Aerocité Section	4	10 km			
CI-S-13	Construction of 4- lane Motorway of the West Exit Line (Songon)	4	12 km			
CI-S-14	Rehabilitation of National Road between Songon and San-Pédro	2	320 km			
CI-S-15	Improvement of Solibra Intersection by Construction of Flyovers in Greater Abidjan	4	- km			
CI-S-16	Construction of 4- lane Motorway; the North Exit Line (Anyama)	4	17 km			
CI-S-17	Construction of Vridi-Bietry Bridge (for Better Access to Abidjan Port)	4	- km			
CI-S-18	Construction of Bypass Road for Yamoussoukro (part of Motorway)	4	20 km			
CI-S-19	Construction of 4- lane Motorway between Yamoussoukro and Bouaké	4	100 km			
CI-S-20	Construction of Western Section for Bouaké Outer Ring Road (part of Motorway)	4	20 km			
CI-S-21	Upgrading of Road between Anyama and Abengourou	4	214 km			
CI-S-22	Upgrading of Road between Boundiali and Tingréla	2	120 km			
CI-M-1	Project for Construction of 6- lane Motorway between Bonoua and the border of Ghana	6	105 km			
CI-M-2	Project for Construction of Motorway between Bouaké and Niakaramandougou	4	120 km			
CI-M-3	Project for Upgrading of Road between Bondoukou and Bouna	2	168 km			
CI-M-4	Project for Upgrading of Road between San-Pédro and Man to 4-lane Road	4	400 km			
CI-L-1	Construction of 4th bridge (Ile Boulay) of Greater Abidjan	4	- km			
CI-L-2	Construction of Motorway between Abidjan and San-Pédro	4	300 km			
CI-L-3	Construction of 4- lane Motorway between Niakaramandougou and Ouangolodougou	4	100 km			
CI-L-4	Upgrading of Road between Man – Odienné – the border of Mali	4	200 km			
CI-L-5	Upgrading of Road between Anyama and Bondoukou to 4-lane Road	4	400 km			

Source: JICA Study Team



Source: JICA Study Team

Figure 17.1.5 Locations of Road Projects in Greater Abidjan



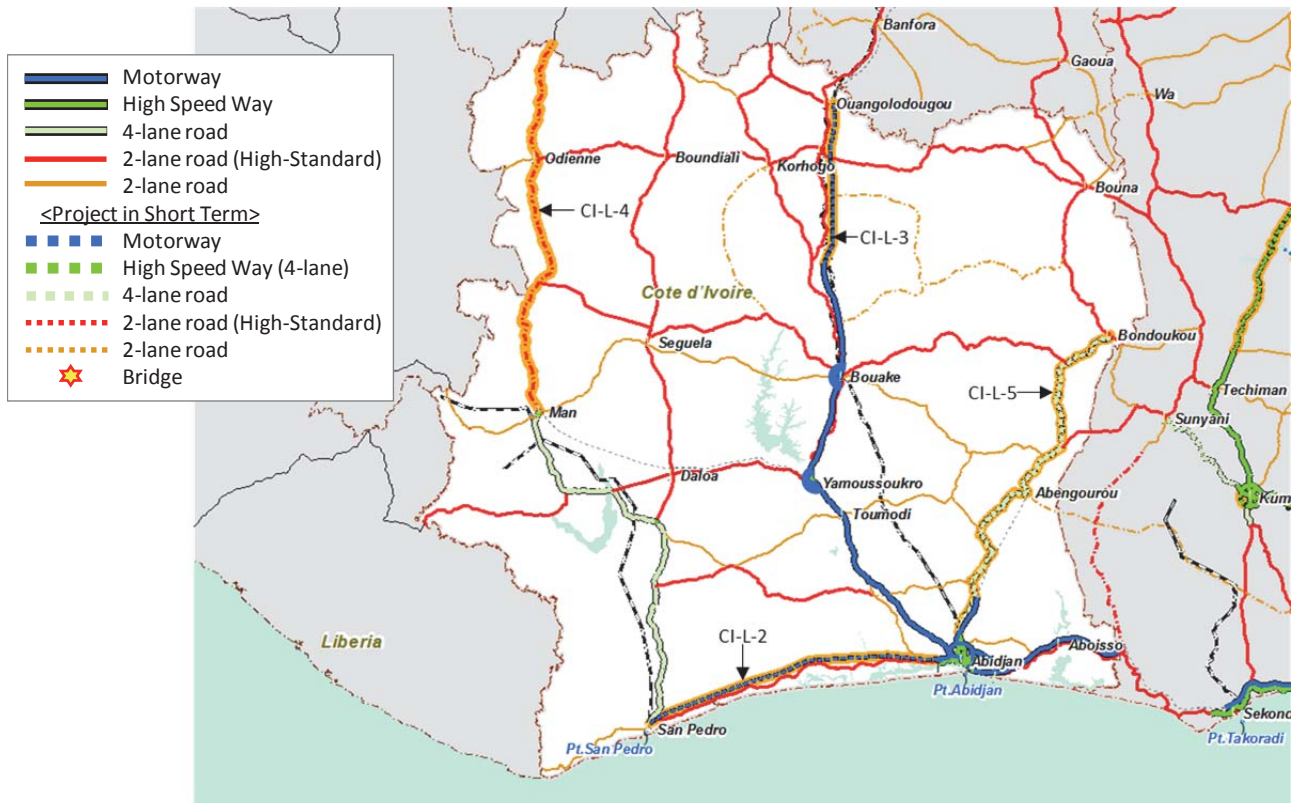
Source: JICA Study Team

Figure 17.1.6 Locations of Priority Road Project in Short Term in Côte d'Ivoire



Source: JICA Study Team

Figure 17.1.7 Locations of Priority Road Project in Mid Term in Côte d'Ivoire



Source: JICA Study Team

Figure 17.1.8 Locations of Priority Road Project in Long Term in Côte d'Ivoire

17.1.6 Profiles of Priority Projects for Road and Highway Sector of Côte d'Ivoire

(1) Construction of 4-lane Motorway of the East Exit Line Cocody-Bonoua (45km)

1) Project Outline

Côte d'Ivoire's potentiality to develop economic sectors is limited in the case of targeting its own domestic consumers' markets. However, such potentiality would be enhanced largely by targeting the sub-regional markets through integration with neighbouring countries' markets. This market integration will become possible by upgrading transportation along the coastal east-west corridor (Abidjan-Lagos Corridor), as well as strengthening of implementation of the customs union.

The upgrading of transportation along Abidjan-Lagos Corridor would become possible by construction of strategically selected sections of the Abidjan-Lagos Motorway. The most important section is the motorway connecting the central area of Greater Abidjan with the eastern coastal area of Côte d'Ivoire.

The existing road from the Abidjan International Airport to Grand Bassam is the only exit road from the central area of Greater Abidjan to the eastern coastal area of Côte d'Ivoire. However, it will become congested by traffic in the near future. Therefore, it is necessary to construct another exit motorway to the eastern coastal area of Côte d'Ivoire for the purpose of strongly integrating the coastal markets along the Abidjan-Lagos Corridor.

The project aims to construct a 4-lane motorway between Cocody and Bonoua, of which distance is about 45 km. It would be called "East Exit Line Cocody-Bonoua."

2) Funding Scheme

ODA Loan or PPP

3) Estimated Project Cost

US\$ 307 million

(2) Projects for Construction of Motorway between Yamoussoukro and Bouaké (including Yamoussoukro Bypass Road and part of Bouaké Outer Ring Road) and Motorway between Bouaké and Niakaramandougou

1) Project Outline

In order to shorten the travel time between inland areas and coastal areas, the projects aims to extend the motorway up to Bouaké and furthermore to Niakaramandougou, by taking advantage of the existing motorway between Abidjan and Yamoussoukro. This kind of high-speed transportation is necessary to attract investment for the economic sectors in inland areas, especially those targeting coastal markets. In addition to reduction of travel time, the motorway is to be a high-standard road which could reduce vehicle costs. Together with Abidjan-Ouagadougou railway (Sitarail), this extension of the north-south motorway could contribute to help inland areas to attract investment in the agriculture and agro-processing sectors.

The projects include the construction of Yamoussoukro Bypass Road and part of Bouaké Outer Ring Road, along which land development is possible for industrial and logistics land use.

2) Funding Scheme

ODA Loan

3) Estimated Project Cost

Construction of Motorway between Yamoussoukro and Bouaké (including Yamoussoukro Bypass Road and part of Bouaké Outer Ring Road) : US\$ 724 million

Construction of Motorway between Bouaké and Niakaramandougou: US\$ 847 million

(3) Project for Construction of 6-Lane Motorway between Bonoua and the border of Ghana (115km)

1) Project Outline

Cote d'Ivoire's potentiality to develop economic sectors is limited in the case of targeting its own domestic consumers' markets. However, such potentiality would be enhanced largely by targeting the sub-regional markets through integration with neighbouring countries' markets. This market integration will become possible by upgrading transportation along the coastal east-west corridor (Abidjan-Lagos Corridor), as well as strengthening of implementation of the customs union.

The upgrading of transportation along Abidjan-Lagos Corridor would become possible by construction of strategically selected sections of the Abidjan-Lagos Motorway. The most important section is the motorway connecting the central area of Greater Abidjan with the eastern coastal area of Côte d'Ivoire. The second most important section is the motorway between Bonoua and Noé, national border with Ghana. Its length is about 115 km.

2) Funding Scheme

ODA Loan

3) Estimated Project Cost

US\$ 1,127 million

17.2 Railways of Côte d'Ivoire

17.2.1 Present Situation of Railways in Côte d'Ivoire

The railway track construction from Abidjan to Ouagadougou (1,154km) started in 1904 and ended in 1954. The operating length in Côte d'Ivoire is 639km from the border of Côte d'Ivoire and Burkina Faso, to Abidjan Station. The track is not electrified. It is a single track and its gauge is 1,000 mm.

Regarding the institutional Framework, the railway assets in Côte d'Ivoire are managed by Railway Assets Management Company of Côte d'Ivoire (SIPF: *Société Ivoirienne de gestion du patrimoine Ferroviaire*). The SIPF manages railway infrastructure, such as tracks, station buildings, other facilities and rolling stock which is the property of the government of Côte d'Ivoire.



Source: JICA Study Team based on the material from Sitarail

Figure 17.2.1 Railway Route and Stations in Côte d'Ivoire

(1) Passenger Transport between Abidjan and Ouagadougou

The present number of passenger trains operated is 3 trains per week in each direction. It takes 35 hours each way. The annual number of passengers in 2014 was 1,894 domestic passengers and 94,699 international passengers between Burkina Faso and Côte d'Ivoire. From 2010 to 2013, the volume of passengers increased, the domestic passengers at an average annual rate of 13.5%, and the international passengers at an average annual rate of 10.6%.

(2) Volumes of Freight Transport between Abidjan and Ouagadougou

Volumes of freight transport between Abidjan and Ouagadougou are shown in Table 17.2.1 and Table 17.2.2.

The freight transport by Sitarail has the following characteristics:

- The volumes of freight transport from Abidjan to inland were five times larger than those from inland to Abidjan in the period of 2011-2015.
- The volume of freight transport in the direction from Abidjan to inland increased at a high rate of over 8% per annum from 2011 to 2015.
- On the other hand, the volume of freight transport in the direction from inland to Abidjan did not increase much between 2011 and 2015.

Major cargos transported from Abidjan to inland by railway in the period of 2011-2015 were as follows (in descending order):

- Petroleum to Burkina Faso
- Containers
- Rice
- Fertilizer to Burkina Faso
- Petroleum for re-export from Burkina Faso
- Corn to Burkina Faso

Major cargos transported from inland to Abidjan by railway in the period of 2011-2015 were as follows (in descending order):

- Cotton Balls from Burkina Faso (Containers)
- Cotton Balls from Burkina Faso (Non-Containerized)
- Returning Empty Wagons
- Dry Vegetables from Burkina Faso

Table 17.2.1 Volumes of Freight Transport of North Bound from Abidjan

	2011	2012	2013	2014	2015 (Until June)
Petroleum BF Local	80,261	187,953	197,527	167,978	230,000
Petroleum BF Export	44,539	20,030	35,606	52,733	40,000
Container	73,607	140,291	161,246	143,038	161,674
Cement to BF	26,675	11,379	5,839	2,560	10,000
Cement to CI	35	0	0	0	0
Fertilizer to BF	23,167	43,487	41,786	33,517	45,000
Fertilizer to CI	3,430	0	96	0	0
Bag to Mali + North CI	0	0	0	0	0
Container to Mali + North CI	0	0	0	0	1,394
Rice to BF	131,953	159,552	135,996	121,176	130,000
Wheat Flour to BF	34,094	46,922	36,930	21,658	27,000
Corn to BF	27,595	34,627	29,770	34,935	37,000
Sugar to BF	17,677	18,133	25,119	12,923	15,000
Other Cereals to BF	507	42	0	0	15,000
Vegetable Oil	29,934	28,174	24,519	25,881	32,000
Salt	5,526	6,161	6,170	6,492	8,000
Other commodity	38,464	39,060	35,227	24,844	33,000
Steel plate (rolled)	10,518	8,206	2,233	12,643	5,000
Vehicles	0	85	230	48	1,732
Drink water	104	1,091	0	707	200
Macadam	269	361	407	226	0
Others	38,924	36,523	32,715	23,274	23,000
Total	587,277	782,076	771,414	684,631	815,000

Source: Sitarail

Table 17.2.2 Volumes of Freight Transport of South Bound from Burkina Faso

	2011	2012	2013	2014	2015
Livestock	16,244	8,645	7,336	3,426	5,000
Mango (Container)	7,209	5,341	6,248	3,695	5,000
Drink water	30	30	0	0	0
Return (sending back)	16,146	11,334	6,828	4,975	25,000
Manganese	0	0	0	0	0
Cotton balls to CI	7,751	437	0	0	0
Cotton balls to BF	12,066	25,029	22,120	18,090	25,000
Cotton balls to BF (Container)	423	2,884	8,028	20,018	30,000
Cotton balls to CI (Container)	0	646	0	0	0
Timber	219	0	0	0	0
Return (sending back) to Mali + North CI	0	0	0	0	7,000
Almond	0	0	4,936	12,290	4,000
Anacarde (Burkina fruit)	8,734	5,449	6,220	8,809	2,000
Cotton seed	0	0	0	0	0
Fertilizer (Made of cotton)	2,478	90	0	0	0
Sesame	8,237	13,135	13,931	12,101	7,000
Dry vegetable	18,419	13,948	15,264	16,027	22,000
Macadam	35	0	0	0	10,000
Others	19,615	19,686	6,711	20,839	10,000
Total	117,606	106,651	97,623	120,270	152,000

Source: Sitarail

17.2.2 Issues on Railways Development of Côte d'Ivoire

The following issues are identified regarding the railways in Côte d'Ivoire:

- Aging of railroad tracks, other rail infrastructures, rolling stocks and equipment
- Low-level transportation service in terms of transport capacity, frequency, travel speed, time reliability and comfortability
- Low-level transit service in terms of cargo handling, storage function, procedure for documentation, lack of adequate access roads from the transit terminal to arterial roads in Abidjan and major urban centres
- Insufficient volume of transport demand which financially enables rehabilitation and upgrading of railway and expansion of new lines
- Absence of urban railway system in Greater Abidjan,
- Absence of freight transport system to potential mining development areas in the western part of the country
- Weakness of the government regulatory body (SOPAFER-B) in regulating of private concessioners' management and operation
- Little substantial effort at promoting multi-modal transport between railway and truck transport

17.2.3 Objectives for Railways Development of Côte d'Ivoire

The objectives for railway development in Côte d'Ivoire are as follow:

- To achieve a proper share of cargo transport between railway transport and road transport
- To establish an urban railway system in Greater Abidjan in response to rapid urbanization and for improvement of airport access
- To upgrade railway cargo transport services not only for providing cheaper, more rapid and higher security transport services, but also for providing a larger volume of long-distance cargo transport services. This could lead to the improvement of the environment of corridor competition between corridors in the WAGRIC countries, as well as in the ECOWAS sub-region
- To upgrade the railway passenger transport services not only for providing cheaper, more rapid

and more comfortable services, but also providing a larger volume of long-distance passenger transport services

- To support the utilization of development potential like mining potential by linking iron ore mines with San-Pédro Port

17.2.4 Strategies for Railways Development of Côte d'Ivoire

(1) General Strategies for Railway Development in Côte d'Ivoire

The following strategies are formulated for railway development in Côte d'Ivoire:

- Promotion of the rehabilitation of the existing railway for effective use of existing assets, improvement of service level, increasing the number of passengers and handling volume of cargos
- Strengthening of the multi-modal transit function by construction of multi-modal dry ports and railway transit terminals (for connecting railway and truck transport) at strategic nodes, and by providing access roads from railway transit terminals to arterial roads (international corridors)
- Strengthening of access to Abidjan Port and industrial zones by rehabilitation of the old bridge, improvement of service line systems in port areas for expansion of berths and the container terminal,
- Ensuring of implementation of a new urban railway project (access railway to Abidjan international airport)
- Establishment of a cargo railway system to a new development area and a new port area on the Island of Boulay
- Strengthening of the regulatory function of the government of Côte d'Ivoire for seeking public interest from the private sector for development and operation of railway assets

(2) Additional Strategies for Railway Development in Côte d'Ivoire

The Government of Côte d'Ivoire should work to gain private investors in order to complete the following two investment contracts between the government and the private sector:

1) Rehabilitation of Railway Track of Sitarail

On 9th September in 2015, a special memorandum of understanding was made between Côte d'Ivoire, Burkina Faso and Sitarail (Bolloré Group) for the upgrading of the railway track of Sitarail. The duration of the rehabilitation is 5 years and its budget is 400 million Euro.

2) Establishment of New Urban Railway in Abidjan

On 7th July in 2016, a BOT (Build-Operate-Transfer) contract was concluded between the Government of Côte d'Ivoire and the concessionaire (STAR Consortium=Joint group of Bouygues Construction (France), Hyundai Rotem and Dongsan Engineering (Korean), and KEOLIS (France)). The new urban line would be open to the public around October 2020. The amount of the investment would be 1 billion Euro. As of 2nd March 2016, the preparation work such as landscape, soil investigation, temporary access and design of alignment was commenced.

17.2.5 Programmes and Projects for Railways Development of Côte d'Ivoire

The projects for railway development in Côte d'Ivoire are listed below.

(1) Short-Term Projects:

- Rehabilitation and upgrading of existing lines: Abidjan - Ouagadougou - border of Burkina Faso
 - Enhancement of rolling stock for cargo transport

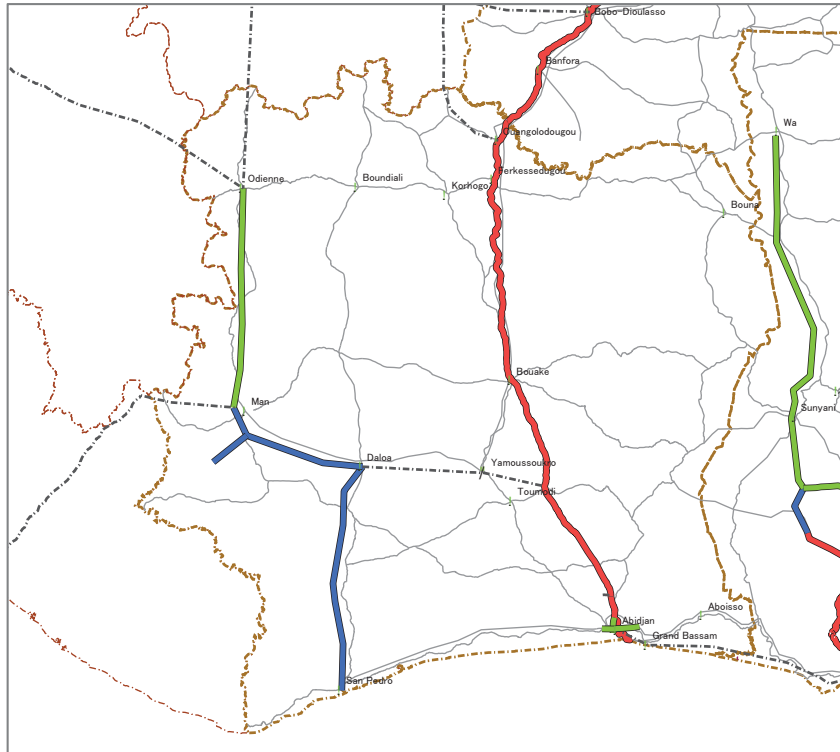
- Construction of access roads from transit terminals to arterial roads
- Improvement of transit handling and documentation
- Rehabilitation of railway stations
- Development of secondary transport system from /to station
- Renewal of rolling stock for passenger transport
- Construction of Ferkessédougou Dry Port
- Construction of Abidjan Urban Railway (Metro Line 1)
- Establishment of system to attract the private investment
- Strengthening of the regulatory function of SIPF for seeking public interest in railway development and operation
- Construction of Off-Loading Facility of Cattle for Railway at Anyama Railway Station
- Construction of Loading and Off-Loading Facility of Cattle for Railway at Ferkessédougou Railway Station or at a Suburban Railway Station near Ferkessédougou
- Coordination Project for Construction of Railway from San-Pédro to Man among Three Iron Ore Companies and Government (with Technical Studies for Railway Construction)
- Construction of Railway from San-Pédro to Iron Ore Mines in Tonkpi Region
 - Railway between San-Pédro – Man
 - Railway between Man – Mt. Nimba
 - Railway between Man – Mt. Klahoyo
 - Railway between Man – Mt. Gao

(2) Mid-Term Projects:

- Strengthening of access to Abidjan Port and industrial zones by rehabilitation of the old bridge, improvement of service line systems in the port area for expansion of berths and the container terminal
- Construction of a cargo railway system to the Island of Boulay
- Construction and rehabilitation of transit terminals: transit terminals (for connection between railway and truck transport) on strategic nodes
- Construction of a new urban rail line (Metro Line 2)

(3) Long-Term Projects:

- Construction of a new railway line: Man – Odienné
- Construction of Railway to New Port in Île Boulay

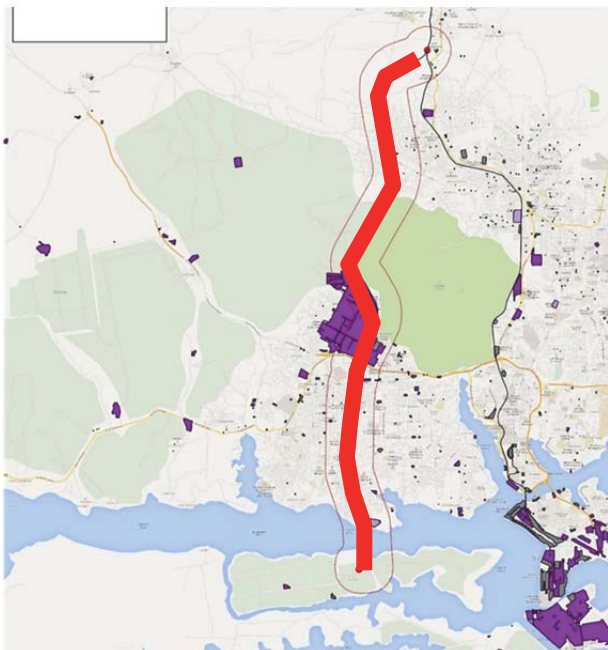


Source: JICA Study Team

Figure 17.2.2 Location of Railway Projects in Côte d'Ivoire

(4) Concept Plan for Connection between Ports and Railways

Regarding the connection between the ports and railways, the following concept plans for the Island of Boulay in Abidjan and for San-Pédro Port should be reviewed at the early stage of project planning.



Source: Fleet Mon Map data

Figure 17.2.3 Cargo Railway to Island of Boulay



Source: JICA Study Team based on San-Pédro Port Development Plan

Figure 17.2.4 Railway and Mining Stock Yard Plan of San-Pédro Port

17.2.6 Priority Projects for Railways Development of Côte d'Ivoire

The projects below were selected as priority projects for railways development in Côte d'Ivoire.

- Construction of Off-Loading Facility of Cattle for Railway at Anyama Railway Station
- Construction of Loading and Off-Loading Facility of Cattle for Railway at Ferkessédougou Railway Station or at a Suburban Railway Station near Ferkessédougou
- Coordination Project for Construction of Railway from San-Pédro to Man among Three Iron Ore Companies and Government (with Technical Studies for Railway Construction)
- Construction of Railway from San-Pédro to Iron Ore Mines in Tonkpi Region
 - Railway between San-Pédro – Man
 - Railway between Man – Mt. Nimba
 - Railway between Man – Mt. Klahoyo
 - Railway between Man – Mt. Gao
- Construction of Railway to New Port in Île Boulay
- Construction of Railway from Man to Odienné

17.2.7 Profiles of Priority Projects for Railway Sector of Côte d'Ivoire

(1) Construction of Cattle Off-Loading Facility for Railway at Anyama Railway Station

1) Project Outline

In response to the increasing middle-income populations in the coastal areas of WAGRIC Sub-Region, the consumption of beef is expected to increase largely not only in Côte d'Ivoire but also in neighbouring countries.

The Ivoirian Government has a plan to establish a cattle market and slaughterhouse complex in Anyama. The WAGRIC Master Plan recommends paying attention to the expanding sub-regional markets for beef by considering the sub-regional economic integration through the customs union and the prospective construction of Abidjan-Lagos Motorway.

The project aims to construct cattle off-loading facilities for the Abidjan-Ouagadougou Railway (Sitarail) at Anyama Railway Station. This off-loading facility should be well connected to the recommended Cattle Market and Slaughterhouse Complex to be constructed in Anyama.

This project should be implemented by the government for supporting private sectors which are to be engaged in the project for establishment of the cattle market and slaughterhouse complex in Anyama.

2) Funding Scheme

ODA Technical Assistance & ODA Loan

3) Estimated Project Cost

US\$ 30 million

(2) Projects for Construction of Railway from San-Pédro to Iron Ore Mines in Tonkpi Region (Mt. Nimba, Mt. Klahoyo and Mt. Gao)

1) Project Outline

The WAGRIC Master Plan points out the importance of economic sectors targeting sub-regional markets for seeking balanced development between inland areas and coastal areas. However, at the same time, it is important for individual countries of the WAGRIC Sub-Region to expand the production of primary commodities, such as minerals and agricultural products.

In the western area of Côte d'Ivoire, there are three promising rich iron deposits including Mount Klahoyo, Mount Nimba and Mount Gao. These three iron deposits are located near Man and they are close each other.

Mount Klahoyo: The iron deposit in Mount Klahoyo is owned by a joint venture between Pan African Minerals Ltd. and SODEMI. It is estimated to have 700 million tons of iron ore, and is planned to produce 11 million tons per annum. Exploratory activity has already begun and plans to build a new rail link to the iron ore are also under consideration.

Mount Nimba: Although Mount Nimba has enormous iron deposits of more than 1 billion tons, it is forbidden to exploit the iron deposit at Mt. Nimba since this area is covered by a nature reserve.

Mount Gao: The iron deposit at Mount Gao is estimated to have 500 million tons of resources. Geophysical surveys were conducted over the last several years, and there has been good progress in the survey conducted by Tata Steel. However, Tata Steel announced its withdrawal from the Mt. Gao project.

In order to exploit iron deposits commercially, it is necessary to build a railway line from San-Pédro Port to Man and thence to the three mines.

The projects of constructing the railway lines for iron exploitation and transportation should be funded by private mining concessioners. However, it is important for the government to be involved in the planning of the railway line for the following purposes:

- To secure timely construction of the railway
- To get adequate access to San-Pédro Port
- To promote coordination with local communities along the railway line to be constructed

2) Funding Scheme

ODA Technical Assistance and Private Investment

3) Estimated Project Cost

US\$ 1,804 million

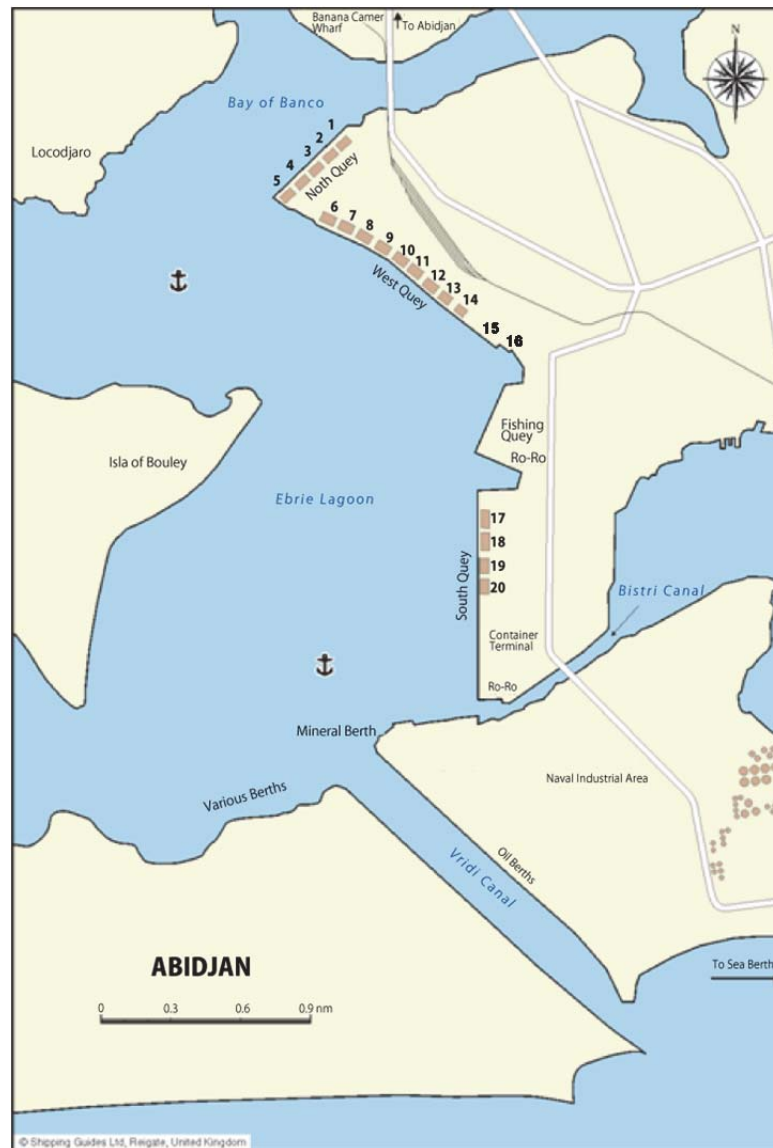
17.3 Sea Ports of Côte d'Ivoire

The two major international sea ports in Côte d'Ivoire are Abidjan Port and San-Pédro Port. In this section, strategies and projects for these two ports are discussed.

17.3.1 Present Situation of Abidjan Port

Abidjan Port is the second largest port in Africa following Durban Port in South Africa. It is located in Treichville (south Abidjan) on a lagoon and is connected to the sea by Virdi Canal (2.8 km long and 13.5 m deep). There is an on-going project for widening and deepening the entrance of this canal in order to be able to handle container ships and conventional ships 250 m long with 16 m draught at any time.

The Port is managed by the Port Autonome d'Abidjan (PAA) which was established as a State Company under the decree No.92-940 of 1992 with responsibility to manage and operate the port of Abidjan. The terminal is run jointly by Bolloré Africa Logistics and APM Terminals.



Source: JICA Study Team based on the material of PAA (Port Autonome d'Abidjan)

Figure 17.3.1 Layout of Present Abidjan Port

The present cargo throughput of Abidjan Port is summarised below.

- Between 2007 and 2014, the import volume of Abidjan Port increased from 10,836,426 ton to 14,006,166 ton (average annual growth rate of 3.7%). On the other hand, its export volume decreased from 9,118,783 ton to 6,806,787 ton (average annual decrease rate of 4.1%). As a result, total volume of cargo throughput has remained relatively unchanged (19,955,209 ton in 2007 and 20,812,953 ton in 2014).
- The total container throughput has also remained relatively unchanged (531,809 TEU in 2007 and 612,410 TEU in 2014). This is partly because the number of containers handled reached the capacity of Abidjan Port.
- Although the total volumes of exported commodities have not increased recently, the volumes of cocoa beans, cotton, rubber, cashew nuts, and manganese ore have increased steadily. (See Figure 17.3.1) The cocoa beans, of which Côte d'Ivoire is the largest producer in the world, have been mostly handled by San-Pédro Port. Cashew nuts are exported in containers.
- The largest volume of imported commodity is clinker and gypsum. The second largest volume of imported commodity is fertilizers and other chemical products. The third largest imported commodity is rice, followed by wheat and sugar. (See Table 17.3.2)

- The transshipment cargo volume has been decreasing dramatically at an average annual decrease rate of 6.6% between 2007 and 2014. However, during the same period, cargoes for the landlocked countries have been increasing remarkably. In fact, the cargo volume from/to Burkina Faso almost doubled from 518,878 ton to 1,039,640 ton, and cargo volume from/to other countries such as Niger and Mali have also been rapidly increasing.

Table 17.3.1 Export Commodities of Abidjan Port (2007 – 2014)

Unit: ton

Commodity	2007	2008	2009	2010	2011	2012	2013	2014
Coffee Beans	109,232	63,361	87,985	96,197	35,100	83,816	86,148	59,509
Cocoa Beans	405,001	396,996	484,437	398,542	609,443	501,597	503,614	610,226
Cocoa Products	269,772	279,158	253,154	241,868	214,701	238,248	262,159	251,597
Bananas	253,188	255,587	272,247	294,344	259,941	272,849	301,389	290,292
Pineapple	81,476	66,964	57,546	48,916	37,089	30,181	31,032	26,903
Timber	99,557	116,810	108,495	129,500	94,189	185,620	331,381	175,653
Lumber	240,917	211,971	124,902	138,639	118,002	47,961	106,608	108,803
Cotton	283,877	245,891	197,993	245,214	116,389	312,384	390,490	402,837
Raw Rubber and Latex	108,723	114,413	117,215	132,750	150,845	157,329	191,162	234,012
Cashew Nuts	257,066	321,835	352,190	367,406	307,505	419,157	414,516	520,176
Manganese Ores	94,618	176,561	156,921	99,703	67,513	120,954	296,165	360,113
Canned Tuna	42,790	40,515	34,534	33,863	28,525	39,543	37,649	31,378
Tranship Cargo	1,408,758	1,638,916	1,332,814	1,155,014	857,440	877,309	743,461	90,732
Others	549,288	784,876	536,062	520,041	455,108	764,641	506,558	726,574
Total	4,204,263	4,713,854	4,116,495	3,901,997	3,351,790	4,051,588	4,202,332	3,908,805

Source: PAA

Table 17.3.2 Import Commodities of Abidjan Port (2007-2014)

Unit: ton

Commodity	2007	2008	2009	2010	2011	2012	2013	2014
Clinker, Gypsum	1,483,482	1,270,405	1,323,476	1,606,501	1,265,660	1,801,769	2,014,338	2,524,015
Rice in Bulk, Rice in Packages	1,144,090	910,095	1,496,192	1,069,866	1,215,282	1,773,040	1,311,756	1,362,997
Wheat	255,659	291,739	468,996	628,656	515,469	641,699	667,507	679,082
Cement	-	-	-	10,759	11,946	53,857	358,375	221,434
Fertilizers and Chemical Products	481,515	664,852	519,063	568,301	414,548	614,705	655,019	898,903
Dairy Products and Eggs	21,953	34,425	34,128	39,913	26,728	50,320	44,090	45,742
Packaged Goods	118,977	121,411	106,438	124,473	122,172	153,021	159,461	170,837
Fruits and Vegetables	61,541	65,342	113,914	108,257	102,034	121,539	134,522	171,832
Wine in Bulk	13,526	11,889	15,054	19,450	17,024	18,005	13,926	3,493
Sugar, Salt, Molasses	267,967	225,658	284,006	309,954	253,334	312,684	428,699	356,696
Transhipped Cargo	1,775,984	1,664,643	1,317,111	1,242,042	896,570	1,137,617	876,272	484,800
Others	1,294,351	1,673,483	1,410,355	1,492,794	1,193,994	1,850,556	2,231,009	2,333,425
Total	6,919,045	6,933,942	7,088,733	7,220,966	6,034,761	8,528,813	8,894,973	9,253,255

Source: PAA

17.3.2 Issues on Abidjan Port

The following issues in Abidjan Port are observed:

- Large size of ships cannot enter into port due to insufficient width and insufficient water depth of Vridi Canal,
- Offshore waiting due to insufficient space and handling capacity of the port
- Insufficient capacity of the existing container terminal, grain terminal, mineral terminal and fishing port
- Aging of port facilities and equipment
- Insufficient land for parking of trucks that are waiting for cargo near the port
- Insufficient land for container depots, industrial use and commercial use near the port
- Heavy traffic congestion within the port area, mainly on roads in front of the port entrance
- Weakness of road transport from the port to final destinations, including weak road accessibility

- to the port
- Higher port charges than other ports

17.3.3 Objectives for Development of Abidjan Port

There are two basic aspects regarding the roles and functions of Abidjan Port:

- To import and export a reasonable amount of goods at more competitive charges for cargo handling by reducing transportation cost and time
- To contribute to development of Greater Abidjan to create an international gateway on the international corridors

Abidjan Port is located on a strategic node of the international corridor. Its importance is very high not only from the point of view for efficient logistics on corridors, but also from the point of view of industrial development. Based on the basic role and function of the port, major objectives of reform and development of the port are set as follows:

- To provide good services and efficient service performance to port users: namely shippers, shipping companies, transporters and other users related to the logistics businesses
- To increase revenues not only from handling domestic cargo, but also from collecting more cargos in transit from / to Burkina Faso, Mali and Niger countries and coastal neighbouring countries, and transshipment cargo by expanding service areas
- Support promotion to attract industry and the creation of employment in port related industries

Regarding the port performance, the following points should be improved for increasing the port competitiveness:

- Port / Terminal operation efficiency level; opening time, reliability, lead time, cargo damage, accuracy of information
- Price reduction of charges; port charge, cargo handling charges, port facilities usage fee, etc.
- Safety improvement; compliance, number of accidents, accident prevention
- Customer orientation; responsiveness, flexibility, reducing claims
- Adaptability to the changing market environment
- Landside accessibility

The lack of accessible surface in the port area and traffic congestion on the roads surrounding the port are pointed out by many port users. The insufficient water depth, limited size of the port area and traffic congestion at the port are also pointed out. These problems should be solved promptly by expansion of the existing port area and by landfilling of part of the lagoon.

Also, the promotion of the development at Boulay Island is very important for growth of Abidjan Port. The preparation to support this Boulay Island development plan should be started immediately including not only access roads and bridges which connect with the coastal corridor and but also a railway connection.

17.3.4 Strategies for Development of Abidjan Port

The following strategies are formulated for development of Abidjan Port:

- To improve a logistics supply chain within the port including road network improvements, and improvement of the layout of the port area and surrounding areas
- To improve the efficiency of the logistics supply chain by improving interfaces between berths and railway lines and between berths and roads for smooth access to the Central Corridor and Coastal Corridor. Mainly the creation of new access roads to the new container terminal to expand the service area of Abidjan Port

- To upgrade port performance by making maximum use of existing facilities and equipment
- To support the development of cargo handling capacity and infrastructure that supports shipping demands, industry advances and changing technologies
- To promote the development of new and innovative berth infrastructure and equipment including a new container terminal and additional berths
- To provide value-added services responding to port user demands
- To promote the expansion in land area of the port including development of truck parking, container depots and dry ports for reducing traffic congestion and for effective utilization of the land in the port area
- To develop business opportunities for increased trade, including diversification, new commodities, new revenue streams and new pricing
- To promote the development of logistics parks to attract related industries and to promote better integration of port areas with the strategic industrial areas. Land could be created by landfill

Regarding the value-added services, the following services should be considered for increasing the quality of customer service and for increasing the port competitiveness.

Table 17.3.3 Value-added Services for Increasing Customer Service and Port Competitiveness

Value-added Logistics Services	Loading/unloading, Stripping/stuffing, Bulk storage, Tank storage, General warehousing, Air conditioned warehousing, Distribution centres
Logistics chain Integration Services	Quality control, Repacking, Customizing, Assembly, Testing, Repair, Re-use
Value-added Facilities	Parking facilities, weighbridges, customs facilities, truck maintenance and repair facilities, container repair and maintenance, cleaning facilities, tanking facilities, trailer renting and leasing, Information and communication, safety and security services, offices, hotels, restaurants, shops

Source: JICA Study Team

17.3.5 Programmes and Projects for Development of Abidjan Port

The projects for Abidjan Port are listed below.

(1) Short-Term Projects

- Widening and Dredging of Vridi Channel (on-going)
- Construction of Landfilling of Vridi Bietry Lagoon and creation of port area and industrial area
- Construction of Vridi-Bietry Bridge and new access road from port area to city centre
- Modernization of facility and equipment for providing the value-added services
- Construction of 2nd Container Terminal for South Dock
- Construction of New Container Terminal
- Construction of Grain Terminal
- Construction of Ore Terminal
- Construction of Ro/Ro Terminal
- Construction of Treatment Station for Liquid Waste
- Construction of Logistic Centre and Inland Container Depot at PK27 (North of Greater Abidjan)
- Construction of Dry Port at inland area (on Central Corridor)

(2) Mid-Term and Long-Term Projects

- Construction of Dry Port at Inland Area (western area)
- Introduction of Barge Transportation System for Containers from the Port to Yopougon
- Development of New Port Area at Boulay Island and Construction of Access Road Bridge and Railway to New Development Area

17.3.6 Priority Projects for Development of Abidjan Port

The projects below were selected as priority projects for the development of Abidjan Port.

- Project for Construction of Cereal Berth at Abidjan Port
- Construction of New Port in Île Boulay

17.3.7 Present Situation of San-Pédro Port

San-Pédro Port, located 350km to the south-west of Abidjan, is Côte d'Ivoire's second largest port. The construction of the San-Pédro Port was part of the integrated development plan initiated in the 1960s by the government of Côte d'Ivoire, and was intended to lessen the regional disparity by becoming the core of the South-West region of the country, and also to serve as a transit port for neighbouring countries such as Mali, Guinea Forest and East Liberia. Today, the port is the largest exporter of cocoa beans, of which Côte d'Ivoire is the largest exporter in the world, and proves to be a vital hub for its neighbouring regions.

The port is managed by the Port Autonome de San Pedro (PASP). PASP is a state company placed under the technical supervision of the Ministry of Transport and under the financial supervision of the Ministry of Finance.

The port has five quays and one fishery harbour. The yard area is 2,000 ha, of which 600 ha is currently used. There are three warehouses, one ice factory and one cold storage.

The present cargo throughput of San-Pédro Port is summarised below:

- The total cargo throughput, especially transshipment cargo, has been increasing remarkably from 2010 to 2014. In the same manner, the total container throughput has grown rapidly from 2012 to 2014.
- Commodities related to cement products account for 70% of the total commodity import volume.
- Agricultural products account for a large part of the total export commodity volume, and have been increasing remarkably.

17.3.8 Issues on San-Pédro Port

The port of San-Pédro is functioning as a port for exporting coffee, cocoa, palm, rubber, wooden products, and cotton. In the future, San-Pédro Port is expected to play a role to promote development of mining potential in the western areas of the country, and extracted minerals will be exported from the port of San-Pédro to overseas. Furthermore, San-Pédro Port has a high possibility to become a main commercial port in the western areas of the country and also to attract transit cargo from / to Mali and Guinea and Liberia.

The following issues are observed on San-Pédro Port:

- Poor port performance because of limited capacity of cargo handling equipment
- Lack of storage space at the port of San-Pédro and in the hinterland of the port
- Insufficient capacity of berths for handling mineral products
- Insufficient capacity of berths for handling hydrocarbon products
- Insufficient land for container depots and for industrial and commercial use
- Insufficient capacity of container handling terminal
- No space for trucks which are waiting for entry to the port
- Aging of fishery harbour
- Poor conditions of port roads including narrow roads and bad road connection with hinterland of the port
- Difficulty to provide additional access roads for prospective port expansion

- Insufficient financial means for realization of an extension project of San-Pédro Port which is estimated to cost 950 billion CFA francs
- Insufficient financial support from the government of Côte d'Ivoire
- Insufficient training of port officers on logistics and management of the port to ensure greater economic efficiency of port infrastructure

17.3.9 Objectives for Development of San-Pédro Port

There are two basic aspects regarding the roles and functions of San-Pédro:

- To import and export a reasonable amount of goods at more competitive charges for cargo handling by reducing transportation cost and time
- To contribute to development of San-Pédro to create an international gateway on the international corridors

Based on these basic objectives of development of the port, the port of San-Pédro will be expected to play a role as an export port for local products, such as coffee, cacao, and palm oil from the western area of the country and also as a commercial port to compliment Abidjan Port.

In addition, San-Pédro Port is located in a strategic location in order to become an export port for mineral resources development. Its importance is very high not only from the point of view for efficient logistics on the corridors, but also from the point of view of industrial development. Based on the basic role and function of the port, major objectives of reform and development of the port are set as follows:

- To provide good services and efficient service performance to port users, namely, shippers, shipping companies, transporters and other users related to the logistics businesses
- To increase revenues not only from handling domestic cargo, but also from collecting more cargos in transit from / to Burkina Faso and Mali, and transshipment cargo by expanding the service areas
- To support and to promote development of mineral resources near Man and Odienné to attract industry and the creation of employment in port related industries

Regarding the port performance, the following points should be improved for increasing the port competitiveness:

- Efficiency of port / terminal operation: opening time, reliability, lead time, cargo damage, information accuracy
- Reduction of port-related charges including port charges, cargo handling charges, port facilities usage fee
- Safety improvement: compliance, number of accidents, accident prevention
- Customer orientation: responsiveness, flexibility, reducing claims
- Landside accessibility to the port
- Adaptability to changing market environment

17.3.10 Strategies for Development of San-Pédro Port

The following strategies are formulated for the development of San-Pédro Port:

- To upgrade port performance by making maximum use of existing facilities and equipment
- To develop a new mineral terminal with cargo handling equipment
- To develop an industrial logistics zone by landfilling in wetlands to attract related industries and to promote better integration of port land with industrial areas
- To promote the extension of the port area in order to develop truck parking space, container

depot and dry port for reducing traffic congestion and for effective utilization of land in the port area. The strategic five-year development plan called “Port San-Pédro Extension I” for the period 2016-2020 is under preparation, which is to provide development plans for a new industrial-logistics zone and a new specialized terminals (quays and embankments), for dedicated containers, oil and gas products, minerals and oil exploration operations

- To improve the efficiency of the logistics supply chain by improving the interfaces between berths and railway lines and between berths and roads
- To enable new railway lines including a railway terminal from potential mining areas to the mineral terminal of San-Pédro Port

17.3.11 Programmes and Projects for Development of San-Pédro Port

The projects for development of San-Pédro Port are listed below:

(1) Short-Term Projects:

- Construction of Mineral Berth (within the existing harbour)
- Construction of New Container Terminal

(2) Mid-Term and Long-term Projects

- Construction of Mineral Berth (offshore)
- Reclamation of 150ha in the Port Domain
- Construction of Access Railway for the Port Area to the additional Mineral Berth
- Arrangement of Logistic Platform
- Construction of Platform for Tankers
- Construction of Hydrocarbon Terminal
- Construction of Fishery Harbour

17.3.12 Priority Projects for Development of San-Pédro Port

The projects below were selected as priority projects for the development of San-Pédro Port.

- Expansion of San-Pedro Port
- Project for Construction and Operation of New Mineral Terminal at San-Pédro Port

17.4 Logistics Infrastructure of Côte d’Ivoire

17.4.1 Present Situation of Logistics Infrastructure in Côte d’Ivoire

(1) Present Situation

The Present situation of the logistics infrastructure in the country is best understood by looking at the diagnosis made by the National Development Plan (PND 2016-2020: *Plan National de Développement 2016-2020*) on the service industry. The PND captured what has been believed to be the major bottleneck that holds back the potential of the sector:

“Low competitiveness of supply chains in the same vein as the service industry. This issue is primarily due to the current port congestion, complexity of export and import procedures and the lack of investment in port and rail infrastructure over the last fifteen (15) years”

Another issue that hounds the industry is the serious traffic congestion of the access roads to Abidjan Port. This issue is compounded by the practice in the sub-region where most of the trucks are old and prone to breakdown which further extended delays on the cargoes. The 2015 World Bank assisted study entitled “Poverty and Social Impact Assessment (PSIA) of Road Transport

Reforms along the Abidjan-Ouagadougou Corridor” revealed that out of 17,000 registered trucks in Côte d’Ivoire, 71% are older than 15 years which resulted in the low quality of service and high operation cost.

(2) Legal Framework

There have been several enacted legal instruments to govern trade between and among the ECOWAS and UEMOA countries. The major legal instruments are as follows:

1) Transit Traffic and Interstate Transport

- 1982 ECOWAS Convention A/P.4/5/82 (Inter-State Road Transit of Goods - ISRT). This protocol calls for single carnet (guarantee) system involving payment (single payment on departure) and sharing of guarantee fees among sureties (guarantor) of countries of transit. This means that a guarantee fee of 0.5% will be paid at the port (assuming imported goods) and a mechanism to split the fee between the coastal country (entry point) and the land-locked country (final destination point) will be established. Currently, only Côte d’Ivoire and Mali have agreed to implement single guarantee system.
- Axle Load control: UEMOA Règlement N°14/2005/CM/UEMOA Relatif à l’Harmonisation des Normes et des Procédures du Contrôle du Gabarit, du Poids, et de La Charge A l’Essieu Des Véhicules Lourds de Transport de Marchandises dans les États Membres de l’UEMOA. This regulation basically confirms the original axle load limit established by the 1982 ECOWAS IST Convention on Inter-State Road Transport which sets a limit of 11.5 tons per axle. For instance, maximum weight of cargoes to be loaded on a 6-axle truck is only 51 ton. Of the four governments, only the Togolese government is currently compelling truckers to observe the regulation.
- Cargo Quota System or Freight Sharing: The ECOWAS Inter-State Road Transportation Convention (No. A/P2/82) allows pairs of member states to conclude bilateral treaties that set quotas in terms of specific percentages of the freight passing through a coastal country’s port en route to a landlocked country to the truckers of each of the two countries. Several such bilateral treaties exist, usually dividing imported goods into “strategic” goods and nonstrategic goods. Strategic goods are 100 percent allocated to the landlocked country and nonstrategic goods are allocated 2/3 to the landlocked country and 1/3 to the coastal country. (Impact of Road Transport Industry Liberalization in West Africa, USAID, 2012)

2) Trade Facilitation

- ECOWAS Decision A/DEC/13/01/03. This relates to establishing a Sub-regional Road Transport and Transit Facilitation Programme in Support of Intra- Community Trade and Cross-Border Movements.
- One Stop Border Posts (OSBP): Supplementary Act /Sa.1/07/13. This relates to the establishment and implementation of the one stop border posts concept within member states of ECOWAS and establishes, among other things, the legal framework for one stop border posts.
- Décision N°15/2005/CM/UEMOA Portant Modalités Pratiques d’Application du Plan Régional de Contrôle sur les Axes Routiers Inter-Etats de l’UEMOA : This decision spells out clearly that there should be no controls on any of the transit traffic along inter-state roads and that all controls must be limited to the point of departure, border crossings and the point of arrival.
- Décision N° 39/2009/CM/UEMOA Portant Création et Gestion des Corridors de l’Union: creation of Corridor Management Committees

3) Trade Policy

- ECOWAS Trade Liberalization Scheme (ETLS) and its various instruments - ECOWAS

operational tool for promoting the West Africa sub-region as a Free Trade Area.

- ECOWAS Common External Tariff: This is one of the instruments for harmonizing ECOWAS Member States and strengthening its Common Market.

(3) Existing Development Plan for Logistics Infrastructure

The National Development Plan (PND 2016-2020) recognized the important role of Logistics Infrastructure in the field of agriculture (through provision of logistics terminals for agriculture outputs), the service sector (through improvement of supply chains) and the industry sector (through cost reduction, supply chain improvement and logistics human resources development). These bottlenecks in the Logistics Infrastructure are some of the factors restricting the rapid growth of the economy as well as holding back the competitiveness of the three sectors mentioned above.

Despite the bold pronouncement on the importance of logistics in propelling the economy to greater height, there's no single document which binds together all development plans related to Logistics Infrastructure in the country. At present, what exist are sporadic efforts by the different line agencies of the government that may have significant impact on the industry. Coordination among the proponents is necessary to avoid duplication and to synergize their impact. Some of the major logistics projects proposed by the government are as follows:

- Construction of Truck Terminal at PK 24: proposed by Office Ivoirien des Chargeurs (Ivorian Office of Chargers)
- Five dry ports in the following locations: Ferkessédougou Dry Port, Man Dry Port, Odienné Dry Port, Bondoukou Dry Port and Niable Dry Port; project proponent is the Ministère de L'intégration Africaine et des Ivoiriens de L'exterieur (Ministry of African Integration and Ivoirians in the Diaspora)

Likewise the 2015 JICA assisted project entitled "The Project for the Development of the Urban Master Plan in Greater Abidjan (SDUGA)" has recommended the construction of :

- Seven logistics: Container Terminal at Yopougon, Grand Bassam Logistics Centre, Bonoua Logistics Centre, Anyama Logistics Centre, Dabou Logistics Centre, Dabou Logistic Centre, Ile Boulay Logistics Centre

17.4.2 Issues on Logistics Infrastructure of Côte d'Ivoire

The critical issues that need to be addressed by the Côte d'Ivoire side to push forward the industry are presented in the table below.

Table 17.4.1 Major Issues affecting the Logistics Industry in Côte d'Ivoire

Grouped Issues	Details
<p>a. Weak (or lack) of compliance on the laws and regulations enacted by regional bodies</p>	<p>Level of compliance on the different enacted major laws by the regional bodies (ECOWAS and UEMOA) is as follows:</p> <ul style="list-style-type: none"> • 2005 Number of control points along the corridor by UEMOA—all controls must be limited to the point of departure, border crossings and the point of arrival. Compliance on this directive is very weak as evident by the multiple check points along the Abidjan-Ouagadougou corridor. • 2005 Axle load control by UEMOA – of the four governments, only the Togolese government is currently compelling truckers to observe the regulation. • ECOWAS protocol on Inter-State Road Transit of Goods (ISTG) –Currently, only Côte d'Ivoire and Burkina Faso have agreed to implement a single guarantee system. At Lomé Port, the two (2) chambers of commerce (guarantors) of Togo and Burkina Faso have signed an MOU in late 2015 to allow the two (2) customs bounds fees to be charged once at Lomé port however this has not been implemented yet. No progress is reported at the Tema/Accra- Ouagadougou corridor.
<p>b. Operational-related Issues</p>	<ul style="list-style-type: none"> • Based on the 2016 JICA Logistics survey for this study, the Abidjan-Ouagadougou Corridor is the most expensive corridor in transporting cargo (both container and bulk) to Burkina Faso (Abidjan by Road=USD 5,531; Abidjan by Rail=USD 4,772; Tema by Road=USD 4,590; Lomé Port=USD 4,215). The prices mentioned are for the case of 40-ft container. • Likewise, Abidjan Port has the highest cost among the competing ports (Abidjan Port=USD1,514; Tema Port=USD1,045; Lomé Port=USD872). • Being the longest among the three corridors, it has also the highest cost for inland transport cost at USD 3,122 (14.6% higher than Tema Port's cost and 28.2% higher than Lomé Port's cost). • Lengthy cargo processing time. Despite some improvements in the clearance procedure, data from Observatoire de la célérité des Opérations Douanières (OCOD) in Abidjan Port indicates that clearance procedures average is about 3 days which is still long and has much room for improvement. • The long dwell time of containers at the port is mostly likely due to the following: pre-arrival customs declaration documents are not made, incomplete documents or late arrival of funds sent by the consignee, port is being used as temporary storage due to 21 days free time especially if container is transported by rail where waiting time to get a wagon is about 7 to 9 days. • Frequent shortage of GPS devises managed by the Ivorian Chamber of commerce is also reported as one of the causes of the delay of cargo at the port. • Shipping lines at Abidjan Port have introduced a new Terminal handling fee this June 2016. This new charge (EURO 115 for 20-ft container and EURO 150 for 40-ft container) are being challenged by importers since they already pay a terminal handing fee to the terminal operator. The same situation is happening in Tema Port although it is currently deferred by the government in August this year. • Serious traffic congestion especially at port access, prevalence of overloaded trucks • Port congestion, trucks illegally parked, preference for bulk cargo (devanning) over containerized cargo thus increased the dwell time, etc. • Strong presence of road blocks (road harassment) for bribery • Inefficient transit system which results in immobilization of trucks (including presence of

Grouped Issues	Details
	several informal brokers, limited number of computers to undertake customs declaration, unstable internet connection resulting in longer wait to process documents, etc.)
c. Infrastructure-related Issues	<ul style="list-style-type: none"> • Shortage/lack of logistics facilities including truck terminals, logistics Centres, warehouses • Poor/congested access road to port • Poor road condition on some sections of the corridor • Old vehicles are used to transport cargoes and are thus more susceptible to frequent breakdowns and accidents • Lack of intermodal terminal which prevents use of multi-modal operation • Lack of truck rest areas along the corridors • Lack of OSBP resulting in complicated and inefficient transit procedures
d. Institutional-related Issues	<ul style="list-style-type: none"> • Cargo sharing agreement between land-locked countries and coastal countries (Freight Sharing) • First-come, first-served system practiced by the truck unions (Queuing System) • Weak implementation of axle load control resulting in road damage and accidents • Lack of regional insurance/guarantee scheme for containers • Insufficient effort by concerned authorities to end road harassment

Source; JICA Study Team

17.4.3 Objectives for Logistics Industry in Côte d'Ivoire

(1) Overall Objective

The overall goal for the logistics sector in this study is to reduce transport and transaction costs by the establishment of an efficient multi-modal logistics system in the region. This bold target naturally calls for upgrading the logistics infrastructure (terminals and links), modernization of logistics operation (mechanization of remaining activities that are currently done manually), promotion of logistics human resources (that would contribute to professionalization of the industry) and gradual abolition of the outdated systems governing the industry.

(2) Specific Objectives

The specific objectives for logistics industry in Côte d'Ivoire are as follows:

- To establish a multi-modal logistics system to capitalize on the strength of each mode (all modes work together to satisfy customers demand)
- To modernize logistics operation (removing manual systems and unnecessary barriers) to take advantage of the available modern technologies
- To promote professionalization of logistics industry in the country

17.4.4 Strategies for Logistics Industry in Côte d'Ivoire

The strategies are designed to achieve the three objectives enumerated above. The strategy is divided into five categories which touches infrastructure, logistics operation, and human resource development.

- To pursue strengthening of logistics nodes (logistics platform) of the country
- To pursue integration of logistics infrastructure for seamless transfer of cargoes from one mode to another
- To pursue provision of cross-border facilities, utilization of modern ITS and data standardization for seamless flow of information
- To pursue promotion of containerization to support intermodal logistics operation
- To pursue promotion of human resources development for logistics industry (to contribute to

professionalization of the industry)

17.4.5 Infrastructure Programmes and Projects for Logistics Industry in Côte d'Ivoire

The list of projects is presented the table below.

Table 17.4.2 Proposed Projects on Logistics Industry in Côte d'Ivoire

Project Name	Project Type	Expected Responsible Organization	Term	
			Short-Mid 2025	Long 2040
Anyama Multi-Modal Terminal	Logistics Terminal	MIE, SIPF	x	
Truck Terminal/Logistics Platform at PK 26	Logistics Terminal	OIC	x	
Grand Bassam Logistics Centre	Logistics Terminal	TBD		x
Bonououa Logistics Centre	Logistics Terminal	TBD		x
Dabou Logistics Centre	Logistics Terminal	TBD		x
Ile Boulay Logistics Centre	Logistics Terminal	TBD		x
Fekessédougou Dry Port	Logistics Terminal	MIAIE	x	
Man Dry Port	Logistics Terminal	MIAIE		x
Odienné Dry Port	Logistics Terminal	MIAIE		x
Bondoukou Dry Port	Logistics Terminal	MIAIE		x
Niable Dry Port	Logistics Terminal	MIAIE		x
Elubo-Noé OSBP (Côte d'Ivoire-Ghana border)	Cross-border facility	Customs of Côte d'Ivoire and Ghana as lead agency	x	
Laléraba OSBP (Côte d'Ivoire-Burkina Faso border)	Cross-border facility	Customs of Côte d'Ivoire and Burkina Faso as lead agency	x	
Ganta OSBP (Côte d'Ivoire – Liberia border)	Cross-border facility	Customs of Côte d'Ivoire and Liberia as lead agency		x

Source; JICA Study Team

Note: MIE=Ministère des Infrastructures Economiques ; SIPF= Société Ivoirienne de gestion du patrimoine Ferroviaire ; MIAIE =Ministère de L'intégration Africaine et des Ivoiriens de L'exterieur ; OIC=Office Ivoirien des Chargeurs

17.4.6 Programmes and Projects for Professionalizing Logistics Services and Trade Facilitation in Côte d'Ivoire

Equally important are the non-infrastructure projects that would complement the infrastructure-based projects. These measures would address concerns regarding existing outdated systems that currently govern how cargoes are transported.

Table 17.4.3 Programmes and Projects for Professionalizing Logistics Services and Trade Facilitation in Côte d'Ivoire

Project Name	Explanation
1. Institutional Strengthening and Capacity Building Support for Freight Transport Stakeholders both in the Public and Private Sectors	<p>This project aims to strengthen the capacity of the Government and of professional associations in the transport, transit and trade sector to effectively provide efficient support and services to private operators operating primarily on the three corridors. This will also support activities that promote the professionalization of the road transport industry, as well as accompanying measures for the transport and logistics operators. This project is about to commence with the support of the World Bank. The project may include the following:</p> <ol style="list-style-type: none"> Strengthening the institutional capacity of the Ministry of Transport (MOT) and related agencies including Observatoire de la Fluidité du Transport (OFT - Transport Fluidity Observatory) and other related agencies. Support to transport operators by (i) building capacity for the professional transport sector associations through the development of public and private training capacity for the transport and logistics profession, (ii) supporting informal transport operators which cannot comply with possible new regulatory requirements to convert them to other transport related activities or retrain them. Support to joint initiatives and formalization of public-private dialogue to facilitate trade on the corridor by (i) supporting communication campaigns on transport and trade reforms to build broad ownership and support, (ii) supporting regional dialogue among the countries on transport and transit facilitation issues on the corridors and (iii) supporting monitoring of transport conditions on the three corridors through road users' survey, logistics cost measurements, and studies of pricing in the trucking industry.
2. Development of Fleet (Truck) Renewal Scheme	<p>This project aims to support the development of a fleet renewal scheme that will allow truck companies to access credit lines to renew their old trucks. It will also support the institutional strengthening of the authority that will be tasked by the government to handle the scheme to ensure that the agency would gain adequate capacity in managing the activities of the project including relationships with the commercial banks and trucking companies. The project may include the following:</p> <ol style="list-style-type: none"> Support to the development of a self-sustaining Fleet Renewal Scheme and institutional strengthening the agency assigned by the government to ensure it has adequate institutional and management capacity to administer and manage the truck renewal scheme on behalf of the Government. These supports may include (i) designing of institutional and implementation arrangements for the involved stakeholders (commercial banks, truck operators and other stakeholders) to qualify for the credit line, (ii) selection of commercial banks to host the line of credit and the selection of operators qualified for truck renewal, including clear flow of funds, and (iii) support in competitive selection of a contractor to manage the truck scrapping system. Capacity building and technical assistance for the designated agency by the government to more effectively manage truck renewal scheme.
3. Support to Customs Modernization and Trade Facilitation along the Corridors	<p>This project aims to improve the efficiency of trade and transit procedures between Burkina Faso and Côte d'Ivoire, Burkina Faso and Ghana; and Burkina Faso and Togo. The primary activities are (i) ensuring efficient connection of customs information systems within the country (i.e. dry ports to border for the case of land-locked countries; ports to borders for coastal countries) and (ii) between the countries (i.e. inter-connection of two customs systems at the border). The proposed project may include the following components:</p> <ol style="list-style-type: none"> Supporting the interconnection of the existing customs' management system on the four corridors (Ouagadougou-Abidjan, Ouagadougou-Tema/Accra, Ouagadougou-Lomé, Abidjan-Lagos) and implementation of new ICT systems to facilitate regional trade by unifying customs procedures. Modernization of customs' clearance procedures and promotion of coordination between customs departments to reduce congestion at gateway ports (Abidjan Port, Tema Port, Lomé Port) and border posts on the corridors and capacity building for customs officials. Training of customs officials and external users of customs systems, including support to professionalization of the clearing and forwarding industry through capacity building. Anti-harassment campaign including information drive to different freight transport operators both from the public and private sectors.
4. Enhancement of Government Road Safety Program	<p>This project aims to focus on activities to improve the safety of road users including truck transport operators along the three corridors. It will also support the institutional strengthening and capacity building of the primary agency which has the overall mandate for road safety oversight. The following activities may compose the project:</p> <ol style="list-style-type: none"> Capacity building for the primary agency tasked for road safety and monitoring of road safety on the three corridors including effective enforcement of axle load control Launching of traffic safety campaigns on the three corridors via television, radio, social activities and other means. Identifying accident black spots along the three corridors. Provision of training equipment and other materials needed by the primary agency for road safety.

Source: JICA Study Team

17.4.7 Profiles of Priority Projects for Logistics Industry in Côte d'Ivoire

Although all the projects are selected from the view point of regional development and corridor development, there are some projects which have greater impact in terms of accelerating regional development and hence are given a priority. Likewise, project readiness (e.g. FS has been conducted), urgency from the government side to pursue the project, and significant impact on the international logistics chain were also given weight in coming up with the priority list. .

(1) Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders

1) Project Outline

In addition to export of primary commodities, such as minerals and agricultural products, it is necessary for Côte d'Ivoire to diversify economic sectors. The WAGRIC Master Plan recommends paying attention to the potentiality of economic sectors both in coastal areas and inland areas, by targeting growing sub-regional markets and taking advantage of the customs union which has been institutionalized by UEMOA and ECOWAS. For this purpose, it is necessary to strengthen the implementation of the customs union by taking advantage of the customs union, which has been institutionalized by the member countries of UEMOA and ECOWAS.

The project aims at enforcement of implementation of the customs union and trade facilitating for sub-regional products with neighbouring countries of the sub-region, especially with Ghana, along Abidjan-Lagos Corridor. The project will also be applied to the national border with Burkina Faso on Abidjan-Ouagadougou Corridor.

The project will establish new materials for training and also train related agencies and personnel. Campaigns for customs union trade facilitation of sub-regional products will also be implemented together with WAGRIC countries and its surrounding countries under this project.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

US\$ 4 million

(2) Construction and Operation of One-Stop-Border Post (OSBP) at Elubo-Noé (National Border between Côte d'Ivoire and Ghana)

1) Rationale

The Abidjan-Lagos Coastal Corridor is the most travelled West African corridor. This high volume of traffic underscores the important economic exchanges among the coastal countries. It is therefore important that aside from the on-going road improvement works, simplifying border crossing procedures by construction of OSBP is equally pursued. The aim is to ease the crossing between countries for people and goods which would contribute in increasing regional trade and regional integration.

2) Objective

The following are the objectives of the project:

- To reduce border crossing time, harassment and cost
- To reduce transport and logistics costs
- To promote trade and economic development amongst countries in the region

3) Project Description

The project involves construction of OSBP in the border of Ghana and Côte d'Ivoire. The facility would sit on an area of about 27 hectares (about 11 hectares on Côte d'Ivoire side the remaining on Ghana side).



Source: JICA Study Team

Figure 17.4.1 Project Location of Noé / Elubo OSBP

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Ease crossing between Côte d'Ivoire and Ghana for people and goods
- Increase regional trade and reduce transport costs
- Contribute in regional integration

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

Cote d'Ivoire side

- Ministry of Transport (Observatoire de la Fluidité des Transports)
- Related agencies: Douane (Customs), Police, Armed Forces of the Republic of Ivory Coast (Forces Republicaines de Côte d'Ivoire), Eaux & Forêts, Vétérinaire, Service Phytosanitaire, Office Ivoirien des Chargeurs, Chambre de Commerce, The Organization of the Abidjan-Lagos Corridor (ALCO)

Ghana side

- Ministry of Roads and Highways
- Related agencies: Customs, Immigration, Port Health, Bureau of National Investigation, Ministry of Trade & Industry, Ministry of Agriculture, Food & Drug Authority, Ghana Standard Authority, Chamber of Commerce, Shippers Council, Bureau Veritas Inspection Valuation Assessment and Control, GCNet, Army, Ghana Institute of Freight Forwarding, State Insurance Company, banks, The Organization of the Abidjan-Lagos Corridor (ALCO)

6) Estimated Project Cost

- USD 20 Million (government estimate)

7) Implementation Schedule

- To be determined

8) Necessary Actions for Implementation / Critical Factor

- Land compensation on both countries has not been completed which require immediate action

9) Related Projects

- Bridge construction committed by the World Bank

10) Social and Environmental Impacts

- Ghana side (Elubo): Environment impact is expected due to cutting of trees and minimal land filling since the area is generally flat. Social impact is minimal since the area is generally not inhabited.
- Côte d'Ivoire side (Noe): Environmental impact is significant due to substantial cutting and filling activity to flat the area. Cutting of trees as well is expected. Social impact is expected and there is a need to relocate 11 individuals inhabiting the area according to the JICA Mission which visited the site on 24 September 2013.

(3) Construction and Operation of One-Stop-Border Post (OSBP) at Laleraba (National Border between Côte d'Ivoire and Burkina Faso)

1) Rationale

In recent years, the trade volume and vehicle traffic from Côte d'Ivoire to Mali and Burkina Faso is increasing. This positive development calls for simplification of cross-border procedures to further encourage economic exchanges between Côte d'Ivoire and land-locked countries like Burkina Faso and Mali.

Currently, transit cargoes are required to be cleared at customs offices in both Côte d'Ivoire and landlocked countries. Processing of documents for crossing both for people and goods are conducted twice – at the towns of Laleraba (Côte d'Ivoire side) and Niangoloko (Burkina Faso side). This duplication of task due to lack of coordination is extending the delays incurred on traffic thus it increases cost for traders and countries (operation cost). Construction of OSBP aims to ease the crossing between countries for people and goods which would contribute in increasing regional trade and regional integration.

2) Objective

The following are the objectives of the project:

- To reduce border crossing time, harassment and cost
- To reduce transport and logistics costs
- To promote trade and economic development amongst countries in the region

3) Project Description

The project involves construction of One-Stop Border Post between Burkina Faso and Côte d'Ivoire. The size of the land to erect the facility is about 50 hectares. There has been initial progress such as building of social services by the government intended for the people living in the area such as school buildings, power supply and other amenities needed by the community.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Ease crossing between Côte d'Ivoire and Burkina Faso for people and goods
- Increase regional trade and reduce transport costs
- Contribute in regional integration



Source: JICA Study Team

Figure 17.4.2 Project Location of Laleraba OSBP

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

Cote d'Ivoire side

- Ministry of Transport (Observatoire de la Fluidité des Transports)
- Related agencies: Douane (Customs), Police, Armed Forces of the Republic of Ivory Coast (Forces Republicaines de Côte d'Ivoire), , Eaux & Forêts, Vétérinaire, Service Phytosanitaire, Office Ivoirien des Chargeurs, Chambre de Commerce

Burkina Faso side

- Ministry of Transport (Observatoire de la Fluidité des Transports)
- Related agencies: Douane (Customs), Police, Forces armées du Burkina Faso (Military of Burkina Faso), Conseil Burkinabè des Chargeurs, Chambre de Commerce, other related agencies

6) Estimated Project Cost

- CFA 26 Billion (per information from the government)

7) Implementation Schedule

The facility is targeted to operate in 2020

8) Necessary Actions for Implementation / Critical Factor

Land evaluation for the 50 hectares identified as location of the OSBP is on-going. Compensation of the land owners would follow. These two activities should be settled quickly to proceed to the next step which procurement and then civil works. It was learned that facility design has been completed.

9) Related Projects

None

10) Social and Environmental Impacts

- Environmental impact is expected to be minimal due to favourable flat terrain thus cut and fill of soil is minimal. However, cutting of trees is unavoidable as well as compensation of the cornfield.
- Social impact however might be moderate due to presence of some houses as well as mosque.

(4) Construction and Operation of Truck Terminal/Logistics Platform at PK 26

1) Rationale

Due to lack of truck terminal, trucks are scattered in the periphery of Abidjan Port and other parts of the city. This unfortunate situation affects port operation as it slowed down entry and exit of trucks and traffic circulation in the city. Due to the above problems, a Logistics Platform is conceived to be placed at PK 26. The idea is that this area will hold trucks with no immediate cargo to load at the port. Entry and exit of trucks at the port should be regulated as well.

2) Objective

To supply a modern facility where all the needs of trucking and transport operators are provided to improve efficiency of logistics operation in the country.

3) Project Description

The project involves construction of an integrated truck terminal with a size of 109 hectares. The facility is envisioned to accommodate as many as 2,000 trucks. The truck terminal or logistics centre should incorporate space for truck parking, facilities for storage (warehouses), loading/unloading of goods, vehicle repair/workshop, amenities and services required for transport operators. A Pre-feasibility study was carried out by bnetd and completed in January 2015. Likewise, it was reported that the government of Cote d'Ivoire and the World Bank are having a discussion on the possible support from the latter to realize the project.

4) Expected Benefits

The following benefits are expected:

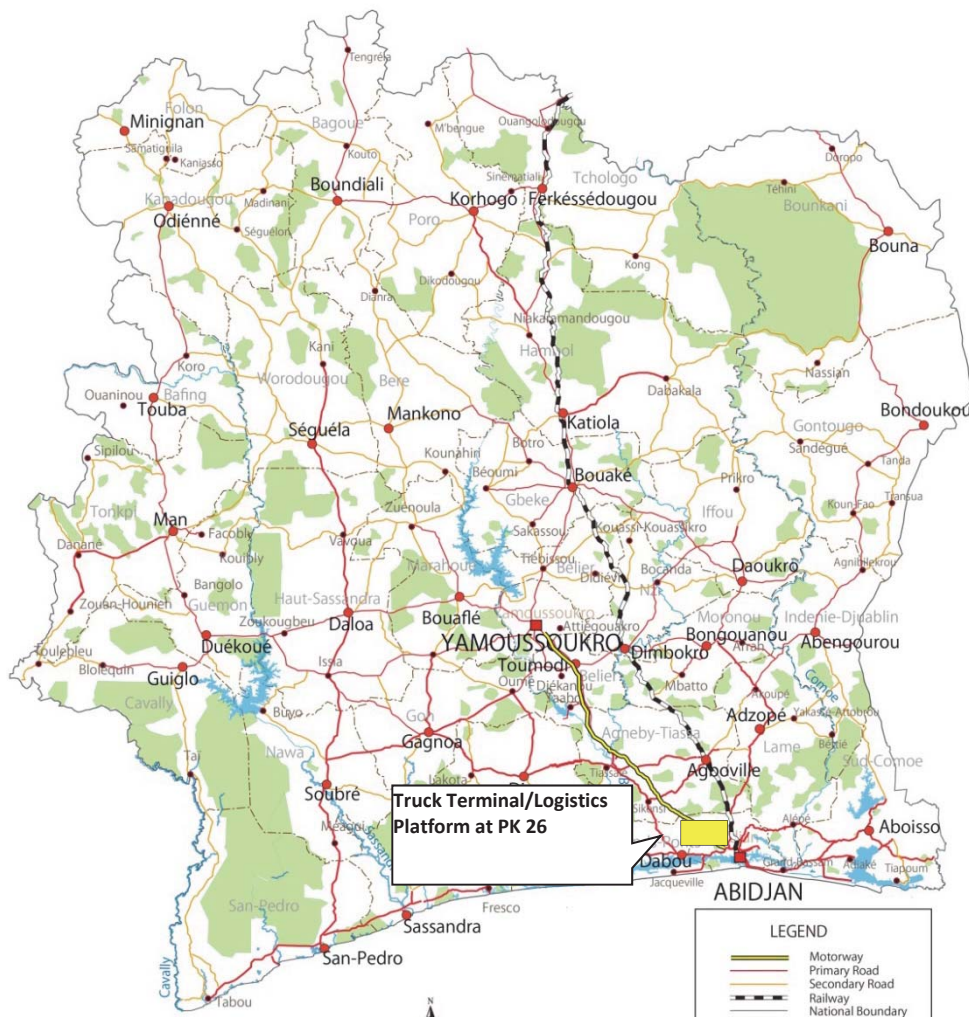
- Improved traffic circulation in the city due to reduced number of trucks parked along the roadsides
- Improved efficiency in logistics operation due to concentration of services in a single area
- Decongestion of port area as a result of removal of parked trucks

5) Executing Agency and Related Institution

DGTT and OIC

6) Estimated Project Cost

CFA 25 Billion (government estimate)



Source: JICA Study Team

Figure 17.4.3 Project Location of Truck Terminal at PK 26

7) Necessary Actions for Implementation / Critical Factor

Funding has not been secured thus identifying a willing partner (be it a private or a donor institution) is the next critical action.

8) Related Projects

The proposed Logistics Centre is a complementary project for the proposed Industrial Centre (PK 24) at Attinguï by the government.

9) Social and Environmental Impacts

Possible Social and Environmental Impacts are as follows:

- Social and environmental impacts are expected to be minimal since the area is not inhabited. Minimal impacts on the environment includes cutting of trees, cut and fill of soil and other construction activities related to clearing of the area.

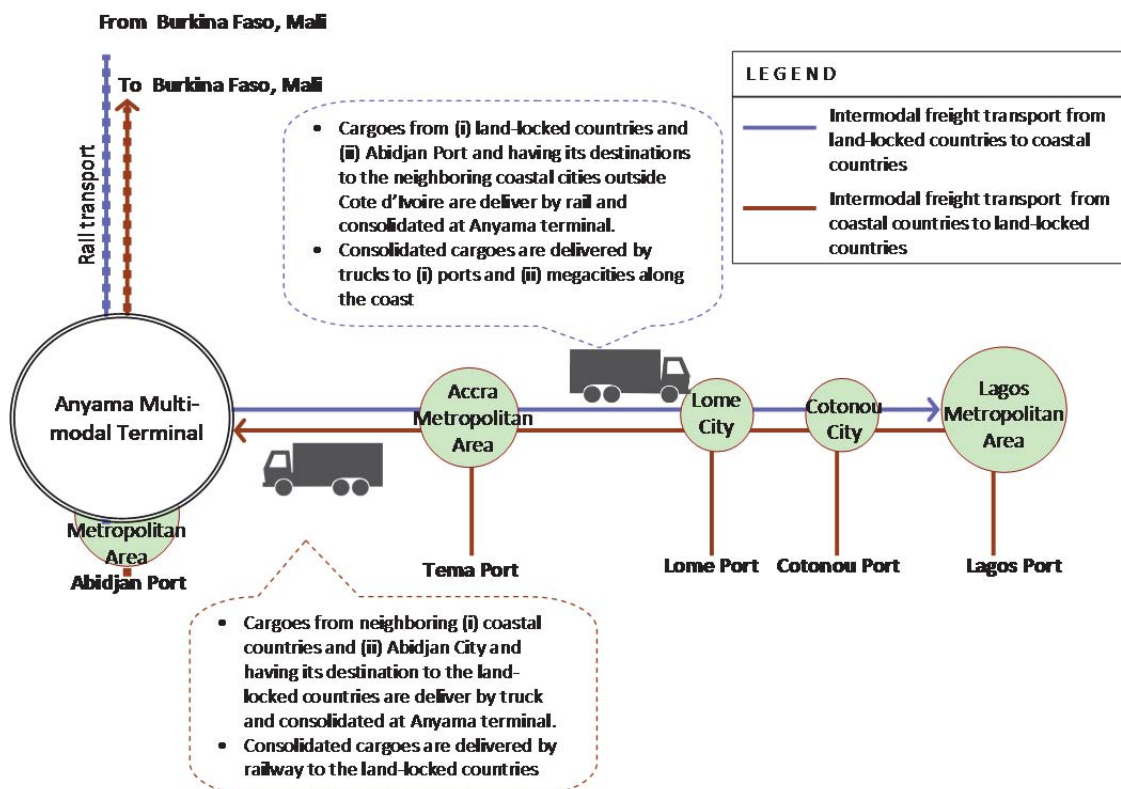
(5) Construction and Operation of Anyama Multi-Modal Terminal

1) Rationale

Côte d’Ivoire has a very important transport infrastructure asset in the form of the railway which connects the primary port of the country to the land-locked countries, as well as to inland areas of Côte d’Ivoire. Sitarail has a good connection with Abidjan Port, but not so good connection with urban areas of Greater Abidjan. In order to take advantage of the long-distance railway (Sitarail) of Abidjan-Ouagadougou, Greater Abidjan needs a railway cargo station which attracts cargos from urban areas of Greater Abidjan.

This scenario calls for the construction of a multi-modal terminal within the periphery of the capital. Anyama town appears to be a suitable location to host such facility. However, at the same town there’s a plan by the government to construct a Cattle Market and Slaughterhouse Complex which also intends to take advantage of the existing railway. The co-existence and complementary functions of the two facilities should be given a serious thought.

As far as freight transport is concern, the figure below illustrates the possible function of the said multi-modal terminal. At first, it could serve as an interface between the two modes of transport (rail and road). Similarly, it could serve as consolidation point for international cargoes where added logistics service can be performed.



Source; JICA Study Team

Figure 17.4.4 Image of possible freight transport function of Anyama Multi-modal Terminal

2) Objective

To construct a modern multi-modal terminal to efficiently connect railway transport and road transport thus allowing uninterrupted transfer of cargo from one mode to another. The specific objectives are as follows:

- To create a logistics hub within the Greater Abidjan region through the integration of rail freight and road freight transport.
- To facilitate and process international trade between land-locked countries and coastal countries and promote value-added services at the multi-modal terminal.

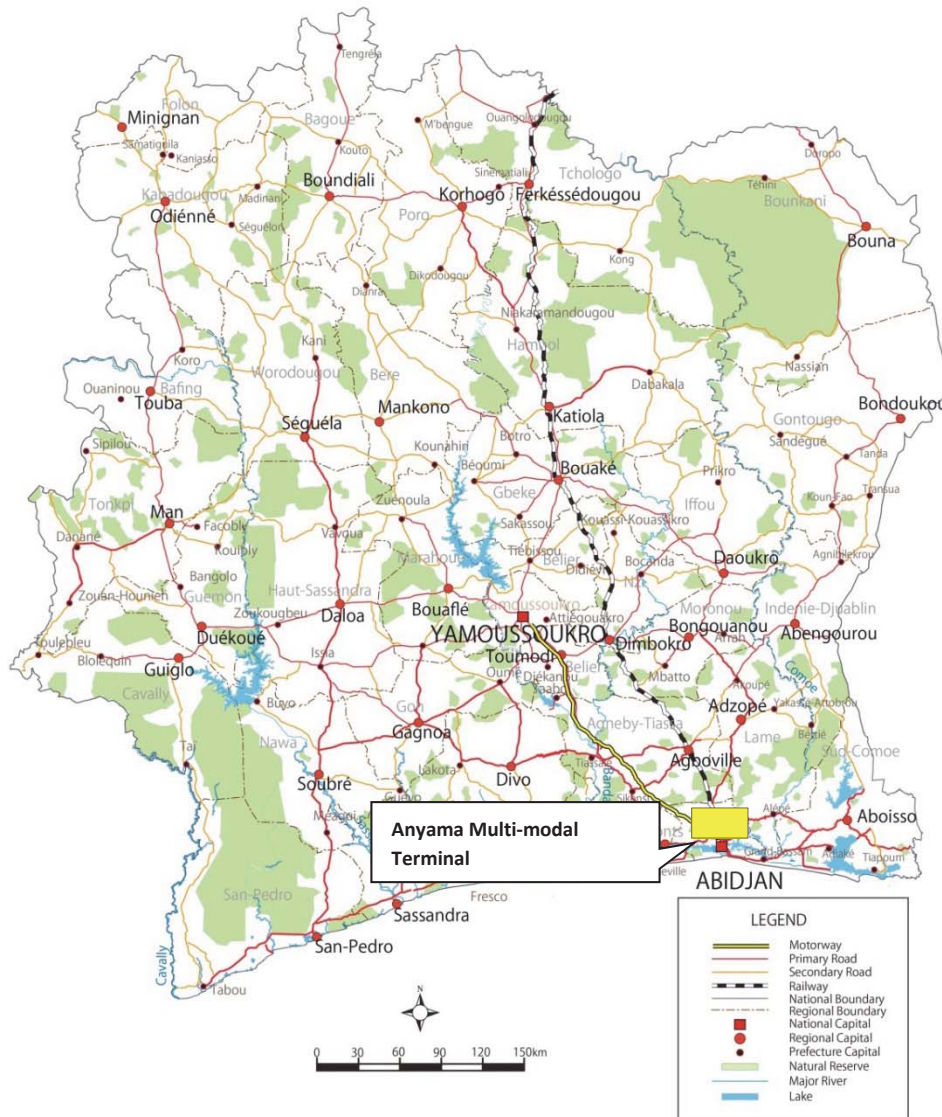
3) Project Description

The project involves construction of an integrated multi-modal terminal that could serve as the logistics hub of the country. The facility should have a railway cargo station, warehouses, truck services, and other logistics services needed for international cargo such as customs office and related agencies. The core components of the project are as follows:

- Container yard
- Truck parking area
- Inland container depot

For the dry port facility, it is envisioned to offer the following core logistics functions:

- Transit point for freight to land-locked countries and coastal countries
- Inland container depots (ICD)



Source: JICA Study Team

Figure 17.4.5 Project Location of Anyama Multi-modal Terminal

4) Expected Benefits

The following benefits are expected:

- Improved efficiency of the logistics system of the country thus strengthening its position in the region for transit cargoes

- Contribute in rationalizing the share of road transport and railway transport by increasing the share of railway for long haul cargo and thus
- Contribute in the promotion of container logistics, decongestion of the port area as a result of removal of parked trucks, and increase in transportation reliability as well as greater security and safer transportation.

5) Executing Agency and Related Institution

- Ministry of Economic Infrastructure (Ministere des Infrastructures Economiques)
- Ivory Coast Management of the Railway Assets Company (SIPF, Société Ivoirienne de gestion du patrimoine Ferroviaire).
- Douanes de Côte d'Ivoire (Customs of Côte d'Ivoire)
- Immigration Office of Côte d'Ivoire
- Abidjan Port Authority (Port Autonome d'Abidjan)

6) Estimated Project Cost

To be determined

7) Implementation Schedule

To be determined

8) Necessary Actions for Implementation / Critical Factor

A feasibility study needs to be carried out to determine the correct size of the facility, facilities to be housed, and funding arrangement among others.

9) Related Projects

The proposed Cattle Market and Slaughterhouse Complex by the government is also situated in the same area and thus close coordination among the agencies involved in the two projects is necessary.

10) Social and Environmental Impacts

Possible Social and Environmental Impacts are as follows:

- Social and environmental impacts are expected to be minimal since the area is not inhabited. Minimal impacts on the environment include cutting of trees, cut and fill of soil and other construction activities related to clearing of the area.

(6) Construction and Operation of Fekessédougou Multi-Modal Dry Port

1) Rationale

The existing long-distance railway (Sitarail) needs to expand its service areas by combining truck transport with rail transport. The multi-modal dry port is a very useful facility to combine truck and rail transport.

The city of Ferkessédougou is identified as a strategic location to place a multi-modal dry port since it is where the traffic to Mali and Burkina Faso merged (for south bound traffic) and diverged (for north bound traffic). By constructing a dry port close to the border of the two countries, in essence the services at Abidjan Port is brought closer to the clients from Burkina Faso, Mali and even the northern parts of Côte d'Ivoire.

2) Objective

The objectives of the dry port are as follows:

- To facilitate and process international trade for Mali and Burkina Faso including the southern part of Côte d'Ivoire and promote value-added services.
- To speed up flow of cargo between Abidjan port to the dry port via the railway thus increasing

efficiency of cargo movement and contributing in diverting freight traffic from road to rail.

- To decongest Abidjan port by moving away the time-consuming sorting and processing of cargoes at the port.

3) Project Description

The project involves construction of a dry port in a flat land with an area of about 650 hectares. Accordingly, an FS by *bnetd* has been completed in January 2016. The facility is envisioned to be connected with the existing railway line of SITARAIL thus allowing it to become a multi-modal terminal. Development of the area should be done in staging depending on the projected cargo volume in the FS. The major work for this project would most likely include:

- Construction of ICD
- Construction of container handling yard
- Introduction of container handling equipment such as reach stacker and top lifter

Likewise, the customs system in the dry port should be inter-connected to the system employed at the Abidjan Port for seamless flow of trade information.



Source: JICA Study Team

Figure 17.4.6 Project Location of Ferkessédougou Dry Port

4) Expected Benefits

The expected benefits are as follows:

- Contribute in decongesting Abidjan Port by allowing containers to automatically depart the port and formalities will be carried out at the dry port

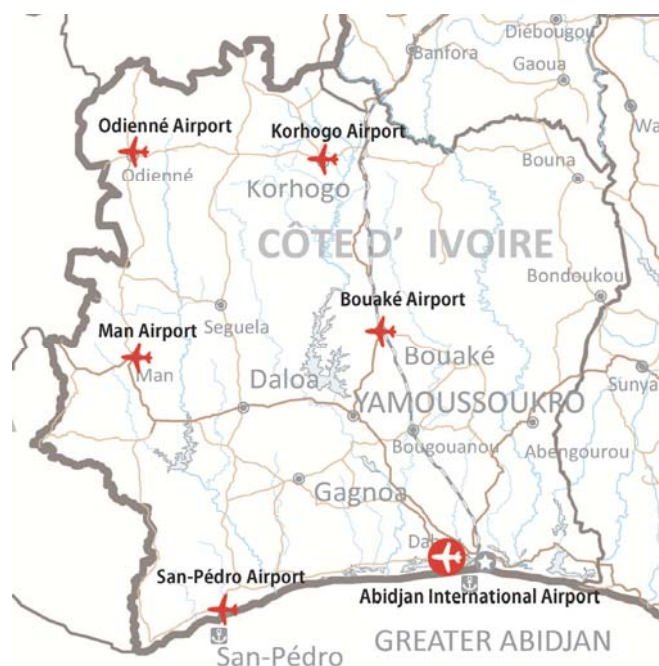
- Enhancement of Côte d'Ivoire's competitiveness for transit cargo to land-locked countries
 - Increase in transport reliability (predictable arrival and departing time)
 - Promotes greater security and safety of cargoes
- 5) Executing Agency and Related Institution**
- MIAIE =Ministère de L'intégration Africaine et des Ivoiriens de L'exterieur
 - Douanes de Côte d'Ivoire (Customs of Côte d'Ivoire)
 - Immigration Office of Côte d'Ivoire
- 6) Estimated Project Cost**
- US\$ 42 million
- 7) Implementation Schedule**
- To be determined
- 8) Necessary Actions for Implementation / Critical Factor**
- First critical action is the compensation of the land owners which has not been settled
 - Second critical action is finding a partner to finance the project. The JST was made aware that Bollore group is interested to the project and in talk with a Chinese company named China National Renewable Energy Centre (CNREC) for possible cooperation
- 9) Related Projects**
- None
- 10) Social and Environmental Impacts**
- Environmental impact is deemed minimal since the terrain is flat thus cut and fill is at minimum. However, social impact is expected to be high due to relocation of affected families living within the identified development area.

17.5 Air Transport Sector of Côte d'Ivoire

17.5.1 Present Physical Situation of Air Transport and Airports of Côte d'Ivoire

(1) Present Operating Airports in Côte d'Ivoire

In Côte d'Ivoire, one international airport, namely Abidjan International Airport, and 5 domestic airports, namely Bouake, Korhogo, San-Pedro, Man and Odienne Airports, are operational. Since November 2015, domestic flights have been operated including the 5 domestic airports.



Source: JICA Study Team

Figure 17.5.1 Location of Operational Airports in Côte d'Ivoire (as of May 2017)

(2) Present Airtransport in Côte d'Ivoire

There are currently 26 direct airport destinations from Abidjan International Airport; Accra, Abuja, Bamako, Bobo-Dioulasso, Brazzaville, Brussels, Casablanca, Conakry, Cotonou, Dakar, Douala, Freetown, Istanbul, Kinshasa, Lagos, Libreville, Lomé, Monrovia, Nairobi, Ndjamena, Niamey, Ouagadougou, Paris, Pointe-Noire, Tunis and Yaounde. (Source: OAG July 2015, Time Table, Air Côte d'Ivoire Website time table, accessed on May 2017)

As for the domestic flights from Abidjan Domestic Airport, there are currently the following five direct airport destinations; Bouaké, Korhogo, San-Pédro, Man, and Odienné (as of May 2017). Although Yamoussoukro has an airport with a 3,000m runway, Yamoussoukro Airport has not been used yet by commercial flights. The operation of Côte d'Ivoire's domestic airports from Abidjan Airport started in November 2014.

The frequency of the domestic flights in Côte d'Ivoire in 2017 is as below. These flights are all served by Air Côte d'Ivoire.

- Four flights per week between Abidjan and Bouaké Airports.
- Seven flights per week between Abidjan and San-Pédro Airports.
- Five flights per week between Abidjan and Korhogo Airports.
- Two flights per week between Abidjan and Man Airports
- Two flights per week between Abidjan and Odienné Airports.

(3) Present Situation of Abidjan International Airport

The air traffic volume of international passengers at Abidjan Airport increased at an annual growth rate of over 9% from 2010 to 2014 and recorded approximately 1,270,000 passengers in 2014. Such an increase of passenger volumes has been supported by introducing larger aircraft operations.

The air traffic volume of international cargos at Abidjan Airport has also been increasing at an annual growth rate of 20% from 2010 to 2014 and the cargo volume reached 20,000 ton in 2014. The air cargo transport in Côte d'Ivoire is expected to continue to increase.

Development of air navigational facilities has progressed for air safety by installing partial ILS Category-II. The partial ILS Category-II is currently effective to safely operate the Abidjan Airport to accommodate the current level of 50,000 movements per year. This system would be completed

by construction of Approach Lighting System and Runway Centreline Lighting System in order to accommodate an increasing number of aircraft landing and taking-off in the future.

(4) Present Situation of Bouaké Airport

The current development level of airside facilities of Bouaké Airport is able to accommodate the operation of many million passengers per year. Since Bouaké Airport is the airport for the second largest city in the country, a high increase of domestic and international flights are expected. Bouaké Airport is also used for military purposes.

Bouaké Airport has a function as an alternate airport for Abidjan International Airport. The passenger terminal building of Bouaké Airport has the capacity to handle current passenger demand for domestic operation. If international flights are started at Bouaké Airport, CIQ facilities should be developed.

17.5.2 Issues regarding Air Transport in Côte d'Ivoire

The following issues confront the air transport in Côte d'Ivoire. They include:

- Limited number of domestic flights for business users compared with neighbouring country such as Ghana.
- No direct flight from domestic airports to other neighbouring countries. Although some domestic airport would seem closer in terms of distances to other surrounding countries, there is no direct flight to them, therefore, travelers from these airport have to fly to Abidjan before they can connect to places like Ghana or Burkina Faso.

(1) Issues of Abidjan International Airport

The terminal buildings and aprons have been expanded and developed in recent years, but due to the rapid increase of international passengers, the airport terminals and other facilities are already starting to be congested. It is considered that an increasing volume of air trips will be demanded by business and tourist purposes in Côte d'Ivoire in the future.

(2) Issues of Bouaké Airport

The Bouaké Airport has a function as an alternate airport for Abidjan International Airport. The passenger terminal building of Bouaké Airport has the capacity to handle current passenger demand for domestic operation. If international flights are started at the Bouaké Airport, CIQ facilities should be developed.

17.5.3 Objectives for the Aviation Sector of Côte d'Ivoire

The objectives for the development of the aviation sector in Côte d'Ivoire are defined as:

- To maintain Abidjan International Airport as one of the major hub airports in West Africa
- To provide facilities to improve access to remote regions, enhance mobility and develop opportunities for travel within the country as well as to increase the frequency of domestic flights

17.5.4 Strategies for the Aviation Sector of Côte d'Ivoire

The strategies for the development of aviation sector in Côte d'Ivoire are the following:

- To increase the capacity of Abidjan International Airport for the future increase in both cargo and passenger flights
- To upgrade the domestic airports and start full operation of these domestic airports
- To encourage private sector participation in the aviation industry

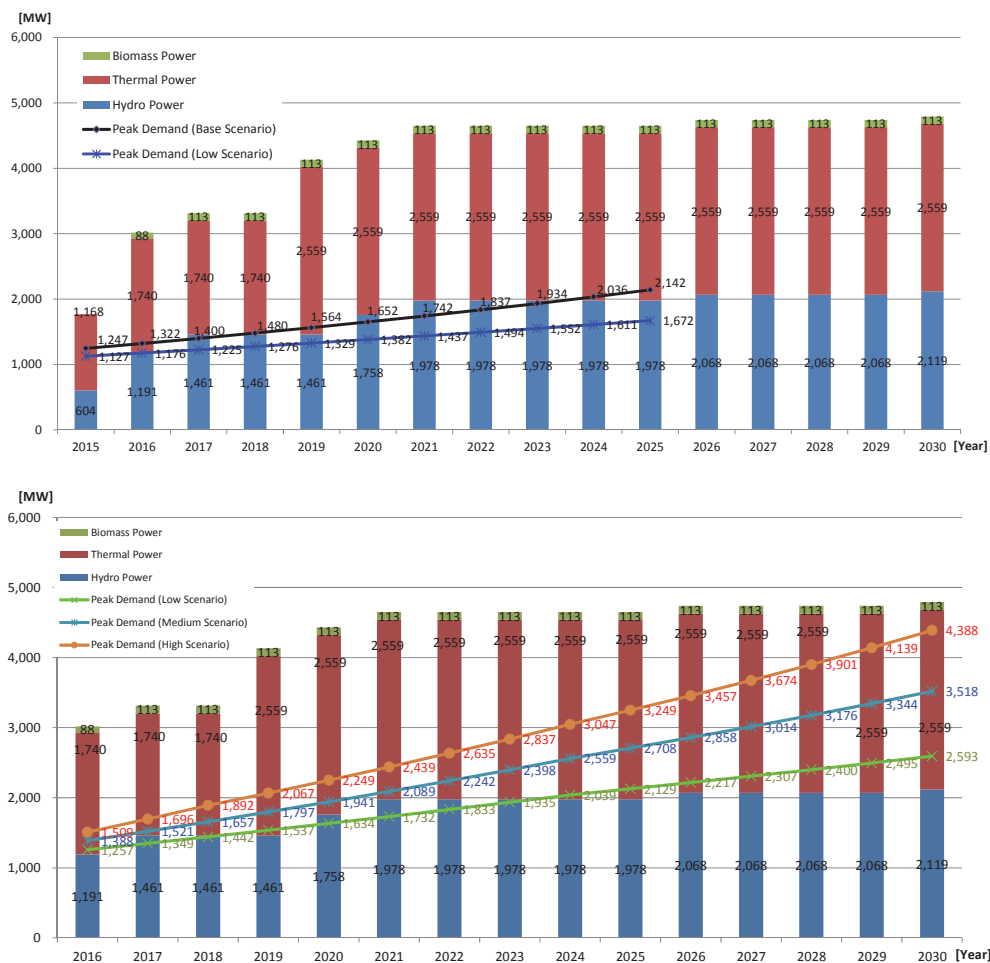
17.5.5 Programmes and Projects for the Aviation Sector of Côte d'Ivoire

- Expansion of Abidjan International Airport
- Upgrading of Bouaké Airport to function as the alternative airport for aircrafts to evacuate in case of bad weather etc. at Abidjan Airport

17.6 Electricity Supply of Côte d'Ivoire

17.6.1 Current Situation of Electricity Supply of Côte d'Ivoire

Côte d'Ivoire has the 2nd largest system capacity in the WAGRIC countries, following Ghana. The power demand is steadily growing at a rate of 5 to 9% due to rapid economic growth. Côte d'Ivoire's maximum peak demand was recorded to be 1,148MW in 2014, which was equivalent to just over a half of that of Ghana. On the other hand, Côte d'Ivoire's total generation capacity in 2014 was 1,772MW. The dependable capacity was 1,114MW, which is below the peak demand due to not only the mechanical constraints and maintenance conditions, but also due to the shortage of the water resources and unstable gas supply. In order to avoid the shortage of the power supply, such as this circumstance, the development plans for hydro, thermal, and biomass power plants were made and several development projects are ongoing. Currently, the share of hydro power plants amounts to around 35%, and thermal power plants amount to around 75%, of the total generation capacity.



Source: JICA Study Team based on Generation Capacity: Provided by MOPE, and Demand Forecast: Provided by CI-Energy

Figure 17.6.1 Generation Capacity (2015-2030) and Demand Forecast (2015-2025)

As a governmental development policy, the importance of development of hydro power plants is emphasized to improve the composition ratio of thermal and hydro power, while promoting development of thermal power plants. The generation capacity will be increased by almost 5,000MW by the end of 2030 far beyond the projected peak demand. Accordingly, Côte d'Ivoire would increase its presence by exporting more power to other countries in the West African Power Pool.

17.6.2 Issues on Electricity Supply of Côte d'Ivoire

The present main issues related to the power sector in Côte d'Ivoire are as follows:

- The development of power generation has not kept pace with the economic recovery since the end of the last civil war, and investments in power generation have been stagnant. Although Côte d'Ivoire has a main role for exporting the power for adjoining countries, such as Burkina Faso, Ghana and Mali and even to Togo through the West Africa Power Pool, it is becoming more and more difficult to supply the power for those countries, as well as to meet the increasing domestic demand, due to the shortage of power generation.
- The power generation by thermal power occupies around 80% of the entire power generation in Côte d'Ivoire. This means that the power supply is affected largely by the supply of the natural gas that is currently unstable.
- Due to reduced precipitation in recent years, some of the hydro power plants cannot run at the rated capacity. For instance at a certain time, although the rated capacity of Tabbo Hydro Power Plan in the Bandama River is 210 MW, its actual power output was 200MW. Moreover, although its rated capacity is 165MW, the actual output of Buyo Hydro Power Plant is only 132MW, according to CIE.

17.6.3 Objectives for Development of Electricity Supply in Côte d'Ivoire

The objectives for development of electricity supply in Côte d'Ivoire are set as follows:

- To develop power plants to meet future demand increase not only of Côte d'Ivoire, but also of member countries of the West African Power Pool (WAPP)
- To reinforce interconnection lines to export the surplus power to adjacent countries of West African Power Pool (WAPP) and supply the power along corridors
- To develop the bulk power to transfer to potential development areas, including corridors, with high reliability

17.6.4 Strategies for Electricity Supply of Côte d'Ivoire

In order to ensure the reliable power supply in Côte d'Ivoire, it is significant to prepare strategic plans based on the priority of the development as follows:

- Prior to further development of power generation plants, it is desirable to establish and reinforce the transmission lines for responding to the increasing power demand not only for Greater Abidjan, but also for areas along the primary corridors including regional cities. If adequate capacity of the transmission lines cannot be secured, the power output will be constrained by the conductors of the transmission lines.
- Considering that Côte d'Ivoire plays a significant role of exporting power to Ghana and Togo through Ghana, it is required to further reinforce the interconnection lines with Ghana.
- In order to realize economic power generation in Côte d'Ivoire, it is necessary to achieve a well-balanced ratio of power supply between thermal and hydro power plants. In Côte d'Ivoire it

is required to expedite the development of hydro power plants by taking advantage of ample water resources in the western part of the country.

17.6.5 Programmes and Projects for Electricity Supply of Côte d'Ivoire

The following projects are formulated and included in a development plan by the national electricity company, for power generation, power transmission and power distribution as follows:

(1) Projects for Development of Power Generation

Year 2016

- Soubre Hydro Power Plant, [275MW]
- Singrobo Hydro Power Plant
- Gribopoli Hydro Power Plant, [112MW]
- Boutoubre Hydro Power Plant
- Biokala-Aboisso 1&2 Biomass Power Plant
- Biokala II Biomass Power Plant
- Songon Thermal Power Plant, [372MW]
- Grand-Bassam Thermal Power Plant, [200-400MW]

Year 2017

- Boundiali Biomass Power Plant

Year 2018

- Lougah Hydro Power Plant, [270MW]

Year 2019

- Abatta Thermal Power Plant, [369MW]
- San Pedro Thermal Power Plant, [450MW]

Year 2020

- Daboitie Hydro Power Plant, [91MW]

Year 2021

- Tiboto Hydro Power Plant, [220MW]

Future

- Tiassalé Hydro Power Plant, [51MW]
- Aboissocomoé Hydro Power Plant, [90MW]
- Tayaboui (Duekué) Hydro Power Plant, [100MW]

(2) Projects for Development of Power System

The following projects identified by the system development plan for Côte d'Ivoire are to be developed every year until 2020:

Year 2016

- 225kV Transmission Line: Soubré - Taabo - Yopougon 2, [162km]
- 225kV/90kV Transmission Line: Bouake 2 - Serebou - Bodoukou, [331km]

Year 2019

- 90kV Transmission Line: Ferké - Kong - Dabakala - Serebou, [326km]
- 90kV Transmission Line: Bouake - Katiola - Marabadiassa, [99km]

- 330kV Interconnection Line with Ghana
- 90kV Transmission Line: Daloa - Bavoua - Zuénoula, [113km]
- 90kV Transmission Line: Seguela - Mokono - Zuénoula, [153km]
- 90kV Transmission Line: Agnibilekrou - Tanda - Bondoukou, [146km]
- 225kV Transmission Line: San Pedro - Soubre - Buyo & Duekoué - Man, [447km]
- 90kV Transmission Line: Man - Touba - Laboa, [165km]
- 90kV Transmission Line: Attakro - Adzopé - Agboville, [123km]
- 225kV Transmission Line: Soubré - Gagnoa & Divo - Taabo - Yamoussoukro - Koussou - Bouké 2"
- 90kV Transmission Line: Zagné - Toulepleu - Danané, [248km]
- 90kV Transmission Line: Duekoué -Zagné, [77km]
- 90kV Transmission Line: Bouna - Bondoukou, [180km]

17.6.6 Profiles of Priority Projects for Electricity Supply of Côte d'Ivoire

In consideration of corridor development in Côte d'Ivoire, priority should be given to the following projects, and profiles of the projects are prepared as follows:

(1) Project of Construction of 330kV Interconnection Line with Ghana

1) Rationale

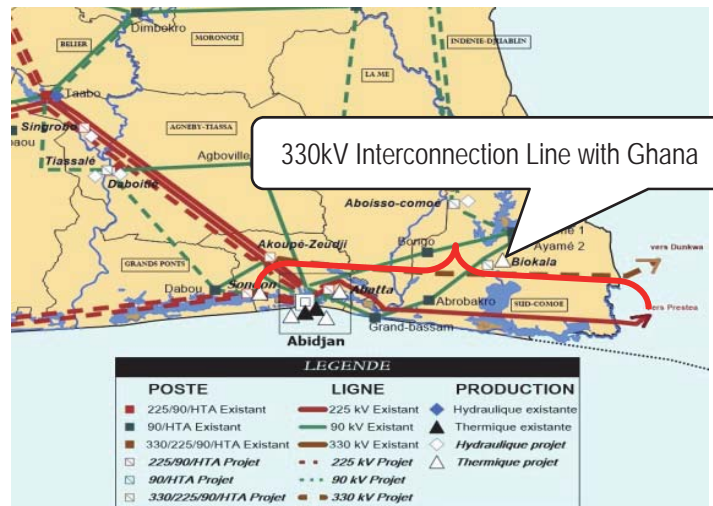
At present, a single circuit of 225kV interconnection line with Ghana is operated. The power demand for Ghana is growing the same as in Côte d'Ivoire. This interconnection line is also important for Côte d'Ivoire to transfer its power to Togo. Since it is projected that mutual power trading will be activated in the near future, it is significant to establish a new 330kV interconnection line with Ghana. In addition, in terms of the improvement of reliability of the outward power supply, it is more effective to add one more interconnection line with Ghana.

2) Objective

The objective of this project is to reinforce the inter-connection line with Ghana and to make it possible to transmit the bulk power from/to Ghana.

3) Project Description

This project was proposed in 2004 and revised in 2011 in order to ensure stable integration of the national electricity network in the ECOWAS region and facilitate optimal power exchanges and trading among ECOWAS countries. The total length of the interconnection line proposed is 296km, the Ivorian section of which accounts for 177km. Also, the construction of two (2) new substations, "Akoupé" and "Zeudji" which are located in the north of Abidjan, is proposed. The project location is shown in Figure 17.6.2



Source: CI-Energy

Figure 17.6.2 Location of 330kV Interconnection Line with Ghana

Typical project components are shown in Table 17.6.1.

Table 17.6.1 Outline of Proposed Component (T/L) of Interconnection Line with Ghana

Transmission Lines					
Voltage	From	To	Length [km]	Ckt	Conductor Type
330kV	Akoupe - Zeudji	Border between Ghana and Côte d'Ivoire	177	2	<ul style="list-style-type: none"> • ACSR 430.71 mm²×2 • Capacity: 644MW
Transmission Tower Type					
<p>Suspension Tower 510 Height -Plane of Suspension Horizontal Standard</p>			<p>Tension Tower 510 Height -Plane of Tower Vertical Standard</p>		

Source: GRIDCo&CI-Energy, "Final Feasibility Study Report for 330kV Côte d'Ivoire – Ghana Interconnection Reinforcement Project"

Table 17.6.2 Outline of Proposed Component (S/S) of Interconnection Line with Ghana

Substations			
Name of Substation	Capacity Addition of Transformers		
	Capacity [MVA]	Voltage Ratio	Nos
Akoupe- Zeudji	320	330kV/225kV	3
	100	225kV/90kV	2
	60	225kV/33kV	2
	50	90kV/15kV	2

Source: GRIDCo&CI-Energy, "Final Feasibility Study Report for 330kV Côte d'Ivoire – Ghana Interconnection Reinforcement Project"

4) Expected Benefits

The following impacts and benefits are expected in this project:

- To contribute to the improvement of the system reliability of the power grid in Côte d’Ivoire
- To make it possible for Côte d’Ivoire to receive/send bulk power from/to Ghana and to further activate power trade among the countries in WAPP
- To contribute to the loss reduction
- To realize the reduction of reserve capacity requirement

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Petroleum and Energy (MOPE)
- National Authority for the Regulation of the Electricity Sector (ANARE)
- CI-Energy
- CIE

6) Estimated Project Cost

To be estimated project cost is shown in Table 17.6.3.

Table 17.6.3 Estimated Project Cost for Interconnection Line with Ghana
Unit: Thousand EURO

Item	Cote d'Ivoire	Ghana	Total
Transformers	18,788	6,600	25,448
Switchyard	10,729	13,720	24,449
Switchgears MV	483	298	781
Loop-in of Existing Lines	460	240	700
Buildings and Other Civil Works	2,484	2,554	5,038
330kV OHL* + OHL Upgrade	56,093	35,454	91,548
Direct Project Cost	89,037	58,866	147,964

* OHL: Overhead Line

Source: GRIDCo, “330kV Côte d’Ivoire – Ghana Interconnection Reinforcement Project – Final Feasible Study Report 2015”

7) Implementation Schedule

The project implementation schedule is designed to be around seven (7) years.

Table 17.6.4 Implementation Schedule of Interconnection Line with Ghana

	2017				2018				2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Preliminary Studies																												
<i>Final Line Routing</i>																												
<i>Permitting</i>																												
<i>Social and Environmental Impact Assessment</i>																												
Engineering and Procurement																												
<i>Preparation Bid Documents</i>																												
<i>Review Bid Documents, Bidders Pre-Qualification, and Launching of Bidding Documents</i>																												
<i>Conclusion of Contracts</i>																												
Construction and Commissioning																												
<i>Construction (Transmission Line)</i>																												
<i>Construction (Substation)</i>																												
<i>Commissioning and Hand-over</i>																												

Source: GRIDCo, “330kV Côte d’Ivoire – Ghana Interconnection Reinforcement Project – Final Feasible Study Report 2015” and modified by JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Social and Environmental Impact Study

9) Related Projects

Related projects are listed as follows:

- Project for the construction of new 330kV inter-connection line with Côte d’Ivoire in Ghana

(2) Project of Development of Lougah Hydro Power Plant

1) Rationale

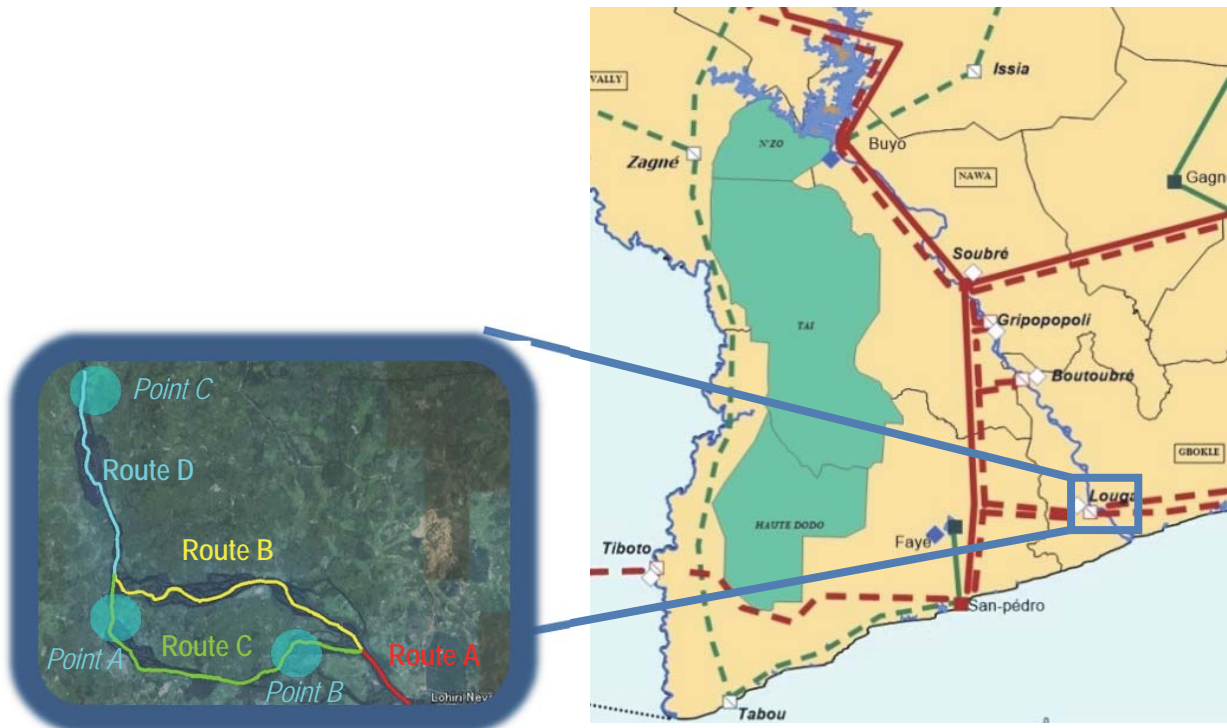
According to the “Master Plan Study on Integrated Water Resources Management in the Republic of the Côte d’Ivoire, 2001”, Sassandra River basin has more than twice as much surface water as Bandama River basin. Additionally, the annual precipitation in the western part of Côte d’Ivoire is much higher than those of the central or eastern parts of Côte d’Ivoire. From this point of view, it is significant to give a priority to the development of Lougah Hydro Power Plant with a capacity of 270MW, which would become the 2nd largest hydro power plant in Côte d’Ivoire, following Sobure Hydro Power Plant, which has a capacity of 275MW. This priority project would highly contribute to the power supply not only for Côte d’Ivoire but also to for the West African Power Pool.

2) Objective

The objective of this project is to increase the capability of power supply in Côte d’Ivoire in utilizing the natural resource.

3) Project Description

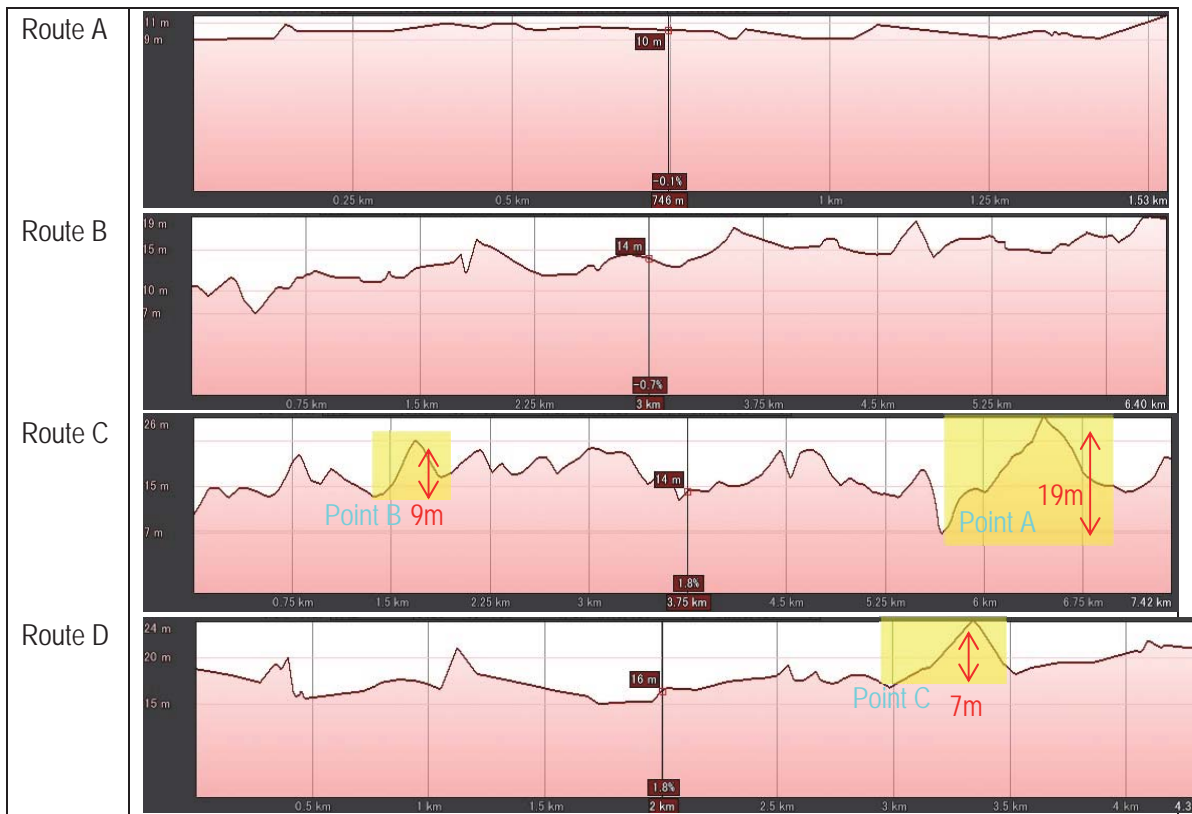
Figure 17.6.3 shows the location of Lougah Hydro Power Plant.



Source: CI-Energy & Google Earth

Figure 17.6.3 Location of Lougah Hydro Power Plant

As its potential output of the power plant, it is estimated to be able to produce 280MW at the maximum. For the development of a hydro power plant, it is important to select a location where effective head can be sufficiently ensured. As shown in Figure 17.6.3, it is found that four routes in the targeted location can be considered to be potential sites for the development of the hydro power plant. Figure 17.6.4 represents the altitude profile for each route for the potential location for the hydro power plant.

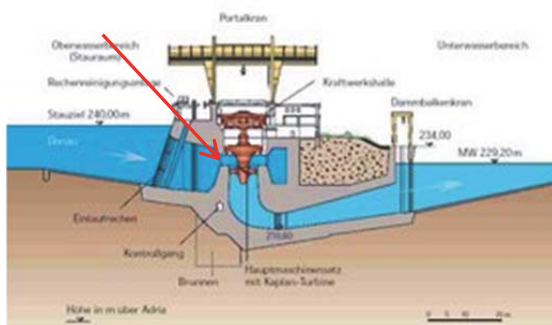


Source: JICA Study Team using the altitude data of Google Earth

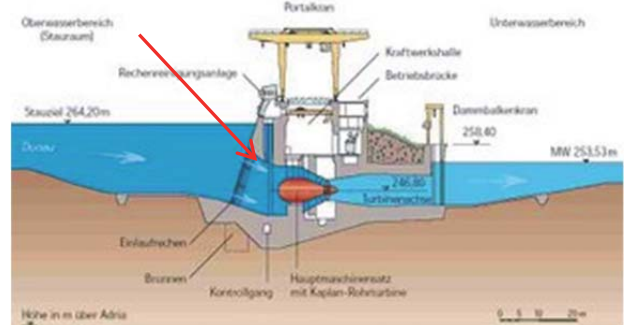
Figure 17.6.4 Altitude Profile for Potential Location for Hydro Power Plant

Regarding “Route A”, there is no attractive point for the development of a hydro since this basin is geographically; mostly flat and therefore, effective head cannot be secured. Also, in “Route B”, it is found that there are several points where differences in elevation exist. However they do not have sufficient head of more than 5m and do not seem to be attractive for the development. In “Route C”, it is found that there are two points where the effective head is around 19m and 9m respectively. This river basin would be highly valued as a potential site of the hydro power plant. Lastly, “Route D” has one point where the effective head is 7m. In these basins, the adoption of “low head” type of hydro power plant is recommended because the low head hydro is most suitable for the location where the effective head is from 15 to 7m. Also, this type of the hydro does not require a dam and is designed as a run-of-river type. Accordingly, this would be effective in terms of the environmental protection.

Kaplan Turbine (conventional type)



Bulb-type Tubular Turbine (up-to-date type)



Source: Website of Verbund

Figure 17.6.5 Image of Low-head Type of Hydro Power Plant (Run-of-River Type)

4) Expected Benefits

The following impacts and benefits are expected in this project:

- To contribute to the improvement of the domestic power supply capacity
- To contribute to the reduction of greenhouse gas emitted from power plants

5) Executing Agency and Related Institution

Expected executing agency and related institution for this project are listed below.

- Executing Agency: Ministry of Petroleum and Energy (MOPE)
- Related Institution: CI-Energy, CIE

6) Estimated Project Cost

Generally, the unit cost [USD/kW] for the middle-scale of hydro power plant is estimated to be from 2.3 to 3.0 [Million USD/MW]. Considering the planned capacity, 275MW, which is provided by CI-Energy, the project cost would be estimated to be from 632 to 825 Million USD.

7) Implementation Schedule

The implementation schedule would be estimated as follows:

Table 17.6.5 Implementation Schedule of Lougah Hydro Power Plant

	2017				2018				2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasibility Study																												
<i>Water Flow & Geographic Survey</i>																												
<i>Surveys on Fishery & Water Rights</i>																												
<i>System Impact Study</i>																												
<i>Economic Analysis</i>																												
<i>Social and Environmental Impact Assessment</i>																												
Financing																												
<i>Financing</i>																												
<i>Permitting</i>																												
Engineering and Procurement																												
<i>Engineering (Basic Design)</i>																												
<i>Bidding Preparation & Bidding</i>																												
Construction and Commissioning																												
<i>Detailed Design</i>																												
<i>Construction</i>																												
<i>Commissioning</i>																												

Source: Created by JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Social and Environmental Impact Study
- System Impact Study
- Surveys on Fishery & Water Rights
- Water Flow & Geographic Survey
- Economic Analysis

(3) Project for Improvement of Transmission and Distribution Networks including Construction and Upgrading of Substations in Greater Abidjan

1) Project Outline

The WAGRIC Master Plan recommends diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of the manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.

Greater Abidjan is the most important economic centre to accommodate manufacturing industries by attracting investment. At the same time, it is the most populous urban area (5 million in 2015) in the country. By 2040, it is forecast that Greater Abidjan is to have nearly 10 million population.

It is necessary for Greater Abidjan to keep strengthening the distribution system of power not only to residential areas, but also to industrial areas.

The project aims to establish a new substation or rehabilitate an existing substation, as well as installing distribution lines in selected areas of Greater Abidjan.

2) Funding Scheme

ODA Loan or ODA Grant

3) Estimated Project Cost

41 US\$ million

17.7 Water Resources of Côte d'Ivoire

17.7.1 Present Situation of Water Resources in Côte d'Ivoire

(1) Water Resources Potential and Water Use

According to FAO-Aquastat, the total renewable water resources in Côte d'Ivoire is estimated at 84.1BCM/yr, of which 76.8BCM/yr are generated internally. The total reservoir capacity is 37.2BCM in 2010.

The estimated total volume of water use in 2005 was 1,549MCM/yr, which is about 1.8% of the total renewable water resources. The highest consumable water use is domestic use (636MCM/yr), followed by agricultural use (595MCM/yr) and industrial use (318MCM/yr).

(2) Legal Framework regarding Water

The following documents are the basis for water resources management and development in Côte d'Ivoire.

- Environmental Code of Law No. 96-766 of 3 October 1996
- Water Code of Law 98-755 of 23 December 1998
- National Water Policy of 2010

(3) Existing Plans and Programmes regarding Water

1) Water Sector in National Development Plan for Côte d'Ivoire

The National Development Plan 2016-2020 (PND 2016-2020: *Plan National de Développement 2016-2020*) is the latest national development plan in Côte d'Ivoire. Among the five strategies shown in the plan, the water sector is mainly related to the following strategy.

- Strategy-4: Development of infrastructure harmoniously distributed on the national territory and environmental preservation

2) Action Plan for Integrated Water Resources Management (PLANGIRE)

The PLANGIRE is the operational implementation plan of the National Water Policy of Côte d'Ivoire.

The IWRM Plan (PLANGIRE) includes the following three areas:

- Area 1: Enabling environment;
- Area 2: Institutional roles;
- Area 3: Management Instruments.

3) Draft National Policy regarding Water Supply for Côte d'Ivoire

The National Policy regarding Water Supply was drafted in 2010 by National Office of Water Supply (ONEP: *Office of National de l'Eau Potable*), but has not yet been approved. However, the strategic guidelines set for the development of the sector remain relevant.

17.7.2 Issues on Water Resources of Côte d'Ivoire

The major issues on water resources management and development, which have been identified in relation to the corridor development, are shown in Table 17.7.1.

Table 17.7.1 Major Issues on Water Resources Management and Development in Relation to Corridor Development in Côte d'Ivoire

Major Issue	Description
Increasing water demand for urban water supply	It is expected that the urban centres along the growth corridor will be developed more intensively, according to the corridor development. It is necessary to address the increasing water demand for urban water supply, in order to secure the appropriate urban environment for the regional growth. As shown in Table 17.7.2, the current bulk water supply capacity per capita in Korhogo and San Pedro is less than 40liters per capita per day (lpc), which is very low. For all major urban centres along major corridors, the bulk water supply capacity per capita in 2025 is expected to be reduced to about 75% of that in 2015 if there will be no additional water source development. In Abidjan, there is a plan to develop additional 200,000m ³ /day by 2020.
Not fully developed hydropower potential	In Côte d'Ivoire, especially in the western part of the country, there is high hydropower potential. However, it has not been fully developed yet.
Undetermined optimum project scale for water resources development for proposed irrigation projects	There are proposed irrigation projects which require water resources development by dams. However, their optimum scales have not yet fully studied considering the economic and socio-environmental impact. It could cause difficulty in investing in irrigation projects.
Uncompleted IWRM plans at basin level	The pressure on water use will be increased by the corridor development. It is necessary to properly coordinate several kinds of water use by preparing and implementing IWRM plans at basin level. However, no IWRM plan at basin level has been prepared so far. Especially in Bandama river basin, which is expected to be hot spot of water use, proper water allocation should be urgently determined though discussion among stakeholders.
Lack of water information system	A water information system is fundamental for proper water management. However, it is still not adequate, and needs to be developed. Especially, the existing surface water monitoring system has been deteriorating in recent years, which needs urgent rehabilitation.
Deterioration of water quality in urban catchments	Many urban centres such as Korhogo and Bouaké use the reservoirs located in their urban territory for their water source for municipal use. Recently, the water quality in such reservoirs has become bad due to urbanisation of the catchment area. In order to secure the water source, it is necessary to properly manage the urban watershed.

Source: JICA Study Team

Table 17.7.2 Bulk Water Supply Capacity per Capita for Major Urban Centres along Major Corridors

	Current Capacity (m ³ /day)	Current Actual Production (m ³ /day)	Population (2015)	Production per capita (lpc) (2015)	Population (2025)	Production per capita (lpc) (2025) without additional water source development
Greater Abidjan	493,050	493,050	4,707,000	104.7	6,166,170	80.0
Yamoussoukro	47,520	28,800	356,000	80.9	466,360	61.8
Bouake	36,600	36,600	608,000	60.2	796,480	46.0
Korhogo	12,540	7,000	286,000	24.5	374,660	18.7
San Pedro	10,120	10,200	262,000	38.9	343,220	29.7

Source: Capacity and actual production – ONEP, Population – JICA Study Team

17.7.3 Objectives for Management and Development of Water Resources in Côte d'Ivoire

(1) Overall Objective

The overall objective of the water resources management and development in the present study is as follows:

“Sustainable and secured water source for major urban centres along major corridors and other water needs such as agriculture and power generation to support promising regional economic growth.”

(2) Specific Objectives

To fully discuss the water resources management and development for the whole of all the countries and covering all sub-sectors related to water is a big task which should be conducted by the appropriate responsible agencies as a separate study on the water sector. Instead, the present study specifically focuses on the following areas, on the basis of the existing water sector policy and plans.

- Water resources management for sustainable water use in relation to corridor development
- Water source development for urban water supply including conveyance, transmission and treatment for major urban centres along major corridors
- Large scale water resources development in relation to economic and infrastructure sector programmes and projects shown in the present study

On the basis of the overall objective as well as the above-mentioned considerations, the specific objectives of the water resources management and development are set as follows:

Objective-1: Sustainable and secured water source for major urban centres along major corridors

Objective-2: Effectively utilized water resources for the economic and infrastructure sectors to support promising regional economic growth

Objective-3: Well-functioning Integrated Water Resources Management

As for the major urban centres along major corridors, the following urban centres are selected for discussion in the present study.

- Greater Abidjan
- Yamoussoukro
- Bouaké
- Korhogo
- San-Pédro

17.7.4 Strategies for Water Resources in Côte d'Ivoire

On the basis of the major issues as well as the current situation and future prospects described in the Situation Report in the Annex of the Final Report of the present project, the strategies to achieve the specific objectives are proposed to be set as shown in Table 17.7.3.

Table 17.7.3 Strategies on Water Resources Management and Development in Côte d'Ivoire

Specific Objective		Strategy
Objective-1: Sustainable and secured water source for major urban centres along major corridors	1a: Greater Abidjan	Strategy 1a-1: Further development of groundwater resources in a sustainable manner Strategy 1a-2: Implementation of planned new water source development Strategy 1a-3: Study and its implementation for new water sources with long-term perspective considering possible hydropower projects in Comoe and Bandama Rivers
	1b: Yamoussoukro	Strategy 1b-1: Effective use of regulated water by Kossou hydropower dam in Bandama River
	1c: Bouaké	Strategy 1c-1: Conservation and effective use of existing Kan and Loca Dams Strategy 1c-2: Study and its implementation for new water sources from Bandama River with long-term perspective
	1d: Korhogo	Strategy 1d-1: Conservation and effective use of existing Koko dam Strategy 1d-2: Expansion of intake and WTP (Water Treatment Plant) from Bandama River
	1e: San-Pédro	Strategy 1e-1: Effective use of existing Fare Dam
Objective-2: Effectively utilized water resources for economic and infrastructure sectors to support promising regional economic growth		Strategy 2-1: Conduct of detail study to clarify optimum project scale for water resources development for proposed irrigation projects considering economic and socio-environmental impacts Strategy 2-2: Implementation of planned irrigation and hydropower projects
Objective-3: Well-functioning Integrated Water Resources Management		Strategy 3-1: Development of water information system Strategy 3-2: Capacity development on water allocation in priority river basin Strategy 3-3: Strengthening of protection of water resources

Source: JICA Study Team

17.7.5 Programmes and Projects for Water Resources in Côte d'Ivoire

The programmes and projects based on the strategies are listed in Table 17.7.4.

Table 17.7.4 Programs and Projects on Water Resources Management and Development in Côte d'Ivoire

Specific Objective	Program and Project	Related Strategy	Expected Responsible Organization	Term	
				Short 2025	Long 2040
Objective-1: Sustainable and secured water source for major urban centres along major corridors					
1a: Greater Abidjan	Groundwater development in Bonoua 2 (80,000m ³ /day), Sogon (40,000m ³ /day) for Greater Abidjan (On-going)	1a-1	ONEP	x	
	Development of Me River and Dabou groundwater (140,000m ³ /day) for Greater Abidjan	1a-1 1a-2	ONEP	x	
	Study for new water source development for Greater Abidjan water scheme, considering regulated flow in Comoe and Bandama rivers by future possible hydropower development	1a-3	ONEP	x	
	Implementation of new water source development for Greater Abidjan water scheme	1a-3	ONEP		x
1b: Yamoussoukro	Expansion of intake and WTP from Bandama River for Yamoussoukro	1b-1	ONEP	x	x
1c: Bouaké	Rehabilitation of WTP in Kan dam for Bouaké	1c-1	ONEP	x	
	Expansion of WTP in Loca dam (30,000m ³ /day) for Bouaké	1c-2	ONEP	x	
	Study for new water source development with conveyance from Bandama River for Bouaké water scheme	1c-3	ONEP	x	
	Implementation of new water source development for Bouaké water scheme	1c-3	ONEP		x
1d: Korhogo	Rehabilitation of WTP in Koko dam for Korhogo	1d-1	ONEP	x	
	Expansion of intake and WTP from Bandama River for Korhogo	1d-2	ONEP	x	x
1e: San-Pédro	Expansion of WTP from Fare dam for San Pedro	1e-1	ONEP	x	x
Objective-2: Effectively utilized water resources for economic and infrastructure sector to support promising regional economic growth¹					
2	Soubre Hydro Power Plant (275MW)	2-2	MOPE	x	
	Singrobo Hydro Power Plant	2-2	MOPE	x	
	Gribopoli Hydro Power Plant (112MW)	2-2	MOPE	x	
	Boutoubre Hydro Power Plant	2-2	MOPE	x	
	Lougah Hydro Power Plant (270MW)	2-2	MOPE	x	
	Daboitie Hydro Power Plant (91MW)	2-2	MOPE	x	
	Tiboto Hydro Power Plant (220MW)	2-2	MOPE	x	
	Tiassalé Hydro Power Plant (51MW)	2-2	MOPE		x
	Aboissocomoé Hydro Power Plant (90MW)	2-2	MOPE		x
	Tayaboui (Duekué) Hydro Power Plant (100MW)	2-2	MOPE		x
	Gao (Biankouma) Hydro Power Plant (74MW)	2-2	MOPE		x
	Koulikoro Hydro Power Plant (32MW)	2-2	MOPE		x
	Project for Support of the Rehabilitation and Construction of Irrigation Facilities in the Programme for Development and Effective Use of Agricultural Infrastructure and Bas-fonds	2-1, 2-2	DGDRME	x	x
	Support for Agro-industrial Pole of Bélier Region	2-2	DGDRME	x	
Objective-3: Well-functioning Integrated Water Resources Management					
3	Implementation of IWRM action plan	3-1,3-2, 3-3	MEF	x	x

Source: Arranged by JICA Study Team based on information provided by relevant agencies

*1: The projects described in the agricultural sector and electricity supply sector in the present study are listed here.

17.7.6 Profiles of Priority Projects for Water Resources in Côte d'Ivoire

Among the programs and projects listed in Table 17.7.4, the ones which are considered to be urgent or strategically important are preliminarily selected as priority projects as shown below.

(1) Project for Surface Water Development of the Me River for Greater Abidjan

1) Rationale

This project is in line with Strategy 1a-1: Further development of groundwater resources in a sustainable manner and Implementation of planned new water source development as well as Strategy 1a-2: Implementation of planned new water source development.

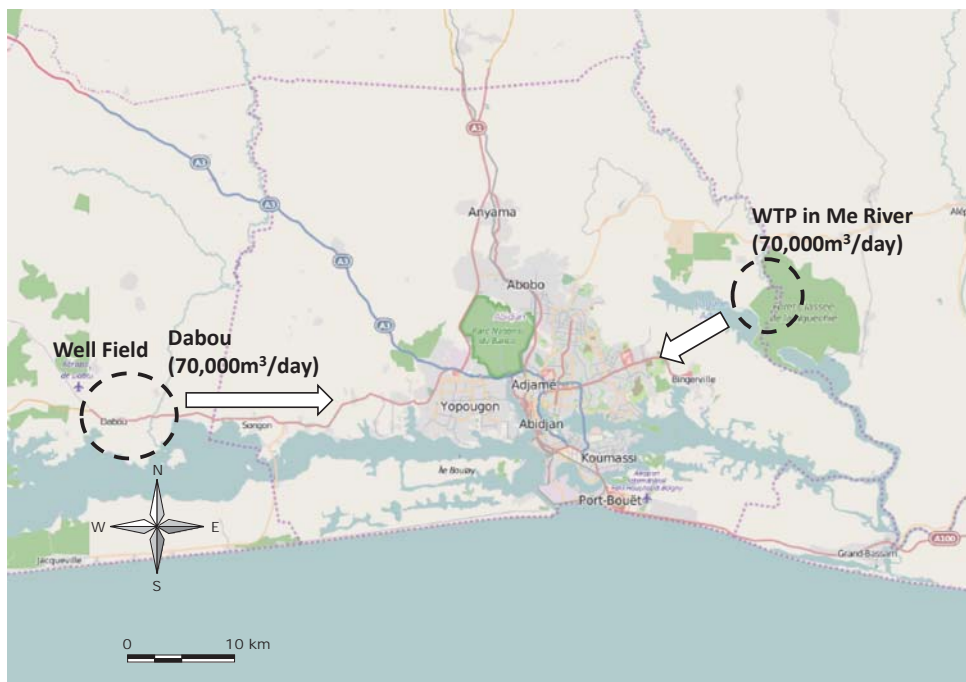
The available groundwater resources and surface water sources around Abidjan should be developed before starting to abstract water from other river basins far from Abidjan.

2) Objective

To secure enough water sources in the mid-term (targeting around 2025) for municipal water supply for Greater Abidjan

3) Project Description

Construction of boreholes in Dabou ($70,000\text{m}^3/\text{day}$) and WTP in Me River ($70,000\text{m}^3/\text{day}$)



Source: Prepared by JICA Study Team based on information provided by MIE

Figure 17.7.1 Project Location for Development of Surface Water of the Me River and Groundwater of Dabou for Greater Abidjan

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in Greater Abidjan, which can contribute not only to enhance urban living condition but also development of the economic zone around Abidjan.

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- ONEP

6) Estimated Project Cost

Not available

7) Remarks

The project is planned and F/S level studies are on-going. No detail information on the project has been obtained.

(2) Expansion of Intake (28,000m³/day) and Water Treatment Plant from Bandama River for Yamoussoukro

1) Rationale

This project is in line with the Strategy 1b-1: Effective use of regulated water by Kossou hydropower dam in Bandama River.

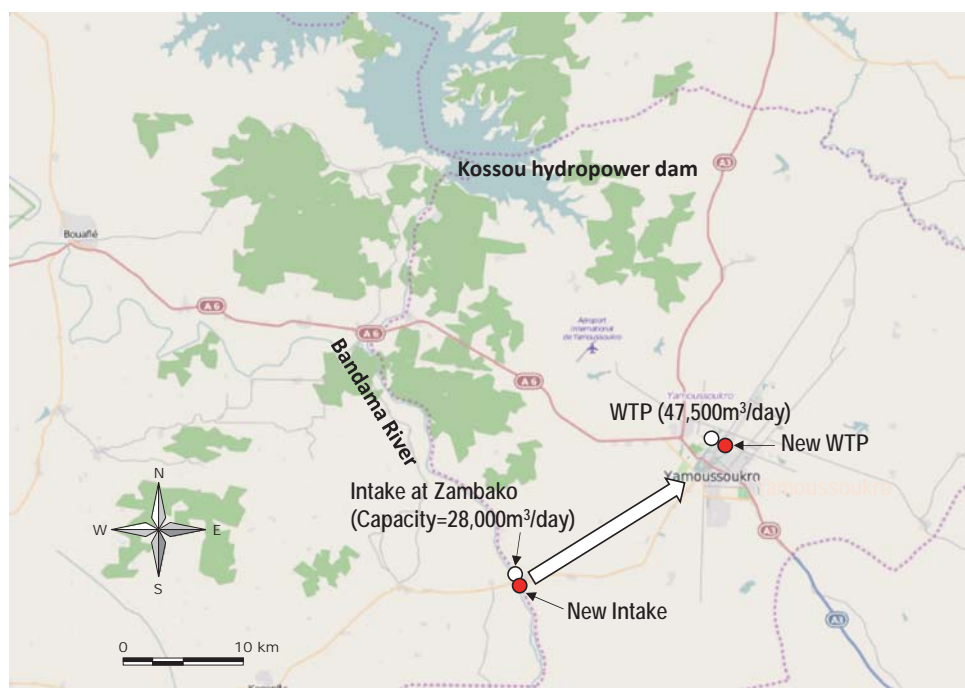
The regulation by Kossou hydropower dam will enable stable abstraction of water in Bandama River, except in extremely dry conditions. The regulated water can be further utilized for urban water supply in the surrounding area.

2) Objective

To secure an adequate water source in mid-term (targeting at around 2025) for municipal water supply for Yamoussoukro.

3) Project Description

Construction of new intake from Bandama River, conveyance pipeline and water treatment plant



Source: Prepared by JICA Study Team based on information provided by ONEP

Figure 17.7.2 Project Location for Expansion of Intake and WTP from Bandama River for Yamoussoukro

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in Yamoussoukro, which can contribute enhancement of urban living condition as capital city of the country.

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- ONEP

6) Estimated Project Cost

US\$ 30 million

7) Remarks

No detail information on the project has been obtained.

(3) Expansion of Water Treatment Plant in Loca Dam for Bouaké (Total capacity = 30,000m³/day)

1) Rationale

This project is in line with the Strategy 1c-1: Conservation and effective use of existing Kan and Loca Dams.

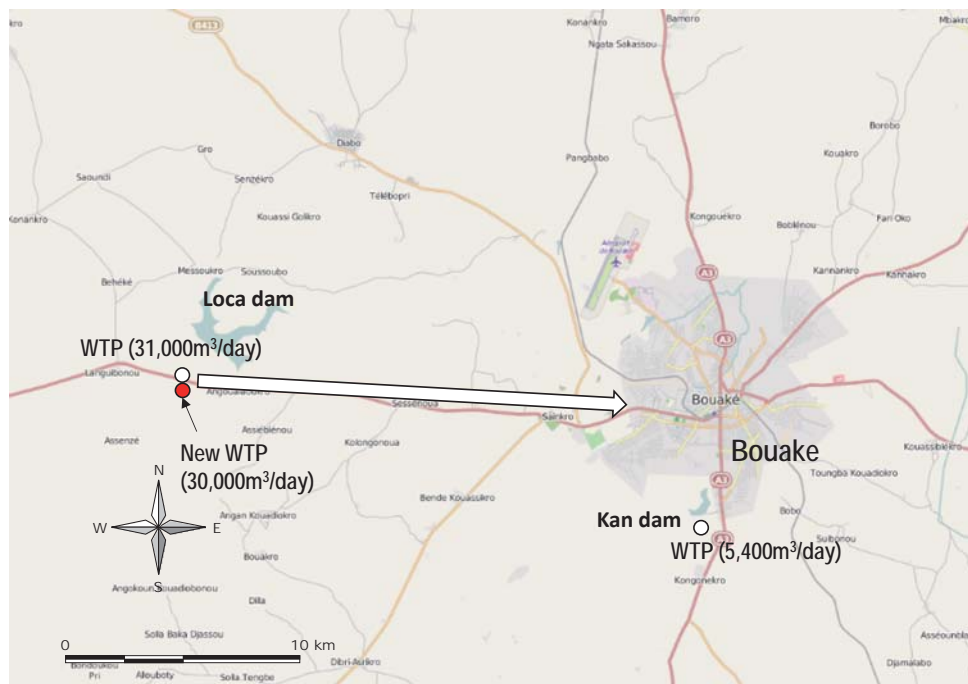
The capacity of the existing Loca Dam has not yet been fully utilized. The expansion of the WTP in Loca Dam is to utilize the currently unused capacity for municipal water supply to address the future increase in water demand.

2) Objective

To secure an adequate water source in the mid-term (targeting at around 2025) for municipal water supply for Bouaké.

3) Project Description

Construction of WTP (Total capacity = 30,000m³/day) and conveyance pipeline



Source: Prepared by JICA Study Team based on information provided by ONEP

Figure 17.7.3 Project Location for Expansion of WTP in Loca Dam for Bouaké

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in Bouaké, which can contribute enhancement of urban living condition as the core area of regional development.

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- ONEP

6) Estimated Project Cost

US\$ 50 million

7) Remarks

No detail information on the project has been obtained.

(4) Expansion of Intake (52,000m³/day) and Water Treatment Plant from Bandama River for Korhogo

1) Rationale

This project is in line with the Strategy 1d-2: Expansion of intake and WTP from Bandama River.

The existing capacity of the intake and WTP at Bandama River for Korhogo is not adequate for the future water demand in Korhogo. It is necessary to expand the capacities of the intake and WTP.

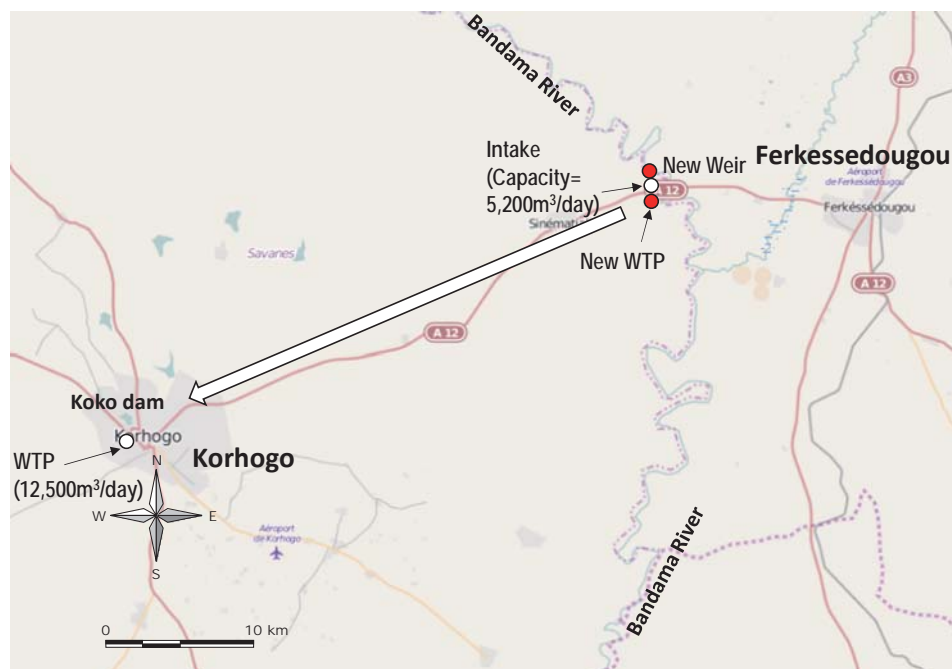
2) Objective

To secure an adequate water source in the mid-term (targeting at around 2025) for municipal water supply for Korhogo

3) Project Description

The project descriptions are as below.

- Construction of intake, weir, WTP and conveyance pipeline



Source: Prepared by JICA Study Team based on information provided by ONEP

Figure 17.7.4 Project Location for Expansion of Intake and WTP from Bandama River for Korhogo

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in Korhogo, which can contribute enhancement of urban living condition as the core area of regional development.

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- ONEP

6) Estimated Project Cost

US\$ 25 million

7) Remarks

No detail information on the project has been obtained.

(5) Expansion of Water Treatment Plant from Fare Dam for San-Pédro

1) Rationale

This project is in line with the Strategy 1e-1: Effective use of existing Fare Dam.

The regulation by Fare hydropower dam will enable stable abstraction of water in the downstream, except in extremely dry conditions. The regulated water can be further utilized for urban water supply in the surrounding area.

2) Objective

To secure an adequate water source in the mid-term (targeting at around 2025) for municipal water supply for San-Pédro.

3) Project Description

The project descriptions are as below.

- Expansion of WTP

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in San Pedro, which can contribute enhancement of urban living condition as the core area of regional development.

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- ONEP

6) Estimated Project Cost

Not available

7) Remarks

No detail information on the project has been obtained.

(6) Master Plan for Water Resources Development for Support of the Rehabilitation and Construction of Irrigation Facilities

1) Rationale

This project is in line with the Strategy 2-1: Conducting of detail study to clarify optimum project scale for water resources development for proposed irrigation projects considering economic and socio-environmental impacts.

The project for support of the rehabilitation and construction of irrigation facilities is proposed to be a priority project in the agriculture sector. However, the required water resource development has not yet been studied well.

2) Objective

To clarify the optimum project scale for water resources development for the project for support of the rehabilitation and construction of irrigation facilities in the proposed priority programme in the agricultural sector.

3) Project Descriptions

The project descriptions are as below.

- Master Plan Study for water resources development for the rehabilitation and construction of irrigation facilities.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Necessary water resources development for the project for support of the rehabilitation and construction of irrigation facilities will be discussed and determined.

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- DGDRME

6) Estimated Project Cost

Not available

7) Remarks

No detailed information on the project has been obtained.

(7) Project for Development of Water Information System

1) Rationale

This project is in line with the Strategy 3-1: Development of water information system.

A water information system is fundamental for proper water management. However, it is still not adequate and needs to be developed urgently.

2) Objective

To develop a nation-wide water information system for water management

3) Project Description

Urgent rehabilitation of hydrological monitoring, Information system development, and water resources assessment

4) Expected Benefits

Enhanced information regarding water, which can make water resources planning and management more effective and efficient

5) Executing Agency and Related Institution

MEF

6) Estimated Project Cost

Not available

7) Remarks

This is one of the activities in the IWRM action plan, which is recognized as one of the priority actions by MEF.

(8) Project for Capacity Development on Water Allocation in Bandama River Basin

1) Rationale

This project is in line with the Strategy 3-2: Capacity development on water allocation in priority river basins, and is related to the Strategies 1a-3, 1b-1, 1c-3 and 1d-2.

No IWRM plan at basin level has been prepared so far. Especially in Bandama River basin, which is expected to be a hot spot of water use, proper water allocation should be urgently determined through discussions among stakeholders.

2) Objective

To properly coordinate water usage by different water users in Bandama River basin

3) Project Description

Database for water use, water balance study, and discussion on water allocation with stakeholders

4) Expected Benefits

Strengthened coordination among stakeholders on water management and coordinated water use in the basin

5) Executing Agency and Related Institution

MEF

6) Estimated Project Cost

Not available

7) Remarks

This is one of the activities in the IWRM action plan which is recognized as one of the priority actions by MEF.

(9) Project for Strengthening the Protection of Water Resources

1) Rationale

This project is in line with the Strategy 3-3: Strengthening the protection of water resources, and is related to the Strategies 1c-1 and 1d-1.

In order to prevent pollution due to degradation of urban watersheds, water pollution management should be strengthened.

2) Objective

To enhance the capacity for water pollution management

3) Project Description

The project descriptions are as below.

- Water quality monitoring and watershed conservation, especially for watersheds located in urban areas, in coordination with relevant stakeholders

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Proper water pollution management

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- MEF

6) Estimated Project Cost

Not available

7) Remarks

This is one of the activities in the IWRM action plan which is recognized as one of the priority actions by MEF.

Chapter 18 Urban Development Strategies for Côte d'Ivoire

18.1 Urban Development in Côte d'Ivoire

18.1.1 Urban Population in Côte d'Ivoire

The urban population in Côte d'Ivoire has been constantly increasing, and over 11 million people live in urban areas, which is almost half of the national population.

Table 18.1.1 Change of Urban Population in Côte d'Ivoire

Year	Total Population	Urban Population	Share of Urban Population	Annual Growth Rate of Urban Population
1975	6,709,600	2,146,293	32.0%	-
1988	10,815,694	4,220,535	39.0%	5.3%
1998	15,366,672	6,529,138	42.5%	4.5%
2014	22,671,331	11,276,646	49.7%	3.5%

Source: INS, 2014, Principaux Résultats Préliminaires du RGPH 2014

18.1.2 Hierarchy of Urban Centres in Côte d'Ivoire

The Government of Côte d'Ivoire does not have any clear hierarchy of urban centres as part of their urban policy. On the other hand, there are 32 regional capitals and 13 district centres (district capitals). Please see the list of regional centres and district centres in Table 18.1.2. Those 13 district centres are regarded as relatively important urban centres. Out of these 13 district centres, 8 urban centres have been selected as key urban centres for corridor development in Côte d'Ivoire.

Those eight cities are Greater Abidjan, Yamoussoukro, Bouaké, Ferkessédougou, Korhogo, San-Pédro, Man and Bondoukou.

Table 18.1.2 Major Cities in Côte d'Ivoire

Region		District Centre	Regional Capital (Commune)	
Region Name	Population 2014		Commune Name	Population 2014
Abidjan Autonomous District	4,707,404	X	-	-
Yamoussoukro Autonomous District	355,573	X	-	-
San-Pédro	826,666	X	San-Pédro	261,616
La Nawa	1,053,084		Soubré	175,163
Gbôklé	400,798		Sassandra	72,221
Indénié-Djuablin	560,432	X	Abengourou	135,635
Sud-Comoé	642,620		Aboisso	86,115
Kabadougou	193,364	X	Odienné	50,506
Folon	96,415		Minignan	14,521
Gôh	876,117	X	Gagnoa	213,918
Lôh-Djiboua	729,169		Divo	179,455
Bélier	346,768		Yamoussoukro	-
L'ffou	311,642		Daoukro	73,134
N'Zi	247,578		Dimbokro	64,957
Moronou	352,616		Bongouanou	62,991
Grands-Ponts	356,495		Dabou	88,430
Agnéby-Tiassa	606,852		Agboville	95,093
La Mé	514,700		Adzopé	98,846
Tonkpi	992,564	X	Man	188,704
Cavally	459,964		Guiglo	113,796
Guémon	919,392		Duékoué	185,344
Haut-Sassandra	1,430,960	X	Daloa	319,427

La Marahoué	862,344		Bouaflé	167,263
Poros	763,852	X	Korhogo	286,071
Tchologo	467,958		Ferkessédougou	120,150
Bagoué	375,687		Boundiali	59,586
Gbéké	1,010,849	X	Bouaké	608,138
Hambol	429,977		Katiola	56,681
Worodougou	272,334	X	Séguéla	63,774
Béré	389,758		Mankono	64,330
Bafing	183,047		Touba	33,188
Gontougo	667,185	X	Bondoukou	117,453
Boukani	267,167		Bouna	58,616

Note : The commune population includes rural population within the commune.

Source 1: <Population> INS, RGPH 2014

Source 2 : <Area> Assemblée des Régions et Districts de Côte d'Ivoire, Districts et Régions: Un espace de développement, Les grandes ambitions à la loupe

18.1.3 Future Urban Population Framework for Côte d'Ivoire

The population of major urban centres in Côte d'Ivoire is expected to continue to increase rapidly. It is projected that the population of Greater Abidjan will reach almost 10 million by 2040. Although it is assumed that the urban population will continue to be concentrated in Greater Abidjan, the population of Bouaké and Korhogo are assumed to exceed one million before 2040.

Table 18.1.3 Future Population of Major Urban Centres in Côte d'Ivoire

Major Urban Centres		2015	2025	2033	2040	Increase 2015-2040
Greater Abidjan	Population	5,004,411	6,611,122	8,292,156	9,832,242	4,827,831
	Annual Growth Rate		2.82%	2.87%	2.46%	2.74%
Bouaké	Population	477,548	687,782	924,411	1,165,586	688,038
	Annual Growth Rate		3.72%	3.77%	3.37%	3.63%
Yamoussoukro	Population	363,313	465,109	571,050	666,826	303,513
	Annual Growth Rate		2.50%	2.60%	2.24%	2.46%
Korhogo	Population	252,622	476,708	769,684	1,108,445	855,823
	Annual Growth Rate		6.56%	6.17%	5.35%	6.09%
San-Pédro	Population	172,411	306,206	508,506	761,785	589,374
	Annual Growth Rate		5.91%	6.55%	5.94%	6.12%
Man	Population	153,380	210,579	272,210	331,290	177,910
	Annual Growth Rate		3.22%	3.26%	2.85%	2.13%
Ferkessédougou	Population	57,965	106,631	168,693	238,649	180,684
	Annual Growth Rate		6.28%	5.90%	5.08%	5.82%
Bondoukou	Population	91,818	132,633	180,422	231,567	139,749
	Annual Growth Rate		3.75%	3.92%	3.63%	3.77%

Source: JICA Study Team

18.2 Urban Development Strategies for Greater Abidjan

18.2.1 Present Situation of Greater Abidjan

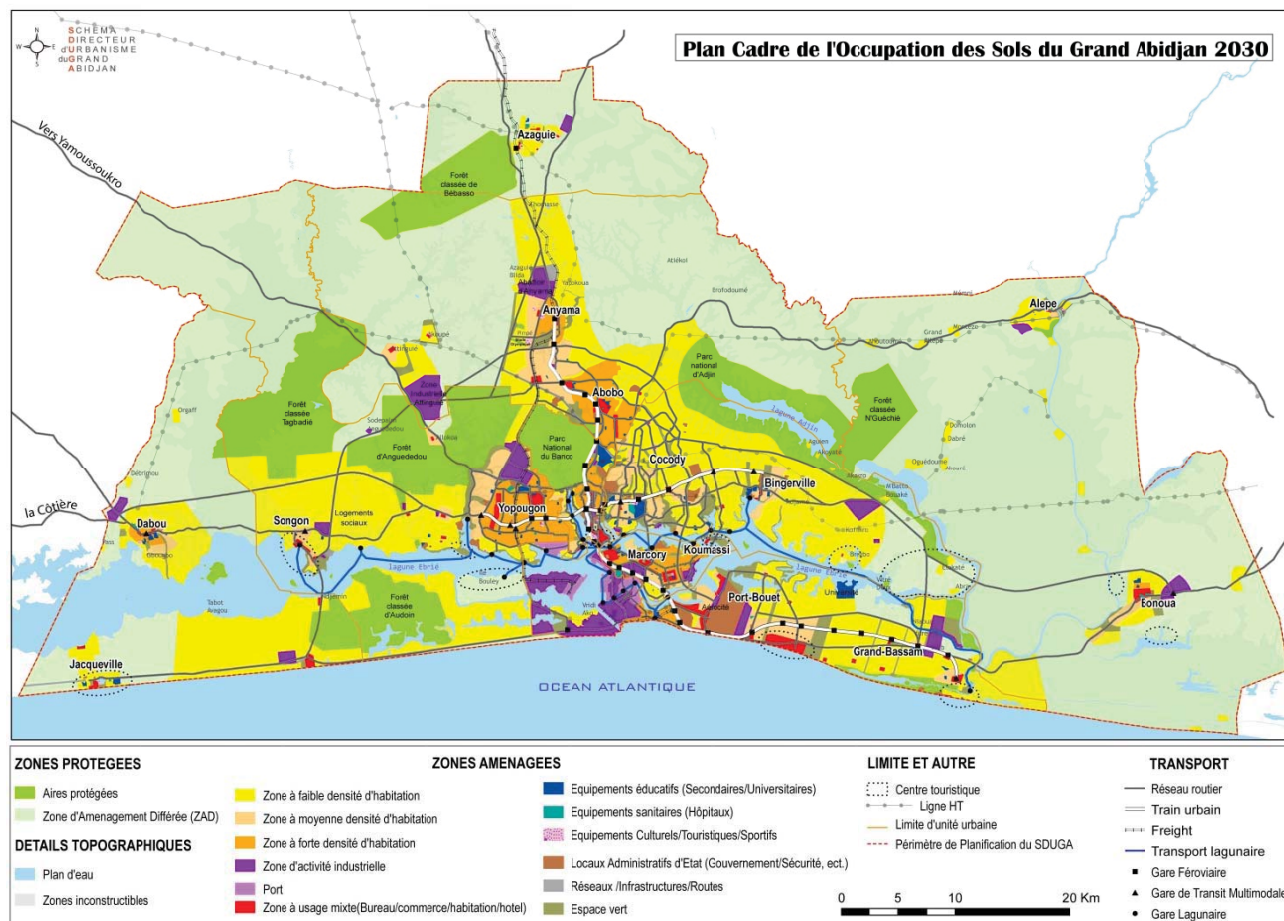
The Urban Master Plan in Greater Abidjan (Schéma Directeur d'Urbanisme du Grand Abidjan (SDUGA)) has been elaborated by MCLAU in 2013-2015, with technical support from JICA.

The Greater Abidjan area is intended to contribute to strengthening the economy of Côte d'Ivoire through improved economic infrastructure, and enriching the quality of life in Greater Abidjan through the provision of adequate social infrastructure and urban amenities. It is a major development initiative for national economic growth to support the achievement of Côte d'Ivoire as an 'emerging economy' as set out in the National Development Plan. The land use planning vision is to enable Greater Abidjan to become the premier economic centre of West Africa.

The Greater Abidjan Urban Development Spatial Strategy 2030 (GAUDSS 2030) is an advisory and guidance document that sets the integrated physical plan for sustainable development to the areas that will be subject to accelerated growth arising from the increase population and stimulated by infrastructure, industrial and land development. See Figure 18.2.1. The key recommendation is to implement and enforce the protection of the natural river valley (thalweg) drainage system that

flows to the major rivers and Ebrie Lagoon, which will act as a green buffer/separator between open space and conserved landscapes, and the urbanized areas of towns and settlements.

One of the major components of the Spatial Strategy is the Industrial Clusters. It will be the primary manufacturing based target to capture the economic development potential that will arise with the completion of the strategic road and rail networks, port expansion and new industrial zones. Traditional industrial areas, zones and estates will be adequately serviced with infrastructure to enable growth. Land use zoning will enable the expansion of these areas including the opportunity to provide worker housing. Future industries to be located in these areas are to be 'green' non-polluting (including light industrial) and complement any existing industries, which are to be upgraded to green status over the strategy period.



Source: Urban Master Plan for Greater Abidjan (SDUGA 2030)

Figure 18.2.1 Land Use Framework Plan for Greater Abidjan in 2030

18.2.2 Issues on Urban Development of Greater Abidjan

Considering existing conditions and urban development plans for Abidjan Autonomous District and Greater Abidjan, the following issues are identified on urban development for Greater Abidjan:

- The current primary road network is a concentric road network in which many roads connect with the city centre, resulting in a traffic mix with many slow vehicles and heavy vehicles. Therefore, traffic congestion can be seen all over the road network during peak hours and nothing has been done to change this trend
- In Abidjan, particularly around the Port of Abidjan, on-street parking of trucks has caused serious traffic problems, due to occupying of road space by trucks thus reducing the traffic capacity of roads. This is because trucks are overflowing outside from the existing truck parks whose capacity is limited

- Issues related to the facilities and infrastructures of Abidjan Port are heavy congestion because of not enough space within the port area and because of old-fashioned and aged port facilities, problem of water depth, as well as because of shortage of roads outside of the port area
- Abidjan has not sufficiently taken the advantage of having a railway line, because of poor connectivity between the railway and Abidjan Port, and between that of rail transport and truck transport
- Expansion of Abidjan International Airport and development of Airport City are not making good progress, while the numbers of passengers and air cargos have been continuously on the increase.
- The existing industrial estates are not sufficient for the rapidly expanding investment demand in Abidjan
- Greater Abidjan is a large city having a huge consuming capacity for agricultural, livestock and marine products. Greater Abidjan is also a commercial centre collecting and distributing agricultural, livestock and marine products from all over the country. However, there are not enough facilities to accommodate, in an integrated manner, processing places and/or market places for agricultural, livestock and marine products.

18.2.3 Objectives for Urban Development of Greater Abidjan

(1) Overall Objectives

The overall objectives for urban development of Greater Abidjan are formulated in order to solve the above issues and achieve the urban development plans:

Strategically reinforce corridor infrastructures and economic sectors in Greater Abidjan
--

(2) Specific Objectives

On the basis of the overall objectives, the specific objectives of urban development of Greater Abidjan are set in order to solve the above issues and achieve the urban development plans:

Objective-1: To enhance road network capacity that promotes economic sector development

Objective-2: To upgrade primary corridor infrastructures in Greater Abidjan so as to increase its comparative advantage

Objective-3: To enable efficient cargo transport in order to support sub-regional and national economic activities

Objective-4: To continue to focus on providing industrial parks and industrial areas in response to expanding investment demand

Objective-5: To strengthen processing and marketing functions for agriculture, livestock industry and fishery in Greater Abidjan

18.2.4 Urban Development Strategies for Greater Abidjan

Urban development strategies are formulated to achieve the specific objectives identified as follows:

(1) Urban Development Strategies to Achieve Objective-1: To enhance road network capacity that promotes economic sector development

Strategy 1-1: Construction of a radial-concentric road network for Greater Abidjan

Strategy 1-2: Increasing of road capacity through development and improvement of the road network in Greater Abidjan

Strategy 1-3: Improving of connectivity between radial-concentric roads and traffic generators, such as a seaport, airports, railway terminals, logistics centres, industrial parks and wholesale markets

(2) Urban Development Strategies to Achieve Objective-2: To upgrade primary corridor infrastructures in Greater Abidjan so as to increase its comparative advantage

Strategy 2-1: Improvement and expansion of Abidjan Port

Strategy 2-2: Development of truck routes in the radial-concentric road network for cargo traffic to/from Abidjan Port

Strategy 2-3: Improvement and development of a freight railway network linked to the port and truck facilities

Strategy 2-4: Promotion of further growth of Abidjan international airport as a hub airport for both passengers and cargos in the West Africa sub-region

(3) Urban Development Strategies to Achieve Objective-3: To enable efficient cargo transport in order to support sub-regional and national economic activities

Strategy 3-1: Development of logistics facilities including logistics centres and facilities for truck parking and customs procedures

Strategy 3-2: Improvement and development of a freight railway network integrated with truck transport

(4) Urban Development Strategies to Achieve Objective-4: To continue to focus on providing industrial parks and industrial areas in response to expanding investment demand

Strategy 4-1: Expanding, improving and upgrading of existing industrial zones

Strategy 4-2: Early completion of a new industrial zone

Strategy 4-3: Providing of industrial estates to meet various types and locations of needs

(5) Urban Development Strategies to Achieve Objective-5: To strengthen processing and marketing functions for agriculture, livestock industry and fishery in Greater Abidjan

Strategy 5-1: Relocation and expansion of the existing slaughterhouse

Strategy 5-2: Development of wholesale markets for agriculture, livestock industry and fisheries

Strategy 5-3: Establishment of an agricultural hub: a new industrial area for processing of agricultural products as a major employment centre in urban hinterland/rural areas

18.2.5 Conceptual Spatial Structure for Greater Abidjan

WAGRIC Project prepared spatial concepts for the coastal metropolitans by conducting preliminary analyses on the following points:

- Where to put an east-west motorway, as part of the Abidjan-Lagos Corridor Motorway, in each coastal metropolitan
- How to secure the connectivity between north-south corridors and coastal corridor within each of the coastal metropolitan
- How to secure a strong access to strategic sea ports which have plans for expansion within coastal metropolitans
- How to get access to new international airports planned within each of the coastal metropolitans
- Where to locate new industrial zones within each of the coastal metropolitans

The conceptual spatial structure for Greater Abidjan is shown in Figure 18.2.2.



Source : JICA Study Team

Figure 18.2.2 Conceptual Drawing to Transform Spatial Structure for Greater Abidjan

18.2.6 Programmes and Projects for Urban Development of Greater Abidjan

The proposed programmes and projects in relation to corridor development are listed by objective and strategy in Table 18.2.1.

Table 18.2.1 Proposed Programmes and Projects on Urban Development for Greater Abidjan in relation to West Africa Growth Ring Corridor Development

Programmes and Projects	Related Strategies	Expected Responsible Organization	Term	
			Short 2025	Long 2040
Objective-1: To enhance road network capacity that supports economic activities				
(1) Construction of Bingerville-Bonoua Highway as part of Abidjan-Lagos Highway	1-1, 1-3 3-1	Ministry of Economic Infrastructure	x	
(2) Connection of Bingerville-Bonoua Highway to Grand-Bassam	1-1, 1-3	Ministry of Economic Infrastructure	x	
(3) Construction of Abidjan-Agboville Highway as part of Eastern Corridor	1-1, 1-3 3-1	Ministry of Economic Infrastructure	x	
(4) Construction of Abidjan-Dabou Highway as part of Abidjan-Lagos Highway (improvement and asphaltting of the highway Abidjan-San-Pédro/Section 1: Abidjan-Dabou)	1-1, 1-3 3-1	Ministry of Economic Infrastructure	x	
(5) Construction of 6-lane motorway between Bonoua and the border of Ghana	1-1, 1-3	Ministry of Economic Infrastructure		x
(6) Construction of outer ring road (Y4 Ring Road) including sixth bridge - Vitre section to Abobo north of Y4 Ring Road - Koumaisi Crossing to Mpouto of Y4 Ring Road	1-1, 1-3, 3-1	Ministry of Economic Infrastructure	x	
(7) Construction of inner ring road (Vridi bridge, Voie V28, fourth bridge)	1-1, 1-3, 3-1	Ministry of Economic Infrastructure	x	
(8) Upgrading of road between Anyama and Bondoukou	1-2	Ministry of Economic Infrastructure	x	
(9) Construction of 4-lane road between Anyama and Bondoukou	1-2	Ministry of Economic Infrastructure		x
Objective-2: To upgrade primary corridor infrastructures in Greater Abidjan so as to increase its competitive advantage				
(1) Improvement of existing Abidjan Port	2-1	Abidjan Port Authority	x	

- Widening and dredging of Channel Vridi - Construction of second container terminal to south dock - Creation of grain terminal - Creation of ore terminal - Landfilling of Vridi Bietry Lagoon - Construction of Ro/Ro Terminal - Construction of treatment station for liquid waste - Construction of new container terminal				
(2) Expansion of Abidjan Port - Introduction of barge transportation system for containers from the Port to Jacquville - Construction of new port in Boulay island	2-1	Abidjan Port Authority		x
(3) Improvement of port access roads of existing Abidjan port - Construction of Vridi-Bietry Bridge - Construction of the second Bridge Vridi - Construction of Motorway Marcelle Boulevard - Rehabilitation of Houphouët-Boigny bridge (AFD funding-C2D) - Construction of Motorway from Carrefour Akwaba to Houphouët-Boigny bridge through Vridi and port	2-2	Abidjan Port Authority	x	
(4) Rehabilitation and operation of existing freight railway line	2-3, 3-3	Ministry of Transport (PPP)	x	
(5) Construction of railway to new port in Boulay island	2-3, 3-3	Ministry of Transport		x
(6) Construction and operation of Anyama multi-modal dry port	2-3, 3-3	MIAIE	x	
(7) Construction of an airport city for FHB Airport	2-4	AERIA	x	
(8) Study on a second international airport for Greater Abidjan	2-4	ANAC	x	
Objective-3: To allow efficient cargo transport in order to support international/regional economic activities				
(1) Renovation of the existing truck terminal	3-1	Abidjan Port Authority	x	
(2) Construction and operation of truck terminal / logistics platform at PK26	3-1	OIC	x	
(3) Construction of a freight railway terminal in Boulay island	3-2	Ministry of Transport		x
Objective-4: To continue to focus on providing industrial estates in response to expanding investment demand				
(1) Creation and operation of a new industrial area in the northern part of Abidjan (Northern Expressway, PK24)	4-2	(PPP) MIM, AGEDI	x	
(2) Development and extension of the technological free zone of Grand-Bassam (VITIB)	4-1, 4-3	MIM, AGEDI	x	
(3) Construction and management of data centre in Grand-Bassam	4-1, 4-3	MIM, AGEDI	x	
(4) Establishment of industrial zones (Bingerville, Bonoua and Abidjan port expansion area)	4-3	MIM, AGEDI		x
(5) Study and implementation of free zone of Songon	4-3	MIM, AGEDI	x	
(6) Construction of an oil storage terminal in Vridi 1100000TM (phase 1) on the west bank of the canal	4-1	(PPP)	x	
Objective-5: To strengthen processing and marketing functions for agriculture, livestock industry and fishery in Greater Abidjan				
(1) Construction of cattle market and slaughterhouse complex in Anyama	5-1, 5-2	MIRAH	x	
(2) Construction of off-loading facility for cattle for railway at Anyama railway station	5-1	Ministry of Transport	x	
(3) Construction of a fruit and vegetable wholesale market place	5-2		x	
(4) Development of a fishery wholesale market place	5-2			x
(5) Development of new industrial areas for processing of agricultural produce in Azaguïé, Alépé, Dabou, Bonoua and Jacquville	5-3	AGEDI		x

Source: JICA Study Team

18.3 Urban Development Strategies for Yamoussoukro

18.3.1 Present Situation of Yamoussoukro

Yamoussoukro has the following strengths and opportunities for development:

1) A natural site and an exceptional building heritage

The city has an exceptional natural site and buildings (Basilica) on the scale of the sub-region. Domestic tourism and the organization of international congresses represent an opportunity for development for the city.

2) A very good road connection to Abidjan

Since the construction of the Yamoussoukro-Abidjan A3 motorway, the city is less than 2 hours' drive from the economic capital of the country.

3) A very high level of infrastructure and a high-quality urban environment

The city of Yamoussoukro is the best endowed with the Ivorian agglomerations in infrastructure and access to basic services. In comparison with the city of Abidjan, it offers a quality urban environment (green areas, large building plots) and does not suffer from congestion or pollution.

4) The presence of an academic centre of excellence

The city is also distinguished by the presence of educational institutions and prestigious university. A qualified workforce (young graduates) is present in the local labour market but is not captured by the city, due to lack of opportunities in the formal sector in Yamoussoukro. There are prestigious academic and university establishments.

18.3.2 Issues on Urban Development of Yamoussoukro

According to Urban Master Plan for Yamoussoukro (SDU 2030, January 2015), the following constraints/problems are identified regarding urban development for Yamoussoukro:

1) Very low urban growth

Unlike the other secondary cities of the country, the city of Yamoussoukro has experienced only a very modest spatial growth in the last decade. Since the 1990s, only a few neighbourhoods (mainly Kokrenou in the north) have been created. The population of the city is only 360,000.

2) Pressure on land markets and poor control of urban extensions

Capital status and the proposed transfer of administrative and political functions have the effect of putting pressure on the local land market. More than a hundred subdivisions have been produced since the 2000s. These subdivisions do not follow the prescriptions of the existing master plan. The master plan has design flaws such as undersized land reserves provided for utilities, low consideration of the natural terrain and overproduction of traditional type of housing estates.

3) Weak development of formal economic activities

Some economic activities have been deliberately removed from the city's development strategy. Without the government's real willingness to encourage companies to invest, nor the dynamism of regional operators, very few formal companies are located in the agglomeration of Yamoussoukro. The economy of the city is dominated by the informal sector (trade or primary sector) resulting in few prospects of formal job creation.

4) The administrations weakened and confronted with the challenge of maintenance of infrastructure

The political-military crisis has weakened and slowed down the functioning of the Ivorian administrations. Local and deconcentrated authorities are also confronted with the important challenge of maintaining the important stock of infrastructure and facilities in the city.

18.3.3 Objectives for Urban Development of Yamoussoukro

(1) Strategic Orientations for Yamoussoukro 2030

In the Urban Master Plan for Yamoussoukro (SDU 2030), the strategic orientations that will provide answers to the various urban issues are grouped in four axes:

- 1) Yamoussoukro, the window of Côte d'Ivoire
- 2) A pole of academic excellence and research
- 3) A green and city with good recreation facilities
- 4) A controlled land for a compact city and urban quality

(2) Overall Objectives

The overall objectives for urban development of Yamoussoukro are formulated in order to solve the above issues:

To establish a compact and smart city that deserves to be the capital of the country, by targeted investments in the economic sectors and a modern transport infrastructure providing for medium-term transfer of the capital

(3) Specific Objectives

On the basis of the overall objectives, the specific objectives of urban development of Yamoussoukro are set as follows:

Objective-1: To upgrade primary corridor infrastructures in Yamoussoukro so as to increase its competitive advantage

Objective-2: To reinforce existing urban functions and resources

Objective-3: To enhance the manufacturing industry of Yamoussoukro

18.3.4 Urban Development Strategies for Yamoussoukro

(1) Scenario of Urban Development

An urban development scenario selected in the Urban Master Plan for Yamoussoukro is to correspond to the hypothesis of a deferred transfer of the capital and start the transfer project from the period 2020-2030 (medium-term transfer of the capital). The urban development strategies shown in this scenario are as follows:

- Targeted investments: To develop by investing in the economic sectors such as higher education/research, domestic tourism, hosting of major events, pending the transfer of the functions of capital. These targeted investments are expected to result in the construction of the northern technology park and the tourist complex in the south, as well as the city's main thoroughfares including the bypass road.
- Development of new neighbourhoods as a priority in the extension of the existing zones
- A gradual takeover of land management, by clarification of roles between central and local administrations and the implementation of land regulation tools, to moderate speculative practices.

(2) Main Principles of Planning

Main planning principles are set in the Urban Master Plan for Yamoussoukro as follows and as shown in Figure 18.3.1.

- 1) The strategic vision of the development of the agglomeration
- 2) The hierarchy of the road network
- 3) The development of secondary polarities in the agglomeration
- 4) The prioritization and classification of land reserves for facilities
- 5) The preservation and enhancement of the green framework and zones where construction is prohibited
- 6) Progressive and compact development of residential areas compatible with the transfer of the capital

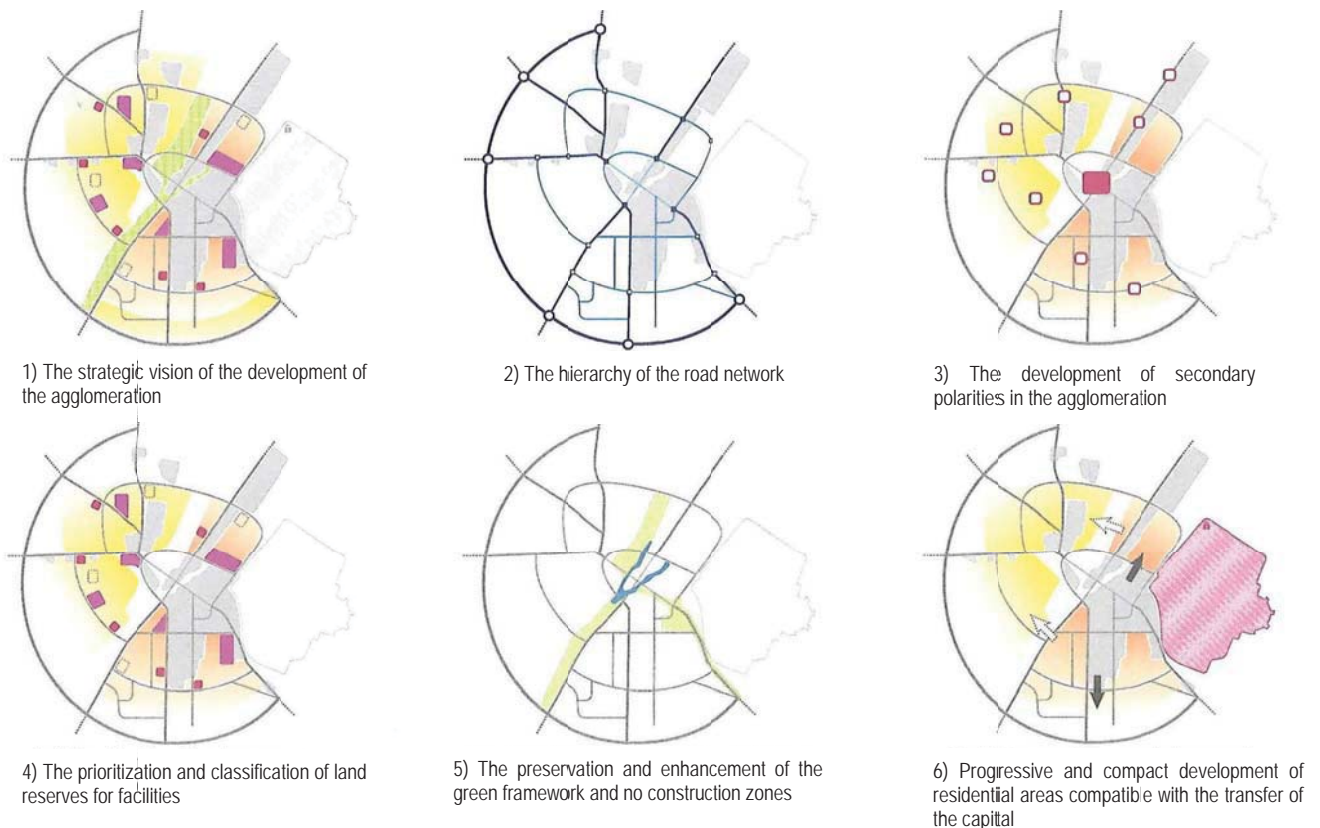


Figure 18.3.1 Main Planning Principles for Urban Development of Yamoussoukro

(3) Urban Development Strategies to Achieve the Objective Above

The urban development strategies to achieve the objective identified above are proposed as follows based on the scenario of urban development and the main planning principles:

1) Urban Development Strategies to Achieve Objective-1: To upgrade primary corridor infrastructures in Yamoussoukro so as to increase its competitive advantage

- Strategy 1-1: Extension of Northern Motorway to the north of Yamoussoukro
- Strategy 1-2: Improvement of service level of Northern Motorway

2) Urban Development Strategies to Achieve Objective-2: To reinforce existing urban functions and resources

- Strategy 2-1: Strengthening the academic centre function
- Strategy 2-2: Strengthening the tourism function
- Strategy 2-3: Strengthening the function of bus stations

3) Urban Development Strategies to Achieve Objective-3: To enhance manufacturing industry of Yamoussoukro

- Strategy 3-1: Development of an industrial zone to attract the manufacturing industry related to the northern technology park

18.3.5 Programmes and Projects for Urban Development of Yamoussoukro

The programmes and projects proposed in relation to corridor development are listed in response to each objective and strategy in Table 18.3.1.

Table 18.3.1 Programmes and Projects on Urban Development for Yamoussoukro

Programmes and Projects	Related Strategies	Expected Responsible Organization	Term	
			Short-Mid 2025	Long 2040
Objective-1: To upgrade primary corridor infrastructures in Yamoussoukro so as to increase its competitive advantage				
(1) Construction of Yamoussoukro-Bouaké section of the Northern Motorway	1-1	Ministry of Economic Infrastructure	x	
(2) Construction of a bypass road of the Northern Motorway also serving as outer ring road for Yamoussoukro	1-2	Ministry of Economic Infrastructure	x	
(3) Construction of a truck terminal along the bypass road of the Northern Motorway (outer ring road)	1-2		x	
Objective-2: To reinforce existing urban functions and resources				
(1) Construction of the northern technology park	2-1		x	
(2) Construction of a tourist complex in the south	2-2	Autonomous District of Yamoussoukro	x	
(3) Improvement of the existing intercity highway bus station in the city centre	2-3	Autonomous District of Yamoussoukro	x	
Objective-3: To enhance manufacturing industry of Yamoussoukro				
(1) Establishment of an industrial zone in Yamoussoukro along the bypass road of the Northern Motorway (outer ring road)	3-1	AGEDI	x	

Source: JICA Study Team

18.4 Urban Development Strategies for Bouaké

18.4.1 Issues on Urban Development of Bouaké

Considering existing conditions and the urban development plan for Bouaké (July 2014), the following issues are identified regarding urban development for Bouaké:

- Existing road network of Bouaké is characterized by many unpaved roads, missing links and low accessibility to/from the neighbourhoods
- Although Abidjan-Ouagadougou Railway Line is one of the strengths of Bouaké, which has a railway station in the central area, Bouaké is not sufficiently utilizing the advantage of having a railway line, because of poor connectivity between the railway line and the roads.
- The three existing industrial estates located in Bouaké are not effectively managed to the point that it is dysfunctional and therefore there is no new investment in setting up a factory, though it is expected to play a major role as a source of employment for young people.
- Bouaké has developed as a central city of the central and northern parts of Côte d'Ivoire. Bouaké is an important centre of national/regional transportation and a major logistics hub for agricultural and livestock products. It is necessary to improve the functions of collecting, processing, delivering and marketing of those local products.
- When a motorway is extended from Yamoussoukro bypassing Bouaké in the future, traffic flow of heavy vehicles might be changed, and Bouaké's economy is likely to be hard hit by the traffic flow change due to the extension of northern motorway.

18.4.2 Objectives for Urban Development of Bouaké

(1) Overall Objectives

The overall objectives for urban development of Bouaké are formulated in order to solve the above issues by implementing the urban development plan for Bouaké:

To revitalize the society and economy of Bouaké by developing economic infrastructure and by promoting private investment

(2) Specific Objectives

On the basis of the overall objectives, the objectives of urban development of Bouaké are set in order to solve the above issues by implementing urban development plans:

Objective-1: To improve or upgrade primary corridor infrastructures in Bouaké so as to increase its competitive advantage

Objective-2: To enhance road network capacity that supports economic activities

Objective-3: To enable efficient cargo transport in order to support international/sub-regional economic activities

Objective-4: To rebuild the manufacturing industries of Bouaké

Objective-5: To strengthen processing and marketing functions for agriculture, livestock industry and fisheries in Bouaké

18.4.3 Urban Development Strategies for Bouaké

The urban development strategies to achieve the objectives identified above are proposed as follows:

1) Urban Development Strategies to Achieve Objective-1: To improve or upgrade primary corridor infrastructures in Bouaké so as to increase its competitive advantage

- Strategy 1-1: Extension of Northern Motorway to the north of Bouaké
- Strategy 1-2: Re-directing drivers and passengers to the Northern Expressway from the existing North-South corridors
- Strategy 1-3: Rehabilitation of existing railway of Abidjan–Ouagadougou section
- Strategy 1-4: Expansion of Bouaké Airport

2) Urban Development Strategies to Achieve Objective-2: To enhance road network capacity that supports economic activities

- Strategy 2-1: Designation and construction of a radial-concentric road network for Bouaké
- Strategy 2-2: Increasing of road capacity through development and improvement of the road network for Bouaké
- Strategy 2-3: Improvement of connectivity between radial-concentric roads and traffic generators, such as an airport, railway terminals, logistics centres, industrial parks and wholesale markets

3) Urban Development Strategies to Achieve Objective-3: To enable efficient cargo transport in order to support international/sub-regional economic activities

- Strategy 3-1: Development of logistics facilities including logistics centres and facilities for truck parking and customs procedures
- Strategy 3-2: Improvement and development of a freight railway network linked to a sea port and truck transport

4) Urban Development Strategies to Achieve Objective-4: To rebuild manufacturing industries of Bouaké

- Strategy 4-1: Expanding, improving and upgrading of existing industrial zones
- Strategy 4-2: Early completion of new industrial zones
- Strategy 4-3: Provision of industrial estates to meet various types and locations of needs

5) Urban Development Strategies to Achieve Objective-5: To strengthen processing and marketing functions for agriculture, livestock industry and fisheries in Bouaké

- Strategy 5-1: Rehabilitation and expansion of existing wholesale markets for agriculture and

livestock industry

- Strategy 5-2: Rehabilitation and expansion of existing slaughterhouses
- Strategy 5-3: Inviting of agricultural processing factories

18.4.4 Programmes and Projects for Urban Development of Bouaké

The programmes and projects proposed in relation to corridor development are listed in response to each objective and strategy in Table 18.4.1.

Table 18.4.1 Programmes and Projects on Urban Development for Bouaké

Programmes and Projects	Related Strategies	Expected Responsible Organization	Term	
			Short 2025	Long 2040
Objective-1: To upgrade primary corridor infrastructures in Bouaké so as to increase its competitive advantage				
(1) Construction of 4- lane motorway between Tiebissou and Bouaké	1-1	Ministry of Economic Infrastructure	x	
(2) Construction of 4- lane motorway between Bouaké and Ferkessédougou	1-2, 3-1	Ministry of Economic Infrastructure		x
(3) Construction of a bus station	1-2		x	
(4) Rehabilitation of railway	1-3	Ministry of Transport	x	
(5) Construction of a freight railway terminal in Bouaké	1-3, 3-2	Ministry of Transport		X
(6) Expansion of Bouaké Airport	1-4	SODEXAM		X
Objective-2: To enhance road network capacity that supports economic activities				
(1) Formulation of an urban transport master plan for Bouaké	2-1, 2-2	Bouaké Commune	x	
(2) Designation and construction of Inner ring road	2-1, 2-2	Ministry of Economic Infrastructure		X
(3) Construction of western section for Bouaké outer ring road	2-1, 2-2	Ministry of Economic Infrastructure	x	
(4) Improvement of road between Seguela and Bouaké	2-1, 2-2	Ministry of Economic Infrastructure	x	
(5) Improvement of road between Bouaké and Tanda	2-1, 2-2	Ministry of Economic Infrastructure	x	
Objective-3: To allow efficient cargo transport in order to support international/regional economic activities				
(1) Renovation of existing truck terminals	3-1		x	
(2) Construction of a freight railway terminal in Bouaké	3-2, 1-3	Ministry of Transport		x
Objective-4: To rebuild manufacturing industry of Bouaké				
(1) Development of a new industrial zone of Bouaké (100ha) and upgrading access road from/to Northern Motorway	4-2, 4-3	AGEDI	x	
(2) Improvement of three existing industrial estates utilizing their characteristics	4-1, 4-3	AGEDI		x
Objective-5: To strengthen processing and marketing functions for agriculture, livestock industry and fishery in Bouaké				
(1) Rehabilitating the wholesale market place of Bouaké	5-1		x	
(2) Construction of a modern municipal slaughterhouse and a livestock market	5-1, 5-2	MIRAH	x	
(3) Development of an industrial area for agro-processing	5-3			x

Source: JICA Study Team

element in the department's development strategies for Ferkessédougou which will be promoted through development of the tourism industry and promotion of arts and crafts.

4) Improvement of the environment and the living conditions of the population

Ferkessédougou is confronted with the phenomenon of the advancing desert with its detrimental effects on agriculture and livestock and water availability. It is therefore important to focus actions in this area on protection of the ecosystems, water control, overall sanitation of towns and villages and development of modern city management tools.

(2) Strategic Development Objectives

For the next ten (10) or fifteen (15) years, twenty-four (24) major strategic development goals are to be achieved to achieve the development targeted by the populations of Ferkessédougou. These strategic objectives define the concrete changes that must be made in each of the sectors of activity in order to achieve the desired development in the sector.

Table 18.5.1 Strategic Development Issues for Ferkessédougou

Development Issues	Objectives
Strengthening the living environment promotion	1. Improvement of the living conditions of the most disadvantaged populations 2. Control of land, town planning and housing 3. Sustainable management of sanitation and drainage 4. Improvement of the electricity network and drinking water 5. Improvement of the communication network and ICT
Security of property and persons	6. Strengthening of security services and civil protection 7. Creation of security (or policing)
Local governance and social cohesion	8. Local governance 9. Social cohesion
Development of the territory and the environment	10. Territory development 11. Preservation of natural resources and the environment
Promotion of the tourist and cultural heritage	12. Strengthening of the tourism sector and development of religious and historical tourist sites 13. Creation of botanical gardens of endangered plants 14. Valorisation of culture and traditions
Development of economic infrastructure and promotion of productive sectors	15. Strengthening of transport and economic infrastructure 16. Development of the agricultural sector 17. Development of the artisanal sector 18. Development of the commercial sector 19. Development and strengthening of the agro-pastoral system
Development of industrial and mining sectors	20. Promotion and creation of incentive and attractive conditions for the installation of industries and other enterprises 21. Promotion of the mining sector
Human development and socio communication infrastructure	22. Strengthening the health system 23. Strengthening of the education system and qualification of human resources 24. Strengthening of socio-cultural and sports infrastructures

Source: Plan d'urbanisme directeur de Ferkessédougou (Septembre 2015)

18.5.2 Issues on Urban Development of Ferkessédougou

According to Urban Master Plan for Ferkessédougou (September 2015), the challenges or concerns faced by the population and local authorities revolve around the following development issues:

- Development of productive sectors (agriculture, livestock, fisheries, tourism, mining, etc.)
- Strengthening of economic and socio-community infrastructures
- Improvement of the environment and living conditions of the population
- Improvement of local governance
- Development of human resources

18.5.3 Objectives for Urban Development of Ferkessédougou

(1) Overall Objectives

The overall objectives for urban development of Ferkessédougou are formulated in order to solve the above issues:

To accelerate the growth of inland areas as the principal inland city along the Abidjan-Ouagadougou Corridor, by developing both primary corridor infrastructures and productive sectors benefiting from them

(2) Specific Objectives

On the basis of the overall objectives, the specific objectives of urban development of Ferkessédougou are set as follows:

Objective-1: To upgrade primary corridor infrastructures in Ferkessédougou so as to increase its competitive advantage

Objective-2: To strengthen producing, processing and marketing functions for agriculture and livestock industry in Ferkessédougou

Objective-3: To strengthen the tourism sector

18.5.4 Urban Development Strategies for Ferkessédougou

The urban development strategies to achieve the objectives identified above are proposed as follows based on the strategic directions:

1) Urban Development Strategies to Achieve Objective-1: To upgrade primary corridor infrastructures in Ferkessédougou so as to increase its competitive advantage

- Strategy 1-1: Increasing transport capacity of the Northern Motorway to the north of Ferkessédougou
- Strategy 1-2: Strengthening of the multi-modal transit function for connecting railway and truck transport
- Strategy 1-3: Strengthening of East-West Roads by extending them from major urban centres on the Central Corridor
- Strategy 1-4: Improving of the primary corridor function by developing other transport modes

2) Urban Development Strategies to Achieve Objective-2: To strengthen producing, processing and marketing functions for agriculture and livestock industry in Ferkessédougou

- Strategy 2-1: Development of facilities related to agriculture
- Strategy 2-2: Modernization of livestock facilities

3) Urban Development Strategies to Achieve Objective-3: To strengthen the tourism sector

- Strategy 3-1: Strengthening of the tourism sector and development of religious and historical tourist sites

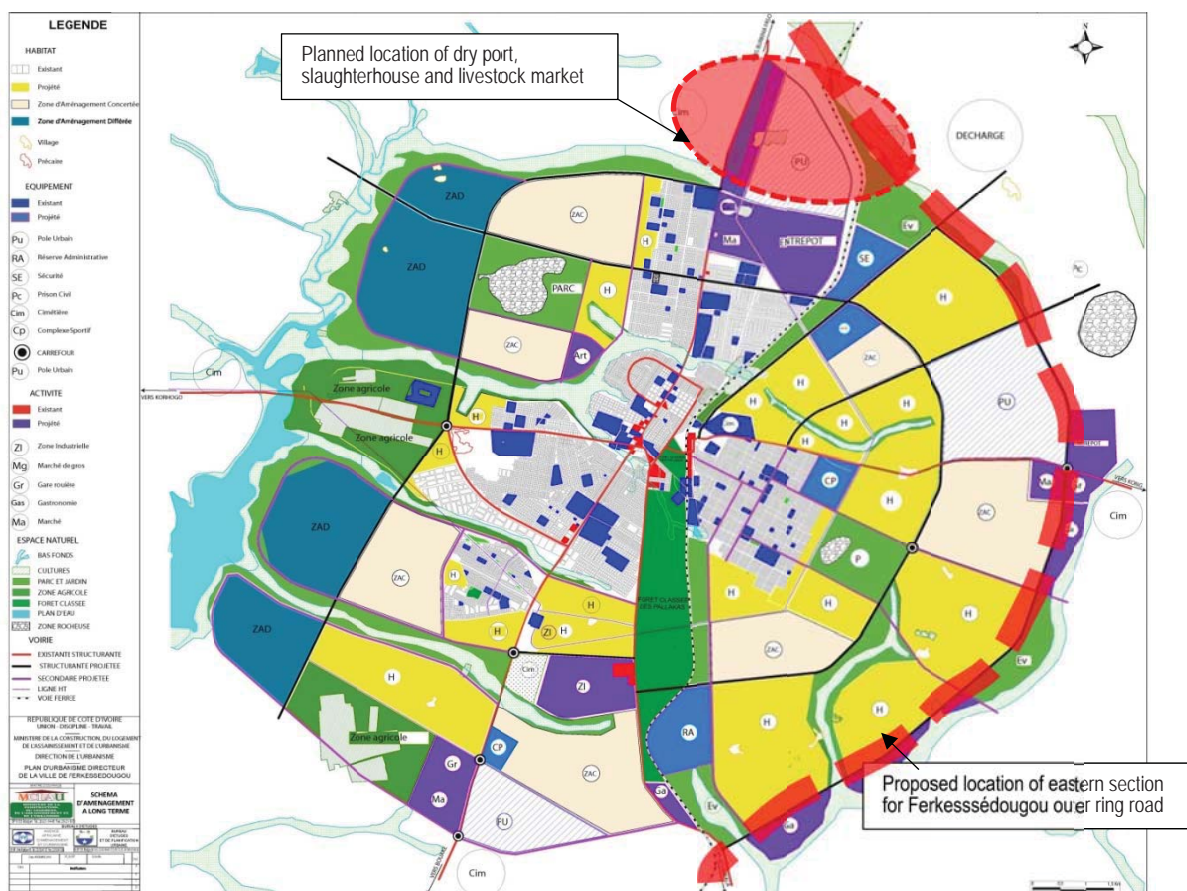
18.5.5 Programmes and Projects for Urban Development of Ferkessédougou

The programmes and projects proposed in relation to corridor development are listed in response to each objective and strategy in Table 18.5.2.

Table 18.5.2 Programmes and Projects on Urban Development for Ferkessédougou

Programmes and Projects	Related Strategies	Expected Responsible Organization	Term	
			Short 2025	Long 2040
Objective-1: To upgrade primary corridor infrastructures in Ferkessédougou so as to increase its competitive advantage				
(1) Construction of 4- lane motorway between Bouaké and Ferkessédougou	1-1	Ministry of Economic Infrastructure		x
(2) Construction of a bypass road of the Northern Motorway also serving as outer ring road for Ferkessédougou	1-1	Ministry of Economic Infrastructure		x
(3) Construction and operation of Ferkessédougou multi-modal dry port	1-2	MIAIE	x	
(4) Rehabilitation and upgrading of existing railway line	1-2	Ministry of Transport	x	
(5) Improvement of road between Korhogo and Ferkessédougou	1-3	Ministry of Economic Infrastructure	x	
(6) Improvement of road between Ferkessédougou and Bouna	1-3	Ministry of Economic Infrastructure		
(7) Construction of a modern bus station	1-4			x
(8) Construction of an airport for the city	1-4	ANAC/ SODEXAM		x
Objective-2: To strengthen producing, processing and marketing functions for agriculture and livestock industry in Ferkessédougou				
(1) Development of an industrial area for agro- processing	2-1			x
(2) Construction of a wholesale market	2-1		x	
(3) Construction of a plant for production of livestock and poultry feed	2-2	MIRAH		x
(4) Construction of a modern slaughterhouse	2-2	MIRAH		x
(5) Construction of a modern livestock park	2-2	MIRAH	x	
(6) Construction of a livestock market	2-2	MIRAH		x
(7) Strengthening of railway cattle loading facility at Ferkessédougou station or at a station in a suburban area of Ferkessédougou	2-2	Ministry of Transport	x	
Objective-3: To strengthen the tourism sector				
(1) Construction of good hotels in the periphery and recovery points within protected forests	3-1			x
(2) Restoration of all old buildings	3-1		x	

Source: JICA Study Team



Source: JICA Study Team based on Long-Term Development Scheme of Urban Master Plan for Ferkessédougou (September 2015)
Figure 18.5.1 Proposed Location of Bypass Road of the Northern Motorway for Ferkessédougou

18.6 Urban Development Strategies for Korhogo

18.6.1 Existing Urban Master Plan for Korhogo

(1) Strategic Directions

In the Urban Master Plan for Korhogo, the following areas or themes of development are taken into consideration as the strategic directions.

1) Development of agriculture

Korhogo is an agricultural sector dominated by cultivation of cotton. Techniques of agricultural production and livestock are still mainly traditional, despite the slow progression of animal traction in the cultivation of cotton. Through the development of agriculture, which will increase the GDP of the area, it will become possible to take action in the areas of modernization of agriculture, fisheries and livestock and applied agricultural research.

2) Strengthening of economic infrastructures

The reinforcement of economic infrastructures accompanies development. To make Korhogo a development pole, it is important to pay particular attention to development of agro-industry, to strengthening of transport and trade infrastructures, to promote the exploitation of underground mineral resources and to improve access to information.

3) Promotion of tourism

Until recently, Korhogo was one of the main tourist destinations of Côte d'Ivoire, with its rich cultural and artisanal heritage and numerous tourist and artisanal sites. Tourism remains a key element in the department's development strategies, and it should be promoted through development of the tourism industry and promotion of arts and crafts.

4) Improvement of the environment and the living conditions of the population

Korhogo is confronted with the phenomenon of the advancing desert, with its detrimental effects on agriculture and livestock and water availability. It is therefore important to focus actions in this area on the protection of ecosystems, water control, overall sanitation of towns and villages and the development of modern city management tools.

(2) Strategic Development Objectives

For the next ten (10) or fifteen (15) years, some twenty-four (24) major strategic development goals are to be achieved to achieve the development targeted by the populations of Korhogo. These strategic objectives define concrete changes that must be made in each of the sectors of activity in order to achieve desired development in the sector.

Table 18.6.1 Strategic Development Issues for Korhogo

Development Issues	Objectives
Strengthening the living environment promotion	1. Improvement of the living conditions of the most disadvantaged populations 2. Control of land, town planning and housing 3. Sustainable management of sanitation and drainage 4. Improvement of the electricity network and drinking water 5. Improvement of the communication network and ICT
Security of property and persons	6. Strengthening of security services and civil protection 7. Creation of security (or policing)
Local governance and social cohesion	8. Local governance 9. Social cohesion
Development of the territory and environment	10. Territory development 11. Preservation of natural resources and the environment
Promotion of the tourist and cultural heritage	12. Strengthening of the tourism sector and development of religious and historical tourist sites 13. Creation of botanical gardens of endangered plants 14. Valorisation of culture and traditions
Development of economic infrastructure and promotion of productive sectors	15. Strengthening of transport and economic infrastructure 16. Development of the agricultural sector 17. Development of the artisanal sector 18. Development of the commercial sector

	19. Development and strengthening of the agro-pastoral system
Development of industrial and mining sectors	20. Promotion and creation of incentive and attractive conditions for the installation of industries and other enterprises 21. Promotion of the mining sector
Human development and socio-communication infrastructure	22. Strengthening of the health system 23. Strengthening of the education system and qualification of human resources 24. Strengthening of socio-cultural and sports infrastructures

Source: Plan d'urbanisme directeur de Korhogo (Septembre 2015)

18.6.2 Issues on Urban Development of Korhogo

According to the Urban Master Plan for Korhogo (September 2015), the challenges or concerns faced by the population and local authorities revolve around the following development issues:

- Development of productive sectors (agriculture, livestock, fisheries, tourism, mining, etc.)
- Strengthening of economic and socio-community infrastructures
- Improvement of environment and living conditions of the population
- Improvement of local governance
- Development of human resources

18.6.3 Objectives for Urban Development of Korhogo

(1) Overall Objectives

The overall objectives for urban development of Korhogo are formulated in order to solve the above issues:

To accelerate the growth of inland areas as the principal inland city along the Abidjan-Ouagadougou Corridor, by developing both corridor infrastructures and productive sectors benefiting from them

(2) Specific Objectives

On the basis of the overall objectives, the specific objectives of urban development of Korhogo are set as follows:

Objective-1: To strengthen corridor infrastructures in Korhogo so as to increase its competitive advantage

Objective-2: To strengthen producing, processing and marketing functions for agriculture and livestock industry in Korhogo

Objective-3: To strengthen manufacturing industry of Korhogo

Objective-4: To strengthen the tourism sector

18.6.4 Urban Development Strategies for Korhogo

The urban development strategies to achieve the objective identified above are proposed as follows:

1) Objective-1: To strengthen corridor infrastructures in Korhogo so as to increase its competitive advantage

- Strategy 1-1: Increasing accessibility to and from the Northern Motorway
- Strategy 1-2: Improving the corridor function by developing other transport modes

2) Objective-2: To strengthen producing, processing and marketing functions for agriculture and livestock industry in Korhogo

- Strategy 2-1: Development of facilities related to agriculture
- Strategy 2-2: Modernization of livestock facilities

3) Objective-3: To strengthen manufacturing industry of Korhogo

- Strategy 3-1: Development of industrial zone to strengthen private sector activities

4) Objective-4: To strengthen the tourism sector

- Strategy 4-1: Strengthening of the tourism sector and development of religious and historical tourist sites



Source: PLAN D'URBANISME DIRECTEUR DE LA VILLE DE KORHOGO

Figure 18.6.1 Long-Term Development Scheme for Korhogo

18.6.5 Programmes and Projects for Urban Development of Korhogo

The programmes and projects proposed in relation to corridor development are listed in response to each objective and strategy in Table 18.6.2.

Table 18.6.2 Programmes and Projects on Urban Development for Korhogo

Programmes and Projects	Related Strategies	Expected Responsible Organization	Term	
			Short 2025	Long 2040
Objective-1: To strengthen corridor infrastructures in Korhogo so as to increase its competitive advantage				
(1) Designation and construction of outer ring road for Korhogo	1-1	Korhogo Commune		x
(2) Improvement of road between Korhogo and Ferkessédougou	1-1	Ministry of Economic Infrastructure	x	
(3) Construction of the airport for the city	1-2	ANAC/ SODEXAM		x
Objective-2: To strengthen producing, processing and marketing functions for agriculture and livestock industry in Korhogo				
(1) Rehabilitation and restoration of agro-industries	2-1		x	
(2) Construction of agro-industries	2-1			x
(3) Construction of a wholesale market	2-1		x	
(4) Construction of a plant for production of livestock and poultry feed	2-2	MIRAH	x	
(5) Construction of modern slaughterhouses	2-2	MIRAH		x
(6) Construction of a modern livestock park	2-2	MIRAH	x	
Objective-3: To strengthen manufacturing industry of Korhogo				
(1) Establishment of a new industrial zone in Korhogo	3-1	AGEDI		x
Objective-4: To strengthen the tourism sector				
(1) Rehabilitation of tourist and historical sites	4-1		x	

Source: JICA Study Team

18.7 Urban Development Strategies for San-Pédro

18.7.1 Present Situation of San-Pédro

There is no urban centre in San-Pédro, but centres have erupted in several places. In the south, in the Balmer district, there are various Ministries, some public administration services, the Town Hall, the BCEAO, etc. To the north of this centre is a zone of port activities. Then, in the industrial zone, there are other facilities and services such as the General Directorate of Taxes, the Technical Department of the Town Council, the Prefecture, the Sub-Prefecture, etc. In Bardo District, there is an extension of the industrial zone.

According to the new urban master plan for San-Pédro, the constraints and potentials are shown as below:

1) Natural Constraints

San-Pedro is surrounded by numerous streams including San-Pédro River, Djiboué Lagoon and also by lakes that occupy the northeast, east and southern parts of the existing city. These natural obstacles offer no possibility of extension in these directions. In the western part of the city there are many shallows which of

fer many more possibilities.

2) Constraints Created

In the centre of the city on the shore of the lake, there is a peninsula attached to the existing airport. A high voltage line runs along the road leading to Soubré. In addition, there are two major constraints, in the east there are the potential areas of extension of the port and in the west, between the road of Tabou and the sea are the reserves that are set aside for the Airport City and the International Airport.

3) Potential of the Site

In view of all the above, potential sites in the city are limited to the area that lies west beyond the road of Tabou.

18.7.2 Objectives for Urban Development of San-Pédro

(1) Overall Objectives

The overall objectives for urban development of San Pédro are formulated in order to solve the above issues:

To support and promote economic sectors in the western part of the country, by integrally upgrading San-Pédro Port and its associated infrastructure

(2) Specific Objectives

On the basis of the overall objectives, the specific objectives of urban development of San-Pédro are set as follows:

Objective-1: To increase the competitiveness of San-Pédro port

Objective-2: To support and promote mining and manufacturing industries in the western part of the country

Objective-3: To upgrade the arterial road network starting from San-Pédro

18.7.3 Urban Development Strategies for San-Pédro

The urban development strategies to achieve the objectives identified above are proposed as follows based on the strategic directions:

1) Objective-1: To increase competitiveness of San-Pédro Port

- Strategy 1-1: Expansion and upgrade of San-Pédro Port
- Strategy 1-2: Development of logistics facilities adjacent to the expansion area of San-Pédro Port

2) Objective-2: To support and promote mining and manufacturing industries in the western part of the country

- Strategy 2-1: Development of a freight railway network in the western part of the country
- Strategy 2-2: Development of a new industrial zone connected directly to the expansion area of San-Pédro Port

3) Objective-3: To upgrade arterial road network starting from San-Pédro

- Strategy 3-1: Development of East-West (Coastal) Corridor
- Strategy 3-2: Strengthening of Western Corridor
- Strategy 3-3: Strengthening of the gateway to San-Pédro city

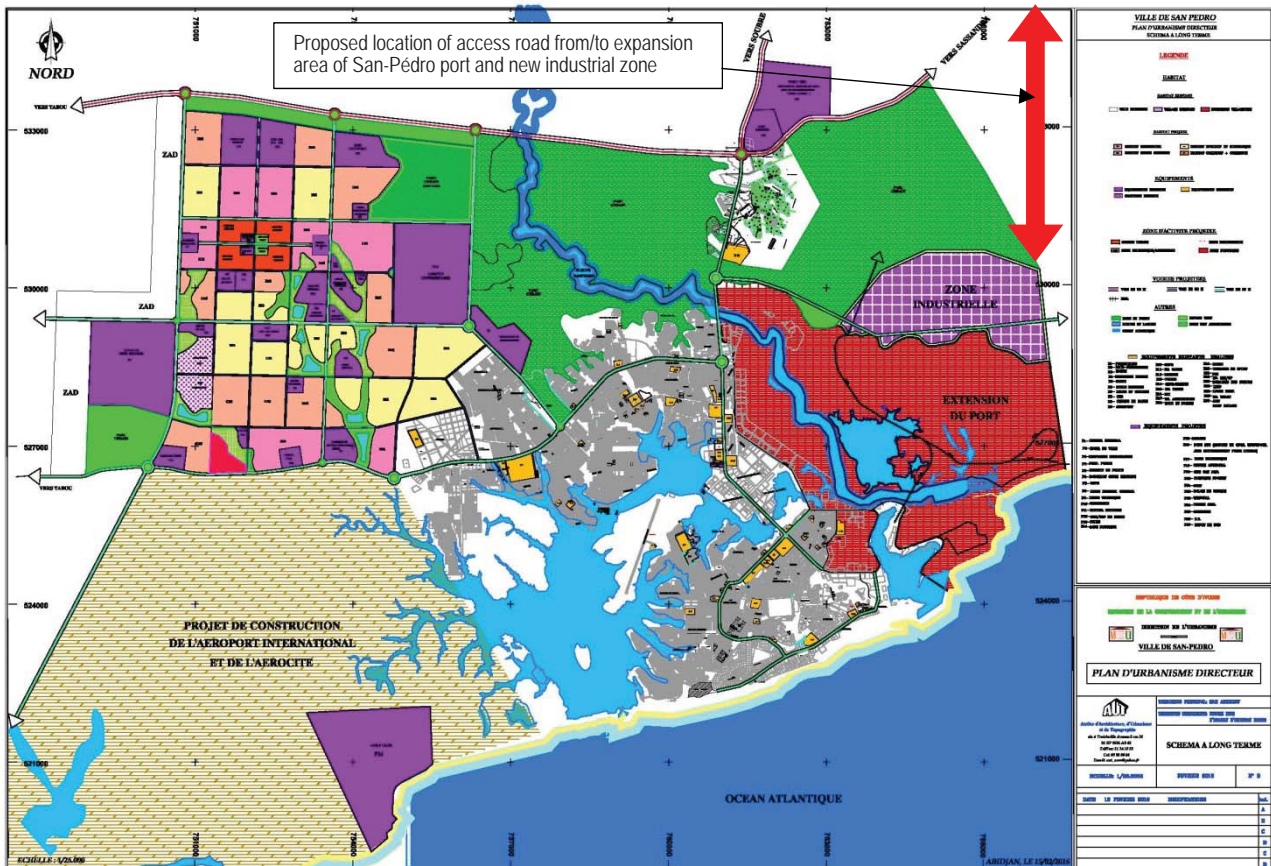
18.7.4 Programmes and Projects for Urban Development of San-Pédro

The programmes and projects proposed in relation to corridor development are listed in response to each objective and strategy in Table 18.7.1.

Table 18.7.1 Programmes and Projects on Urban Development for San-Pédro

Programmes and Projects	Related Strategies	Expected Responsible Organization	Term	
			Short 2025	Long 2040
Objective-1: To upgrade primary corridor infrastructures in San-Pédro so as to increase its competitive advantage				
(1) Expansion of San-Pédro Port	1-1	San-Pédro Port	x	
(2) Development of new mineral terminal including storage area at San-Pédro Port	1-1	San-Pédro Port		x
(3) Establishment of logistics zones adjacent to the expansion area of San-Pédro Port	1-2	San-Pédro Port		x
(4) Construction of a new access road from/to the expansion area of San-Pédro Port and the new industrial zone	1-1 1-2	San-Pédro Port		x
Objective-2: To support and promote mining and manufacturing industries in the western part of the country				
(1) Construction of railway from San-Pédro to iron ore mines in Tomkpi Region	2-1	Ministry of Transport		x
(2) Establishment of a new industrial zone in San-Pédro	2-2	AGEDI		x
Objective-3: To upgrade arterial road network starting from San-Pédro				
(1) Construction of motorway between Abidjan and San-Pédro	3-1	Ministry of Economic Infrastructure		x
(2) Construction of 4- lane road between San-Pédro and Man	3-2	Ministry of Economic Infrastructure		x
(3) Widening of access road from/to the centre of the city and the existing port	3-3	Ministry of Economic Infrastructure		x

Source: JICA Study Team



Source: JICA Study Team based on Long-Term Development Scheme of Urban Master Plan for San-Pédro City
Figure 18.7.1 Proposed Location of Access Road from/to Expansion Area of San-Pédro Port and New Industrial Zone

18.8 Urban Development Strategies for Man

18.8.1 Existing Urban Master Plan for Man

According to the Urban Master Plan for Man (September 2015), the following factors were taken into account in making the strategies for sustainable development of the city:

- Man is both the capital of the Montagnes District and the capital of the Tonkpi Region, and a centre of economic development in the district;
- The city occupies a favourable geographical position in the region. The strengthening of this position will develop a true urban image and promote trade with other urban areas;
- Man enjoys economic dynamism through its commercial activities, transportation and tourism. But local economic activity must be strengthened and diversified;
- Man has a rapidly growing population. Estimated at 116,657 inhabitants in 1998, it increased to 180,799 in 2013. The rate of growth could evolve with the various urbanization projects in progress;
- The city is crossed by lowland that has become unhealthy due to human actions. In order to take care of the image of the city, actions to improve the urban environment must be undertaken.

18.8.2 Objectives for Urban Development of Man

(1) Orientation of Urban Development

The diagnosis presented new orientations that will be the challenges to make the capital a competitive and economically viable urban centre.

1) Vision statement

In formulating the development strategy for the capital of the Tonkpi region, the vision statement is: **MAN, a prosperous and attractive economic centre, focused on the development of cultural, tourism, technological and mining activities.**

The vision was chosen based on the three essential elements below.

- Man has many natural advantages that are capable of promoting the development of tourism. These include its mountain ranges, waterfalls, the sacred forest or the Gbèpleu monkey forest. Besides its natural potential, the cultural heritage of Man is enriched by its tradition with its arts and crafts (weaving, sculpture, etc.) and traditional dances.
- Man has many vocational schools with workshops from which come many electronic products (solar panels, electronic boards, etc.). In addition, the locality benefits from a university that it will be useful to orient towards two areas of research, namely the mines and the technology. These training and research structures, in addition to what they will offer to Côte d'Ivoire, researchers and engineers, equipped in the study and extraction of minerals, will also be highly valuable places of design and manufacture Technology, thus highlighting all the resources of the city.
- The subsoil is immensely rich in iron ore but this wealth remains unexploited.

2) Strategic Directions

The strategic directions taking into account the vision for the city can be retained:

- Orientation 1: Develop and promote a tourism economy in the city;
 - To make Man a sought after tourist destination of Côte d'Ivoire
 - To enhance the tourism potential of the city
 - To improve and strengthen tourism infrastructure
- Orientation 2: Make Man a city of mining, innovation and technological research

- To develop the activity of support of the mining in the city
- To provide the city with modern equipment in the fields of mining and technological research
- To encourage the creation and transfer of mining and technology industries
- Orientation 3: Offer to the city, the amenities related to its vision of being a tourist and technological city
 - To encourage the idea of its being a green city
 - To improve the landscape quality of the main axes of the capital
 - To protect the landscapes and ecosystems
 - To improve the urban image
 - To provide the city with quality urban infrastructure
 - To harmonize urban forms
 - To improve the framework and living conditions of the population.

(2) Overall Objectives

The overall objectives for urban development of Man are formulated in accordance with the urban development orientation:

To strengthen the competitive and economically viable urban centre in the western areas as the principal city along the western Corridor, by promoting sustainable development of the corridor infrastructures and the distinctive economic sectors

(3) Specific Objectives

On the basis of the overall objectives, the specific objectives of urban development of Man are set as follows:

Objective-1: To strengthen the competitiveness of Man

Objective-2: To encourage opportunities for sustainable economic development

18.8.3 Urban Development Strategies for Man

(1) Scenario for Sustainable Development

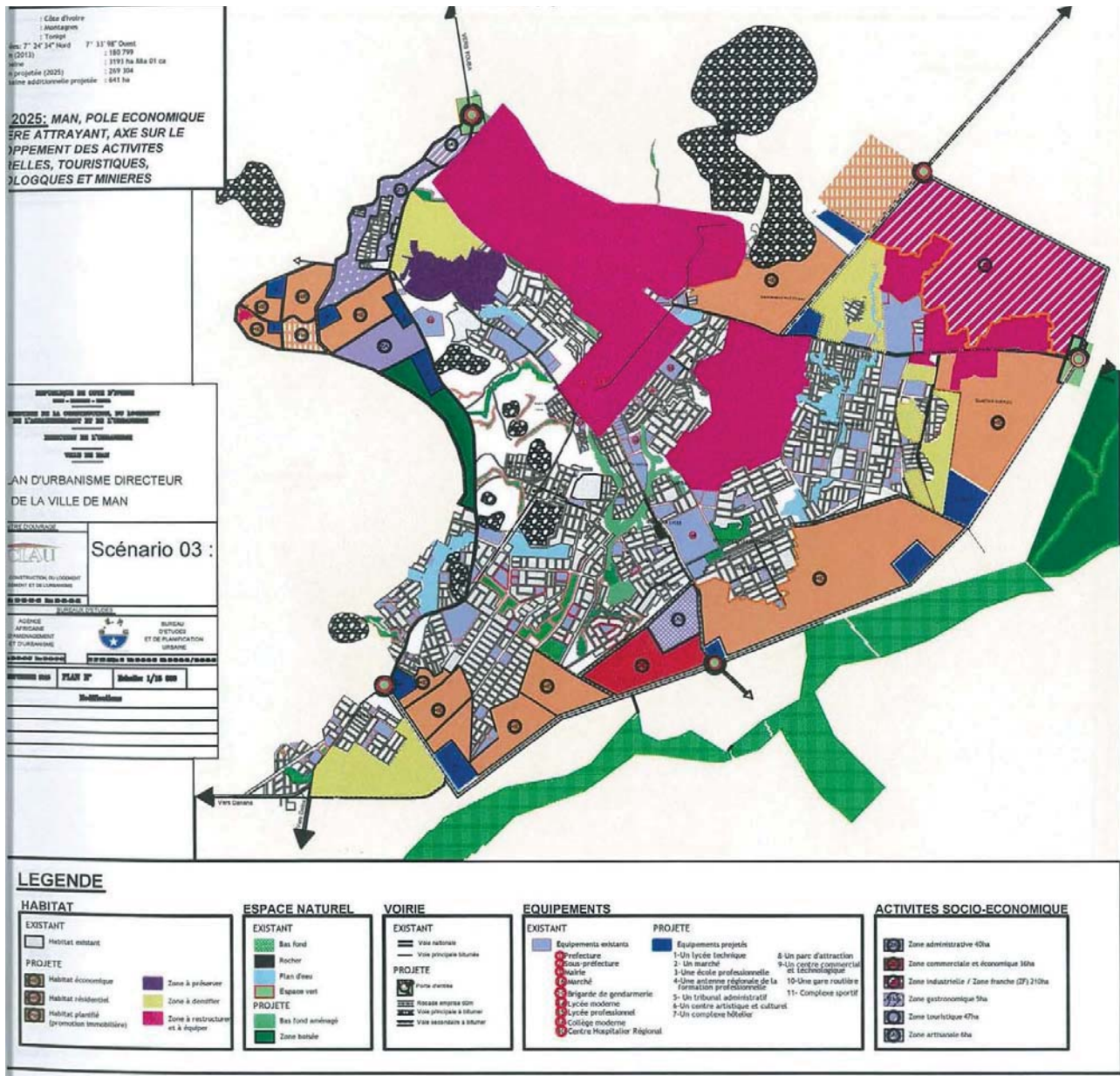
Three scenarios were proposed for sustainable development for the city of Man in the Urban Master Plan:

Scenario 1: Development based on demographic projections,

Scenario 2: Development based on the strengthening of the status of the regional capital,

Scenario 3: Development based on the vision of making the city of Man a prosperous and attractive economic pole, focused on the development of cultural, tourism, technological and mining activities.

Scenario 3 was retained of these three scenarios, whose implementation will necessarily integrate the other two. This scenario will allow the city to meet the expectations of the government to make the regional capitals of the competitive economic poles. (See Figure 18.8.1)



Source: Document provisoire, PLAN D'URBANISME DIRECTEUR DE LA VILLE DE MAN HORIZON 2025

Figure 18.8.1 Scenario 3 for Sustainable Development for Man

(2) Urban Development Strategies

The urban development strategies to achieve the objective identified above are proposed as follows based on the selected scenario:

Objective-1: To strengthen the competitiveness of Man

- Strategy 1-1: Strengthening of Western Corridor
- Strategy 1-2: Development of a freight railway network in the western part of the country
- Strategy 1-3: Strengthening of the multi-modal transit function for connecting railway and truck transport

Objective-2: To encourage opportunities for sustainable economic development

- Strategy 2-1: Strengthening of the tourism function
- Strategy 2-2: Development and operation of a new industrial zone (exclusive

industrial zone)

- Strategy 2-3: Strengthening of mining and technological research functions

18.8.4 Programmes and Projects for Urban Development of Man

The programmes and projects proposed in relation to corridor development are listed in response to each objective and strategy in Table 18.8.1.

Table 18.8.1 Programmes and Projects on Urban Development for Man

Programmes and Projects	Related Strategies	Expected Responsible Organization	Term	
			Short-Mid 2025	Long 2040
Objective-1: To strengthening the competitiveness of Man				
(1) Construction of 4-lane road between San-Pédro and Man	1-1	Ministry of Economic Infrastructure		x
(2) Upgrading of road between Man – Odienné – the border of Mali	1-1	Ministry of Economic Infrastructure		x
(3) Construction of railway from San-Pédro Port to iron ore mines in Tomkpi Region	1-1, 1-2	Ministry of Transport		x
(4) Construction of railway from Man to Odienné	1-1, 1-2	Ministry of Transport		x
(5) Development of multi-modal dry port at Man	1-1, 1-3	MIAIE		x
Objective-2: To encourage opportunities for sustainable economic development				
(1) Development and restoration of tourist sites	2-1	Man Commune	x	
(2) Construction of inter-city bus stations for the south, east and west destinations	2-1	Man Commune	x	
(3) Establishment of a new industrial zone near the old one in Man	2-2	AGEDI		x
(4) Investment promotion for development of iron ore mines in Tonkpi Region (Mt. Nimba, Mt. Klahoyo and Mt. Gao)	2-3		x	

Source: JICA Study Team

18.9 Urban Development Strategies for Bondoukou

18.9.1 Existing Urban Master Plan

The city of Bondoukou, the capital of the Gontougo Region, is located in the northeast of Côte d'Ivoire, 414 km from Abidjan, the economic capital of the country and about ten kilometres from the Ghanaian border. The population of Bondoukou city estimated at 85,785 inhabitants in 2014 will increase to 126,480 inhabitants by 2030.

According to the Urban Master Plan for Bondoukou (September 2016), the long-term scheme for the urban master plan for Bondoukou is drawn as shown in Figure 18.9.1. The summary of the plan is as follows:

1) Structure of the Urban Space

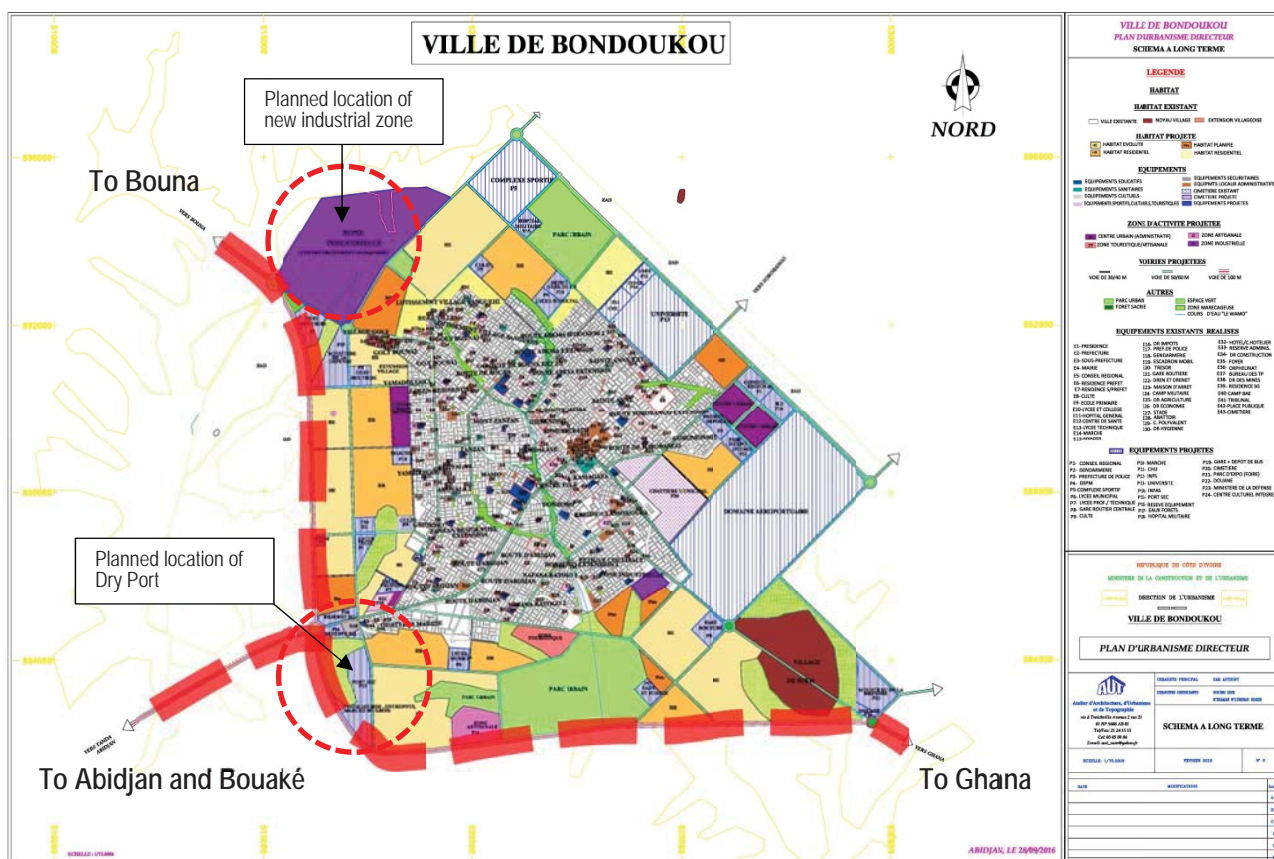
The primary roads consist of a 100 m right-of-way deviation and a 50m belt. ROW lanes that are each 30 meters wide for a total of 60 meters are also planned to complete the future urban framework.

2) Areas of Activity

An Industrial Zone is located along the Eastern Corridor (A1) in the northwest part of the city.

3) Facilities Implementation Projects

There are facilities implementation projects for an airport, two bus depots, a large market, three bus stations, and a dry port (truck parking area, warehouses, wholesale market) as trade and transport functions.



Source: JICA Study Team based on Plan d'Urbanisme Directeur de la Ville de Bondoukou

Figure 18.9.1 Long-term Scheme of Urban Master Plan for Boudoukou

18.9.2 Objectives for Urban Development of Bondoukou

The objectives for urban development of Bondoukou are formulated as follows:

- Objective-1: To upgrade eastern corridor infrastructures in Bondoukou so as to increase its competitive advantage
- Objective-2: To strengthen manufacturing industry of Bondoukou

18.9.3 Urban Development Strategies for Bondoukou

The urban development strategies to achieve the objectives identified above are proposed as follows:

Objective-1: To upgrade eastern corridor infrastructures in Bondoukou so as to increase its competitive advantage

- Strategy 1-1: Strengthening of Eastern Corridor
- Strategy 1-2: Strengthening of East-West Roads by extending them from major urban centres on the Eastern Corridor
- Strategy 1-3: Development of dry port function making full use of the location near the border with Ghana
- Strategy 1-4: Improving of the primary corridor function by developing other transport modes

Objective-2: To strengthen manufacturing industry of Bondoukou

- Strategy 2-1: Development and operation of a new industrial zone (exclusive

industrial zone)

- Strategy 2-2: Inviting of agricultural processing factories

18.9.4 Programmes and Projects for Urban Development of Bondoukou

The programmes and projects proposed in relation to corridor development are listed in Table 18.9.1.

Table 18.9.1 Programmes and Projects on Urban Development for Bondoukou

Programmes and Projects	Related Strategies	Expected Responsible Organization	Term	
			Short-Mid 2025	Long 2040
Objective-1: To upgrade eastern corridor infrastructures in Bondoukou so as to increase its competitive advantage				
(1) Upgrading of road between Anyama and Bondoukou	1-1	Ministry of Economic Infrastructure	x	
(2) Upgrading of road between Bondoukou and Bouna	1-1	Ministry of Economic Infrastructure		x
(3) Construction of 4-lane road between Anyama and Bondoukou	1-1	Ministry of Economic Infrastructure		x
(4) Improvement of road between Bondoukou and the Ghana border	1-2	Ministry of Economic Infrastructure		x
(5) Improvement of road between Bondoukou and Bouaké	1-2	Ministry of Economic Infrastructure		x
(5) Development of multi-modal dry port at Bondoukou	11-1, 1-2, 1-3	MIAIE		x
(6) Construction of a modern bus station	1-4			x
(7) Construction of an airport of the city	1-4	ANAC/ SODEXAM		x
Objective-2: To strengthen manufacturing industry of Bondoukou				
(1) Establishment of a new industrial zone in Bondoukou	2-1, 2-2	AGEDI		x

Source: JICA Study Team

Chapter 19 Social Development Strategies for Côte d'Ivoire

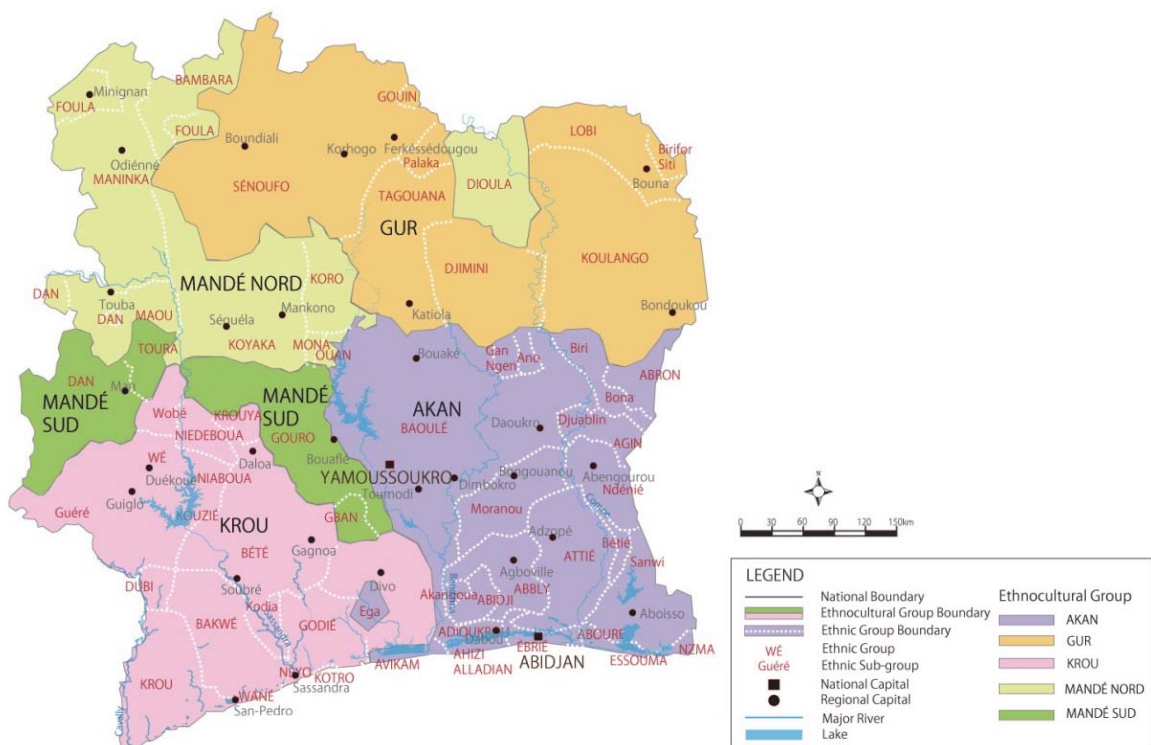
19.1 Present Social Situation in Côte d'Ivoire

19.1.1 Present Situation of Social Structure in Côte d'Ivoire

(1) Ethnicity

Côte d'Ivoire has more than sixty ethnic groups whose cultures are different from each other.

These ethnic groups are divided into five main clusters: namely the Akan group; the Gur (Voltaic) group; the Northern Mande group; Southern Mande group; and the Krou group. According to the General Population and Housing Census 1998 (RGPH: *Recensement Générale de la Population et de l'Habitation de 1998*), the Akan makes up 42.1% of the total population and are based in the south-eastern part of the country. The Gur (Voltaic) makes up 17.6% and are based in the north-western part, the Northern Mande makes up 16.5% and are based in the north-western part, the Krou makes up 12.7% and are based in the south-western part, and the Southern Mande makes up 10.0% of the population and are based in the western part of the country. Under the Akan, the Baoule which is a sub-group of Akan is the largest group.



Source: Les Editions du Jaguar, Atlas de l'Afrique Côte d'Ivoire

Figure 19.1.1 Map of Ethnic Groups in Côte d'Ivoire

(2) Religion

The following table shows the composition of religion by ethnic group. In the whole of Côte d'Ivoire 33.9% are Christian, 27.4% are Muslim, 20.7% don't follow any particular religion, and 15.3% are Animism.

More than 50% of Akan and Krou are Christian, while the majority of Gur (Voltaic) and Northern Mande are Muslim, and 38.4% of Southern Mande follow no particular religion.

Table 19.1.1 Composition of Religions and Ethnic Groups in Côte d'Ivoire

Unit: %

Religion	Ethnic Group							Total Ivoirians
	Akan	Krou	Mande Nord	Mande Sud	Gur (Voltaic)	Naturalized	Unspecified	
Catholic	31.8	27.6	0.8	12.0	13.5	13.7	12.2	20.7
Protestant	13.2	12.1	0.2	7.0	1.7	2.2	2.8	8.2
Harrist	2.6	3.2	0.2	0.7	0.2	0.2	0.3	1.6
Other Christians	3.9	9.3	0.1	3.3	0.9	1.2	1.0	3.4
Christians Total	51.5	52.2	1.4	23.1	16.4	17.3	16.3	33.9
Muslim	5.0	2.6	95.6	5.6	44.7	74.0	69.7	27.4
Animism	18.7	7.5	0.6	30.1	19.2	1.9	4.9	15.3
Other Religions	2.4	5.1	0.1	2.2	0.5	0.7	0.5	2.0
No Religion	21.7	31.7	1.9	38.4	18.7	5.2	7.4	20.7
Undeclared	0.7	0.9	0.5	0.7	0.6	0.9	1.2	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: INS, RGPH1998

Distribution of the population by religion and place of residence is shown in the following table. In Abidjan, 42.3% of the residents are Christians whereas Muslim marked the highest in other cities and rural areas. Animism is also found more frequently in rural areas compared to Abidjan and other cities in the country.

Table 19.1.2 Distribution of Population by Religion and by Place of Residence

Religion	Place of Residence			
	Abidjan	Other Urban	Rural	Total
Catholic	28.8%	19.1%	16.4%	19.4%
Protestant	7.5%	6.5%	6.4%	6.6%
Harrist	1.3%	0.8%	1.5%	1.3%
Other Christians	4.7%	3.4%	2.4%	3.1%
Christians Total	42.3%	29.5%	26.8%	30.3%
Muslim	41.0%	49.4%	33.5%	38.6%
Animism	2.9%	4.9%	17.6%	11.9%
Other Religions	2.1%	1.8%	1.6%	1.7%
No Religion	11.1%	13.3%	19.9%	16.7%
Undeclared	0.6%	0.8%	0.7%	0.7%
Total	100.0%	100.0%	100.0%	100.0%

Source: INS, RGPH1998

19.1.2 Present Situation of Social System in Côte d'Ivoire

(1) Education and Gender

The following table shows the distribution of literacy rate by place of residence, sex, and poverty status. The literacy rate of rural areas is far behind that of Abidjan and other cities in the country. In rural areas especially, the literacy rate of females is very low with only 17.2%. The literacy rate of females in non-poverty status is still only 23.6% which is lower than the females in poverty status in the urban areas. However, the literacy rate of females in Abidjan is also very low with less than 50%. Therefore, it can be said that the literacy rate is still very low in general in Côte d'Ivoire compared to the neighbouring country Ghana, and the regional and gender gap in Côte d'Ivoire is also notable.

Table 19.1.3 Literacy Rate by Gender and Place of Residence

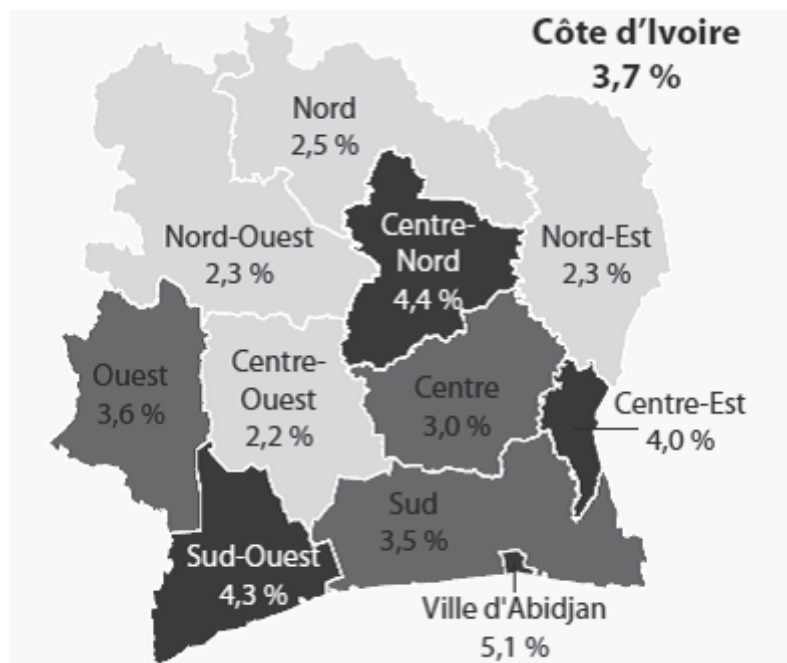
Place of Residence and Sex of the individual		Poverty Status		Total
		Poverty	Non Poverty	
Abidjan	Male	60.4%	79.4%	75.8%
	Female	42.3%	65.8%	61.5%
	Total	51.2%	72.5%	68.5%
Other Cities	Male	53.4%	65.9%	61.7%
	Female	33.5%	48.9%	42.8%
	Total	42.9%	58.1%	52.5%
Rural	Male	34.7%	41.7%	38.6%
	Female	17.2%	23.6%	20.2%
	Total	25.6%	33.8%	29.8%
Total	Male	42.9%	59.1%	53.3%
	Female	24.6%	44.5%	36.3%
	Total	33.3%	52.3%	45.0%

Source: INS, 2015, Enquete sur le Niveau de Vie des Menages en Côte d'Ivoire (ENV) 2015

(2) Health

According to World Health Organization (WHO), 61 % of deaths in Côte d'Ivoire are caused by communicable, maternal, perinatal and nutritional conditions.

In terms of HIV/AIDS, 3.7% of the population are infected by HIV/AIDS in Côte d'Ivoire, which is the second highest among ECOWAS countries. The prevalence rate of HIV/AIDS in urban areas is 4.3% whereas it is 3.1% in rural areas. The prevalence rate is the highest in Abidjan with 5.1% followed by Vallée du Bandama District with 4.4% where Korhogo and Ferkessédougou are located.



Source : Ministère de la Santé et de la Lutte contre le Sida ,INS and Ministère d'État, Ministère du Plan et du Développement, 2013, Enquete Demographique et de Sante et a Indicateurs Multiples (EDS-MICS) 2011-2012

Figure 19.1.2 Map of HIV/AIDS Prevalence Rate by Region

Due to the civil war, in 2002, many health workers moved to the southern part of the country. Therefore, disparity of human resources in the health sector can still be seen today. Public health infrastructures are also concentrated in the southern part including referral hospitals. This disparity of health infrastructure also causes a disparity of health workers in Côte d'Ivoire.

19.1.3 Present Situation of Economic Activities and Land Use

(1) Economic Activities

In 2014, Côte d'Ivoire had approximately 13 million people in the age group between 15 and 64 years old, which is known as the productive age. The share of productive-age population in 2014 was 56.0%, which is approximately 8 million people, and this was an increase from 51.1% in 1998.

In 1998, approximately half of the employed population was working in the primary sector. However, in the major urban centres such as Abidjan and Bouake, over 60% of the employed people were working in the tertiary sector and around 17% in the secondary sector.

Table 19.1.4 Composition of Employed Population 15 Years Old and Over by Industry in Major Urban Areas and Other Areas in Côte d'Ivoire (1998)

		Primary Sector	Secondary Sector	Tertiary Sector	Unknown	Total
Abidjan	Number	17,546	200,419	777,595	133,737	1,129,297
	Share	1.6%	17.7%	68.9%	11.8%	100.0%
Bouake	Number	18,038	27,186	97,707	13,306	156,237
	Share	11.5%	17.4%	62.5%	8.5%	100.0%
Other Area	Number	2,954,411	225,632	885,125	362,910	4,428,078
	Share	66.7%	5.1%	20.0%	8.2%	100.0%
Total	Number	2,989,995	453,237	1,760,427	509,953	5,713,612
	Share	52.3%	7.9%	30.8%	8.9%	100.0%

Source: INS, RGPH 1998

Poverty ratios vary from 22.7% in the Abidjan Autonomous District to 71.7% in the Kabadougou Region. The poverty rates in only two autonomous districts and four regions (San-Pédro, Cavally, Guémon and La Nawa) are below the national average of 46.3%. The poverty ratios are higher in the regions closer to the national border in the north. The national average of the poverty ratios in urban areas and rural areas are 35.9% and 56.8% respectively.

Regarding the Gini Index, there are nine regions where the Gini index is higher than that of the national average. These are the regions of Tonkpi, Kabadougou, Gôh, Cavally, Gbôklé, Grands-Ponts, Guémon, La Mé and Tchologo.

(2) Land Use

Côte d'Ivoire has 20.6 million ha of agricultural area, accounting for 63.9% of the total country area. Agricultural land refers to the share of land area that is arable land and permanent crops, and under permanent pastures permanent meadows and pastures. The land for arable land and permanent crops is 7.4 million ha and accounts for 22.9%, and under permanent pastures permanent meadows and pastures which is 13.2 million ha accounts for 40.9% of total.

(3) Land Disputes

Land disputes in Côte d'Ivoire are rooted in the thought of "the land belongs to those who develop it" since 1960, the time of President Félix Houphouët-Boigny.

Although laws for land ownership exist, the current procedure requires time and the procedure is not well understood by the people. Therefore, only a few percent of land is legally registered and land transactions are seldom recorded. This creates land disputes among farmers, cattle breeders and transhumance.

However, to overcome this situation, the Government of Côte d'Ivoire is currently trying to implement a new law which creates an easier process for farmers to register their lands.

19.2 Social Development Strategies for Côte d'Ivoire

19.2.1 Issues on the Social Development in Côte d'Ivoire

(1) Conflict over Land

As a result of an increase in the amount of farmed land, vacant lands continue to decrease. Livestock farmers (cattle breeders/ transhumance) raise their livestock in vacant lands. Since most rural lands are unregistered, conflicts over land might increase.

(2) Basic Education Inequity

In Côte d'Ivoire, the literacy rates not only in rural areas but also in urban areas except for Abidjan are low. Even if job opportunities increase in urban centres other than Abidjan due to corridor development, people without basic education who are illiterate will not be able to take part in the development.

There are also a number of illiterate people among certain generations due to the last 12-year civil war when government stopped constructing school buildings and stopped operating schools in the central and northern part of the country.

(3) Employment Creation and Industrial Promotion in Urban Areas

With the increase in foreign investments, job opportunities would increase. However, it is reported that although the number of job opportunities have increased, companies cannot find qualified human resources for their operation.

(4) Gender Disparity in Rural Areas

In rural areas, women are predominantly engaged in commercial activities, especially selling agricultural products. There are limited employment opportunities for women outside their villages in rural areas due to women's lack of education and low literacy rates. There is a real possibility that women could be left behind in reaping the bounty from the development and their economic and social status will not be raised.

(5) Lack of Social Infrastructure

There is a lack of health facilities and human resources, especially in the northern area of Côte d'Ivoire. The rapid increase of national population will also cause a lack of social infrastructure nationwide. This is partly because governments had not construct schools and health centres during the civil war period.

19.2.2 Objectives for Social Development in Côte d'Ivoire

To tackle existing problems on social development in Côte d'Ivoire, the following objectives are defined:

- To promote land registration, especially in rural areas
- To create employment opportunities, as well as to promote development of local industries in urban areas
- To increase literacy rates in rural areas for improving employability by promoting school education
- To diversify the livelihoods of women in rural areas in order to secure their living standards
- To improve health care centres, especially in the northern part where their number is insufficient

19.2.3 Strategies for the Social Development in Côte d'Ivoire

The following strategies are formulated for social development in Côte d'Ivoire:

- To strengthen government's implementation system and capacity for protecting local people's land rights
- To improve basic education at the local level by improving primary school buildings and monitoring the activities of primary school education
- To promote the creation of linkage with private companies for job creation for local people, especially for the youth
- To provide opportunities for the youth in urban areas in starting businesses, as well as getting jobs
- To increase women's access to vocational training
- To promote primary health care at the local level by improving health centres in terms of buildings, equipment, and monitoring activities

19.2.4 Programmes and Projects for Social Consideration in Côte d'Ivoire

The following projects and measures are proposed for social development in Côte d'Ivoire:

- Project for Promotion of Land Registration for Communities
- Project for Capacity Development of Land Registration Process
- Programme for Constructing Schools in Major Urban Centres
 - Bouaké
 - Korhogo
 - Man
- Project for Improvement of Access Roads for Education in Rural Areas
- Project to Create Linkage between Universities/Vocational Schools and Local Industries
- Project to Support Starting a Business in Abidjan and Bouaké
- Project to Support Female Farmers
- Project for Expansion and Improvement of Health Centres and Community Health Workers

PART VI

CORRIDOR DEVELOPMENT PLAN FOR GHANA

Chapter 20 National Development Strategies for Ghana

20.1 Existing National Development Plans in Ghana

In the present development planning systems of Ghana, there are two lines of development plans. The one is the line of socio-economic development plans. The other is that of spatial development plans.

Socio-economic development plans are to be formulated at the national level and district level. The socio-economic development plans that are to be formulated at the national level are as follows:

- Long-Term National Development Plan
- 4-year Medium-Term National Development Plan
- 6-year Coordinated Programme of Economic and Social Development Policies
- Sector Medium-Term Development Plans

Spatial development plans are formulated at the national, regional, sub-regional and district levels. The spatial development plan to be formulated at the national level is the National Spatial Development Framework (SDF).

Besides the above socio-economic development plans and spatial development plans, National Development Planning Commission prepared National Infrastructure Plan (2018-2047).

This section describes national-level socio-economic development plans and national-level spatial development plans. The various National-level Sector Medium-Term Development Plans are described in the chapters for the individual sectors.

20.1.1 Long-Term National Development Plan

In 1995, the National Development Planning Commission (NDPC) put together long-term national objectives for 2020 consisting of five pillars, namely human development, economic development, rural development, urban development, and creation of an enabling environment. Unfortunately, Ghana-Vision 2020 was not approved by the Cabinet due to the change in the government.

However, several medium-term development plans have been formulated as tools to implement the goal of this long-term development plan which was to establish an open and liberal market economy for optimizing the rate of economic development and ensuring the maximum welfare and material well-being of all Ghanaians.

In July 2015, the preparation of the 40-year LTNDP was launched by the NDPC. The planning process of this plan is consultative not only with various government sectors but also with local-level actors.

The long-term development goals are as follows:

- Inclusive and resilient economy
- Equitable and healthy society
- Safe and sustainable communities
- Effective and efficient institutions
- Influential role of Ghana in international affairs

For formulation of the LTNDP, the NDPC projected that the population of Ghana in 2030, 2050 and 2057 would be 34.7 million, 45.7 million and 49.1 million respectively.

One of the most important indicators to be included in the LTNDP is the Tertiary Enrolment Ratio (TER). Ghana's TER was recently 12%, and LTNDP aims to raise this figure to a level beyond the average of developed countries. Another highlighted topic in the LTNDP is the railway construction.

20.1.2 Coordinated Programme of Economic and Social Development Policies

A new Coordinated Programme of Economic and Social Development Policies is to be formulated by the new Government within two years after assuming office. It is usually a 6-year plan which guides the Medium-Term Development Plan. The most recent Coordinated Programme presented in Ghana is the Coordinated Programme of Economic and Social Development Policies, 2014-2020 - An Agenda for Transformation.

(1) Vision

The Vision for the nation, which President John Dramani Mahama elaborated in his inaugural State of the Nation Address, was to transform the Ghanaian economy and society towards a "stable, united, inclusive and prosperous country with opportunities for all." Under this vision, one of the major goals of this Programme is to increase the average national income from the current US\$1,550 (lower middle-income) to upper middle-income standard by 2030.

(2) Economic Transformation

Two key areas that are highly expected to contribute to the rapid transformation in Ghana are: building or strengthening the essential elements of good governance, including decentralisation; and, promoting light manufacturing that builds upon Ghana's existing strengths in natural resource endowments (including agriculture), such as agriculture and agro-industry and forestry and wood processing. This includes transformed agriculture of high value addition.

20.1.3 Medium-Term Development Plan - Ghana Shared Growth and Development Agenda (GSGDA) II, 2014-2017

The Ghana Shared Growth and Development Agenda (GSGDA) II, 2014-2017, is the fifth and latest medium-term national development plan. The GSGDA II was prepared as the operational framework of the Coordinated Programme of Economic and Social Policies, 2014-2020 – An Agenda for Transformation.

(1) Vision

Based on the Coordinated Programme, the vision in the medium-term is "A stable, united, inclusive and prosperous country with opportunities for all."

(2) Targeted Economic Growth by National Development Plans for Ghana

As highlighted earlier, the programmes for driving the national vision propose an annual rate of real GDP growth of 8.0% to be achieved for attainment of a per capita income of at least US\$3,000 by year 2020.

Table 20.1.1 Future GDP Growth Rates for Ghana

	2014	2015	2016	2017	2014-2017
Primary sector	5.7	5.9	6.6	7.2	6.4
Secondary sector	8.6	10.5	14.0	20.0	13.2
Tertiary sector	8.1	9.9	10.8	11.2	10.0
Real GDP with oil	8.3	9.5	11.4	13.2	10.6
Real GDP without oil	7.9	9.1	10.2	11.1	9.6

Source: NDPC, 2014, Medium-Term Development Plan - Ghana Shared Growth and Development Agenda (GSGDA) II, 2014-2017

(3) Fundamental Challenges and Constraints

In order to achieve the economic targets, the growth in oil and gas is essential. Some of the major development challenges in the oil and gas sector which the GSGDA II identified are: limited capacity of national institutions to regulate, monitor, supervise, and coordinate the implementation of interventions in the oil and gas industry; potential security threats to oil and gas infrastructure; inadequate local content and local participation in the upstream oil and gas industry; inadequate local technical and financial capacity to propel Ghanaian investment and participation in the development of the industry; inadequate baseline information on the environmental impact of the operations in the oil and gas industry; and low capacity to manage environmental impacts.

(4) Development Opportunities and Priorities

Besides the oil and gas sector, the rise in the middle class population who are the major consumers of goods is an opportunity. The increasing purchasing power of the middle class in Ghana has been helping propel growth.

However, the current trend where merchandise imports continue to rise, while the manufacturing is shrinking is a big challenge to overcome. Therefore, it is essential to strengthen the manufacturing sub-sector, which will effectively link the consumption pattern of the middle class to the domestic economy.

20.1.4 National Spatial Development Framework (NSDF)

The National Spatial Development Framework (NSDF) is a 20-year strategy for spatial development at the national level in Ghana's spatial planning system. The formulation of the NSDF was done under the Town and Country Planning Department (TCPD) considering national policies and plans and views of government agencies from the national to the district level during the country-wide consultation process.

(1) General Spatial Development Policies

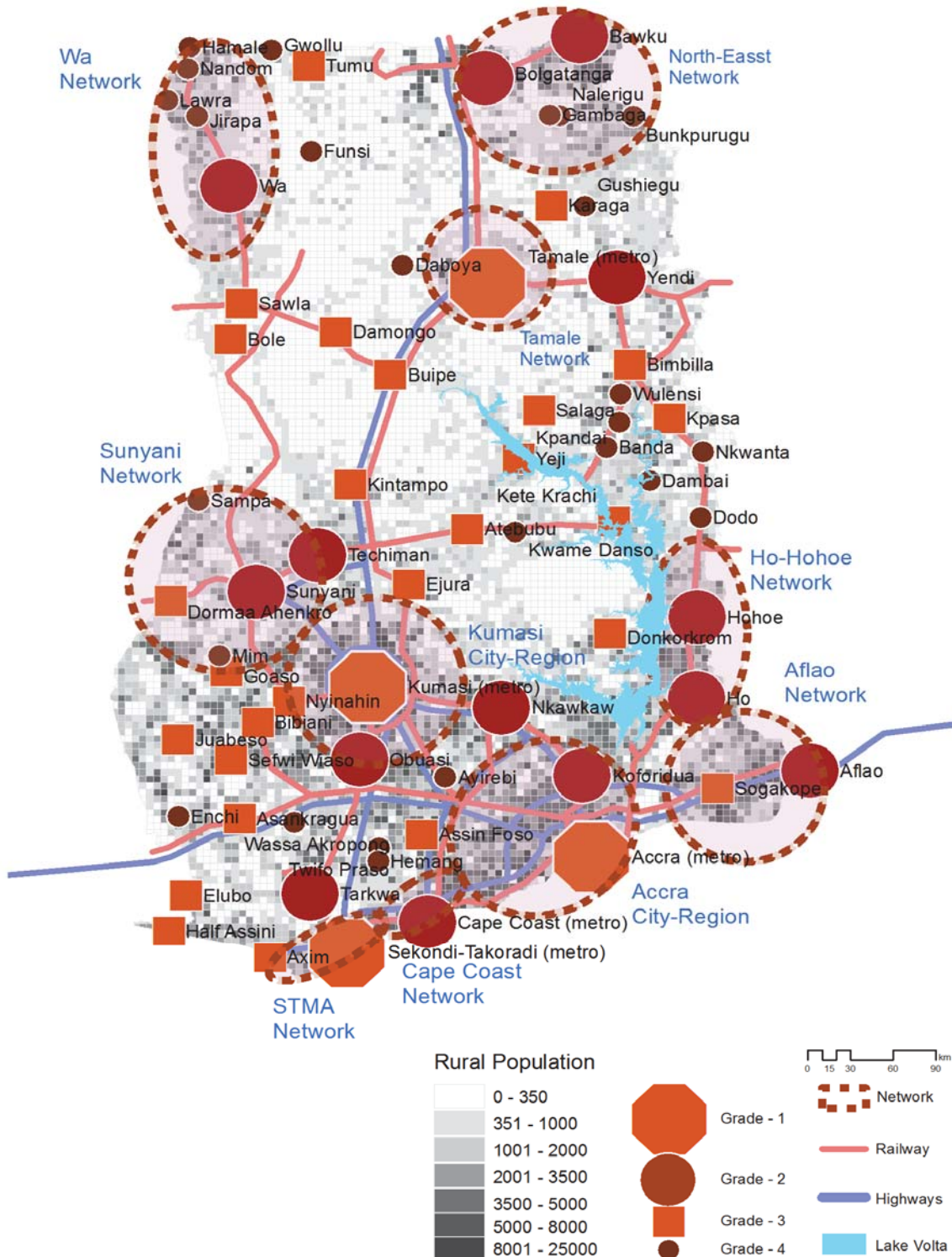
Concentrated development is recommended as an overall policy in the NSDF. This policy will be implemented through the following key strategies:

- Promote development of the Accra Capital Region as a world-class city
- Promote existing urban settlements and discourage new ones
- Promote larger / discourage smaller settlements
- Promote urban settlements along major transport corridors
- Plan for integration of rural settlements into expanding urban areas
- Protect agricultural land and forests
- Maintaining and improving the efficiency of the main expressway network

(2) Diagram of NSDF

The integrated spatial development concept of NSDF is shown in Figure 20.1.1. The diagram identifies the general location of urban settlement hierarchy, two city-regions (Accra and Kumasi), eight urban networks, proposed rail network, proposed national and international expressway and the proposed international and national rail networks.

NSDF also identifies eight urban networks around Sekondi-Takoradi, Tamale, Cape Coast, Sunyani, Bolgatanga-Bawku, Aflao, Ho-Hohoe and Wa.



Source: COWI-ORGUT, Ghana National Spatial Development Plan 2015-2035, 2015, TCPD

Figure 20.1.1 Integrated Concept of National Spatial Development Framework for Ghana

(3) Abidjan-Accra-Lagos Corridor

The NSDF also acknowledges the importance of corridor development, suggesting the necessity of corridor planning including an SDF. In the Abidjan-Accra-Lagos Corridor SDF, the following are recommended to be determined:

- How the urban areas can become more spatially connected and functionally bound, but also how they might maintain distinct spatial entities separated by green infrastructure with natural landscapes worthy of protection
- How intercity travel and freight movement can be best managed over roads, high speed rail and new air and water links

20.1.5 National Infrastructure Plan (2018-2047)

National Infrastructure Plan (2018-2047) is a 30-year plan aiming to form the basis for driving change in the way public sector agencies manage their existing infrastructure assets and plan for Ghana's long-term infrastructure needs to serve the purposes of an emerging middle-income country. The formulation of the National Infrastructure Plan was done under the National Development Planning Commission (NDPC) considering national policies and plans and views of government agencies.

The Plan is to be implemented as an integral part of the LTNDP, in conjunction with the NSDF.

(1) Vision

The vision is "To build world-class infrastructure assets that are efficient, dependable, resilient, functional, accessible and inclusive with the capacity to support Ghana's export-led growth and improve the quality of life of all Ghanaians."

(2) Principles

The infrastructures under the plan are to have the following five characteristics:

- Cost-effective
- Accessible
- Efficient
- Environmentally sustainable
- Maintenance framework

(3) Sectors

The plan includes the following sectors:

- Energy
 - Electricity
 - Petroleum
- Transportation
 - Road Transport
 - Road Safety
 - Aviation
 - Railways
 - Ports and Harbours
- Water
 - Drainage and Flood Systems
 - Water Supply Systems
 - Sanitation and Waste Management Systems

- Human Settlements
 - Social Infrastructure
 - Housing Systems and Services
 - Civic Infrastructure
 - Commercial Infrastructure
- ICT
- Institutional Development
- Logistic Infrastructure

20.2 Vision and Goals for Ghana

In accordance with the “Coordinated Programme of Economic and Social Development Policies 2014-2020: Agenda for Transformation, 2014,” the vision of Ghana is set as creating a “Stable, United, Inclusive and Prosperous Country”. The long-term goal of Ghana is to transform the Ghanaian economy and society to become an upper middle income country by 2030.

In the recent national government policies, key challenges include the following two directions of transformation:

- To transform the natural resources dependent economy into a more efficient economy based on financial capital and human capital
- To transform the economic and spatial relationships of Ghana with surrounding countries into a more economically and spatially integrated sub-regional relationship, in which Ghana could attract foreign and domestic investment in the development of productive sectors targeting sub-regional markets, as well as overseas markets

Through such economic and spatial transformation, the middle-income class population will increase largely, resulting in the boosting of purchasing power of individual countries and that of sub-regional economies as a whole.

20.3 National-Level Spatial Development Initiatives

The National Spatial Development Framework (NSDF) of target year 2033 proposes the following national initiatives for spatial development. These spatial development initiatives have important implications not only to Ghana’s corridor development, but also to the sub-regional-level corridor development.

- A national and international expressway system
 - Accra-Kumasi expressway
 - Kumasi-Paga expressway
 - Sunyani loop (Techiman-Sunyani-Kumasi)
 - Accra city-region expressway system
 - ECOWAS Trans-West African Coastal expressway
- Improve connectivity with new and improved trunk roads
 - Improve Savannah Accelerated Development Authority (SADA) trunk road system
 - Improve connectivity around and across Volta Lake
 - Improve connectivity in the Western Region
 - Improve the Ho-Akanu border crossing
- A national and international railway network
 - A modern, high-speed line between Accra and Kumasi running through the centre of the

- “triangle”, with links to Cape Coast and Takoradi, Bolgatanga and Bawku, and on the ECOWAS railway system at Ghana's borders with Togo and Burkina Faso
- Links to the cities in the neighbouring countries such as to Korhogo in Côte d'Ivoire and to Zabzugu, Kara and Sokode in Togo;
 - New alignment of the proposed ECOWAS coastal railway line from the centre of the "triangle" (Accra-Kumasi-Takoradi) to the Côte d'Ivoire border;
 - Links to areas with significant mineral deposits.
- Two international airports
 - New Accra International Airport (Prampram) or new international airport at the centre of Accra- Kumasi-Takoradi “Triangle”
 - Tamale International Airport
 - New airport city at centre of triangle (Accra, Kumasi and Sekondi-Takoradi) south west of Achiasi
 - Expressway
 - New expressway and high speed rail links from the centre to the three large cities
 - Model urban development and management centre
 - Options for three new seaports
 - Akaplabanya Port: 68km from Tema
 - Adina Port: close to boarder of Togo
 - Cape Three Points Port: close to Takoradi
 - Green infrastructure network
 - River, lake and coastal buffers
 - Cattle drive corridor
 - Agricultural growth corridor
 - National level trunk road from Accra to Bolgatanga
 - Institution with similar agricultural projects
 - Major markets to buy and supply agriculture outputs and inputs
 - Proposed urban food sheds in major urban centres
 - Alternative energy projects
 - Biomass energy at Buipe and Tamale
 - Solid waste power plant in Accra-Kumasi-Takoradi “triangle” area
 - Solar energy at Navrongo

20.4 Population Framework for Ghana

20.4.1 Past Population Trend in Ghana

According to the 2010 population census, the national population of Ghana was 24,658,823. The total population in Ghana has grown rapidly in the past decades, doubling its population in a quarter century between 1984 and 2010. The annual growth rate of population has been steady at approximately 2.7% between 1994 and 2010.

Table 20.4.1 Past Population of Ghana by Region (1984, 2000 and 2010)

Region	Population			Increase in Population		Annual Growth Rate	
	1984	2000	2010	1984-2000	2000-2010	1984-2000	2000-2010
Western Region	1,157,807	1,924,577	2,376,021	766,770	451,444	3.23%	2.13%
Central Region	1,142,335	1,593,823	2,201,863	451,488	608,040	2.10%	3.28%
Greater Accra Region	1,431,099	2,905,726	4,010,054	1,474,627	1,104,328	4.53%	3.27%
Volta Region	1,211,907	1,635,421	2,118,252	423,514	482,831	1.89%	2.62%
Eastern Region	1,680,890	2,106,696	2,633,154	425,806	526,458	1.42%	2.26%
Ashanti Region	2,090,100	3,612,950	4,780,380	1,522,850	1,167,430	3.48%	2.84%
Brong Ahafo Region	1,206,608	1,815,408	2,310,983	608,800	495,575	2.59%	2.44%
Northern Region	1,164,583	1,820,806	2,479,461	656,223	658,655	2.83%	3.14%
Upper East Region	772,744	920,089	1,046,545	147,345	126,456	1.10%	1.30%
Upper West Region	438,008	576,583	702,110	138,575	125,527	1.73%	1.99%
Total	12,296,081	18,912,079	24,658,823	6,615,998	5,746,744	2.73%	2.69%

Source: Ghana Statistical Service, 1984, 2000, 2010 Population and Housing Census

20.4.2 Future Population Projection by NSDF

The NSDF projects the total Ghanaian population to be 42 million in 2035. The inter-region migration trend is also projected to continue and that the population will be more concentrated in Greater Accra Region and Ashanti Region with populations of approximately 8 million and 8.8 million, respectively, in 2035.

20.4.3 Two Patterns of Regional Populations for Spatial Development of Ghana under the Selected Sub-Regional Corridor Development Scenario

Under the selected growth scenario (Corridor Development oriented to Sub-Regional Markets) for sub-regional corridor development, two patterns of future population by region are proposed for Ghana.

- Pattern 1: Balanced Development of Major Cities along North-South Corridors and Coastal Corridor
- Pattern 2: Concentrated Development in the Coastal Corridor

The first one is a pattern, which promotes development not only in Greater Accra, but also in major cities, such as Greater Kumasi, Sekondi-Takoradi and Greater Tamale. The other pattern assumes that extreme concentration will occur in the larger cities along the coastal corridor including Greater Accra, Sekondi-Takoradi and Cape Coast. In the second pattern, Aflao will also grow rapidly due to ripple effects of Greater Lomé's development.

Based on these two patterns, two population frameworks by region for Ghana are prepared as shown in Table 20.4.2.

Table 20.4.2 Two Patterns of Future Population by Region in Ghana

Unit: thousand

Regions		Alternative Patterns	Balanced Development of Major Cities along North-South Corridors and Coastal Corridor			Concentrated Development along Coastal Corridor		
			2015	2025	2040	2015	2025	2040
Western	Population		2,752,752	3,649,400	5,426,264	2,660,493	3,526,802	5,346,251
	Annual Growth Rate			2.86%	2.68%		2.86%	2.81%
Central	Population		2,558,078	3,401,881	4,963,050	2,579,377	3,542,657	5,349,830
	Annual Growth Rate			2.89%	2.55%		3.22%	2.79%
Greater Accra	Population		4,656,357	6,185,817	8,586,724	4,695,375	6,444,516	9,264,071
	Annual Growth Rate			2.88%	2.21%		3.22%	2.45%
Volta	Population		2,382,868	2,971,004	3,936,510	2,395,930	3,024,945	4,067,559
	Annual Growth Rate			2.23%	1.89%		2.36%	1.99%
Eastern	Population		2,909,791	3,500,994	4,575,657	2,916,451	3,475,071	4,507,872
	Annual Growth Rate			1.87%	1.80%		1.77%	1.75%
Ashanti	Population		5,452,085	7,096,956	10,172,072	5,447,583	6,871,302	9,564,825
	Annual Growth Rate			2.67%	2.43%		2.35%	2.23%
Brong Ahafo	Population		2,577,249	3,158,159	4,010,598	2,583,147	3,134,775	4,016,724
	Annual Growth Rate			2.05%	1.61%		1.95%	1.67%
Northern	Population		2,859,910	3,761,385	5,647,716	2,866,456	3,721,119	5,275,284
	Annual Growth Rate			2.78%	2.75%		2.64%	2.35%
Upper East	Population		1,103,241	1,207,963	1,355,390	1,105,766	1,199,019	1,297,627
	Annual Growth Rate			0.91%	0.77%		0.81%	0.53%
Upper West	Population		765,817	897,684	1,084,238	767,570	891,038	1,068,176
	Annual Growth Rate			1.60%	1.27%		1.50%	1.22%
Ghana	Population		28,018,147	35,831,244	49,758,219	28,018,147	35,831,244	49,758,219
	Annual Growth Rate			2.49%	2.21%		2.49%	2.21%

Source: JICA Study Team

20.4.4 Population Framework for Ghana

The selected pattern (Balanced Development of Major Cities along North-South Corridors and Coastal Corridor) for the population framework of Ghana is shown in the table below.

Table 20.4.3 Population Framework by Region for Ghana

Unit: thousand

Region		2010 (Census)	2015	2020	2025	2030	2035	2040
Western	Population	2,376,021	2,752,752	3,176,024	3,649,400	4,196,530	4,790,922	5,426,264
	Annual Growth Rate		2.13%	2.99%	2.90%	2.82%	2.83%	2.68%
Central	Population	2,201,863	2,558,078	2,959,627	3,401,881	3,879,639	4,401,188	4,963,050
	Annual Growth Rate		3.28%	3.04%	2.96%	2.82%	2.66%	2.55%
Greater Accra	Population	4,010,054	4,656,357	5,384,462	6,185,817	7,008,593	7,820,109	8,586,724
	Annual Growth Rate		3.27%	3.03%	2.95%	2.81%	2.53%	2.22%
Volta	Population	2,118,252	2,382,868	2,669,453	2,971,004	3,280,931	3,604,419	3,936,510
	Annual Growth Rate		2.62%	2.38%	2.30%	2.16%	2.00%	1.90%
Eastern	Population	2,633,154	2,909,791	3,202,191	3,500,994	3,816,882	4,174,140	4,575,657
	Annual Growth Rate		2.26%	2.02%	1.93%	1.80%	1.74%	1.81%
Ashanti	Population	4,780,380	5,452,085	6,224,632	7,096,956	8,045,302	9,073,126	10,172,072
	Annual Growth Rate		2.84%	2.66%	2.69%	2.66%	2.54%	2.43%
Brong Ahafo	Population	2,310,983	2,577,249	2,862,304	3,158,159	3,450,423	3,737,375	4,010,598
	Annual Growth Rate		2.44%	2.20%	2.12%	1.99%	1.79%	1.61%
Northern	Population	2,479,461	2,859,910	3,285,091	3,761,385	4,330,592	4,960,107	5,647,716
	Annual Growth Rate		3.14%	2.90%	2.81%	2.74%	2.86%	2.75%
Upper East	Population	1,046,545	1,103,241	1,158,197	1,207,963	1,254,564	1,303,965	1,355,390
	Annual Growth Rate		1.30%	1.06%	0.98%	0.84%	0.76%	0.78%
Upper West	Population	702,110	765,817	831,850	897,684	961,203	1,023,885	1,084,238
	Annual Growth Rate		1.99%	1.75%	1.67%	1.53%	1.38%	1.27%
Ghana	Population	24,658,823	28,018,147	31,753,831	35,831,244	40,224,659	44,889,236	49,758,219
	Annual Growth Rate		2.69%	2.59%	2.53%	2.45%	2.34%	2.22%

Source: JICA Study Team

The population of Ghana is projected to be more than 35 million by 2025 and almost 50 million by 2040.

The most populated region will continue to be Ashanti Region where Kumasi is located with population of over 10 million in 2040. Greater Accra Region will also continue to be the second most populous region in Ghana with over 8.5 million people in 2040. However, the annual population growth rate of Greater Accra Region is assumed to start to decline with the Central Region absorbing the urban population of Greater Accra. This will increase the population of the Central Region to almost 5 million by 2040. The populations of the Western Region and Northern Region are also projected to be over 5 million by 2040.

Chapter 21 Corridor Development Plan for Ghana

21.1 SWOT Analysis of Ghana in relation to Corridor Development

A SWOT Analysis for Ghana was conducted in relation to sub-regional corridor development.

The result of the SWOT Analyses for the WAGRIC four countries is presented in Chapter 3.

Table 21.1.1 SWOT Analysis for Ghana

Strength	Weakness
<ul style="list-style-type: none"> Greater Accra (including Tema) is quite a large metropolitan area in Africa in terms of population size, economic size, and infrastructure development level, except for electricity supply. Regional cities, as well as the capital city, have been developed. There are four cities whose populations are more than 350,000, namely Greater Accra, Greater Kumasi, Sekondi-Takoradi and Tamale. Greater Kumasi had a population of 2.46 million in 2010 and Tamale had 0.37 million. These two cities have functions not only as commercial centres, but also as agro-processing centres for their surrounding areas. Economic and industrial accumulations are not concentrated only in Greater Accra, but they are distributed to the regional cities. Ghana has had social and business exchanges with Nigeria, whose economy is expected to grow significantly. 	<ul style="list-style-type: none"> Due to the electricity shortage in the last several years, it was not possible for Ghana to promote the manufacturing sector. As a result, Ghana has had to import a lot of manufactured products from overseas. In such an economy which is too dependent on imports, the Ghanaian government has relied on revenues from customs duties. Some industries have developed in regional cities, but they are relatively small. The development and operation of free zones in regional cities should be promoted beginning immediately. Since 2010 Ghana Railways has not been able to operate most parts of the railway lines, because of deterioration of rolling stocks and tracks. As a result, Ghana's economy and cargo transport rely heavily on roads and trucks. Although the recovery of railways is strongly desired by businesses and the government, there is no clear road map for railway re-development in Ghana. Ghana Railways used to be located and operated only in the south up to Kumasi. It is not easy to extend the railway to northern part of the country. All of Ghana's the neighbouring countries which are French speaking countries.
Opportunities	Threats
<ul style="list-style-type: none"> The discovery of oil and gas has revitalized the Ghanaian economy. Ghana has prospects for accelerating the growth of its economy. Ghana is considered to have overcome its electricity crisis through its effort at developing its own power generation capacity (by utilizing gas and water resources). Due to its overcoming of its electricity crisis, Ghana is now ready for embarking on re-development of the manufacturing industries. Because of the huge size of the accumulated population and economy in Greater Accra, it is possible to create a business environment favourable for high-level services and innovative businesses. Ghana occupies the geographical centre position of the WAGRIC four countries. Ghana has good physical accessibility to the markets of the other three countries. Ghana is relatively close to Nigeria by road (460 km between Accra and Lagos) and also by coastal shipping. Therefore, Ghana has a geographically advantageous place to target the market of Nigeria. It is expected to expand production of food crops, such as rice and maize, by utilizing the high development potential of irrigation and rain fed farming. This is important in the effort to respond to the increase of domestic food demand. At the same time, such increase of grain production can lead to reduction of costs for producing feeds for the poultry industries and expansion of their production. 	<ul style="list-style-type: none"> Ghana is one of the countries targeted by terrorist groups based in the interior of West Africa. This risk might continue. As a result, incoming foreign direct investment and other foreign and domestic investment might be affected negatively. Although Ghana has been getting out from the electricity crisis by accelerated development of hydro and gas power plants in the last several years, the electricity crisis might come back if continued gas exploration is not very successful and if Ghana's electricity demand increases more rapidly than expected in the future. There might be an increase of conflicts over water utilization due to the increase of water demand in the future.

Source: JICA Study Team

21.2 Objectives for Corridor Development in Ghana

There are two types of corridor development in Ghana. The one is north-south corridor development based on international transport corridors. The other is coastal corridor development based on the Abidjan-Accra-Lomé-Cotonu-Lagos transport corridor.

(1) Objectives for North-South Corridor Development in Ghana

- To promote economic sectors development by utilizing north-south transport corridors
- To upgrade north-south corridor transport infrastructure in order to connect with Burkina Faso's transport corridor infrastructure by responding to increased corridor transport demand and for the purpose of promoting further development of economic sectors in northern part of the country
- To provide infrastructure in order to widen areas to accommodate agricultural development in rural areas and manufacturing industrial development in regional cities
- To contribute to wider spatial development by taking advantage of north-south corridor development within Ghana
- To achieve a proper transport sharing between railway transport, road transport and inland water transport by establishing a multimodal transportation system

(2) Objectives for Coastal Corridor Development in Ghana

- To upgrade economic sectors development by utilizing coastal Abidjan-Accra-Lomé-Cotonu-Lagos transport corridor by utilizing benefits to be created by customs union by sub-regional economic integration
- To upgrade coastal corridor transport infrastructure by responding to increased corridor transport demand and for the purpose of promoting further development of economic sectors in metropolitan areas of Greater Accra, Sekondi-Takoradi and Cape Coast
- To provide infrastructure in order to widen areas to accommodate not only manufacturing industrial development, but also ICT-BPO and other service sector development, in Greater Accra, Sekondi-Takoradi and Cape Coast
- To contribute to wider spatial development by taking advantage of coastal corridor development within Ghana

21.3 Super-Long Term Pattern of Ghana's Corridor Development

Based on the discussion through Ghana's Technical Committee meetings, a corridor development pattern for the super long term (beyond year 2040) was prepared. The super-long term pattern of Ghana's corridor development aims to achieve the following:

- Physical and economic sub-regional integration with Ghana's surrounding countries
- Development of diverse economic sectors targeting both overseas markets and sub-regional markets
- Wide development in the country to improve the living standard of the people in various areas of the country
- To create a high-speed transport corridor in order to attract investment in the various economic sectors

The transport corridor infrastructures to be developed in the super long term are shown in the figure below.



Source: JICA Study Team

Figure 21.3.1 Ghana's Super-Long Term Corridor Development Pattern

21.4 Patterns for Corridor Development in Ghana

Based on the super-long term corridor development pattern, alternative patterns for Ghana's corridor development were prepared for the target year 2040.

21.4.1 Patterns for Corridor Development in Ghana for 2040

(1) Factors to Differentiate Corridor Development Scenarios

The following four types of factors are utilized for differentiate corridor development patterns (C-GN-1, C-GN-2 and C-GN-3) in Ghana:

1) Types of Economic Sectors to be Promoted

- Major types of agricultural sectors to be promoted in the northern part of Ghana
 - Both development of medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) and support to small-scale agriculture are equally promoted. The medium and large-scale agriculture is based on foreign and domestic investment while promoting out-grower schemes.
 - Support to small-scale agriculture is emphasized with less reliance on foreign and domestic investment in the agricultural sector.
- Major economic sectors for regional cities along the Central Corridor in the central and northern part of Ghana
 - Manufacturing industries and ICT & BPO industries in addition to commerce and service sectors in well-targeted regional cities, namely Kumasi and Tamale
 - Mostly commercial and service sectors to support regional cities but also their surrounding rural areas, as well as the additional economic sectors of ICT & BPO

- Major economic sectors for coastal metropolitan areas, such as Greater Accra, Sekondi-Takoradi, Cape Coast and Aflao
 - To promote development of Greater Accra by attracting and accommodating not only manufacturing industries and ICT & BPO industries targeting at sub-regional markets, but also sub-regional business functions, advanced financial services, high-end medical services, higher education services and international recreational services, in addition to existing commerce and services
 - To promote development of Greater Accra by attracting manufacturing industries and ICT and BPO industries, in addition to existing commerce/services and the government administration function
 - To promote development of Sekondi-Takoradi, Cape Coast and Aflao by attracting manufacturing industries and ICT & BPO industries targeting at sub-regional markets, in addition to promoting the existing commerce and services

(2) Three Patterns for Corridor Development in Ghana for the Year 2040

The following three patterns of corridor development are formulated by combining different transport corridors for accommodating the different geographical areas that are to be developed by the year 2040:

- **C-GN-1:** Strengthening of Central Corridor by upgrading its trunk road to a high-speed way from Accra to Tamale, while implementing partial road development for the Eastern Corridor and Western Corridor
- **C-GN-2:** Strengthening of Central Corridor by upgrading its trunk road to a high-speed way from Accra to Kintampo, while completing road development for the Eastern Corridor and Western Corridor
- **C-GN-3:** Balanced regional development along the Eastern Corridor and Western Corridor, as well as the Central Corridor, by completing road development between the southern and northern borders, while promoting limited strengthening of the Central Corridor

1) Ghana's Corridor Development Pattern C-GN-1: Strengthening of Central Corridor by upgrading its trunk road to a high-speed way from Accra to Tamale, while implementing partial road development for the Eastern Corridor and Western Corridor

Corridor Development Pattern C-GN-1 has the following characteristics in development of corridor infrastructure and economic sectors:

- Major types of agricultural sectors in the northern part of Ghana: Medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) based on foreign and domestic investment, not only by upgrading Accra-Tamale road section to a high-speed way, but also by providing better access roads for the east-west direction from the Central Corridor in the northern parts of the Eastern Corridor and Western Corridor
- Major economic sectors for regional cities along the Central Corridor in the central and northern parts of Ghana: Manufacturing industries and ICT and BPO industries in addition to commerce and service sectors in well-targeted regional cities along the Central Corridor, namely Kumasi and Tamale, by upgrading of Accra-Tamale road to a high-speed way
- To promote development of Greater Accra by attracting and accommodating not only manufacturing industries and ICT and BPO industries targeting at sub-regional markets, but also sub-regional business functions, advanced financial services, high-end medical services, higher education services and international recreational services, in addition to the promoting the existing commerce and services, by developing a coastal motorway between Sekondi-Takoradi

and Prampram

- To promote development of Sekondi-Takoradi, Cape Coast and Aflao by attracting manufacturing industries and ICT and BPO industries targeting at sub-regional markets, in addition to promoting the existing commerce and services



Source: JICA Study Team

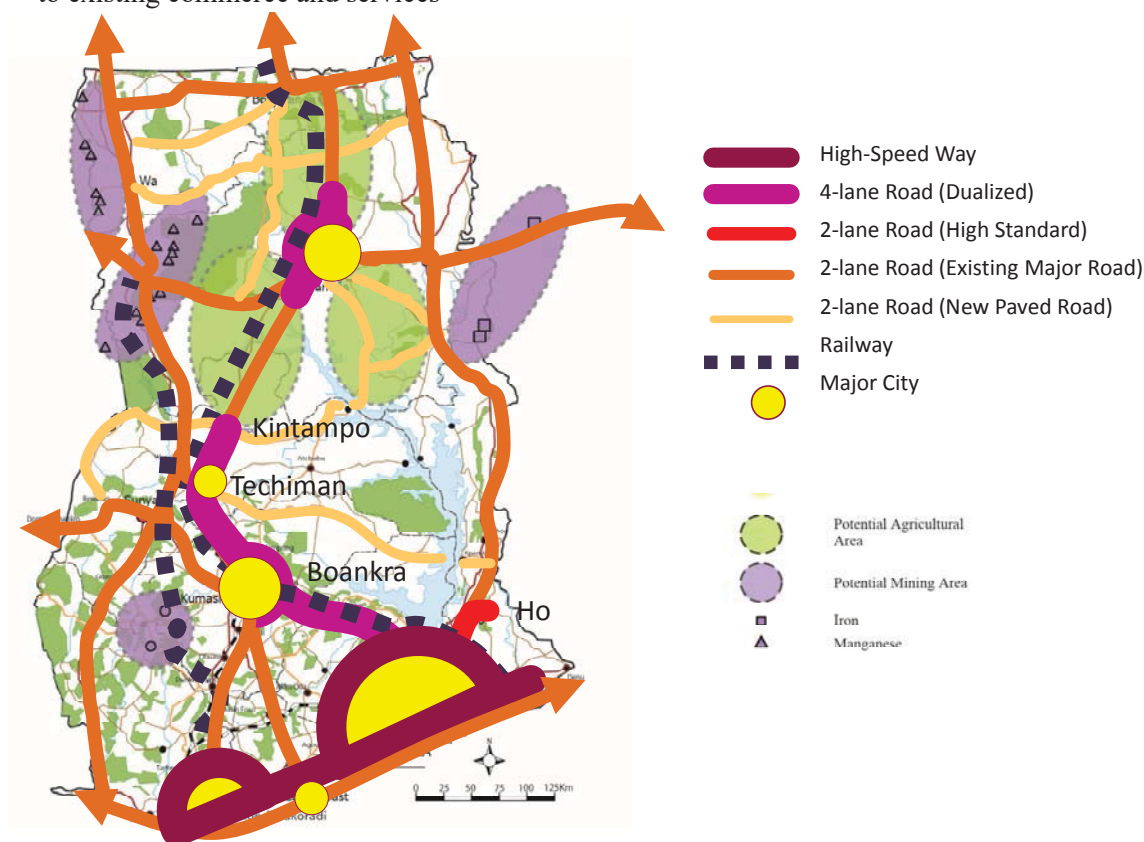
Figure 21.4.1 Ghana's Corridor Development Pattern C-GN-1 2040

2) Ghana's Corridor Development Pattern C-GN-2: Strengthening of Central Corridor by upgrading its trunk road to a high-speed way from Accra to Kintampo, while completing road development for the Eastern Corridor and Western Corridor

Scenario C-GN-2 has the following characteristics in development of corridor infrastructure and economic sectors:

- Major types of agricultural sectors in the northern part of Ghana: Medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) based on foreign and domestic investment by not only upgrading Accra-Kintampo road section to a high-speed way, but also by providing better road connections (north-south direction) along the Eastern Corridor and Western Corridor
- Major economic sectors for regional cities along the Central Corridor in the central and northern parts of Ghana: Mostly commercial and service sectors to support regional cities but also their surrounding rural areas, as well as the additional economic sectors of ICT & BPO in addition to manufacturing industries and ICT & BPO industries besides commerce and service sectors in Kumasi
- To promote development of Greater Accra by attracting and accommodating not only manufacturing industries and ICT & BPO industries targeting the sub-regional markets, but also sub-regional business function, advanced financial services, high-end medical services, higher education services and international recreational services, in addition to the existing commerce and services

- To promote development of Sekondi-Takoradi, Cape Coast and Aflao by attracting manufacturing industries and ICT & BPO industries targeting sub-regional markets, in addition to existing commerce and services



Source: JICA Study Team

Figure 21.4.2 Ghana's Corridor Development Pattern C-GN-2 2040

3) Ghana's Corridor Development Pattern C-GN-3: Balanced regional development along Eastern Corridor and Western Corridor, as well as Central Corridor, by completing road development between the south and northern borders, while promoting limited strengthening of the Central Corridor

Corridor Development Pattern C-GN-3 has the following characteristics in development of corridor infrastructure and economic sectors:

- Major types of agricultural sectors in northern part of Ghana: Medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) based on foreign and domestic investment by not only upgrading the Accra-Kumasi road section to a high-speed way, but also by providing better road connections (north-south direction) along the Eastern Corridor and Western Corridor
- Major economic sectors for regional cities along the Central Corridor in the central and northern parts of Ghana include: Mostly commercial and service sectors to support regional cities but also their surrounding rural areas, as well as additional economic sectors of ICT & BPO in addition to manufacturing industries and ICT & BPO industries besides commerce and service sectors in Kumasi
- To promote development of Greater Accra by attracting and accommodating not only manufacturing industries and ICT & BPO industries targeting at sub-regional markets, but also sub-regional business functions, advanced financial services, high-end medical services, higher education services and international recreational services, in addition to existing commerce and services

- To promote development of Sekondi-Takoradi, Cape Coast and Aflao by attracting manufacturing industries and ICT & BPO industries targeting at sub-regional markets, in addition to promoting the existing commerce and services



Source: JICA Study Team

Figure 21.4.3 Ghana's Corridor Development Pattern C-GN-3 2040

21.4.2 Comparison of Alternative Patterns for Corridor Development in Ghana

The three alternative patterns of corridor development for the target year 2040 formulated in the previous section are compared from the following perspectives:

- Characteristics of Spatial Development
- Effect on Economic Development of Ghana as a whole
- Effect on Inland Development
- Social and Environmental Impacts
- Cost for Corridor Development

(1) Corridor Development Pattern C-GN-1

1) Characteristics of Spatial Development

- Primary north-south corridor development of Tema-Ouagadougou Corridor between Accra and Tamale is supported by strong connection with a high-speed way
- Development of “Coastal Economic Belt” is extended between Greater Accra and Sekondi-Takoradi (connected by motorway)

2) Effect on Economic Development of Ghana as a whole

- Scenario C-GN-1 has lower cost performance in the economic development of Ghana as a whole in terms of effect over cost than Scenario C-GN-2.

3) Effect on Inland Development

- Corridor Development Pattern C-GN-1 has a larger effect on inland development than Scenario C-GN-3.
- Corridor Development Pattern C-GN-1 has a similar level of effect on inland development to Pattern C-GN-2.

4) Social and Environmental Impacts

- Corridor Development Pattern C-GN-1's social development effect is not wider in terms of size of affected population and affected areas than Corridor Development Patterns C-GN-2 and C-GN-3
- Corridor Development Pattern C-GN-1's environmental impact along the Central Corridor is larger than Pattern C-GN-2 and C-GN-3. However, while Pattern C-GN-1 will concentrate its development along the existing developed Central Corridor, Patterns C-GN-2 and C-GN-3 will need to develop the Eastern Corridor and the Western Corridor in addition to the Central Corridor.

5) Cost for Corridor Development

- Scenario C-GN-1's cost is higher than Scenario C-GN-3 but similar to C-GN-2.

(2) Corridor Development Pattern C-GN-2

1) Characteristics of Spatial Development

- Primary north-south corridor development of Tema-Ouagadougou Corridor between Accra and Kintampo is supported by connection with a high-speed way.
- Secondary north-south corridor development of both the Eastern and Western Corridors by developing these two corridors as high standard 2-lane roads
- Development of the "Coastal Economic Belt" is extended between Greater Accra and Sekondi-Takoradi (connected by motorway)

2) Effect on Economic Development of Ghana as a whole

- Corridor Development Pattern C-GN-2 has higher cost performance in the economic development of Ghana as a whole in terms of effect over cost than Patterns C-GN-1 and C-GN-3

3) Effect on Inland Development

- Corridor Development Pattern C-GN-2 has a larger effect on inland development than Pattern C-GN-3.
- Corridor Development Pattern C-GN-2 has a similar level of effect to Pattern C-GN-1.

4) Social and Environmental Impacts

- Corridor Development Pattern C-GN-2 has a higher social development effect than Pattern C-GN-1.
- Corridor Development Pattern C-GN-2 has a similar level of social development effect as Pattern C-GN-3.
- Corridor Development Pattern C-GN-2's environmental impact is smaller than Pattern C-GN-1, but larger than Pattern C-GN-3.

5) Cost for Corridor Development

- Corridor Development Pattern C-GN-2' cost is higher than Pattern C-GN-3 but smaller than C-GN-1.

(3) Corridor Development Pattern C-GN-3

1) Characteristics of Spatial Development

- Primary north-south corridor development of Tema-Ouagadougou Corridor between Accra and Kumasi (connected by high-speed way)
- Secondary north-south corridor development of both the Eastern and Western Corridors by developing these two corridors as high standard 2-lane roads
- Development of the “Coastal Economic Belt” is extended between Greater Accra and Sekondi-Takoradi (connected by motorway)

2) Effect on Economic Development of Ghana as a whole

- Corridor Development Pattern C-GN-3 has a lower cost performance in the economic development of Ghana as a whole in terms of effect over cost than Patterns C-GN-1 and C-GN-2.

3) Effect on Inland Development

- Effects on inland development are lower than Corridor Development Patterns C-GN-1 or C-GN-2

4) Social and Environmental Impacts

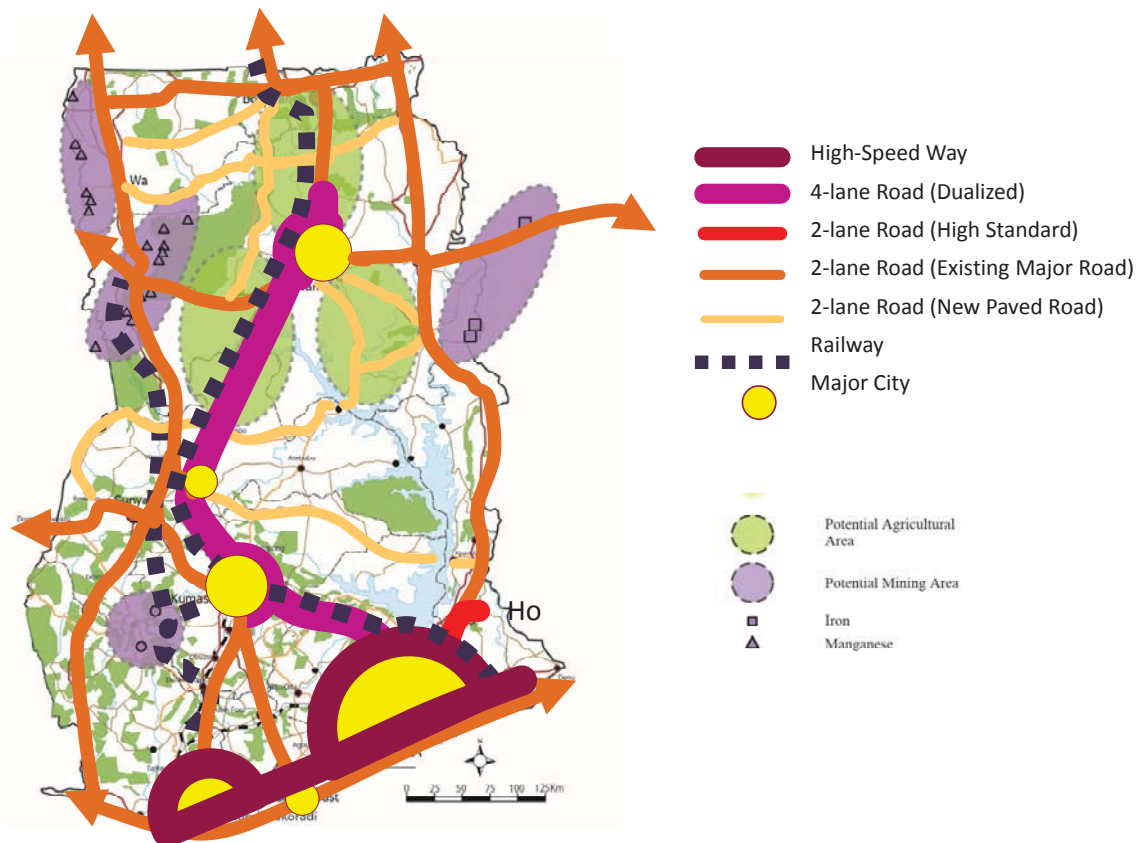
- Social development effect is wider in terms of size of affected areas than Corridor Development Pattern C-GN-1 and is similar to Pattern C-GN-2, but the affected population will be smaller than Pattern C-GN-1 or C-GN-2
- Environmental impact is smaller than Scenario C-GN-1 or C-GN-2.

5) Cost for Corridor Development

- Corridor Development Pattern C-GN-3 is lower than Pattern C-GN-1 or C-GN-2.

21.5 Selected Pattern of Corridor Development for Ghana (Corridor Development Pattern C-GN-1)

Following the selected growth scenario for sub-regional corridor development (Growth Scenario 1) and based on the evaluation of alternative patterns of corridor development, the following corridor development pattern **C-GN-1: “Strengthening of Central Corridor by upgrading its trunk road to a high-speed way from Accra to Tamale, while implementing partial road development for the Eastern Corridor and Western Corridor ”** has been selected for the long-term future (target year 2040) of Ghana.



Source: JICA Study Team

Figure 21.5.1 Selected Corridor Development Scenario for Ghana in 2040

21.6 Phased Corridor Development Plan for Ghana

Scenario C-GN-1 is composed of development of two corridors. The one is for the north-south corridor development. The other is for the coastal east-west corridor development.

In order to achieve the Scenario C-GN-1: “Strengthening of Central Corridor by upgrading its trunk road to a high-speed way from Accra to Tamale, while implementing partial road development for the Eastern Corridor and Western Corridor” by 2040, it is necessary to implement the following actions in a phased manner:

(1) North-South Corridor Development

In line with the selected **growth scenario for sub-regional corridor development (Growth Scenario 1)**, the following phased development for corridor transport infrastructure and economic sectors are formulated for **Ghana’s north-south corridor development scenario**:

- **In the short term (2018-2025)**, to promote development of economic sectors targeting domestic and sub-regional markets in inland areas of Ghana by improving north-south corridor transport infrastructure and providing additional necessary infrastructure and supporting measures
 - Induce development of potential economic sectors by the following:
 - **Investment promotion** in agricultural production, processing and marketing of crops in the central and northern parts of Ghana, while supporting out-grower schemes by providing better access roads (east-west direction) based on the relatively-well developed Central Corridor (roads)

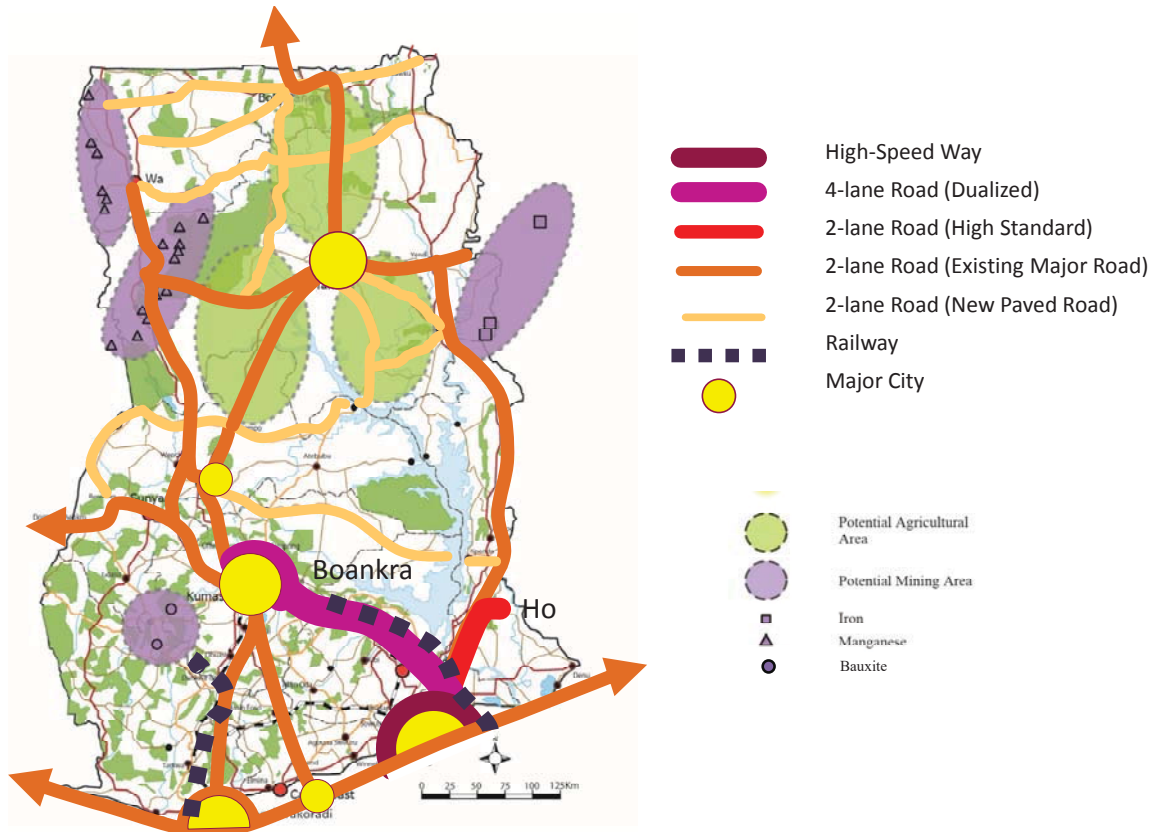
- Promotion of investment and development of manufacturing industries and nurturing of ICT-BPO industries in major cities along the Central Corridor in the central and northern parts of Ghana, while supporting SMEs
- Induce the increase of transport demand for north-south corridor transport infrastructure (roads)
- **In the medium term (2025-2033)**, to promote development of economic sectors not only targeting domestic markets of the coastal corridor within Ghana but also targeting sub-regional markets of neighbouring countries by strengthening production, processing and marketing of crops (rice and maize and specialized crops marketable in the coastal corridor)
 - Induce development of economic sectors by the following:
 - Promotion of substantial investment in agricultural production, processing and marketing of crops in the northern part of Ghana targeting domestic and sub-regional markets
 - Substantial development of manufacturing industries and ICT-BPO industries in major cities along the Central Corridor in the central and northern parts of Ghana, by targeting domestic markets to be expanded in the coastal corridor
 - So as to induce the increase of transport demand for north-south corridor transport infrastructure
- **In the long term (2033-2040)**, to upgrade corridor transport infrastructure in response to transport demand that will be increased by implementing strategies in the short and medium terms
 - By upgrading the road of the Central corridor to a high-speed motorway between Accra and Tamale
- **In the long term (2033-2040)**, to promote development of economic sectors targeting sub-regional markets of the coastal corridor (Abidjan-Accra-Lomé-Cotonu-Lagos Corridor) by upgrading north-south corridor transport infrastructure
 - The following are necessary in order to induce development of economic sectors:
 - Expansion of investment in agricultural production, processing and marketing of crops in the central and northern parts of Ghana, by targeting sub-regional markets including Nigeria, as well as domestic markets
 - Expansion of manufacturing industries and ICT-BPO industries in major cities along the Central Corridor in the central and northern parts of Ghana, by targeting sub-regional markets including Nigeria, as well as at domestic markets to be expanded in the coastal corridor

(2) Coastal Corridor Development

- **In the short term (2018-2025)**, to prepare a strategic master plan regarding how to accommodate the coastal Abidjan-Accra-Lomé-Cotonu-Lagos Motorway, including how to connect the motorway not only with the Central Corridor and Eastern Corridor, but also with Tema Port
- **In the short term (2018-2025)**, to promote economic sector development by initiating redevelopment of manufacturing Industries after Ghana's resolving the electricity crisis
- **In the medium term (2025-2033)**, to promote strengthening of corridor transport infrastructure including the following:
 - East Exit Motorway (Tema-Prampram and farther) from Greater Accra
 - West Exit Motorway from Greater Accra to the west
 - Upgraded Access to Tema Port
- In the medium term, furthermore, to strengthen transmission lines and bulk power points for

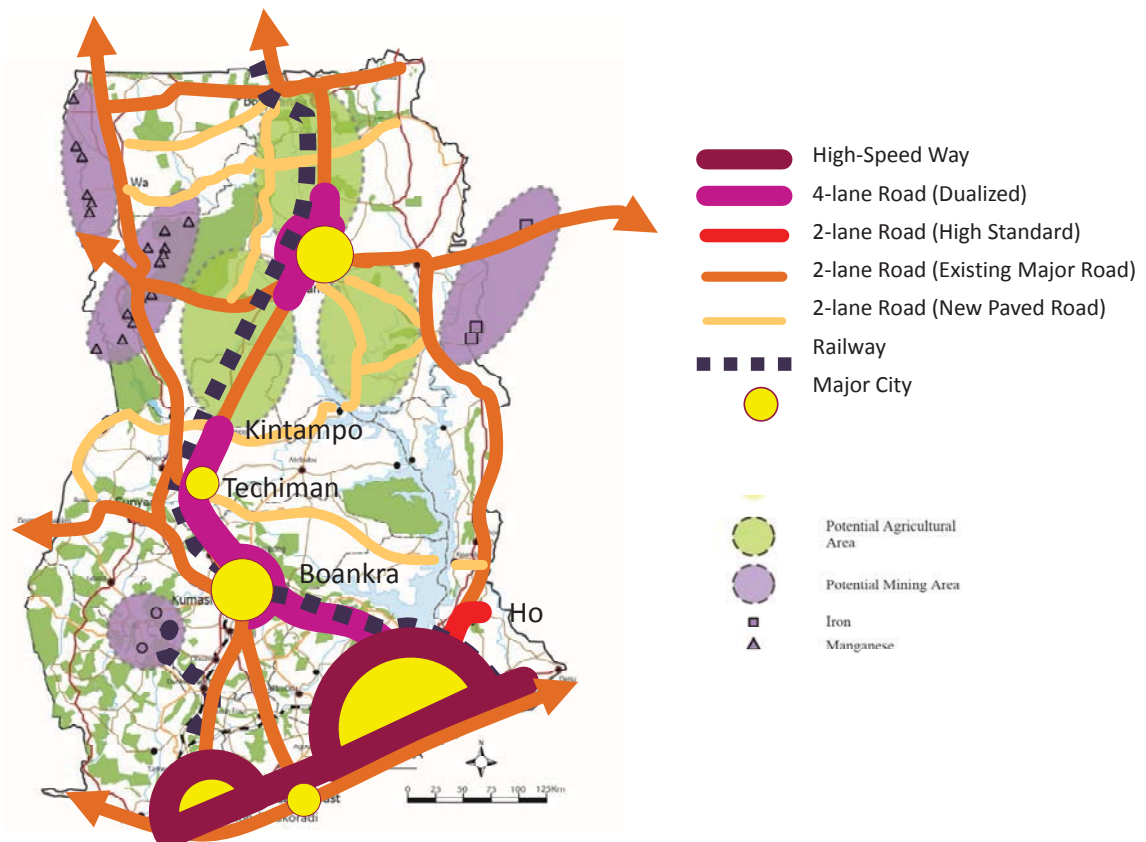
power supply in the coastal corridor including the following metropolitan areas:

- Greater Accra
- Sekondi-Takoradi
- Cape Coast
- **In the medium term (2025-2033)**, to promote economic sector development by revamping of manufacturing industries targeting markets of WAGRIC countries, as well as domestic markets (by attracting foreign investment in such manufacturing industries)
- **In the long term (2033-2040)**, to promote strengthening of corridor transport infrastructure by the following:
 - Sekondi-Takoradi-Greater Accra Motorway, part of Abidjan-Accra-Lomé-Cotonu-Lagos Motorway
 - North Exit Motorway connected with the Central Corridor and Western Corridor
- **In the long term (2033-2040)**, to promote economic sector development including the following:
 - Development of manufacturing industries targeting Nigeria, as well as WAGRIC countries (by continuing and expanding attraction of foreign investment in such manufacturing industries)
- **In the long term (2033-2040)**, eventually to develop the “Coastal Economic Belt” by promoting sub-regional economic integration among southern parts of Cote d’Ivoire, Ghana and Togo through implementing a customs union and by promoting sub-regional spatial integration by Abidjan-Accra-Lomé-Lagos Motorway, as well as by upgrading various functions as follows:
 - Government administration function
 - Corporate headquarters function
 - Production function including manufacturing, ICT-BPO and research & development
 - High-end service providing function, such as medical services and higher education
 - Commercial function including high-end retail and wholesale targeting not only domestic markets but also sub-regional markets
 - Recreational function targeting not only domestic markets but also sub-regional markets



Source: JICA Study Team

Figure 21.6.1 Corridor Development for Ghana in 2025



Source: JICA Study Team

Figure 21.6.2 Corridor Development for Ghana in 2033



Source: JICA Study Team

Figure 21.6.3 Corridor Development for Ghana in 2040

21.7 Key Points for Ghana's Corridor Development Plan

One of Ghana's strength for corridor development is its relatively large urban population in the inland area. Ghana has developed large regional cities, such as Greater Kumasi (3 million population in 2015) and Tamale (0.5 million population in 2015). Greater Kumasi is located in between two areas (the inland area and coastal area), and is about 270 km from Tema Port. Tamale is the capital city of the Northern Region, located about 650 km from the coastal area. Tamale is expected to increase its population to 1.8 million by 2040. These cities could function as service centres for their surrounding rural areas, but also could accommodate manufacturing sectors, such as agro-processing industries. These regional cities will become development centres for inland areas of Ghana.

On the other hand, a weak point of Ghana is Volta Lake's occupation of the eastern part of Ghana's territory. Because of this geographic feature, the central corridor of Ghana follows a large curve route from Tema to the north, turning west then east. Consequently, the long distance separating the coastal and inland areas would be a disadvantage for Ghana's inland area development.

Moreover, the railway in Ghana has not been substantially operational as a long-distance cargo railway. In view of the present situation, its recovery would not be easy. This is partly because of an inefficiency of rail transport due to its relatively short length of railways. The Eastern Railway Line used to have about 300 km of operational length, and Western Railway Line had about 280 km. Ghana's railway length is not long enough to be efficient. It should be complemented by the inland waterway of the Volta Lake. The transport of petroleum products had been operated by combining 1) a pipeline between Tema and Akosombo, 2) inland water transport on the Volta Lake and 3) a pipeline between Buipe and Bolgatanga. However, this combined transport system has posed various problems in the recent years.

Tema Port has a much lower volume of transit cargo for inland countries than neighbouring countries' ports. However, it has an ambitious strategy to become a hub port to handle an increased volume of transit and transshipping cargos in the sub-region in the future.

Ghana is characterized by its geographical position surrounded by French-speaking countries. In the implementation of strategies for promoting sub-regional economic integration, Ghana is expected to play a key role to integrate its neighbouring countries spatially by upgrading transport infrastructure and by implementing a customs union.

In this situation, in order to initiate and drive corridor development, Ghana is to push the following three buttons to take necessary measures:

[Button A]: Development of economic sectors oriented to sub-regional markets should be promoted not only in coastal areas, but also in inland areas by taking the following actions:

- Investment promotion to economic sectors in both coastal areas and inland areas, by emphasizing the importance of integrated and expanded markets within the sub-region
- Promotion of development of agriculture targeting sub-regional markets in the Northern Zone by attracting investments and by providing infrastructure (including east-west access roads to potential agricultural areas and irrigation facilities) in inland areas from the Central Corridor (Tema-Ouagadougou Corridor) of Ghana
- Strengthening of economic infrastructure, such as electricity, water and industrial parks, for supporting the development of Tamale as a Major Regional City in the Northern Zone for attracting investment to agro-processing industries targeting sub-regional markets

[Button B]: Sub-regional markets should be integrated and expanded for creating the enabling environment to attract investment to economic sectors oriented to sub-regional markets by taking the following actions:

- Strengthening of implementation of the Customs Union at the national border with Côte d'Ivoire and Togo for integrating Ghana's coastal markets with neighbouring coastal markets
- Construction of strategically selected sections of a Coastal Motorway within Ghana, not only for spatially integrate coastal markets, but also for forming a coastal industrial and urban belt (a coastal economic corridor)
- Formulation of Greater Accra's urban transportation master plan, especially for identifying the location of the East-West Motorway within Greater Accra
- Formulation of a road plan for securing the connectivity of the new Tema container terminal with the Abidjan-Lagos Motorway, as well as with Tema-Ouagadougou Corridor (Central Corridor of Ghana)

[Button C]: North-south Connectivity should be strengthened for reducing transport costs and transport time between inland areas and coastal areas, for creating an enabling environment for developing economic sectors in inland areas by taking the following actions:

- Extension of a 4-lane high-standard road between Nkawkaw and Kumasi, construction of Greater Kumasi Outer Ring Road and extension of a 4-lane high-standard road between Kumasi and Kintampo for reducing travel time between inland areas and coastal areas
- Revitalization of water transport of the Volta Lake in the short term, by combining 1) construction of Tema-Akosonbo Railway, 2) development of Debre Port in the upstream of the Volta Lake and Akosonbo Port in its downstream, 3) rehabilitation of pipelines between Buipe and Bolgatanga
- Revitalization of the Western Railway Line (Takoradi-Awaso-Kumasi) and the Eastern Railway Line (Tema-Boankra-Kumasi) in the short term, and new construction of railway from Kumasi up to northern areas in the mid and long terms

21.8 Priority Projects and High Priority Projects for Ghana's Corridor Development

21.8.1 Priority Projects

There is a total of 92 projects selected as priority projects to be implemented between 2018 and 2040 for Ghana.

Priority projects to achieve the selected scenario by phases are listed in Table 21.8.1 through Table 21.8.3.

These priority projects are selected by using the following criteria:

- Those projects which are required for implementing the ten essential strategies
- Those projects which could initiate and drive corridor development in line with the selected growth scenario
- Those projects which needs proactive implementation, ahead of increased demand for infrastructure or production of economic sectors
- Those projects which are technically and institutionally implementable

By using these criteria, the priority projects are selected not only from newly formulated projects by WAGRIC Project, but also from existing prioritized projects by individual countries' governments.

Table 21.8.1 Short-Term Priority Projects for Ghana (2018-2025)

Sector	Priority Project for Ghana
Agriculture	Tamale-Mamprusi Agricultural Cluster Area Development Programme Phase 1
	Atebubu-East Gonja Agricultural Cluster Area Development Programme Phase 1 (including Daka Valley Irrigation Project)
	Gonja-Kintampo and Bole-Tain Agricultural Cluster Area Development Programme Phase 1 (including Bui Irrigation Scheme Project)
	Accra Plains Irrigation Development Project
Livestock	Feed Resource Development Project Phase 1
	Improvement of Livestock Stations of Pong Tamale Livestock Breeding Station, Babile Pig Breeding Station and Amrahia Dairy Farm Phase 1
	Development of Poultry Processing Plants with Cold Storage Phase 1
	Formulating National Plan for Transhumance Management
Fishery	Programme for Aquaculture Development on the Volta Lake Phase 1
Mining	Project for the Study on Transportation of Iron Ore from Shieni Iron Mine considering Possibilities of Railway, Inland Water Transport and Truck transport
Manufacturing	Project for Establishment of Tamale Industrial Park
	Project for Establishment of Ashanti Technology Park in Ejisu
	Project for Establishment of Sekondi Export Processing Zone
	Project for Establishment of Shama Export Processing Zone in Shama Ahanta District (Western Region)
	Project for Establishment of Prampram Industrial Park
	Project for Establishment of Kasoa Industrial Park
	Project for Establishment of ICT Park in Cape Coast
ICT	Tema ICT Park Expansion Project
	Project for Construction of Community Information Centre in Tema
	Project for Development of ICT Park at Cape Coast
Investment Promotion	Project for Promotion of Utilization of Principles of Responsible Investments to Agriculture, Livestock and Fisheries Sectors
	Investment Promotion for Development of Nyinahin Bauxite Mine
	Investment Promotion for Development of Shieni Iron Mine
	Investment Promotion for Manufacturing Industries in Sekondi-Takoradi
	Investment of Promotion for Manufacturing Industries in Greater Kumasi
Road	Investment Promotion for ICT-BOP Industries in Greater Kumasi
	Projects for Improvement of Inter-Regional and Regional Roads for Providing Better Access to Agricultural Potential Areas from Central Corridor
	• Improvement of Inter-Regional Road between Yawgu and Wa
	• Improvement of Regional Road between Navrongo and Fian
	• Improvement of Inter-Regional Road between Navrongo and Banusu
• Improvement of Inter-Regional Road between Tamale and Makango	

Sector	Priority Project for Ghana
	<ul style="list-style-type: none"> Improvement of Inter-Regional Road between Yeji and Kintampo Improvement of Inter-Regional Road between Salaga and Bimbila Improvement of Inter-Regional Road between Techiman and Agordeke Improvement of Inter-Regional Road between Kpando-Torkor and Golokwati Improvement of Inter-Regional Road between Berekum and Banda Nkwanta Improvement of National Road No. 11 between Bolgatanga and Bawku Improvement of National Road No. 13 between Lawra and Navrongo
	Projects for Strengthening of National Roads in the Coastal Corridor <ul style="list-style-type: none"> Construction of East-West Motorway in Greater Accra Replacement of Ankobra Bridge (Coastal Corridor) Replacement of Iture Bridge (Coastal Corridor) Widening of Accra – Tema Motorway up to 6 Lanes (Abidjan - Lagos Corridor) Construction of Motorway between Tema and Prampram (Abidjan-Lagos Corridor)
	Project for Upgrading of National Road No. 2 between Tema Roundabout and Atimpoku to 4-lane Road (Eastern Corridor)
	Projects for Strengthening of North-South Central Corridor Road <ul style="list-style-type: none"> Improvement of Tema Intersection by Construction of Flyovers Construction of 4-Lane High-Speed Way of National Road No.1 (Juaso, Yawkwei and Konongo Bypass Roads, 15km) Construction of Greater Kumasi Outer Ring Road North-East Section (Central Corridor) Upgrading of National Road No.1 between Tamale-Yaipe and Tamale- Savelugu to 4-lane Road (Central Corridor) Completion of North-East Section of Inner Ring Road in Tamale Replacement of Buipe Bridge (Central Corridor) Replacement of Yapei Bridge (Central Corridor)
	Projects for Improving East-West Road in Inland Areas <ul style="list-style-type: none"> Improvement of Regional Road between Tamale and the National Boarder with Togo (Nachemba) Improvement of National Road between Sunyani and the National Boarder with Côte d'Ivoire (Gonnokron)
Railway	Rehabilitation of Takoradi - Awaso Section of Western Railway Line
	Strengthening and Reform of Regulatory Function of Railway Sector
	Upgrading of Tema - Accra Railway
	Construction of Railway from Tema Port to Akosombo Port (Eastern Corridor)
	Project for Rehabilitation of Tema Port-Boankra-Kumasi Section of Eastern Railway
Urban Transportation	Project for Urban Transportation Master Planning for Greater Accra
Pipeline	Project for Construction of Aboadze-Tema Natural Gas Pipeline
	Project for Extension of Oil Multi-Products Pipeline from Buipe Port to Debre Port in order to respond to Lowering of Water Level of Volta Lake
	Project for Construction of Oil Multi-Products Pipeline between Tema and Kumasi
Logistics	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders
	Project for Operationalization of Noépé OSBP (National Border between Ghana and Togo)
	Project for Construction and Operation of One Stop Border Post (OSBP) in Elubo-Noé (National Border between Côte d'Ivoire and Ghana)
	Project for Construction and Operation of One Stop Border Post (OSBP) in Paga (National Border between Burkina Faso and Ghana)
	Project for Construction of Ashaiman Truck Terminal along Accra-Tema Motorway
Inland Water Transport	Study on Inland Water Transport between Damanko Port and Akosombo Port on the Volta Lake for supporting Iron Ore Mining in Shieni Mine
	Project for Construction of Debre Port at Volta Lake
	Project for Upgrading Akosombo Port at Volta Lake
Air Transport	Construction of New Airport in Sekondi-Takoradi
Electricity	Project for Development of 330kV Interconnection Line (Dunkwa 2-Côte d'Ivoire)
	Projects of Hydro Power Plants (Pwalugu, Juale and Hemang)
	Projects of Thermal Power Plants (General Electric, Kpong Combined Cycle, Globeleq Combined Cycle, Aksa Combined Cycle, Tadi Combined Cycle, Chrispod Combined Cycle, Astro and Domunli)
	Expansion of Water Treatment Plant in Weija Dam for Greater Accra
Water Resource	Expansion of Water Treatment Plant in Barakese Dam for Greater Kumasi
	Tamale Water Supply Project
	Interconnection of Sekyere-Hemang Water Treatment Plant to the Sekondi-Takoradi Water Supply System and the Aboadze Thermal Plant

Source: JICA Study Team

Table 21.8.2 Medium-Term Priority Projects for Ghana (2026-2033)

Sector	Priority Project for Ghana
Agriculture	Tamale-Mamprusi Agricultural Cluster Area Development Programme Phase 2
	Atebubu-East Gonja Agricultural Cluster Area Development Programme Phase 2
	Gonja-Kintampo and Bole-Tain Agricultural Cluster Area Development Programme Phase 2
Livestock	Feed Resource Development Project Phase 2
	Improvement of Livestock Stations of Pong Tamale Livestock Breeding Station, Babile Pig Breeding Station and Amrahia Dairy Farm Phase 2
	Development of Poultry Processing Plants with Cold Storage Phase 2
Fishery	Programme for Aquaculture Development on the Volta Lake Phase 2
Mining	Development of Nyinahin Bauxite Mine with Construction of Railway between Awaso and Nyinahin
	Development of Shieni Iron Mine
Investment Promotion	Investment Promotion for Manufacturing Industries in Sekondi-Takoradi
	Investment Promotion for Manufacturing Industries in Greater Kumasi
	Investment Promotion for Manufacturing Industries in Tamale
	Investment Promotion for ICT-BPO Industries in Tema, Cape Coast and Greater Kumasi
Road	Projects for Construction of Abidjan-Lagos Motorway <ul style="list-style-type: none"> Construction of Outer Ring Road for Sekondi-Takoradi as part of Abidjan-Lagos Motorway (Coastal Corridor) Construction of Abidjan-Lagos Motorway between Accra (Kasoa)- Cape Coast Construction of Abidjan-Lagos Motorway Section between Cape Coast – Sekondi-Takoradi (Coastal Corridor) Construction of Outer Ring Road for Greater Accra
	Projects for Upgrading to 4-Lane High-Speed Way for North-South Central Corridor <ul style="list-style-type: none"> Construction of 4-Lane High-Speed Way on National Road No.1 between Buipe and Savelugu including Bypass Road for Tamale as part of High-Speed Way (Central Corridor) Construction of 4-Lane High-Speed Way on National Road No.1 between Kumasi and Kintampo including Bypass Road at Techiman and Kintampo (Central Corridor)
	Upgrading of National Road No. 9 between Tamale and Bimbila
	Projects for Improving East-West Road in Inland Areas <ul style="list-style-type: none"> Upgrading of National Road No. 11 between Bolgatanga and Bawku to 2-Lane High-Standard Road Upgrading of National Road No. 13 between Lawra and Navrongo to 2-Lane High-Standard Road
	Projects for Construction of Greater Kumasi Outer Ring Road South-East Section
Railway	Construction of Railway between Awaso-Nyinahin
	Project for Construction of Kumasi-Paga Railway
Pipeline	Project for Construction of Oil Multi-Products Pipeline between Kumasi and Buipe
	Construction of Oil Multi-Products Pipeline between Bolgatanga and Bingo
Logistics	Strengthening of Operation of Noépé OSBP (National Border between Ghana and Togo)
	Strengthening of Operation of Elubo-Noé OSBP (National Border between Côte d'Ivoire and Ghana)
	Strengthening of Operation of Paga OSBP (National Border between Burkina Faso and Ghana)
	Project for Establishment of Boankra Multi-Modal Dry Port

Source: JICA Study Team

Table 21.8.3 Long-Term Priority Projects for Ghana (2034-2040)

Sector	Priority Project for Ghana
Agriculture	Tamale-Mamprusi Agricultural Cluster Area Development Programme Phase 3
	Atebubu-East Gonja Agricultural Cluster Area Development Programme Phase 3
	Gonja-Kintampo and Bole-Tain Agricultural Cluster Area Development Programme Phase 3
Livestock	Feed Resource Development Project Phase 3
	Improvement of Livestock Stations of Pong Tamale Livestock Breeding Station, Babile Pig Breeding Station and Amrahia Dairy Farm Phase 3
Fishery	Programme for Aquaculture Development on the Volta Lake Phase 3
Mining	Development of Manganese Mine in the North Western Part of Ghana with Construction of Railway between Nyinahin and Wa
Road	Construction of Abidjan-Lagos Motorway between Prampram - Sogakope (Coastal Corridor)
	Construction of High-Speed Way between Kintampo and Buipe (Central Corridor)

Source: JICA Study Team

21.8.2 High Priority Projects

Out of the 92 priority projects formulated and shown in the above sections, 23 priority projects are selected as “High Priority Projects” for achieving the selected Corridor Development Pattern **C-GN-1: “Strengthening of Central Corridor by upgrading its trunk road to a high-speed way from Accra to Tamale, while implementing partial road development for the Eastern Corridor and Western Corridor.”**

Outlines, funding schemes and estimated project costs of the high priority projects are shown in Table 21.8.4.

Table 21.8.4 Outlines of High Priority Projects for Ghana

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
1	A	1	Northern Zone’s Agricultural Cluster Area Development Programme (Tamale-Mamprusi Cluster, Atebubu-East Gonja Cluster and Gonja-Kintampo and Bole-Tain Cluster)	ODA Technical Assistance & ODA Loan	US\$ 984 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. The recommended growth scenario pays attention to the importance of targeting sub-regional markets, especially targeting the increasing middle-income populations in coastal areas, for developing economic sectors by attracting investment.</p> <p>Demand for agricultural products from coastal markets is expected to grow at higher rates due to economic growth and increasing middle-income populations. Coastal corridor development and north-south corridor development could create an enabling environment for development of economic sectors, especially the agricultural sector, in inland areas.</p> <p>In this context, the following three programmes aim to develop agricultural and agro-processing industries in inland areas by developing irrigation infrastructure, attracting investment, enhancing the supply chain of agricultural input and by taking various other measures:</p> <ul style="list-style-type: none"> • Tamale-Mamprusi Agricultural Cluster Area Development Programme • Atebubu-East Gonja Agricultural Cluster Area Development Programme • Gonja-Kintampo and Bole-Tain Agricultural Cluster Area Development Programme <p><u>Tamale-Mamprusi Agricultural Cluster Area</u> is located in Mamprusi West, Tolon Kumbugu and Savelugu Nanton Districts and Tamale Metropolis in the Northern Region. The programme aims to increase production of rice, maize, soybeans, vegetables, fruits and other crops. The programme will develop modern rice storage and processing centres in Tamale city, so as to supply rice not only to Ghana’s domestic market, but also to neighbouring countries. The programme is to increase production of maize and soybeans and to develop value chains such as flour, edible oil and animal feed especially for poultry. This programme includes 1) utilization of water harvesting techniques for rain-fed rice production (10,000 ha), 2) Natia-Nabogo Valleys’ Irrigation Development (10,000-30,000 ha), and 3) Irrigation development by utilizing the water from Pwalugu Multi-purpose Dam Project of VRA.</p> <p><u>Atebubu-East Gonja Agricultural Cluster Area</u> is located in East Gonja, Pru, Atebubu-Amantin, which is a part of Sene District in Brong Ahafo Region, which is part of the Northern Savannah Ecological Zone. The programme aims to increase production not only of existing crops, such as rice, grains, sugarcane and other crops, but also of promising crops, such as cowpea, sorghum, soybean, millet, and ground nuts. The programme includes activities to attract fruit processing factories such as the citrus juice factory in Atebubu, and to promote production of emerging cash crops such as cashew nuts, dawadawa, and shea nuts in Atebubu-Amantin District. This programme includes 1) Daka Valley Irrigation Project (35,000 ha) and 2) Katanga Valley Water Management Project (50,000 ha).</p> <p>In the <u>Gonja-Kintampo and Bole-Tain Agricultural Cluster</u>, there are two cluster areas. Gonja-Kintampo Cluster Area is located in West Gonja, a part of Central Gonja, Kintampo North, and Kintampo South Districts, and Bole-Tain Agricultural Cluster Area covers Sawla-Tuna-Kalba, Bole, and Tain Districts, Barong Ahafo Region. The target crops include rice, cashew, citrus and mango. The programme includes Bui Irrigation Scheme Project (30,000 ha) for Gonja-Kintampo Agricultural Cluster Area. Kintampo is expected to be a cashew processing centre by attracting investment.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
2	A	1	Project for Establishment of Prampram Industrial Park	PPP	US\$ 30 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>Prampram is located to the east of Tema, and it is part of Greater Accra. Currently Prampram is connected by National Road No.1 (N1) with Tema. In the future, it is expected that Prampram will be connected by a motorway, and part of Abidjan-Lagos Motorway, as well as by N1.</p> <p>The WAGRIC Master Plan selected the Prampram Industrial Park as one of the high-priority projects for industrial parks because of its strategic location close to the following facilities:</p> <ul style="list-style-type: none"> • Abidjan-Lagos Motorway: just on the motorway in the future • Tema Port : 23 km • Accra International Airport: 37 km • Greater Lomé: 150 km • Greater Lagos: 400 km <p>The project aims to establish a new industrial park which is equipped with qualified infrastructure for the purpose of attracting investment to various economic sectors in Greater Accra. The project will provide divided sites with high-standard infrastructures to private companies of various economic sectors including manufacturing, logistics and ICT. The land for the industrial park is around 500 ha in the first phase.</p>					
3	A	1	Project for Establishment of Tamale Industrial Park	ODA Loan	US\$ 14 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>The population of Tamale Municipality was 495,000 in 2015. Greater Tamale consisting of Tamale and its surrounding areas is one of the most rapidly increasing urban centres in Ghana in recent years. It is forecast that Greater Tamale's population is to be 1.8 million by 2040. Greater Tamale is located on the Tema-Ouagadougou Corridor. By taking advantage of the upgrading of the Central Corridor, Greater Tamale will be able to play an important role as the agricultural, industrial, logistical, and commercial centre for the Northern Region and the Northern Development Authority Area of Ghana.</p> <p>The Ministry of Trade and Industry has a plan to develop an industrial park in Sagnarigu District adjacent to Tamale Municipality. The target industries in the manufacturing sector are agro-processing, which is one of the expected or promising industries, food products, beverages, textiles, wearing apparel, rubber and plastics products, and furniture.</p> <p>The project aims to construct and manage an industrial park in Greater Tamale for the purpose of attracting investment for manufacturing sectors including agro-processing industries utilizing local products. The Ministry of Trade and Industry has secured land of 24 ha for the project. The actual development will be managed by a PPP scheme. The project will provide divided lots with adequate infrastructure including electricity, water drainage and telecommunications. The project will also provide management services for factories in the industrial park.</p> <p>From the viewpoint of human resources development, a project for improving and expanding of Dabokpa Technical Vocational Institute in Tamale is important to provide qualified technicians and experts. The institute is under the Ghana Education Services of Ministry of Education.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
4	A	1	Project for Establishment of Ashanti Technology Park in Ejisu	PPP	US\$ 20 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>The Ghana Free Zones Authority (GFZA) has secured land of 444 had in Ejisu of Ashanti Region for the Ashanti Technology Park. The GFZA has a plan to establish this industrial park by PPP scheme. Ejisu is located on the Central Corridor (Tema-Ouagadougou Corridor) and at a junction of the proposed Outer Ring Road and National Road No.6 (N6).</p> <p>Ashanti Region and Ghana's northern areas have rich cocoa beans, gold, timber and wood, leather ware, and tourist sites, as well as various agricultural products. Potential industrial sub-sectors include the following:</p> <ul style="list-style-type: none"> • ICT industries • Cocoa processing • Agro-processing industries • Light industrial manufacturing • Warehousing and logistics industries • Bio-technology development <p>The project aims to provide necessary infrastructures for establishing an industrial park, Ashanti Technology Park, in Ejisu, Ashanti Region by attracting investment. At the same time, the project will facilitate providing necessary off-site infrastructures for the industrial park.</p>					
5	A	2	Investment Promotion for Economic Sectors targeting Sub-Regional Markets	ODA Technical Assistance	US\$ 4 million
<p><u>Project Outline</u></p> <p>In 2013, the Ghana Investment Promotion Centre (GIPC) was established. It has tried to attract investment to infrastructure development, as well as to the mining sector. However, it has not paid much attention to the growth potential of Ghana's economic sectors targeting coastal markets in the sub-region.</p> <p>By taking advantage of the possibility to integrate and expand the size of sub-regional consumers' markets, it is possible for GIPC to attract investment to economic sectors targeting sub-regional consumers' markets. Such target economic sectors include those of agriculture and fisheries and agro-processing.</p> <p>The project aims to making a clear shift of investment promotion toward economic sectors orientated to sub-regional markets. For this purpose, the project will prepare new promotion materials, provide training to related agencies and personnel and implement actual activities for investment promotion.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
6	A	3	Projects for Improvement of Inter-Regional and Regional Roads for Providing Better Access to Potential Agricultural Areas from the Central Corridor	ODA Loan or partly ODA Grant	US\$ 2,000 million
<p><u>Project Outline</u></p> <p>The size of the coastal consumers' markets is increasing within Ghana, and neighbouring coastal markets are expected to become integrated with Ghana within the sub-region through the customs union. Because of this situation, Ghana, as well as other WAGRIC countries, has high potential to develop economic sectors, both in coastal areas and inland areas, targeting these integrated and expanded coastal markets of the sub-region. Moreover, the roads of the Central Corridor (Tema-Ouagadougou Corridor) are relatively good and usable for promoting inland development, while WAGRIC Master Plan strongly recommends the upgrading of the existing roads of the Central Corridor to high-standard four-lane roads.</p> <p>The WAGRIC Master Plan points out the possibility to attract investment to agriculture by providing improved access roads to potential agricultural areas, as well as by providing other infrastructure, such as irrigation schemes.</p> <p>The projects aim to improve the following access roads to potential agricultural areas in the Northern Development Authority Zone:</p> <ul style="list-style-type: none"> • Improvement of Inter-Regional Road between Yawgu and Wa • Improvement of Regional Road between Navrongo and Fian • Improvement of Inter-Regional Road between Navrongo and Banusu • Improvement of Inter-Regional Road between Tamale and Makango • Improvement of Inter-Regional Road between Yeji and Kintampo • Improvement of Inter-Regional Road between Salaga and Bimbila • Improvement of Inter-Regional Road between Techiman and Agordeke • Improvement of Inter-Regional Road between Kpando-Torkor and Golokwati • Improvement of Inter-Regional Road between Berekum and Banda Nkwanta • Improvement of National Road No. 11 between Bolgatanga and Bawku • Improvement of National Road No. 13 between Lawra and Navrongo <p>This project is in line with the policy directions of the Northern Development Authority of Ghana. The project should be implemented together with the Northern Zone's Agricultural Cluster Area Development Programmes.</p>					
7	A	3	Project for Construction of Aboadze-Tema Gas Pipeline (250km)	ODA Loan or PPP	US\$ 400 million
<p><u>Project Outline</u></p> <p>Ghana is endowed with off-shore natural gas reserves. However, its natural gas reserves are not large enough to develop chemical industries using the gas from its own territory, but it is possible to use the natural gas for power generation. It is important for Ghana to continue to attract investment to exploration and exploitation of natural gas for power generation to satisfy the increasing demand for electricity not only by its own country's people and economies, but also by neighbouring countries of the West African Power Pool (WAPP).</p> <p>Natural gas is an important energy source for power generation now in Ghana. The demand centres of natural gas are Tema and Takoradi, where both existing and planned gas-fired thermal power plants are concentrated.</p> <p>With a significant growth of gas demand for power generation in Ghana, gas infrastructure developments will be required for increasing production of gas in Ghana and prospective importing of LNG to Ghana. In addition to these gas infrastructures, a transmission gas pipeline between the eastern part and western part should be constructed to balance supply and demand of gas across the regions in Ghana.</p> <p>The project aims to construct a transmission gas pipeline from Aboadze to Tema to extend the existing pipeline of Atuabo-Aboadze from Atuabo Gas Processing Plant for the following purposes:</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
			<ul style="list-style-type: none"> To supply gas from domestic gas fields in the western part to major demand centres in the eastern part in Ghana To supply gas to meet possible gas demand along the coast line. To ensure the security of gas supply for the flow in both directions by combination of the planned pipeline and the West African Gas Pipeline (WAGP) <p>The length of the Atsuabo - Aboadze transmission pipeline will be 230 -250 km. FEED for the project was done by Penspen in 2016.</p>		
8	A	3	Project for Development of 330kV Interconnection Line (Dunkwa 2-Côte d'Ivoire)	ODA Loan	US\$ 64 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of the manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>Currently, the power demand of Ghana is growing and Ghana is increasing power production in an attempt to keep pace; however, Ghana needs to continue to import electricity through the West African Power Pool (WAPP). However, in the near future, it is expected that Ghana will become one of the power exporting countries to its neighbouring countries including Côte d'Ivoire. It would be important to further reinforce the interconnection line with Côte d'Ivoire along the coastal corridor for mutual power trading.</p> <p>The project aims to construct another 330kV interconnection line with Côte d'Ivoire for the following purposes:</p> <ul style="list-style-type: none"> Improvement of reliability of the outward power supply from Côte d'Ivoire Improvement of system stability for both Ghana and Côte d'Ivoire For Côte d'Ivoire to transfer its power to Togo through Ghana. Mutual power trading between Côte d'Ivoire and Ghana in the near future <p>The total length of the interconnection line proposed is 296km between Côte d'Ivoire and Ghana, the Ghanaian section of which accounts for 119km. The project is to include the construction of a new substation, "Dunkwa 2", which is to be a junction point between the interconnection line and the Ghanaian national grid.</p> <p>This project was proposed in 2004 and revised in 2011 in order to ensure stable integration of the national electricity network in the ECOWAS sub-region and facilitate optimal power exchanges and trading among ECOWAS countries.</p> <p>In 2015, GRIDCo carried out a feasibility study on the project for "330kV Côte d'Ivoire – Ghana Interconnection Reinforcement Project."</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
9	A	3	Project for Expansion of Water Treatment Plant in Weija Dam for Greater Accra	ODA Loan	US\$ 60 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends development efforts at economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries.</p> <p>In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks. The population of Greater Accra was 4.8 million in 2015. It is forecast to be 9.2 million by 2040. Greater Accra is Ghana's most important economic production centre, which is expected to continue to attract investment in the manufacturing sector. Greater Accra's water demand is expected to continue to increase rapidly because of the increase of middle-income populations and development of economic sectors, as well as of its high population growth.</p> <p>The project aims to construct a new Water Treatment Plant for Weija Dam in order to increase the volume of water supply to Greater Accra.</p> <p>The present water supply for Greater Accra depends on the Water Treatment Plant (463,000m³/day) for Kpong Dam on the Volta River, the existing Water Treatment Plant (264,000m³/day) for Weija Dam and the Water Treatment Plant for Teshie Desalination Plant (60,000m³/day).</p> <p>The storage capacity of Weija Dam is 130 million m³. The current total capacity of the Water Treatment Plant at the Weija Dam is about 264,000m³/day (97 million m³/year). It is considered that there is still room for further abstraction for domestic water supply from the Weija Dam since the planned irrigation area has been converted to urban areas.</p> <p>Ghana Water Company Limited (GWCL) will be responsible for implementation of this project.</p>					
10	A	3	Project for Expansion of Water Treatment Plant in Barakese Dam for Greater Kumasi	ODA Loan	US\$ 110 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries.</p> <p>In order to support such development of the manufacturing sector in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>The population of Greater Kumasi was 3 million in 2015. It is forecast to be 7.8 million by 2040 due to Greater Kumasi's rapid natural increase and massive in-migration from northern areas. Greater Kumasi is located on the Central Corridor. Greater Kumasi has the potential to attract investment to the manufacturing sector.</p> <p>The current total capacity of the Water Treatment Plant (WTP) at the Barikesse Dam is about 136,000m³/day. It is considered that the total possible volume of water abstracted from the Barikesse Dam for increasing the volume to supply would be 218,000m³/day if its reservoir is properly managed.</p> <p>The project aims to construct a Water Treatment Plant for using the remaining water from the Barikesse Dam. Ghana Water Company Limited (GWCL) will be responsible for implementation of this project.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
11	A	3	Tamale Water Supply Project	ODA Loan	US\$ 233 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends development efforts for economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>The population of Tamale Municipality was 495,000 in 2015. Greater Tamale consisting of Tamale and its surrounding areas has been one of the most rapidly increasing urban centres in Ghana in recent years. It is forecast that Greater Tamale's population is to be 1.8 million by 2040. Greater Tamale is located on the Tema-Ouagadougou Corridor. By taking advantage of the upgrading of the Central Corridor, Greater Tamale will be able to play an important role as the agricultural, industrial, logistical, and commercial centre for the Northern Region and the Northern Development Authority Area of Ghana.</p> <p>The project aims to strengthen the water supply to serve the increasing population and expected increase of economic activities, including the manufacturing sector, of Greater Tamale.</p> <p>The existing capacity of the intake (45,000m³/day) and Water Treatment Plant (WTP) at Nuuni in the White-Volta River is not enough for the future water demand by Greater Tamale. It is necessary to expand the capacities of the intake and WTP.</p> <p>The project includes the following components:</p> <ol style="list-style-type: none"> i) Rehabilitation of the existing Water Treatment Plant (WTP) in Naumi, ii) Construction of a new intake and a Water Treatment Plant (45,000 m³/day) in Yapei, which is located far downstream from Naumi in the White-Volta River, and a conveyance pipeline 					
12	B	4	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders	ODA Technical Assistance	US\$ 4 million
<p><u>Project Outline</u></p> <p>In addition to export of primary commodities, such as minerals and agricultural products, it is necessary for Ghana to diversify economic sectors. The WAGRIC Master Plan recommends paying attention to the potential of the economic sectors both in coastal areas and inland areas by targeting growing sub-regional markets and taking advantage of the customs union which has been institutionalized by UEMOA and ECOWAS. For this purpose, it is necessary to strengthen the implementation of the customs union by taking advantage of the customs union, which has been institutionalized by the member countries of UEMOA and ECOWAS.</p> <p>The project aims at enforcement of implementation of the customs union and trade facilitating for sub-regional products with neighbouring countries of the sub-region, especially with Cote d'Ivoire and Togo, along Abidjan-Lagos Corridor. The project will also be applied to the national border with Burkina Faso on Tema-Ouagadougou Corridor.</p> <p>The project will establish new materials for training and also train related agencies and personnel. Campaigns for customs union trade facilitation of sub-regional products will also be implemented together with WAGRIC countries and their surrounding countries under this project.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
13	B	5	Project for Urban Transportation Master Planning for Greater Accra	ODA Technical Assistance	US\$ 9 million
<p><u>Project Outline</u></p> <p>Greater Accra had a population of 4.8 million in 2015. It is expected to increase to 9.2 million by 2040. Greater Accra will be one of the important coastal metropolitan areas along the Abidjan-Lagos Corridor. Greater Accra occupies the important junction between the two important economic corridors, namely the coastal Abidjan-Lagos Corridor and the north-south Central Corridor. At the same time, Tema Port and Accra International Airport are located within Greater Accra. Therefore, it is very essential for Greater Accra to continue to secure high urban mobility not only within its urban area, but also between the urban area and surrounding areas, for the purpose of maintaining the function and performance of the two economic corridors.</p> <p>For this purpose, the formulation of a strategic and comprehensive master plan for urban transportation is required for Greater Accra. This urban transportation master plan is very significant not only for Greater Accra but also for the Abidjan-Lagos Corridor and the Tema-Ouagadougou Corridor. That is, it is very critical for effectively implementing the WAGRIC Master Plan.</p> <p>A Greater Accra Spatial Development Framework was formulated covering the Greater Accra Region by the Department of Town Planning under the assistance of the World Bank. A transportation master plan was formulated for management of public transportation including Bus Rapid Transits (BRTs) covering part of Greater Accra under the technical assistance of KOICA. An outer ring road is proposed for Greater Accra under the assistance of a Chinese Private Company. Unfortunately, Greater Accra has no urban transportation master plan so far.</p> <p>The project aims to formulate a comprehensive urban transportation master plan for guiding short-term, mid-term and long-term investment in urban transportation infrastructure, as well as traffic management.</p>					
14	B	5	Project for Construction of East-West Motorway in Greater Accra (100km)	ODA Loan or partly PPP	US\$ 683 million
<p><u>Project Outline</u></p> <p>Greater Accra had a population of 4.8 million in 2015. It is expected to increase to 9.2 million by 2040. Greater Accra will be one of the important coastal metropolitan areas along the Abidjan-Lagos Corridor. Greater Accra occupies the important junction between the two important economic corridors, namely the coastal Abidjan-Lagos Corridor and the north-south Central Corridor. At the same time, Tema Port and Accra International Airport are located within Greater Accra. Therefore, it is very essential for Greater Accra to continue to secure high urban mobility not only within its urban area, but also between its urban area and surrounding areas, for the purpose of maintaining the function and performance of the two economic corridors.</p> <p>The East-West Motorway is one of the important solutions for enhancing the urban mobility both within Greater Accra and between its urban area and surrounding areas. Therefore, it is necessary to identify a possible route for the East-West Motorway through the urban area of Greater Accra in order to connect Kasoa (in the east) and Prampram (in the west) within Greater Accra. For identification of a feasible route of the East-West Motorway, it is necessary to conduct the Study Project for Urban Transportation Master Planning for Greater Accra.</p> <p>The project aims to construct an urban motorway connecting the eastern part and western part of Greater Accra. There are two possible routes for the East-West Motorway. The one is on the route of National Road No.1 and the Accra-Tema Motorway. The other is the route for running through northern areas of the Greater Accra using parts of the proposed Outer Ring Road.</p> <p>This project will be implemented by government budget (ODA loan) or PPP scheme.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
15	B	5	Project for Construction of Motorway between Tema and Prampram (16 km)	ODA Loan	US\$ 109 million
<p><u>Project Outline</u></p> <p>The project aims to extend the existing Accra-Tema Motorway up to Prampram along the National Road No.1.</p> <p>Tema Municipality has not only the most important sea port of Ghana, but also has the first export processing zone (EPZ) of Ghana. The number of factories and warehouses is increasing along the National Road No.1 between Tema and Prampram. Because of this situation, traffic congestion on the section between Tema and Prampram has become serious.</p> <p>The Accra-Tema Motorway and prospective Tema-Prampram Motorway could contribute to the enhancement of the connectivity between the central area of Greater Accra and the eastern part of the coastal area of Ghana on the Abidjan-Lagos Corridor. The prospective Tema-Prampram Motorway could help to attract investment to factories and warehouses in Prampram area and further eastern areas within Greater Accra.</p>					
16	C	6	Project for Construction of Tema – Akosombo Railway	PPP	US\$ 398 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the establishment of efficient and low-cost freight transportation for strengthening of the connectivity between inland areas and coastal areas. It could attract investment to economic sectors in inland areas targeting sub-regional markets.</p> <p>At present, there is no railway operational between inland areas and coastal areas in Ghana. Therefore, it is feasible to utilize the inland water transport of the Volta Lake. In order to utilize the Volta Lake for inland water transport for long-distance cargo transportation, it is necessary to take the following actions:</p> <ul style="list-style-type: none"> • To provide a railway between Tema Port and Akosombo Port on the Volta Lake • To build a new Akosombo Port on the Volta Lake • To upgrade Debre Port on the Volta Lake and provide a conveyance pipeline between Debre Port and Buipe • To rehabilitate the pipeline between Buipe and Bolgatanga <p>The project aims to construct an 84-km railway connecting Tema Port and Akosombo Port. The project will include the construction of rail tracks of standard gauge, railway maintenance facilities for locomotives and wagons, the building of stations at specific locations with communications and signal equipment and capacity building for personnel in all aspects of the railway system.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
17	C	6	Project for Construction of Debre Port at Volta Lake	ODA Loan	US\$ 13 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the establishment of efficient and low-cost freight transportation for strengthening of the connectivity between inland areas and coastal areas. It could attract investment to economic sectors in inland areas targeting sub-regional markets.</p> <p>At present, there is no railway operational between inland areas and coastal areas in Ghana. Therefore, it is feasible to utilize the inland water transport of the Volta Lake. In order to utilize the Volta Lake for inland water transport for long-distance cargo transportation, it is necessary to take the following actions:</p> <ul style="list-style-type: none"> • To provide a railway between Tema Port and Akosombo Port on the Volta Lake • To build a new Akosombo Port on the Volta Lake • To upgrade Debre Port on the Volta Lake and provide a conveyance pipeline between Debre Port and Buipe • To rehabilitate the pipeline between Buipe and Bolgatanga <p>The route of petroleum product transfer to Buipe has a major deficiency, especially during the dry season, when the Volta Lake reduces in volume, resulting in shallow draft that does not support navigation on the Volta. To make up for this deficiency, this project is to allow river barges to dock at Debre during the dry season or shallow waters.</p> <p>The project aims to upgrade the existing Debre Port on the Volta Lake for the objective of easing the passage of vessels on the Volta Lake to Buipe during dry season or shallow waters and to increase port efficiency. The completion of the project will provide for navigation of vessels in all seasons.</p>					
18	C	6	Project for Rehabilitation of Tema Port – Boankra – Kumasi Section of the Eastern Railway	PPP	US\$ 1,080 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan points out the potential of developing economic sectors targeting sub-regional markets, especially coastal consumers' markets both in inland areas and coastal areas. The Eastern Railway used to be operational in the 2000s for connecting Tema and Kumasi through Accra. However, it is not operational between Accra and Kumasi due to its rail track deterioration.</p> <p>The project aims to rehabilitate the rail section (330 km) between Kumasi and Tema Port through Accra and Boankra. The project will also establish a multi-modal dry port (inland container depot) at Boankra, which is located 28km from central Kumasi, for the purpose of decongesting the Tema Port.</p> <p>Ghana Shippers Authority has secured land of 161 ha in Boankra for establishing the inland container depot just along the National Road and the Eastern Railway Line. Ghana Shippers Authority is inviting private investors for rehabilitation of the railway and development of the inland container depot.</p> <p>A feasibility study on this project was conducted by a private management consulting firm for inviting private sectors' investment for development and operation for the project.</p> <p>However, the length of the 330-km cargo railway is too short for users of cargo railway to be attractive, and it is also too short for the cargo railway operator to be profitable. Therefore, the investment in the extension of the Eastern Railway Line up to the northern areas of Ghana and furthermore to Burkina Faso (800 km between Tema Port and Bolgatanga in total) is essential so that users of cargo railway feel it attractive and operators of the cargo railway consider it profitable. Therefore, this project for the rehabilitation of the Eastern Railway Line between Tema Port and Kumasi is very critical eventually for extending the railway toward the northern areas of Ghana and further to Burkina Faso in the long-term or in the super-long term (beyond 2040).</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
19	C	6	Project for Rehabilitation of Takoradi – Awaso Section of the Western Railway	ODA Loan	US\$ 1,085 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan brings attention to the importance of economic sectors targeting sub-regional markets for seeking balanced development between inland areas and coastal areas. However, at the same time, it is important for individual countries of WAGRIC Sub-Region to expand the production of primary commodities, such as minerals and agricultural products, for promoting economic growth of the country and the increasing number of middle-income populations.</p> <p>Awaso is a bauxite mine which had 30 million tons of bauxite deposits originally. In the past, more than 20 million tons of bauxite has been exploited. However, in the 2000s, the railway transporting coal from Awaso Mine to Takoradi Port had deteriorated very much. As a result, at present, there are no railway services for transporting bauxite, resulting in the utilization of trucks for transporting bauxite to Takoradi Port. This causes an increase of transport cost and deterioration of road pavement.</p> <p>Besides easing the pressure on the road corridor in the country, the rail line will also significantly reduce the cost of transportation of bulk commodities as well as offer an alternative and cheaper means of transport for passengers.</p> <p>The Takoradi-Awaso Section (267km) of the Western Railway used to be operational for transporting bauxite from Awaso to Takoradi Port. At that time, the Awaso-Kumasi section was also operational. Coco beans were transported from Kumasi to Takoradi Port. However, deterioration of the railway track and rolling stock had become too serious to continue its railway operation. It is necessary for the government to start rehabilitating the Takoradi-Awaso Section of the Western Railway in order to revive the railway in Ghana.</p> <p>The project aims to rehabilitate Takoradi – Awaso Section (267km) of the Western Railway for re-starting the transport of bauxite and for re-starting the operation of the West Railway Line between Takoradi and Kumasi.</p> <p>There is a possibility to extend this railway line to Nyinahin for developing another bauxite mine, which has a huge deposit.</p>					
20	C	6	Project for Construction of Railway between Awaso – Nyinahin	Private Investment	US\$ 286 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan points out the importance of economic sectors targeting sub-regional markets for seeking balanced development between inland areas and coastal areas. However, at the same time, it is important for individual countries of the WAGRIC Sub-Region to expand the production of primary commodities, such as minerals and agricultural products.</p> <p>Nyinahin (Ashanti Region) is located about 30km to the north of Awaso bauxite mine. Nyinahin bauxite deposit is regarded as one of the most promising undeveloped bauxite deposits. It is considered that Nyinahin would have 700 million ~ 1 billion tons of bauxite reserve.</p> <p>While Awaso used to be connected by the Western Railway Line, there is no transportation available in Nyinahin except for roads. The rehabilitation of Takoradi-Awaso Section of the Western Railway Line is very essential for attracting investment from a bauxite mining company for the construction of Awaso-Nyinahin Section by extending the Takoradi-Awaso Section of the Western Railway Line.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
21	C	7	Project for Construction of Greater Kumasi Outer Ring Road North-East Section (25km)	ODA Loan or ODA Grant	US\$ 171 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends establishing high-speed transportation in the north-south corridor for strengthening the connectivity between inland areas and coastal areas. The north-south high-speed transportation is important for attracting investment to economic sectors targeting sub-regional markets, while the establishment of efficient and low-cost cargo transportation in the north-south corridor is required for establishing an enabling environment for competitive business operation.</p> <p>The government of Ghana started upgrading national roads to high-standard four-lane roads between Greater Accra and Greater Kumasi, including providing by-pass roads.</p> <p>Since the central area of Greater Kumasi is very congested by traffic, it takes a long time to go through Greater Kumasi, which is on the Central Corridor. In order to reduce the travel time and maintain the high speed on the roads of the Central Corridor, it is necessary to construct the Outer Ring Road of Greater Kumasi.</p> <p>The project aims to construct the north-east section (25km) of the Greater Kumasi Outer Ring Road.</p>					
22	C	7	Project for Construction of 4-Lane High-Speed Way of National Road No.1 (Juaso, Yawkwei and Konongo Bypass Roads, 15km)	ODA Loan	US\$ 79 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends establishing high-speed transportation in the north-south corridor for strengthening the connectivity between inland areas and coastal areas. The north-south high-speed transportation is important for attracting investment to economic sectors targeting sub-regional markets, while the establishment of efficient and low-cost cargo transportation in the north-south corridor is required for establishing an enabling environment for competitive business operation.</p> <p>The government of Ghana started upgrading national roads to high-standard four-lane roads between Accra and Kumasi, including providing by-pass roads. By having taken this action, the travel time between Accra and Kumasi has reduced largely to around 4 hours by road.</p> <p>In response to the prospective increase of road traffic on the Central Corridor of Ghana, it will be necessary to increase the 4-lane high-speed sections between Accra and Kumasi. The project aims to construct bypass roads for Juaso, Yawkwei and Konongo. The total length of those three bypass roads would be about 15km.</p>					
23	D	10	Project for Strengthening of Airport Security by Installing Security Equipment	ODA Grant	US\$ 20 million
<p><u>Project Outline</u></p> <p>More movement of goods and people will be generated within the sub-region and between the sub-region and outside the sub-region due to development of the north-south corridors and the coastal corridor in the sub-region. To correspond to such increase in movements, it is necessary to install equipment and providing trainings to strengthen security at national borders, including airports.</p>					
			Total		US\$ 7,856 million

Chapter 22 Development Strategies for Economic Sectors of Ghana

22.1 Agriculture Sector of Ghana

22.1.1 Present Situation of Agriculture Sector in Ghana

Gross Domestic Product (GDP) generated by the agricultural sector of Ghana was 22.0% of total non-oil GDP in 2014. Within the agricultural sector, the crops sub-sector contributes 16.9% and it is the largest single sub-sector contributing to GDP. The agriculture sector performed poorly in the last plan period, 2010 to 2013, with an average annual growth rate of 3.4%. This has implications for the majority of Ghanaians since the largest proportion of the population is still dependent on this sector for employment and sustenance. The agricultural labour force (44%) continues to be the highest of all the sectors (GSS, 2014), despite the sector's relatively low contribution to national GDP. The Ministry of Food and Agriculture (MOFA) has adopted the Medium Term Agricultural Sector Plan (METASIP 2014 – 2017) which has been developed with a strong emphasis on food security and the creation of decent jobs in the sector. The target is GDP growth of at least 6.4% per annum for agriculture sector during the plan period. METASIP II (2014-2017) has been adopted by MOFA and the target of agricultural growth is firmly maintained.

22.1.2 Issues regarding the Agriculture Sector of Ghana

The agriculture sector of Ghana has several development issues to accelerate transformation to modern and profitable agriculture. The development issues are found in the low productivity due to low average yield of crops and high post-harvest losses. In addition to the production and productivity issues, there are many development issues related to undeveloped or insufficiently developed value chains and markets for agricultural commodities, which causes low added value and low income generation in the agricultural sector.

In the agricultural sector, the following development issues are defined:

(1) Issues related to Agricultural Production and Productivity

- Low use of improved technologies in crops, limited availability of improved technological packages, especially planting materials and certified seeds
- Low use of inputs and high cost of inputs
- Low access to mechanization services along the value chain
- Climate variability, unpredictability and over-dependence on rain-fed agriculture
- Inefficient use of and low productivity of existing irrigation systems
- Inadequate diversification and competitiveness in staples and cash crops
- Inadequate raw materials to meet increasing demand by local industries
- Inadequate post-production infrastructure, High post-harvest losses along the value chain

(2) Issues related to Marketing and Processing of Agricultural Commodities

- Agricultural production is not driven by market demands
- Inadequate agricultural commodity volumes that have the required specifications and quality to supply the international markets
- High cost of aggregation due to many scattered small producers

- Limited access to input and output markets by smallholder farmers (men, women and youth)
- Low level of agro-processing and inadequate institutional arrangements to support large-scale commercial agro-processing
- Inadequate access to market information, intelligence and operations

(3) Issues related to Promoting Agricultural Industry

- Poor rural infrastructure (poor road network, limited rural industries, inadequate energy and access to potable water etc.)
- Over-dependence on rainfall and inadequate measures to mitigate climate change effects
- Disjointed value chains of most agricultural commodities
- Limited availability of storage and processing facilities

22.1.3 Objectives for Agriculture Sector of Ghana

The development goal of agriculture sector is to accelerate agricultural transformation and to transform the agricultural sector to drive productivity and output, create jobs, increase incomes, and ensure food security, through realizing accelerated agricultural transformation and sustainable natural resources management.

In order to achieve the development goals, the objectives of the agricultural sector are defined as:

- To increase productivity and production of agricultural commodities, which will contribute to improving food security and emergency preparedness,
- To increase added value of agricultural commodities by diversifying agricultural production, and developing value chains which will contribute to realize the increased growth in incomes
- To promote export of agricultural produce/products and agro-industry which will contribute to acceleration of the growth of the markets, establishment of value chains and the value added of agricultural production. Especially it is necessary to promote the production of agricultural products and agro-processing products targeting sub-regional consumers' markets.

22.1.4 Strategies for the Agriculture Sector of Ghana

The strategies for the agriculture sector development in Ghana are the following:

(1) Basic Strategy related to Agricultural Production and Productivity

- Improving the timing of ploughing and seeding through enhancement of the mechanization service. The appropriate timing of ploughing and planting is of the essence for improved rain-fed and water harvesting farming.
- Promotion of nucleus farmer and out-grower schemes and contract farming, which will provide local farmers the access to farming techniques, inputs and materials and markets.
- Combination of the development of formal irrigation including large scale commercial irrigation and the alternatives to formal irrigation such as improved rain-fed production, water harvesting, surface water extraction and peri-urban agriculture including informal irrigation.
- Development of potential large-scale formal irrigation schemes by the Public Private Partnership (PPP) approach, such as Accra Plain, Nasia-Nabogo Valley and Daka Valley Irrigation Projects.
- Improvement of rate of post-harvest losses.
- Promotion and increase of production of speciality crops in the regions, such as oil palm in the south-west and south-east regions, cashew nuts, shea and dawadawain in the northern and central regions.
- Attracting of private investment to the production and trading of agricultural products targeting sub-regional markets

(2) Basic Strategy related to Marketing and Processing of Agricultural Commodities and Promoting Agricultural Industry

- Promotion of nucleus farmer and out-grower schemes and contract farming, which will provide the environment in which private processing and transportation companies ensure the agricultural products and raw materials are available in high quality and constant quantity. It is essential for the Government to formulate and adopt the guidelines and institutional framework to promote fair out-grower schemes and contract farming and to secure the rights of small farmers.
- Attracting of private investment to agriculture by developing infrastructure such as roads, irrigation, storage and transportation facilities.
- Promotion of agro-processing through increase of production of agro-based local raw materials of high quality and adequate quantity.
- Promotion of commercial agriculture for oil palm, cassava, cocoa, cotton, sorghum, sugar-cane, pine-apples, citrus, mangoes and tomatoes.

(3) Basic Strategy for Agricultural Cluster Area Development

- Establishing the integrated development concept of agricultural cluster areas, which will increase agricultural production, improve coordination of agriculture and livestock production and processing, creating added value, etc.
- Developing the pilot cluster area and expansion of the development to other potential cluster areas.
 - Formulating value chains for agricultural and livestock products at the agricultural cluster area development through increase of agricultural and livestock production and fostering related industry.
 - Promotion of agricultural cluster development by utilizing the regional potential and specialty, implication and coordination with the corridor development.
 - Potential irrigation development projects are considered as key projects of the agricultural cluster development in combination with attracting the processing and distribution subsector.
 - Promotion of development in the Northern Savannah Ecological Zone and the Accra Plain in coordination with GCAP.
 - Promotion of formulating value chains by the private sector in coordination with GASIP.
 - Promotion of production of agricultural products targeting sub-regional markets

22.1.5 Programmes and Projects for the Agriculture Sector in Ghana

The following programmes, projects and measures are planned:

- Atebubu-East Ganja Agricultural Cluster Area Development Programme, including Kattanga Valley Water Management Project, Kabaka Development Area, Daka Valley Irrigation Project
- Bole-Tain Agricultural Cluster Area Development Programme, including Bui Multipurpose Dam Project (Irrigation Component)
- Bolgatanga-Bawku Agricultural Cluster Area Development Programme, including Fumbusi Valley Water Management Project, Expansion of Tono Irrigation Project (Phase 2) and Rehabilitation of Veve Irrigation Project
- Gonja-Kintampo Agricultural Cluster Area Development Programme
- Kirachi-Dambai Agricultural Cluster Area Development Programme, including Sabare Irrigation Project

- Sissala-Wa East Agricultural Cluster Area Development Programme, including Kamba Irrigation Project
- Tamale-Mamprusi Agricultural Cluster Area Development Programme, including Improved rain-fed agriculture project, Nasia-Nabogo Irrigation Development Project, Pwalugu Multipurpose Dam Project (Irrigation Component)
- Wa-Jirapa Agricultural Cluster Area Development Programme
- Yendi-Binbilla Agricultural Cluster Area Development Programme, including Karaga Irrigation Project
- Accra Plain Irrigation Project
- Oil Palm Development by Nucleus Estate, Small Holders System and Village Local Replanting
- 10-year Cashew Sector Master Plan

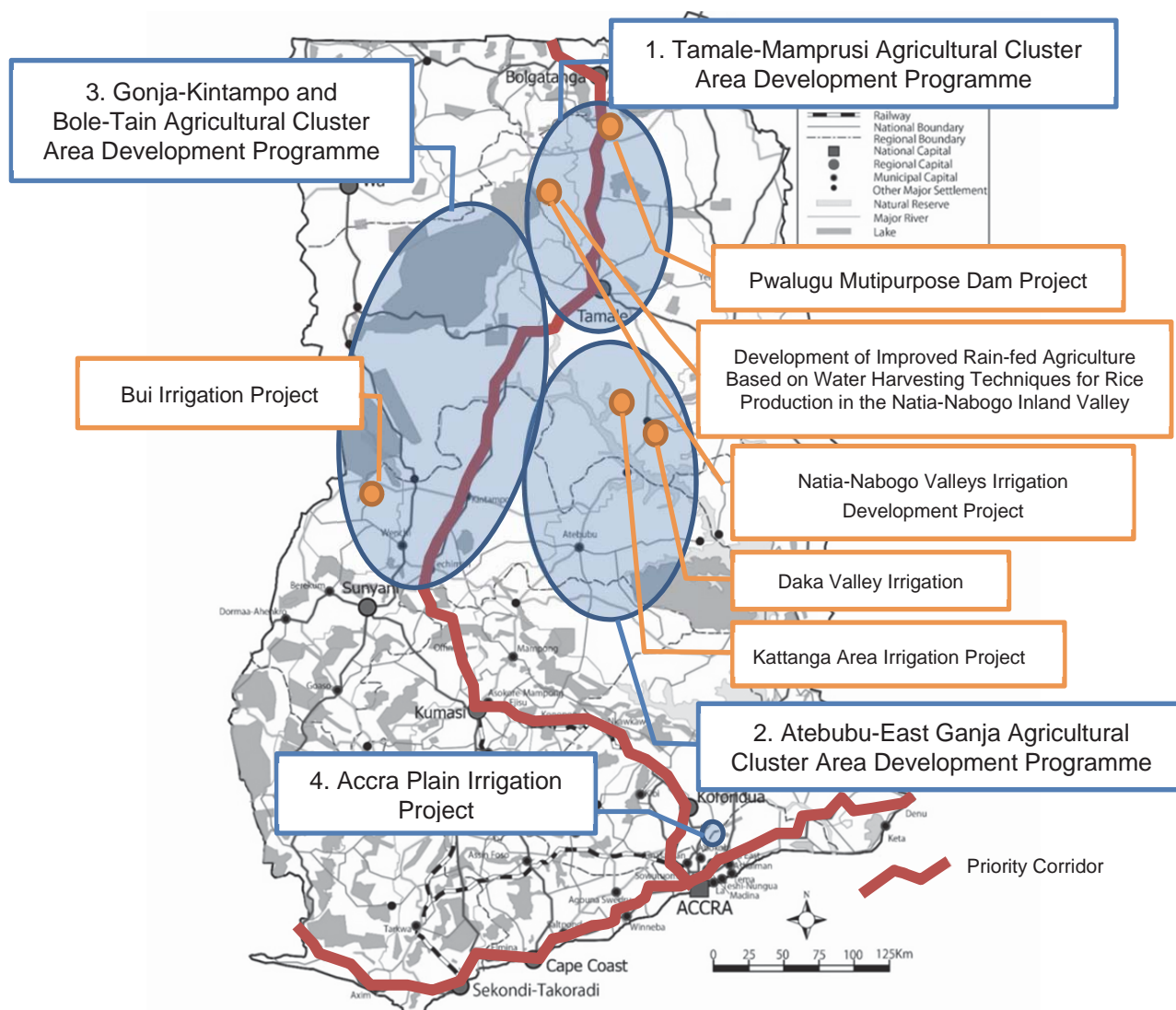
22.1.6 Priority Projects for Agricultural Sector in Ghana

The agriculture sector is key to overall economic growth and development of Ghana. At the same time, the sector supports livelihood of rural inhabitants as well as supports food security of the country.

The corridor development will contribute to improve transportation of agricultural input to farms, as well as transportation of produce to the market with timely and low cost movement. It will enable farmers/farms to reduce production cost, to increase productivity, and to access regional and international markets as well as wide domestic markets. The development of corridor infrastructure will make it possible to develop accumulation centres and/or processing centres for agricultural products within or near the production area. It will bring the growth of the value chains of certain agricultural products covering from production in the field, distribution, processing to market. Of primary importance, the provision of such corridor infrastructure will bring in private investment to the potential agricultural production area. It will promote and accelerate the development of agriculture in the area.

The priority projects for agriculture sector were selected considering above mentioned aspects. The locations of the priority projects are shown in Figure 22.1.1.

- Tamale-Mamprusi Agricultural Cluster Area Development Programme
- Atebubu-East Ganja Agricultural Cluster Area Development Programme
- Gonja-Kintampo and Bole-Tain Agricultural Cluster Area Development Programme
- Accra Plain Irrigation Project



Source: JICA Study Team

Figure 22.1.1 Locations of Priority Projects in the Agriculture Sector of Ghana

22.1.7 Profiles of the Priority Projects for the Agriculture Sector

(1) Tamale-Mamprusi Agricultural Cluster Area Development Programme Phase 1

1) Rationale

The Tamale-Mamprusi Agricultural Cluster Area is one of the top priority areas in the Spatial Development Framework (NSDF) for the Northern Savannah Ecological Zone (NSEZ). The Area includes Zone-2 of the Agri-business Development Zones of the “Resources and Masterplan for the Transformation of Agriculture in the SADA Zone”. The Area is expected to increase production of food crops including rice and other grains, through utilizing the full potential of the land and water resources, and promotion of poultry production. It will contribute to food security and emergency stores of food for the country. Tamale city, which has a huge advantage, especially for marketing and processing of agricultural products, is located within the area. Thus, various value chains of agricultural products including rice and other grain crops are expected to be developed and this will contribute to increase growth in incomes and marketing of agricultural products.

2) Objectives

The main objective of the programme is to increase agricultural production and develop value chains of the various agricultural products in the Tamale-Manprusi Agricultural Cluster Area, by utilizing

the natural and economic potential of the area. Food crops including rice and other grain crops are considered some of the most promising products of the area. Other objectives are:

- To increase production of rain-fed paddy rice by applying improved rain-fed agriculture based on water harvesting techniques
- To increase production of rice, maize, soybeans, etc. and other crops which have comparative advantage by development of irrigation farm land
- To develop a modern rice storage and processing centre at Tamale city, so as to supply rice to the domestic market and, in the future, it is expected to be exported to neighbouring countries
- To increase production of maize and soybeans and to develop value chains such as flour, edible oil and animal feed especially for poultry
- In the future, to produce various cash crops such as vegetables and fruits in the irrigated land, which are expected to be shipped to the major domestic markets, such as Accra and Tema, in the southern part of the country

3) Project Description

The Tamale-Mamprusi Agricultural Cluster Area is located in Mamprusi West, Tolon Kumbugu and Savelugu Nanton Districts and Tamale Metropolis.

The project specifications are as below.

- Implementation of Development of Improved Rain-fed Agriculture based on Water Harvesting Techniques for Rice Production in the Natia-Nabogo Inland Valley, of which expected developed area is 10,000ha
- Irrigation development of Natia-Nabogo Valleys Irrigation Development Project (Walewale, Nasia, Nobogo and Pong Tamale Area) of which it is expected that irrigable area will be 10,000-30,000ha. This project is expected to be implemented by a Public Private Partnership (PPP) scheme
- Irrigation development of Pwalugu Mutipurpose Dam Project (VRA)
- Promotion of commercial poultry production
- Attracting private investment for storage and processing facilities for rice and other agricultural products
- Attracting private investment for oil mill processing facilities for maize and soybeans
- Attracting private investment for animal feed processing and supply especially for poultry
- Strengthening of public technical extension service and application of private sector for technical extension, especially for rain-fed paddy rice cultivation and irrigation farming by small scale farmers
- Enhancement of supply chain of agricultural input to which small scale farmers can access easily
- Increase access to post harvest services such as storage and milling in order to increase quality of products
- Enhancement of agricultural machinery service provider (agricultural machinery centre) through private investment

4) Expected Benefits

The following benefits are expected in this project:

- The production of food crops such as rice will increase and contribute to satisfy the growing demand in the county. It will contribute to reduce the amount of imported rice through replacing the export with the domestic rice production.
- Development of value chains of agricultural products including rice, maize, soybeans, etc. will

contribute to increase growth in incomes and marketing of agricultural products.

5) Executing Agency and Related Institutes

Expected executing agencies and related institutions for this project are listed below.

- MOFA
- Savannah Accelerated Development Authority (SADA)
- Ghana Commercial Agriculture Project (GCAP)
- Ghana Irrigation Development Authority (GIDA)
- District Assemblies

6) Estimated Project Cost

The estimated project cost is counted:

- Natia-Nabogo Valleys Irrigation Development Project: 191.2 million USD for 3 years
- Mutipurpose Dam Project (Irrigation Component): 200 million USD for Pwalugu Mutipurpose Dam Project (Irrigation Component): 200 million USD for 8 year (estimated by GIDA)

7) Necessary Actions for Implementation/Critical Factor

Necessary actions for implementing this priority project are as follows:

- Implementation of the feasibility study of key projects such as Natia-Nabogo Valleys Irrigation Development Project
- Development of access roads to the potential areas of key projects

8) Related Plans and Projects

- Ghana Agriculture Sector Investment Programme (GASIP)
- GCAP
- Spatial Development Framework for the Northern Savannah Ecological Zone

9) Social and Environmental Impacts

The programme includes development of irrigation facilities and rural tracks. It is necessary to assess the social and environmental impacts when the feasibility study is conducted.

(2) Atebubu-East Gonja Agricultural Cluster Area Development Programme Phase 1 (including Daka Valley Irrigation Project)

1) Rationale

The Atebubu-East Gonja Agricultural Cluster Area is one of the top priority areas in the Spatial Development Framework (SDF) for the Northern Savannah Ecological Zone (NSEZ). The Area consists of Zone-3 and Zone-4 of the Agri-business Development Zones of the “Resources and Masterplan for the Transformation of Agriculture in the SADA Zone”. The area is expected to increase production of food crops including rice and other grains, through utilizing the full potential of the land and water resources, and promotion of poultry production. This will contribute to food security and emergency stockpiles of food for the country. The cluster area is close to Tamale, which is a huge advantage especially for marketing and processing of raw products and semi-processed products into finished goods. Thus, it will be easy to establish various value chains of agricultural products. In addition to the value chains of rice and other grain crops, value chains of emerging cash crops such as cashew are expected to be developed. This will contribute to increase growth in incomes and marketing of agricultural products.

2) Objectives

The main objective of the programme is to increase agricultural production and develop value chains of the various agricultural products in the Atebubu-East Gonja Agricultural Cluster Area. By fully

utilizing the geographical advantage, which is the fact that the area is located close to Tamale, and there is great natural potential in and around the area, it is expected to increase production and develop value chains of various cash crops such as cashew, citrus, maize, and yams, as well as food crops including rice, other grains and soybeans. Other objectives are:

- To increase production of rice, grains, sugarcane, etc. and other crops which have comparative advantage by development of irrigation farmland
- To promote the production of promising crops, such as cowpea, sorghum, soybean, millet, ground nuts, etc. and to ship them to the market and processing factory in Tamale
- To attract fruit processing factories such as the citrus juice factory in Atebubu
- To promote production of emerging cash crops such as cashew nuts, dawadawa, and shea nuts in Atebubu-Amantin District
- In the future, agricultural products are expected to be shipped to the Greater Accra via water transportation on the Volta Lake

3) Project Description

The Atebubu-East Gonja Agricultural Cluster Area is located in East Gonja, Pru, Atebubu-Amantin, which is a part of Sene District.

The project specifications are as below.

- Implementation of Daka Valley Irrigation Project,
 - This project is set as a priority project in GIDA, Ghana Irrigation Development Program (2015)
 - Potential area of irrigation development is 35,000 ha. It is proposed to start with 10,000 ha as a pilot area development.
 - Target crops: rice, sugar cane, wide range of crops, livestock for infertile soil areas
 - Other investments in infrastructure should be coordinated (asphalt roads, power grid and Volta Lake landing)
 - A small landing site and ferry crossing on Volta Lake at Makango is expected to be upgraded and then it could serve as a hub for storage, processing and transportation for various agricultural commodities for both domestic consumption and export
- Katanga valley water management project
 - Conduct feasibility study and implement irrigation scheme on 50,000 ha
- To attract fruit processing factories such as the citrus juice factory in Atebubu
- To promote production of emerging cash crops such as cashew nuts, dawadawa, and shea nuts in Atebubu-Amantin District
- To attract private investment for storage and processing facilities for agricultural products
- Strengthening of public technical extension service and application of private sector for technical extension of irrigation farming by small scale farmers
- Research and development of selecting promising emerging cash crops and extension of cultivation technique
- Enhancement of supply chain of agricultural input to which small scale farmers can access easily
- Increase access to post harvest services such as storage and milling in order to increase quality of products
- Enhancement of agricultural machinery service provider (agricultural machinery centre) through private investment

4) Expected Benefits

The following benefits are expected in this project:

- The production of food crops, such as rice, will increase and contribute to satisfy the growing demand in the county.
- Production of emerging cash crops will contribute to increase growth in incomes and marketing of agricultural products.
- Development of value chains of agricultural products such as fruit processing factories will contribute to increase growth in incomes and marketing of agricultural products.

5) Executing Agency and Related Institutes

Expected executing agencies and related institutions for this project are listed below.

- MOFA
- SADA, GCAP, GIDA and District Assemblies

6) Estimated Project Cost

The estimated project cost is counted:

- Daka Valleys Irrigation Development Project: 32.4 million USD (3 years) for initial development of 3,000ha of pilot area
- Kattanga Valley Water Management Project: 500 million USD (10 years)

(estimated by GIDA)

7) Necessary Actions for Implementation/Critical Factor

Necessary actions for implementing this priority project are as follows:

- Implementation of the feasibility study of the key projects such as Natia-Nabogo Valleys Irrigation Development Project
- Development of access roads to the potential areas of the key projects

8) Related Plans and Projects

- GASIP
- GCAP
- Spatial Development Framework for the Northern Savannah Ecological Zone
- A landing site and ferry crossing on Volta Lake at Makango is expected to be upgraded which means that it could serve as a hub for storage, processing and transportation for various agricultural commodities for both domestic use and export.

9) Social and Environmental Impacts

The programme includes development of irrigation facilities and rural tracks. It is necessary to assess the social and environment impacts when the feasibility study is conducted.

(3) Gonja-Kintampo and Bole-Tain Agricultural Cluster Area Development Programme Phase 1 (including Bui Irrigation Scheme Project)

1) Rationale

The Gonja-Kintampo Agricultural Cluster Area is one of the top priority areas in the Spatial Development Framework (SDF) for the Northern Savannah Ecological Zone (NSEZ). The Area consists of Zone-5 and the southern part of Zone-6 of the Agri-business Development Zones of the “Resources and Masterplan for the Transformation of Agriculture in the SADA Zone”. The Kintampo market provides the most effective economic link between the southern and northern parts of the country trading in all of the major eleven food crops in the country. It offers the second largest

market, just behind Tamale, and should be well established to provide marketing outlets for all the clusters, particularly districts in the southern part of the NSEZ. For crop production, the Area is leading in the production of all the comparative advantaged crops, and the Area has a high potential in production of cereal.

The Bole-Tain Agricultural Cluster Area is not categorized as a top priority area in the Spatial Development Framework. However, the Area is adjacent to the Gonja-Kintampo Agricultural Cluster Area and it has a great potential in the production of rice and cashews. The Area has a key irrigation development project, the Bui Irrigation Scheme, which has a high potential for irrigation development. Cashew produced in the Area is expected to be gathered and processed in Kintampo. Thus, the Bole-Tain Agricultural Cluster Area is planned to be developed together with the Gonja-Kintampo Agricultural Cluster Area.

2) Objectives

The objective of the programme is to increase agricultural production and develop value chains for the various agricultural products by utilizing the full natural and economic potential of the area. Rice, cereals and cashew and other emerging tree crops are considered some of the promising products of the Area. Other objectives are:

- To increase production and processing of all cereals and cashew
- To increase production and processing of maize for cornflakes
- To increase cashew production in both cluster areas, Gonja-Kintampo and Bole-Tain, with high concentration in Bamboi and New Lorno areas
- To develop Kintampo as a cashew processing centre covering Bole and Atebubu clusters
- To increase rice production of the Bole-Tain Agricultural Cluster Area and make the Area one of the major rice producing and processing areas
- To promote ginger production

3) Project Description

The Gonja-Kintampo Agricultural Cluster Area is located in West Gonja, a part of Central Gonja, Kintampo North, and Kintampo South Districts, and the Bole-Tain Agricultural Cluster Area consists of Sawla-Tuna-Kalba, Bole, and Tain Districts.

The project specifications are as below.

- Bui Irrigation Scheme Project
- The required reservoir, Bui Hydro-power Dam, has already been built. Only the head works and water conveyance are required.
- Irrigation target area is 30,000ha. Starting at 5,000 ha as a first phase.
- Target crops: rice, tree crops such as cashew, citrus and mango.
- To invite interested parties to establish a cashew processing plant in Kintampo expecting supply from Bole and Atebubu clusters
- To promote ginger production
- Strengthening of public technical extension service and application of private sector for technical extension of irrigation farming by small scale farmers
- Research and development of selecting promising emerging cash crops and extension of cultivation technique
- Enhancement of supply chain of agricultural input to which small scale farmers can access easily
- Enhancement of agricultural machinery service provider (agricultural machinery centre) through private investment

4) Expected Benefits

The following benefits are expected in this project:

- Production of cashew of the Agricultural Cluster Areas of Gonja-Kintampo and Bole-Tain will increase.
- Kintampo will become a gathering and processing centre for agricultural products, such as cereal crops and cashew.
- The Bole-Tain Agricultural Cluster Area will become one of the major rice producing and processing areas.

5) Executing Agency and Related Institutes

Expected executing agencies and related institutions for this project are listed below.

- MOFA
- SADA, GCAP, GIDA and District Assemblies

6) Estimated Project Cost

The estimated project cost is counted:

- Bui Irrigation Scheme Project: 60 million USD (5 years) for development of 5,000ha of pilot area (estimated by GIDA)

7) Necessary Actions for Implementation/Critical Factor

Necessary actions for implementing this priority project are as follows:

- Implementation of the feasibility study of key projects such as Natia-Nabogo Valleys Irrigation Development Project
- Development of access roads to the potential areas of key projects

8) Related Projects

- GASIP
- GCAP
- Spatial Development Framework for the Northern Savannah Ecological Zone
- Bui Hydro-power Dam Project

9) Social and Environmental Impacts

The programme includes development of irrigation facilities and rural tracks. It is necessary to assess the social and environmental impacts when the feasibility study is conducted.

(4) Accra Plains Irrigation Development Project

1) Rationale

Accra Plains is located within the Greater Accra and the Volta Regions of Ghana, on the lower banks of the Volta River. Kpong Irrigation Scheme (KIS) was rehabilitated by the Ghana Irrigation Development Authority (GIDA) in 2003 after years of poor maintenance. To date, however, the irrigation infrastructure for the KIS remains in poor condition and in need of upgrade and rehabilitation work. A new irrigation development plan for selected areas of the Accra Plains, including the rehabilitation of the former KIS Project areas, has been initiated following a new commitment from the Government of Ghana to improve Ghana's agricultural production. This new initiative is being led by the MOFA and GIDA.

2) Objectives

The objective of this development scheme is to rehabilitate the existing KIS and extend new irrigation infrastructure and services to a proposed additional 8,000 ha under the New Development

Irrigation Scheme (NDIS). MOFA and GIDA's development initiative also targets private sector investment through PPP arrangements for the development, operation and maintenance of new and rehabilitated irrigation infrastructure and the crowding-in of commercial agriculture firms.

3) Project Description

The project specifications are as below.

- Under the proposed PPP arrangement, a private operator would finance, supervise, operate and maintain the Accra Plains Irrigation Scheme leading to the development of up to 11,000 ha of irrigated land.
- The Scheme would require the rehabilitation of the KIS Irrigation Project area as well as the construction, operation and maintenance of the new NDIS irrigation network.
- Target crops and value chains: Production and processing of rice, vegetables, and fruits
- Pre-feasibility studies have been completed for the entire area and a detailed feasibility study has been completed for an area of 11,000 ha. The government is looking for a loan for the construction of the project after which management entities will be funding sources for the operation of the scheme.
- Strengthening of public technical extension service and application of private sector for technical extension of irrigation farming by small scale farmers
- Strengthening of farmers' association especially for marketing and water user's organization
- Enhancement of supply chain of agricultural input to which small scale farmers can access easily
- Increase access to post harvest services such as storage and milling in order to increase quality of products
- Enhancement of agricultural machinery service provider (agricultural machinery centre) through private investment

4) Expected Benefits

The following benefits are expected in this project:

- KIS will be maintained at a level that allows it to perform its proper function and the production of rice and vegetables will be increased.
- NDIS will be developed and commercial farms will start to produce agricultural products.

5) Executing Agency and Related Institute

Expected executing agencies and related institutions for this project are listed below.

- MOFA, GIDA
- GCAP and District Assemblies

6) Estimated Project Cost

The estimated project cost is counted 110 million USD for 5 years (estimated by GIDA)

7) Related Project

- GCAP

8) Social and Environmental Impacts

The Project includes development of irrigation facilities. It is necessary to assess the social and environmental impact when the feasibility study is conducted.

22.2 Livestock Sector of Ghana

22.2.1 Introduction

The agriculture sector, which composes subsectors of crops, livestock, forestry and logging, and fishing, is 22.0% of total Non-oil Gross Domestic Product (GDP). Among total GDP generated by the agricultural sector, the livestock subsector occupies only 5.8% of GDP generated by the agricultural sector. The livestock is a weak and minor subsector in Ghana.

The livestock sector of Ghana is dominated by small scale operators who are mainly crop farmers keeping livestock to supplement their incomes and/or for food security purposes. There are a few well organized commercial poultry and pig operations.

The quantity of domestic meat produced has been increasing in recent years and the self-sufficiency of meat production has increased from 44.5% in 2008 to 75.8% in 2014. On average, the country over the period met about 60% of its meat requirements annually from local production. Among the imports of meat, poultry represents a high proportion. Due to rapid growth of domestic poultry production, the proportion decreased from 75.8% to 67% in 2014.

In the Food and Agriculture Sector Development Policy II (FASDEP II), the livestock development policy sets the goals as “increasing the supply of meat, animal and dairy products from domestic production, which is at the current aggregate level of 30% to 80% by the year 2015; and contributing to the reduction of the incidence of poverty among farmers (who are also livestock keepers) from 59% to 30% by the year 2015.” Because the increase of domestic demand for meat products is expected, the increase of livestock production is still desired. Increase of livestock production is able to contribute to income growth of small farmers as well as to contribute to the national economy through reducing this import commodity.

22.2.2 Issues on the Livestock Sector of Ghana

The development issues in the livestock sector of Ghana can be pointed out:

- Low use of improved technology and practices with livestock by farmers.
- Low productivity of animal breeds and low production of improved breeds to meet demand.
- Limited market linkages for livestock and poultry products.
- Poor rural infrastructure (poor road network, limited rural industries, inadequate energy and access to potable water etc.).
- Poor quality of data and monitoring systems.
- High cost of feed and poor management practices
- High levels of animal diseases as well as inadequate and poor quality feed and water for animals.
- Specific issues for Poultry
 - Lack of processing plants
 - High cost of poultry production due to high feed cost
 - Comprehensive procedures to obtain vaccines
 - Poultry diseases
 - Lack of financing scheme for farmers
- Issue of transhumance, which is threatening national cattle production with the huge competition for grazing land.

22.2.3 Objectives for the Livestock Sector of Ghana

The development goal of the livestock sector is to increase the supply of meat, animals and dairy products from domestic production through promoting livestock and poultry development, so that

food security will be ensured, the share of imported meat will be reduced, and the income of local farmers will be generated.

In order to achieve the development goals, the objectives of the livestock sector are defined as:

- To increase productivity and production of livestock and poultry, which will contribute to improving food security and reducing imports,
- To create added value of livestock products by improving product quality and developing processing and market facilities, which will contribute to realize increased growth in incomes
- To improve animal feed supply and reduce cost for animal feed, which will contribute to realize increased growth in incomes.

22.2.4 Strategies for the Livestock Sector of Ghana

The strategies for the livestock sector development in Ghana are the following:

(1) Basic Strategy related to Breed Improvement and Extension Service to Farmers/Producers

- Strengthen research into large scale breeding and production of guinea fowls, cattle, sheep, and goats, especially in the northern regions
- Strengthen existing training facilities and establish additional ones in animal health
- Intensify disease control and surveillance, especially for zoonotic and scheduled diseases
- Support the production of small ruminants
- Promotion of out grower farms among proven selected farmers in various communities for the supply of breeding stock to commercial and small scale farmers. The Breeding Stations can be resourced to serve as focal points to facilitate this action
- Organizing and strengthening livestock farmers' associations.

(2) Basic Strategy related to Poultry Development

- Collaboration of the poultry industry and Agricultural Cluster Area Development
- Develop commercial poultry as a priority for improving meat supply in the short-term, while measures are implemented to transform smallholder production into profitable enterprises, or introduction of the out-grower concept and promotion of private investment in the poultry production sector
- Interventions to address processing and marketing of livestock and increase the awareness on food safety and public health
- Processing plants and cold storage, to meet demand of the market
- Promotion of guinea fowl production

(3) Basic Strategy related to Improvement of Animal Feed Supply

- Support large scale cultivation of maize and soya beans for the formulation of animal feed
- Promote integrated crop-livestock farming
- Develop technology and promote use of by-products of crop production and processing for animal feed.
- Securing a stable supply of animal feed at a low price through enhancing production of feed crops and developing stable supply channels to farmers
- Establishment of production centres for feed crops such as maize linking with poultry and other animals such as pig production

(4) Basic Strategy related to Issues on Transhumance

- Development of transhumance routes for cattle

22.2.5 Programmes and Projects for the Livestock Sector of Ghana

The following programmes, projects and measures were planned:

(1) Breed Improvement

Table 22.2.1 Improvement of Livestock Stations in Ghana

	Station	Region	Major Activity
a.	Ejura Sheep Breeding Station	Ashanti	Breed improvement of the Djallonke sheep
b.	Nungua Livestock Breeding Station	Greater Accra	Breed improvement of Pigs
c.	Pong Tamale Livestock Breeding Station	Northern	Breed improvement of cattle, sheep, goats, pigs, guinea fowls, milk processing
d.	Kintampo Goat Breeding Station	Brong Ahafo	Breed improvement of goat
e.	Babile Pig Breeding Station	Upper West	Breed improvement of the ashanti forest black pig
f.	Amrahia Dairy Farm	Greater Accra	Breed improvement through artificial insemination, training and milk processing
g.	Nkwanta livestock Breeding Station	Volta	Breed improvement of sheep, goats, use donkeys as animal traction

Source: JICA Study Team

(2) Poultry Production and Processing Development

- Poultry Production Promotion Project
- Development of Poultry Processing Plants with Cold Storage

(3) Dairy Development

- Development of Artificial Insemination Centres at Pong Tamale, Amrahia, Ejura (based on Livestock Stations)

(4) Feed Resources Development

- Technical extension of integrated crop-livestock farming technology
- Development of Animal Feed Resources Centres in each district
- Development of Fodder Seed Production Centre at Ejura Sheep Breeding Station

(5) Formulating National Plan for Transhumance Management

- Formulating National Plan for Transhumance Management

22.2.6 Priority Projects for Livestock Sector of Ghana

The access to road transportation provided by the corridor development will contribute to increase productivity of the sector through reducing transportation cost of inputs such as animal feed and the shipping products, and to develop the value chain of livestock through bringing in the investment to production and market related facilities.

In prove the productivity and quality of the sector, such as providing appropriate support service for superior breeds of livestock by rehabilitation of breeding station network.

Because Ghana is noted to be a big importer of poultry products, well-developed and competitive local livestock and poultry industries are expected to be developed. The poultry sub-sector is considered to have a high potential to increase production, because of the potential availability of grains which are the base ingredients for feed meal production. The corridor infrastructure will prepare an attractive environment to private investment for developing meat processing plants, cold storage and other necessary distribution infrastructure.

The priority projects shown below were selected considering above mentioned aspects.

(1) Improvement of Pong Tamale Livestock Breeding Station, Babile Pig Breeding Station and Amrahia Dairy Farm

- Pong Tamale Livestock Breeding Station
- Babile Pig Breeding Station
- Amrahia Dairy Farm

(2) Formulating National Plan for Transhumance Management

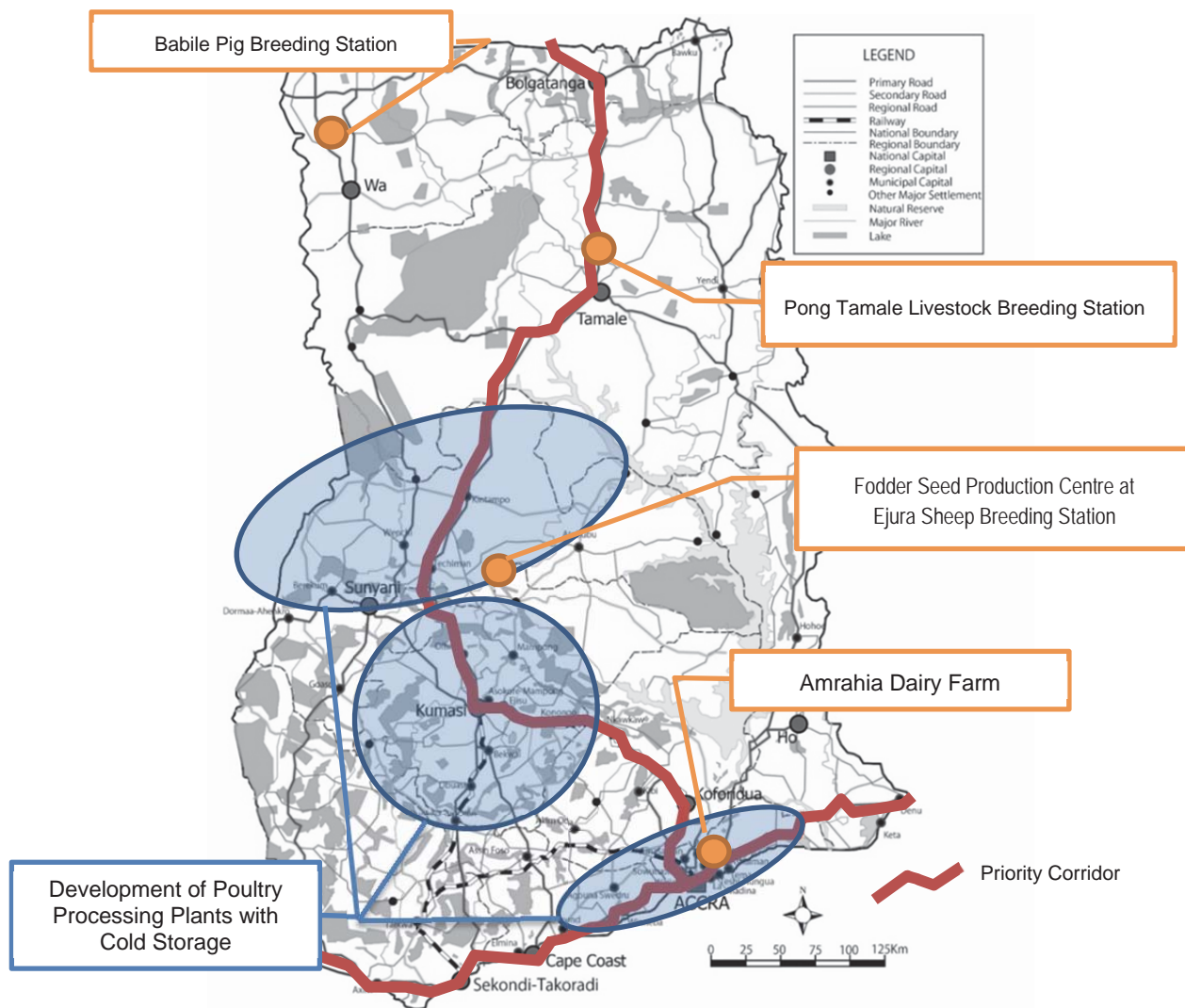
- Identifying potential grazing land
- Creating designated corridors/routes for transiting cattle
- Improving quarantine stations
- Establishing monitoring system

(3) Development of Poultry Processing Plants with Cold Storage

- New facilities in Greater Accra, Ashanti and Brong Ahafo Regions where poultry production is high. Not yet decided on the towns and districts.
- Technical support to farmers/producers, such as facilitating farmers' access to credit, ensuring high standards of hatchery hygiene and feed quality, improving availability of poultry vaccines and drugs.

(4) Feed Resource Development Project

- Technical extension of integrated crop-livestock farming technology
- Development of Animal Feed Resources Centres in each district
- Development of Fodder Seed Production Centre at Ejura Sheep Breeding Station



Source: JICA Study Team

Figure 22.2.1 Locations of Priority Projects of Livestock Sector of Ghana

22.2.7 Project Profile of the Priority Projects for the Livestock Sector of Ghana

(1) Feed Resource Development Project Phase 1

1) Rationale

Some of the constraints affecting ruminants in Ghana are poor nutrition in terms of quality and quantity. In the dry season especially, animals lose weight and this affects production and productivity. Feed contributes about 70% to the cost of production for any livestock project. Thus the improvement of the nutrition of the animals with cost effective measures, as well as the improvement of the feeding technology of producers, is very important in the production cycle.

2) Objectives

The objective of the project is to increase production and productivity of the livestock sector through improving nutrition for the animals from the aspects of ensuring all year round nutrition, increasing animal feed production including effective use of agro by-products, and decreasing feeding cost.

3) Project Description

The project specifications are as below.

- Technical extension of integrated crop-livestock farming technology

- Development of Animal Feed Resources Centres in each district, which provide technical extension for processing and production of valuable feed for livestock to reduce the cost of feeding, including dissemination of feed use of by-products of crop production and processing, supplying fodder seed to farmers, support for organizing livestock farmers and strengthening livestock farmers' associations, etc.
- Development of Fodder Seed Production Centre at Ejura Sheep Breeding Station
- Research and development of feeding technology, including the development and use of agro by-products for animal feed, such as yam peels, brewer's spent malt, corn chaff, rice bran and straw, maize/millet/sorghum stover

4) Expected Benefits

The following benefits are expected in this project:

- Increase in the area of the natural pasture improvement
- Reduction of feeding cost for animals and ensure appropriate nutrition
- Increase of productivity of livestock production

5) Executing Agency

Expected executing agency is listed below.

- MOFA

6) Social and Environmental Impacts

The project includes development and operation of building facilities, ranch paddocks and forage fields. Because they are rehabilitation of existing facilities, major social and environmental impacts will not be expected.

(2) Improvement of Livestock Stations of Pong Tamale Livestock Breeding Station, Babile Pig Breeding Station and Amrahia Dairy Farm Phase 1

1) Rationale

There has been a growing trend among farmers to mate larger and heavier imported strains of livestock from the sub-region with the indigenous breeds to produce offspring and strains of higher mature weight, or of other important commercial traits. It is therefore important that breed improvement programmes will be pursued with the aim of making the various breeds attain optimum productivity and commercial objectives.

Currently, there are seven breeding stations operated by MOFA. Even though they have an important role in promoting and modernizing animal production by local producers, most stations face many problems due to the aged facilities and malfunctioning of equipment. Thus, rehabilitation and upgrade of the facilities of breeding stations is considered an urgent issue.

2) Objectives

The objective of the project is to improve the productivity of livestock producers through providing appropriate support service to meet the quest and demand for superior breeds of livestock by rehabilitation and upgrade of facilities of selected breeding stations.

The breeding stations can be resourced to serve as focal points to facilitate the development of out grower farms among proven selected farmers in various communities for the supply of breeding stock to commercial and small scale farmers.

3) Project Description

The project specifications are as below.

Pong Tamale Livestock Breeding Station

Major activities of the station:

- Breed improvement of cattle, sheep, goats, pigs and guinea fowls
- Improvement of milk processing
- Major improvement/installation of facilities
- Construction of new kraals and rehabilitation of existing pens for cattle
- Construction of small ruminant pens
- Establishment of artificial insemination centre
- Increase of hatchery capacity for Guinea fowls
- Guinea fowls housing structures
- Rehabilitation of mini dairy factory
- Establishment of pasture land

Babile Pig Breeding Station

Major activities of the station:

- Breed improvement of the Ashanti Forest Black Pig

Major improvement/installation of facilities:

- Rehabilitation and renovation of infrastructure
- Construction of growers pen
- Installation of tools and equipment

Amrahia Dairy Farm

Major activities of the station:

- Breed improvement of milk cows
- Artificial insemination
- Improvement of milk processing
- Training of producers

Major improvement/installation of facilities

- Construction of paddocking
- Construction of artificial insemination laboratory
- Rehabilitation of cattle shed, watering system, silage bunker
- Installation of tools, equipment and farm machinery
- Breeding stock 1,000 heifers
- Establishment of pasture land
- Construction of training centre

4) Expected Benefits

The following benefits are expected in this project:

- Pong Tamale Livestock Breeding Station will function properly and provide genetically superior breeding stocks, technical services for breed improvement of cattle, sheep, goats, pigs and guinea fowls, and improvement of milk processing.
- Babile Pig Breeding Station will function and provide genetically superior breeding stocks, technical services for breed improvement of the Ashanti Forest Black Pig.
- Amrahia Dairy Farm will function and provide technical services for breed improvement of milk cows through providing genetically superior breeding stocks, artificial insemination, improvement of milk processing and training of producers.

5) Executing Agency

Expected executing agency is listed below.

- MOFA

6) Estimated Project Cost

The estimated project cost is counted:

- Improvement of Pong Tamale Livestock Breeding Station, Babile Pig Breeding Station and Amrahia Dairy Farm: 12,094,000 GHC (estimated by MOFA/APD)

7) Social and Environmental Impacts

The project includes development and operation of building facilities, ranch paddocks and forage fields. Because they are rehabilitation of existing facilities, major social and environmental impact will not be expected.

(3) Development of Poultry Processing Plants with Cold Storage Phase 1

1) Rationale

The production of poultry meat has been increasing rapidly to meet the increasing domestic demand in recent years, however, some issues become constraints to increasing production and supply to the market. Already there is enough hatchery capacity to produce an adequate supply of day old chicks and the infrastructures exist for commercial production of both meat and eggs. What is required now in order for the industry to perform satisfactorily is to facilitate farmers' access to cheaper credit, reduce imports of poultry products, ensure high standards of hatchery hygiene and feed quality as well as availability of poultry vaccines and drugs. There is also the need to facilitate the establishment of three poultry processing plants with cold storage facilities where poultry production is high. This will allow for broilers at maturity (6-7weeks) to be processed and stored for sale to consumers and curb the incidence of farmers having to keep mature birds beyond the optimal economic period.

2) Objectives

The objective of the project is to develop processing plants with cold storage facilities which will enable farmers/producers to ship poultry at the most advantageous timing so that farmers will not have to keep mature birds beyond the most economical period.

The processing plants with cold storage shall be developed in Greater Accra, Ashanti and Brong Ahafo Regions where poultry production is high, however, it is not yet decided in which towns and districts.

3) Project Description

The project specifications are as below.

- Development of poultry processing plant with cold storage in: Greater Accra, Ashanti and Brong Ahafo Regions where poultry production is high. It is not yet decided in which towns and districts. Further study is required to determine the exact locations and specifications of the facilities.
- Technical support to farmers/producers, such as facilitating farmers' access to credit, ensuring high standards of hatchery hygiene and feed quality, improving availability of poultry vaccines and drugs.
- To attract poultry industry companies to introduce out-grower schemes with farmers.

4) Expected Benefits

The following benefits are expected in this project:

- Increasing quality of poultry meat at the market

- Reduction of production cost of poultry meat
- Increasing market access.

5) Executing Agency and Related Institute

Expected executing agencies and related institutions for this project are listed below.

- MOFA and District Assemblies

6) Necessary Actions for Implementation/Critical Factor

Necessary actions for implementing this priority project are as follows:

- It is required to obtain consensus between possible farmers who will participate in the out-grower schemes for poultry production.

7) Related Projects

- Ghana Broiler Revitalization Programme (GHBROP)
- GASIP¹

8) Social and Environmental Impacts

During the construction of the processing plants with cold storage buildings and their operation, some impact to the natural environment is expected, however, it will be little.

(4) Formulating National Plan for Transhumance Management

1) Rationale

The activities of alien herdsmen are currently a national security problem. These herdsmen do not only damage crops and the environment but in many cases have resulted in dangerous clashes between communities resulting in loss of human lives. The disturbing aspect of this problem is its recurrent nature on a yearly basis.

2) Objectives

In order to solve and prevent conflict between farmers and herdsmen, the National Plan for Transhumance Management will be formulated and the necessary institutional framework will be prepared.

3) Project Description

To overcome damage to crop farms and the environment as well as avoid unnecessary clashes and deaths, which ultimately affect the economy and the nation's food security situation, several interventions have been proposed. One of which is to select lands in the transitional and savannah ecological zones for development into grazing lands to cater for the cattle population for both local and migrant herdsmen. There is also the need to create designated corridors/routes for transiting cattle from neighbouring countries.

There are some quarantine stations along the borders of the northern part of Ghana for health checks before entry into the country. Improving on these stations will go a long way toward curbing the perennial menace.

The National Plan for Transhumance Management which will be formulated in the project consists of:

- Identifying potential grazing land
- Creating designated corridors/routes for transiting cattle
- Improving quarantine stations

¹ GASIP is expected to cover poultry and the small livestock sub-sector in their intervention area.

- Establishing monitoring systems

4) Expected Benefits

The following benefits are expected in this project:

- National masterplan and institutional framework for transhumance management will be prepared.
- By adopting the masterplan, transhumance routes for cattle will be developed and the conflict between local farmers and herdsmen will be reduced.

5) Executing Agency and Related Institute

Expected executing agencies and related institutions for this project are listed below.

- MOFA
- Related District Assemblies

6) Necessary Actions for Implementation/Critical Factor

Necessary actions for implementing this priority project are as follows:

- Formulating the consensus on the paddock area and transhumance route among both of local farmers and herdsmen.

7) Social and Environmental Impacts

The following social and environmental impacts should be taken into account:

- Conflicts over land and water for paddocking areas and transhumance routes between crop producers and herdsmen

22.3 Fisheries Sector of Ghana

22.3.1 Present Situation of Fisheries Sector in Ghana

In Ghana, the amount of fish consumption accounts for 60% of that of all animal protein consumption. Especially in the rural areas, smoked fish becomes one of the important sources of protein. The fisheries sector generates approximately 4.5% of Ghana's Gross Domestic Product (GDP).

By utilization of the Volta Lake, Ghana also has a high potential for developing aquaculture. In 2010, Ghana's annual output of aquaculture was estimated at 10,200 ton, according to the Fisheries Commission. A production target of 100,000 ton is expected to be achieved within a period of three years (2016-2019).

On the other hand, the marine fisheries sector in Ghana has approximately 300,000 ton of catch. In 1996, Ghana experienced the largest catch of over 450,000 ton from marine fisheries. In the past decade, the catch amount has been stable.

The Ghana National Aquaculture Development Plan (GNADP) prepared by the Fisheries Commission in 2012 aims at filling the large gap between national fish demand and supply in the medium term by taking advantage of its environment of strong research capacity and of rising local and international prices of fish.

The Fisheries Management Plan was prepared to provide a strategic policy framework to ensure the sustainable management of the fisheries resources of Ghana.

22.3.2 Issues on the Fisheries Sector in Ghana

The following issues are identified regarding the fisheries sector in Ghana:

- Increasing demand for fish products with the growth of population
- Fish stock in the Gulf of Guinea can decline due to heavy exploitation by the fisheries sector and lack of information on stock assessment
- Lack of effective enforcement of fisheries legislation
- Post-harvest losses
- Transport barrier to exporting fish to the neighbouring countries

22.3.3 Objectives for Development of the Fisheries Sector in Ghana

The objectives for development of the fisheries sector in Ghana are set as follows:

- To develop marine fisheries in a sustainable manner in order to conserve fishery resources in the Gulf of Guinea for the future
- To develop aquaculture in order to satisfy the county's demand and also to supply fish products to surrounding countries

22.3.4 Strategies for the Fisheries Sector in Ghana

The strategies for development of the fisheries sector in Ghana are as follows:

- To promote fisheries-related industry in Sekondi-Takoradi taking advantage of the corridor development and the construction of new Sekondi Fishing Port
- To establish cold chain networks in order to decrease postharvest losses and increase the amount of export of fresh fish to inland countries
- To increase the production of tilapia, catfish and tiger prawn by promoting aquaculture on the Volta Lake by using nutritious fish feed
- To increase production of nutritious fish feed to supply to aquaculture within Ghana but also to neighbouring countries
- To develop value chains for aquaculture in the Volta Lake

22.3.5 Programmes and Projects for the Fisheries Sector in Ghana

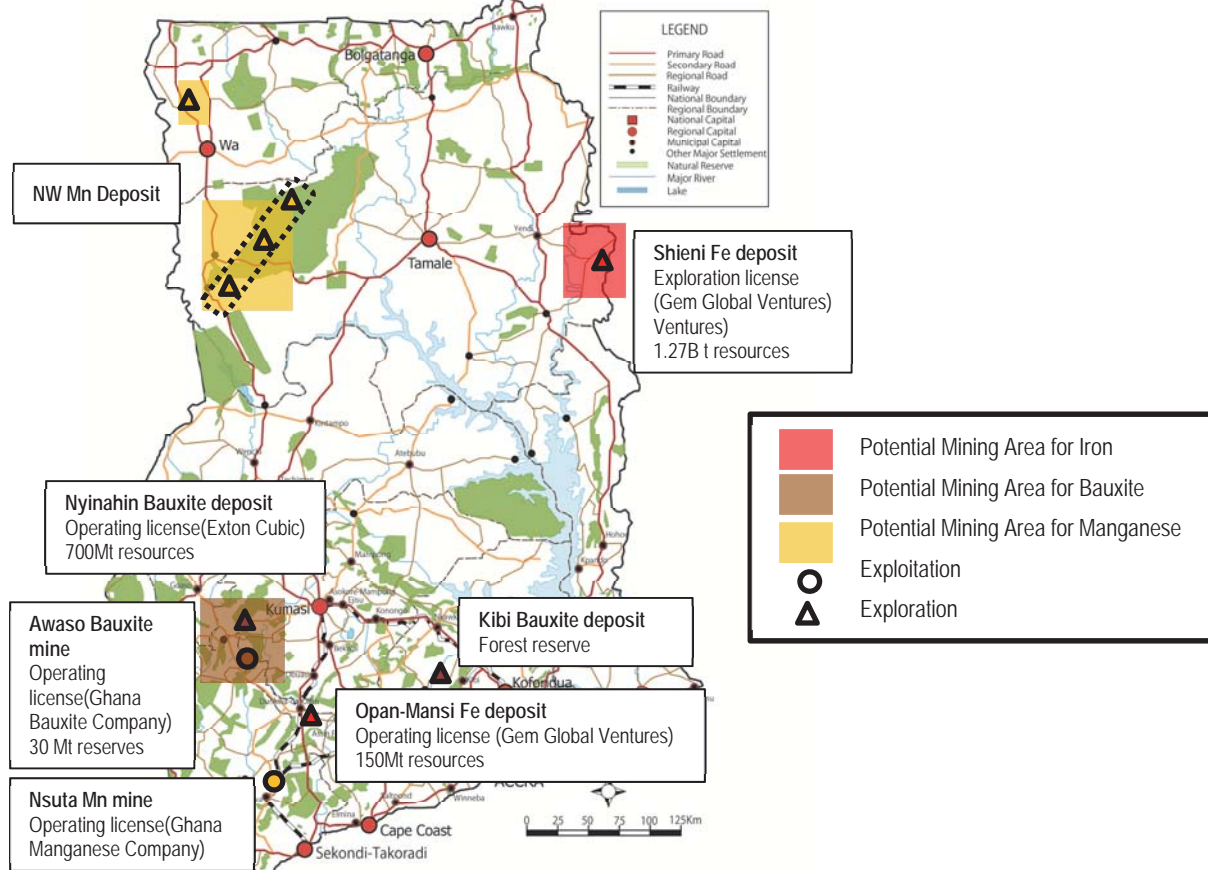
The following programmes and projects are proposed for the fisheries sector in Ghana:

- Project for developing fisheries-related industries, such as fish feed production and fish processing in Sekondi-Takoradi by preparing light industrial areas for food processing using fish
- Project for constructing necessary facilities for cold chain establishment along transport corridors
- Programme for aquaculture development on the Volta Lake
 - Development of fish landing sites on the Volta Lake
 - Development of road network between the Volta Lake and local urban centres
 - Establishment of value chain for aquaculture
- Capability development project for reducing illegal fishing

22.4 Mining Sector of Ghana

22.4.1 Present Situation of Mining Sector of Ghana

Ghana's most important mineral resources are gold, diamonds, manganese and bauxite. Among them, Gold is the most important in terms of government revenues. Other than gold, there are manganese and bauxite producing mines and also promising undeveloped bauxite and iron deposits. According to the Mineral Commission, the government's new policy for bauxite is to stop exporting raw bauxite and ensure that the ore is processed into alumina for use by local aluminium companies. Although this does not apply to current production like Awaso Mine which has already started mining, it applies to any new developed mines in the future.



Source: JICA Study Team

Figure 22.4.1 Existing and Potential Mining Sites in Ghana

Table 22.4.1 Mineral Reserves and Resources and Production Forecast of Main Mines

Ore Deposit	Reserves and Resources	Production forecast
Nsuta Mn Mine (Operating)	—	Production plan is not clear
Awaso Bauxite Mine (Operating)	30 million tons reserve (more than 20million tons produced)	Production plan is not clear.
Nyinahin Bauxite Deposit (Not developed)	700 million tons resources* 1billion tons resources **	2017: 3 million tons ** 2018: 12 million tons **
Opan-Mansi Fe Deposit (Not developed)	150 million tons Inferred resources*	—
Shieni Fe Mine (Not developed)	1.27 billion tons Inferred resources*	—

Source*: Minerals Commission, 2015

Source**: Exton Cubic Ltd, 2016

(1) Manganese Mines

1) Nsuta Mn Mine

The Ghana Manganese Company Limited (GMC) operates a manganese mine in Ghana. 90% is owned by Consolidated Minerals Limited, and the remaining 10% is owned by the Government of Ghana. GMC operates Nsuta manganese mine which produces a high grade manganese oxide ore in the Western Region of Ghana. GMC holds an exploitation concession for manganese over an area of 175 square kilometres in and around Nsuta. It produces around 1.5 million tons of ore per annum, and manganese ore is transported to Takoradi Port by rail or truck. The high grade oxide ore is being depleted and low grade carbonate ore needs to be mined for the extension of the mine life.

(2) Bauxite Mines and Deposits

1) Awaso Bauxite Mine

Bonsai Minerals Group is the owner of Ghana Bauxite Company, which owns Awaso bauxite mine. The ore produced at Awaso used to be transported by rail, but now it is transported to Takoradi Port by truck. The reserve is decreasing and additional exploration is needed for mine life extension.

2) Nyinahin Bauxite Deposit

Nyinahin bauxite deposit is regarded as one of the most promising undeveloped bauxite deposits located in the middle of Ghana. According to the Chamber of Mines, the resources of Nyinahin are estimated at over 700 million tons. However, it is said that the resources are more than 1 billion tons according to the estimation of Exton Cubic Ltd (Ghana capital company) which owns an exploration license. The company is considering setting up an alumina plant near the mine site. Currently, it is looking for an investment partner for the project.

(3) Iron Deposits

1) Shieni Iron Deposit

Shieni iron deposit is regarded as a huge undeveloped iron deposit, located in the eastern part of Ghana near the border with Togo. Emmaland Resources owns an exploration license. The amount of inferred resources for iron deposits is around 1.27 billion tons. Further works will be necessary to confirm the actual amount of deposit. The deposit is considered to extend to the western part of Togo. Lack of adequate infrastructure is one reason for the underdevelopment of Shieni iron deposit. As of now, there is no plan for the exploitation for the deposit.

2) Opon Masnsi Iron Deposit

Opon Masnsi iron deposit is owned by Gem Global Ventures Ltd (UK), and its resources are estimated at 150 million tonnes. A feasibility study is on-going, but the company has not done the necessary works under the agreement with the government owing to the shortage of cash needed to work the project, the government instructed the company to do some work and to proceed with the feasibility study.

22.4.2 Issues on Mining Sector of Ghana

The following issues are identified for the mining sector in Ghana:

- Stagnant mining activities in mineral recession periods
- Big potential mineral sites, such as Shieni iron site, are in the less accessible areas in Ghana which will be expensive for the mining company to prepare the means of transportation between the mining site and the sea port
- Lack of foreign investments in exploration and extraction of the mining sector
- Underdevelopment of downstream sectors of mining including processing of mineral resources within the country
- Unsafe condition of mine workers

- Negative impacts of mining projects on surrounding natural and social environments
- Lack of utilization of local people, including women, from local communities as a labour force in mineral resource development in their country
- Improper mining activities by artisanal small-scale mining

22.4.3 Objectives for Mining Sector of Ghana

The objectives for development of the mining sector are defined as follows:

- To sustain mining activities so that the mining sector could continue to contribute to the national economy and employment
- To develop transport infrastructure for transporting extracted minerals, as well as to deliver fuel and equipment for mining activities
- To attract foreign investments in exploration and extraction of the mining sector
- To create an industrial structure which focuses not only on upstream industries but also on downstream sectors including processing of mineral resources within the country
- To ensure the safety of mine workers, and to mitigate the impacts of mining projects on the surrounding natural and social environments
- To utilize local people, including women, from the local communities as the labour force in mineral resource development in their country.
- To enable artisanal small-scale mining to engage in proper mining activities in full consideration for the environment and local community.

22.4.4 Strategies for Mining Sector of Ghana

The following strategies are formulated for development of the mining sector in Ghana:

- To select potential target mines, formulate and implement an integrated programme for promoting sustainable mining activities by involving government organizations in charge of mining, the railway and roads, as well as investment promotion
- To raise the level of mining policies and laws to the same standards as those in advanced countries and develop mining businesses.
- To distribute taxes and royalties derived from mining activities to local communities and create a funding system that can contribute to community development, in addition to Corporate Social Responsibility (CSR) activities
- To establish a proper monitoring system of artisanal small-scale mining

22.4.5 Target Mines for Development of Mining Sector in Ghana

The mines to be targeted for development of the mining sector in Ghana are as follows:

- Nyinahin Bauxite Deposit
- Shieni Iron Deposit

Necessary interventions to promote sustainable development of Nyniahin's bauxite deposit are as follows:

- To activate investment in Nyinahin bauxite mine by attracting foreign investors who are interested in working together with existing mine owners or in buying existing mineral concessions
- To construct the railway section between Awaso and Nyinahin and to operate the rail transport from Nyinahin to Takoradi Port

Necessary interventions to promote sustainable development of Shieni iron deposit are as follows:

- To activate investment in Shieni iron mine by attracting foreign investors who are interested in working together with existing mine owners or in buying existing mineral concessions
- To consider possible transport routes including the following:
 - To construct and operate a new railway line between Shieni iron mine and Tema Port
 - To develop inland waterway transport by utilizing the Volta Lake to link Shieni iron mine and Tema Port
 - To construct a new railway line to connect Shieni iron mine with the prospective railway between Lomé and Kabou

22.5 Manufacturing Sector of Ghana

22.5.1 Present Situation of Manufacturing Sector in Ghana

The current Industrial Policy was set in 2012 within the context of Ghana's long-term strategic vision of achieving middle income status by 2020, through transformation into an industry-driven economy capable of delivering decent jobs with widespread, equitable and sustainable growth and development. For this to be achieved, the full spectrum of industrial policy instruments is formulated across 21 thematic policy areas.

These thematic areas have been categorized into four main components, namely: (i) Production and Distribution, (ii) Technology and Innovation, (iii) Incentives and Regulatory Regime and (iv) Cross-cutting Issues.

As for the Production and Distribution component, the following subjects/topics are designated as sub-components:

- Raw materials, input supply, plant, equipment and machinery,
- Industrial manpower development and training,
- Financing for industrial development,
- Land and infrastructure for industrial development,
- Industrial subcontracting,
- Marketing and distribution of industrial products, and
- Standards for industrial development.

Especially, in terms of land and infrastructure, the Industrial Policy by the Ministry of Trade and Industry stresses the challenge of land acquisition and the lack of adequate and cost-competitive physical infrastructure are critical factors constraining investment and competitive manufacturing performance. Consequently, development of industrial land and infrastructure are planned and will be executed over the long term.

In the Technology and Innovation component the following subjects/topics are designated as sub-components, (i) technology, innovation, research and development for industry, (ii) ICT for industrial development, and (iii) intellectual property rights for industrial development.

As sub-components of the Incentives and Regulatory component, the following subjects/topics are designated, (i) incentives for industrial development, (ii) industrial legislation and regulations, (iii) labour and industrial relations, (iv) spatial distribution and (v) strategic interventions for industrial development. In terms of spatial distribution, the Industrial Policy stresses that spatial distribution of industries is critical for achieving the government's strategic objective of widespread job creation and economic development in deprived areas since manufacturing establishments in Ghana are mainly concentrated in the capital region. This uneven distribution of industries is a challenge to creating balanced economic development and equity in the distribution of job opportunities and incomes.

In Cross-cutting Issues, several subjects, such as (i) to provide a safe and healthy workplace environment for employees in industrial establishments, (ii) to ensure that industrial development is pursued in an environmentally sustainable manner, (iii) to provide timely and credible data for decision making by firms and government and (iv) to ensure equal opportunities for men and women in industry are stated.

22.5.2 Issues regarding the Manufacturing Sector of Ghana

Especially from the viewpoint of the Corridor Development, the following are recognized as issues or constraints for industrial development.

- Lack of land and infrastructure for industrial development
- Insufficient value-added of agro-processing and industrial products and difficulties in marketing and distribution
- Lack of high technology for industries including the oil, gas and chemical industries
- Insufficient numbers of technicians and experts of high enough quality for industrial development

22.5.3 Objectives for Manufacturing Sector of Ghana

Major objectives for the manufacturing sector of Ghana are;

- To develop industrial zones especially along the North-South Corridor to promote agro-based industries, with high value-added products in particular,
- To develop high technology industries, especially in free zones, along the East-West (or Coastal) Corridor in accordance with the appropriate types of industrial subsectors,
- To strengthen the capacity of public vocational training

22.5.4 Strategies for Manufacturing Sector of Ghana

The strategies for the manufacturing sector of Ghana are determined as follows:

- To develop free zones and industrial zones along the East-West (or Coastal) and North-South Corridors,
- To support public Technical and Vocational Education and Training (TVET) institutes in response to the demand from the private sector,
- To introduce the following expected types of industrial sub-sectors such as food, beverage, and plastics for industrial zones along the Coastal and North-South Corridors as shown in **Table 22.5.1** which can be consumed by the emerging middle income population not only within Ghana but also in the sub-region
- To develop parts and intermediate goods manufacturing for motor vehicles and electrical and electronics industries on a long-term basis along the Coastal Corridor aiming at the large market of Nigeria

Table 22.5.1 Expected Types of Industries in Ghana

Classification of sub-sector/ISIC	Prioritized types of sub-sector by Ministry of Trade and Industry in the whole country	Typical types of industries in major cities along the East-West Corridor factors	Existing types of industries in major cities along the East-West Corridor	Expected Types of Industries in major cities along the Coastal Corridor	Typical types of industries along North-South Corridor such as Tamale	Existing types of industries along North-South Corridor such as Tamale	Expected Types of Industries along North-South Corridor such as Tamale
10 - Manufacture of food products (Based on cocoa, cashew, etc.)	V	V	V	X	V	V	X
11 - Manufacture of beverages	V	V	V	X		V	X
12 - Manufacture of tobacco products							
13 - Manufacture of textiles		V	V	X	V		X
14 - Manufacture of wearing apparel		V	V	X	V	V	X
15 - Manufacture of leather and related products			V				
16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials		V	V	X			
17 - Manufacture of paper and paper products		V					
18 - Printing and reproduction of recorded media		V					
19 - Manufacture of coke and refined petroleum products	V	V	V	X			
20 - Manufacture of chemicals and chemical products	V	V	V	X		V	X
21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	V	V	V	X			
22 - Manufacture of rubber and plastics products		V	V	X	V	V	X
23 - Manufacture of other non-metallic mineral products	V	V	V	X		V	X
24 - Manufacture of basic metals		V					
25 - Manufacture of fabricated metal products, except machinery and equipment		V				V	X
26 - Manufacture of computer, electronic and optical products	V	V		X			
27 - Manufacture of electrical equipment	V	V		X			
28 - Manufacture of machinery and equipment	V	V		X		V	X
29 - Manufacture of motor vehicles, trailers and semi-trailers		V					
30 - Manufacture of other transport equipment		V					
31 - Manufacture of furniture		V	V	X		V	X
32 - Other manufacturing							
33 - Repair and installation of machinery and equipment			V	X		V	X

Source: JICA Study Team based on the information from the Ministry of Trade and Industry and Ghana Free Zone Board (GFZB)

22.5.5 Programmes and Projects for Manufacturing Sector of Ghana

The following programmes and projects are proposed:

- Development of three free zones such as (a) Shama Export Processing Zone (EPZ), which is located in the Shama Ahanta, adjacent to Takoradi in the Western Region, (b) Sekondi Export Processing Zone (EPZ) and (c) Ashanti Technology Park (ATP), which is located at Ejisu in the Ashanti Region.
- Development of new industrial zones in urban centres along North-South Corridor such as Sagnarigu District adjacent to Tamale in the Northern Region with introduction of expected or prioritized types of subsectors.
- Development of ICT Park at Cape Coast.
- Improving and expanding of the qualified public Technical and Vocational Education and Training (TVET) System. In response to development of Tamale industrial zone, Dabokpa Technical Vocational Institute at Tamale should be strengthened.

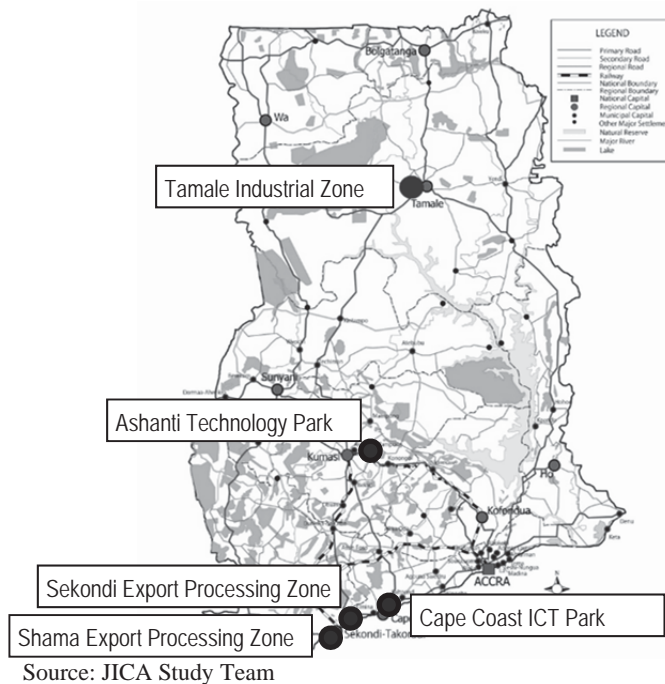


Figure 22.5.1 Project Location for Projects for Manufacturing Sector

22.5.6 Profiles of Priority Projects for Manufacturing Sector of Ghana

(1) Project for Establishment of Tamale Industrial Park

1) Rationale

Tamale occupies the central place in the Northern Region, where agricultural activities are dominant. In addition, Tamale is located on the Accra / Tema - Ouagadougou Corridor (North-South Corridor), which is one of the most important North-South corridors in this Study.

By taking advantage of the upgrading of this Corridor, Tamale will be able to play an important role as the agricultural, industrial, logistical, and commercial centre for the Northern Region and the Savannah Economic Zone of Ghana.

To attract investment for manufacturing sectors including agro-processing industries, it is necessary to provide a secure industrial zone for investors with adequate infrastructures in Tamale.

The Ministry of Trade and Industry has a plan to develop an industrial zone at Sagnarigu District adjacent to Tamale. The target industries in the manufacturing sector are agro-processing, which is one of the expected or promising industries, food products, beverages, textiles, wearing apparel, rubber and plastics products, and furniture.

2) Objectives of the Project

- To provide industrial enterprises with industrial space in which qualified infrastructure and management services are available
- To attract foreign investors in Tamale as a strategic growth centre for the Northern Region and the Savannah Economic Zone along the North-South Corridor.

3) Project Description

The land of 24 ha (60 acre) is earmarked for development into an industrial park under a PPP arrangement. Part of the project land may be used for an Industrial Free Zone for exporting industries in the future since the Ghana Free Zone Board (GFZB) has such a plan.

The Project is to provide divided lots with adequate infrastructure including electricity, water drainage and telecommunications. Also, the Project is to provide management services for enterprises located in the industrial zone in cooperation with the Ministry of Trade and Industry. The total investment amount for this project is estimated at GHS39.7 million.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Effective and efficient development of industrial sector in Tamale along the North-South Corridor.
- Expansion of activities of small and medium industries (SMI) and agro-processing industries by stimulating new investment

5) Executing Agency and Related Institutions

The Ministry of Trade and Industry (MTI) would be the executing agency for the Project with participation of the private sector through PPP schemes. MTI and a private developer will be responsible for basic design and detailed design of the industrial zone, preparation of management plans for the industrial zone and implementation of EIA in cooperation with the local administration. Also, coordination with the related agencies in terms of the external infrastructure development of the industrial zone is indispensable.

6) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 22.5.2 Implementation Schedule for Tamale Industrial Zone Project

Item/Activity	Year 1	Year 2	Year 3	Year 4	Note
1. Component 1 Planning & Promotion					Technical & Financial Support will be necessary.
2. Component 2 Design Works					
Preparatory Works					
Construction					

Source: JICA Study Team

7) Necessary Actions for Implementation / Critical Factor

It is necessary to coordinate with the related agencies in terms of the external infrastructure development. The site is already connected to the national grid, but the quantum of energy demand for the zone is yet to be determined.

8) Related Projects

From the viewpoint of human resources development, improving and expanding of Dabokpa Technical Vocational Institute at Tamale, which is under the Ghana Education Services of Ministry of Education, should be strengthened to provide qualified technicians and experts.

9) Estimated Project Cost

US\$ 14 million

(2) Project for Establishment of Ashanti Technology Park in Ejisu

1) Project Outline

The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban

centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.

The Ghana Free Zones Authority (GFZA) has secured land of 444 had in Ejisu of Ashanti Region for the Ashanti Technology Park. The GFZA has a plan to establish this industrial park by PPP scheme. Ejisu is located on the Central Corridor (Tema-Ouagadougou Corridor) and at a junction of the proposed Outer Ring Road and National Road No.6 (N6).

Ashanti Region and Ghana's northern areas have rich cocoa beans, gold, timber and wood, leather ware, and tourist sites, as well as various agricultural products. Potential industrial sub-sectors include the following:

- ICT industries
- Cocoa processing
- Agro-processing industries
- Light industrial manufacturing
- Warehousing and logistics industries
- Bio-technology development

The project aims to provide necessary infrastructures for establishing an industrial park, Ashanti Technology Park, in Ejisu, Ashanti Region by attracting investment. At the same time, the project will facilitate providing necessary off-site infrastructures for the industrial park.

2) Funding Scheme

PPP

3) Estimated Project Cost

US\$ 20 million

(3) Project for Establishment of Prampram Industrial Park

1) Project Outline

The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.

Prampram is located to the east of Tema, and it is part of Greater Accra. Currently Prampram is connected by National Road No.1 (N1) with Tema. In the future, it is expected that Prampram will be connected by a motorway, and part of Abidjan-Lagos Motorway, as well as by N1.

The WAGRIC Master Plan selected the Prampram Industrial Park as one of the high-priority projects for industrial parks because of its strategic location close to the following facilities:

- Abidjan-Lagos Motorway: just on the motorway in the future
- Tema Port : 23 km
- Accra International Airport: 37 km
- Greater Lomé: 150 km
- Greater Lagos: 400 km

The project aims to establish a new industrial park which is equipped with qualified infrastructure for the purpose of attracting investment to various economic sectors in Greater Accra. The project will provide divided sites with high-standard infrastructures to private companies of various

economic sectors including manufacturing, logistics and ICT. The land for the industrial park is around 500 ha in the first phase.

2) Funding Scheme

PPP

3) Estimated Project Cost

US\$ 30 million

22.6 Information and Communication Technology (ICT) Industry of Ghana

22.6.1 Present Situation and Future Prospects of ICT Infrastructure of Ghana

(1) ICT Policy of Ghana

The ICT policy of Ghana called Ghana ICT for Accelerated Development (ICT4AD) Policy (2003) states the strategic focus of the policy is: “To simultaneously target the development of the ICT sector and industry as well as use ICTs as a broad-based enabler of developmental goals, with emphasis on the development, deployment and exploitation of ICTs to aid the development of all other sectors of the economy.”

(2) Telecommunication Network

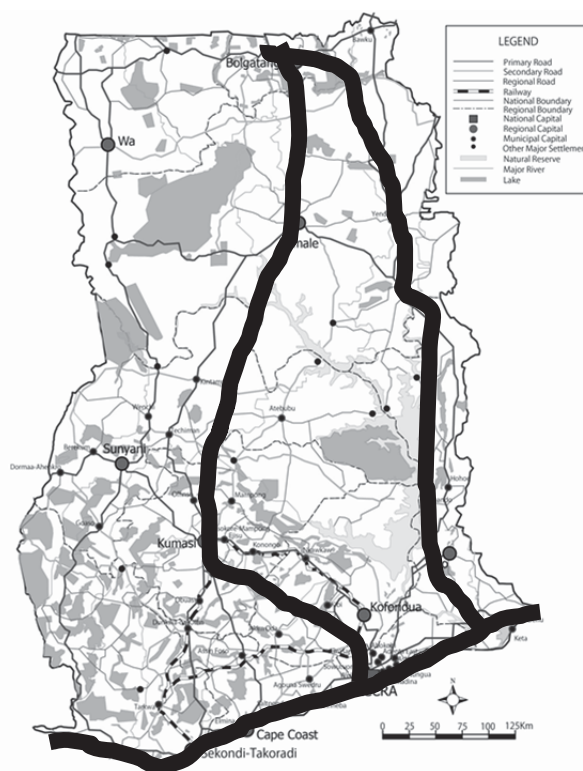
Backbone optic fibre cables are currently implemented and operated by private telecommunication operators. But private sectors cannot invest much in the unprofitable areas. Therefore, these infrastructures cannot be expanded into rural areas. The government has recently implemented the Eastern Corridor cable and plans to implement a Western Corridor cable. Along with the continuous effort to implement more trunk lines or branch lines and to upgrade them, accessibility from end-users must be improved. Though mobile phone penetration rate reaches 100%, and in the city of Accra, 4G service has been provided, it is still difficult to get broadband access, especially from rural areas.

(3) Data Centre

An ICT Park is under construction in the Tema Export Processing Zone. The first building has started operation as a business processing outsource (BPO) centre. A national data centre in the centre of the city started operation last year with a 600 rack capacity and there is a small data centre in Kumasi, mainly for back-up purposes.

(4) Human Resources Development

There is an educational institute under the Ministry of Communication with Indian support schools. Besides this, there are no notable appearances in the HR development area.



Source : JICA Study Team

Figure 22.6.1 Telecommunication Network in Ghana

(5) Industry Services

Local market for ICT industry is still small. Therefore, providers must depend on public projects.

(6) Future Prospects

The table below compares the current situation and proposed future demand of the ICT sector in Ghana.

Table 22.6.1 Current Situation and Future Prospects of ICT Sector in Ghana

	Now (2013)	2025	2040
Individuals using Internet	12.30%	50%	70%
Broadband subscription	0.27%	10%	50%
ICT HRs		2,000	50,000

Source: JICA Study Team based on ITU Statistics and Estimation

The ICT improvement to support other infrastructures which constitute corridors and industries that will be established along those corridors is the key. Necessary measures have to be ready earlier than implementing the new corridor infrastructures. In this sense, infrastructure development must be prioritized. However, ICT services must grow at the same time. It is because infrastructure development may cause easier access to foreign countries, and procurement of services, software and contents will increase.

22.6.2 Issues on ICT Industry of Ghana

The following issues are identified related to ICT industry in Ghana:

(1) ICT Infrastructure

- Telecommunication infrastructure is still necessary, especially in the Western Region to reach rural areas and to build more reliable networks.
- Local networks are still weak.
- People in rural areas have no way to access ICT. Cities or rural areas must be provided with optic fibre connections or wireless broadband for more utilization of IT applications with internet connection and the facilities to access them.

(2) Human Resources Development

- Programming level education is currently being provided, however, high level IT resources must be developed. This includes systems design skills, project management skills, requirements, systems operation skills, etc.
- More participation in actual projects is expected.

(3) ICT Services

- The growth of BPO business in Ghana is remarkable, but other types of ICT business must also grow rapidly.

22.6.3 Objectives for Development of ICT Industry of Ghana

The objectives for development of ICT industry of Ghana are as follows:

- To expand the telecommunication infrastructure
- To provide more opportunities to use ICT so that ICT will be reachable by all the citizens of Ghana

22.6.4 Strategies for ICT Industry of Ghana

The strategies for the development of the ICT industry of Ghana are determined as follows:

- To expand telecommunication infrastructure as well as keeping it upgraded.
- Provide more opportunity to use ICT to all of the citizens not only telecommunication, but also by providing equipment to access to ICT and also user-friendly applications.
- To prepare facilitation and develop the human resources necessary to expand the ICT infrastructure and ICT accessibility to avoid procurement by foreign companies
- To strengthen BPO industry, while growing other ICT industry

22.6.5 Programmes and Projects for ICT Infrastructure of Ghana

- Upgrading the Back-up Data Centre in Kumasi
- ETC system implementation with Ghana Highway Authority
- Cabling the Western Corridor with Optic Fibre
- Sub-marine Cable Implementation for Oil & Gas Plants (related to Oil/Gas sector)
- Community Information Centre
- ICT Park Expansion
- Facilitate the expansion of the mobile telephone network coverage throughout the country.
- Education Network Development
- Supporting Disable People in ICT Access

22.6.6 Profiles of Priority Projects for ICT Infrastructure of Ghana

(1) Tema ICT Park Expansion Project

1) Rationale

Tema is located at the centre of the Abidjan-Lagos Corridor meaning that it is a strategic site for providing all kinds of ICT services. Because this will be located inside the Export Processing Zone, many opportunities to serve ICT services and BPO services are expected and this will attract foreign investment into the country.

This project is in relation with the following national plans:

- An Integrated ICT led Socio-economic Development Policy and Plan Development Framework for Ghana (2003)
- The Ghana ICT for Accelerated Development (ICT4AD) Policy (2003) : BPO is to be promoted as a global competitive industry.

2) Objectives

The objectives of this project are as follows:

- To strengthen the BPO sector by preparing a more capable facility.
- To provide a new data centre which makes the national data centre more reliable and provide ICT services to the corridor's infrastructure and public sector,
- To show the ICT show case to foreign countries.
- To gather ICT human resources and to develop them well by training and OJT.

3) Project Descriptions

The project descriptions are as below.

- Three buildings are to be constructed. 1) Administration building with utility functions, 2) Data Centre, 3) BPO dedicated building.
- The Data Centre will be utilized more for private companies who will come to Tema Export Processing Zone, but also as a secondary centre of the existing National Data Centre.
- The BPO building is for future expansion to meet the requirements of new investors in the

country.

- The Administration building is for management of the park, employees and visitors.
- This space already has underground utilities such as electricity, telecommunication lines and water supply.
- Technical Assistance for efficient and reliable System Operation and park management.



Source: JICA Study Team

Figure 22.6.2 Project Location for ICT Park Expansion Project

4) Expected Benefits

The following benefits are expected in this project:

- Contribute to other sectors in utilizing ICT to grow those sectors and to attract foreign investment, especially into the zone.
- Support to improve governance of the administration office.
- Provide usable domestic services rather than foreign services. This contributes to the improvement of the national economy.
- More international revenue from offshore BPO business

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Communication
- NITA (National Information Technology Agency)
- ITES (IT Enable Services, under MOC)

6) Estimated Project Cost

The estimated project cost is US\$12-15 mil.

7) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 22.6.2 Implementation Project for ICT Park Expansion Project in Ghana

Item/Activity	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Note
Design	■				
Construction		■	■		
HR development for System Operation		■	■		

Source: JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Operational organization

9) Social and Environmental Impacts

The site has been assessed already.

(2) Project for Construction of Community Information Centre in Tema

1) Rationale

Tema is located at the centre of Abidjan-Lagos Corridor meaning that it is a strategic site for providing all kinds of ICT services. Along with the development of this corridor, rural areas must be pulled up to their maximum potential. This project can help these developments.

The project is in relation with the following national plans:

- Integrated ICT led Socio-economic Development Policy and Plan Development Framework for Ghana (2003)
- Ghana ICT for Accelerated Development (ICT4AD) Policy (2003): BPO is to be promoted as a global competitive industry.

2) Objective

- To provide public access facilities to rural areas as well as application systems which motivate citizens to utilize the internet
- To support internet access opportunities to citizens, especially in rural areas.

3) Project Description

The project descriptions are as below.

- 2,000 to 5,000 (Final target) centres will be constructed starting from a few pilot centres.
- Centres will have PCs, printers, scanners, cameras, internet connections, vital sensors connected with the internet, electric generators, etc.
- Internet access will be established by suitable measures from cable connection, wireless

connection, UPSs, etc.

- Application systems and contents will be developed to attract citizens such as vital checks, remote medical examinations, e-learning, etc.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- More citizens can access the internet to avoid the creation of a digital divide.
- Provide citizens in rural areas health-care opportunities and educational opportunities,

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Communication
- GIFEC (Ghana Investment Fund for Electric Communications)

6) Estimated Project Cost

The estimated project cost for pilot is US\$5-10 mil.

7) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 22.6.3 Implementation Schedule for Community Information Centre Construction Project in Ghana

Item/Activity	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Note
Design	■						
Development		■					
Pilot		■	■				
Lot 1- n			■	■	■		

Source: JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Operational organization

9) Social and Environmental Impacts

The site has been assessed already.

22.7 Oil Sector of Ghana

22.7.1 Current Situation and Future Prospects of Oil Sector of Ghana

(1) Refinery

Tema Oil Refinery (TOR) is the only refinery in Ghana. It has a refining capacity of 45,000 barrels per stream day (bpsd) or 2.25 million tons/year. TOR ran at a low operation rate, about 20%, in 2013, because it has problems in plant reliability and efficiency. Petroleum products of TOR cover only 13% of demand in Ghana. 87% of demand has to be covered by imports.

Table 22.7.1 Demand for Petroleum Products in Ghana in 2013

	Consumption	Production	Net Import	Stock Change
LPG	251.8	25.6	203.9	-22.3
Gasoline	1,080.6	167.3	981.4	68.1
Kerosene	27.8	14.6	0.0	-13.2
Aviation Turbine Kerosene	131.9	59.8	41.4	-30.7
Gas Oil	1,722.6	113.3	1,586.9	-22.4
Fuel Oils	39.3	43.5	40.6	44.8
Total	3,254.0	424.1	2,854.2	24.3

Source: JICA Study Team based on Energy Statistics 2014 (Energy Commission)

TOR has been performing various tasks such as the Plant Stabilization and Profit Enhancement Programmes (PSPEP), diversification of its business, seeking international partners for cooperation through the Government of Ghana to solve the following problems.

- Very low capacity utilization,
- Unprofitable business,
- Plant shutdown due to technical troubles, and
- Unable to continuously procure crude oil due to a lack of working capital

(2) Storage and Distribution of Petroleum Products

1) Petroleum Product Consumption by Region

Table 22.7.2 shows the consumption of petroleum products by administrative region in Ghana in 2012. Gasoil and gasoline are the major products in demand. The largest consuming region of gasoil is Greater Accra (29%), followed by Ashanti (21%) and Western Regions (14%). As for gasoline consumption, the largest is Greater Accra (36%), followed by Ashanti (15%) and Western Regions (10%).

Burkina Faso imports petroleum products through the four ports, Abidjan, Tema, Lomé, and Cotonou. Gasoil imports through Tema in 2014, 11 ktons, accounted for only 3% of total gasoil imports into Burkina Faso. Gasoline imports through Tema in 2014, 28 ktons, accounted for 16% of total gasoline imports to Burkina Faso.

Table 22.7.2 Consumption of Petroleum Products by Region in Ghana (2012)

Region	Gasoline	Gasoil	Kerosene	LPG
Ashanti Region	152,926	280,504	4,202	50,481
Brong Ahafo Region	60,642	89,457	918	23,242
Central Region	68,614	105,662	4,922	27,146
Eastern Region	57,886	93,864	5,322	19,078
Greater Accra Region	361,956	379,144	12,728	89,959
Northern Region	43,688	44,252	2,343	3,177
Upper East Region	58,020	36,694	1,357	2,827
Upper West Region	17,899	18,859	517	1,374
Volta Region	71,577	79,699	11,161	19,856
Western Region	101,587	181,249	2,173	31,588
Total to Ghana	994,794	1,309,384	45,644	268,726
Tema to Burkina Faso (2014)	28,072	11,493	-	-

Source: NPA for Ghana, Sonaghy for Burkina Faso

2) Bulk Transport through the Volta Lake for the Remote Areas

Gasoil and kerosene are transported by oil barge from Tema to the northern part of Ghana across the Volta Lake. The transport route is done by lorry tanker (previously by pipeline) for the section Tema – Aksoombo; by barge for the section Akosombo – Buipe; and by pipeline for the section Buipe – Bolgatanga.

Transport volume over the Volta Lake was estimated at 88 ktons per year or 241 tons per day in 2012. This was only 3% of the total consumption of petroleum products and it was for transporting gasoil and kerosene to the remote areas, Upper East and Northern Regions, but not for reducing heavy lorry tanker traffic on roads to avoid causing damage, reducing transport costs of petroleum products, or reducing carbon dioxide emissions.

3) Distribution of Petroleum Products by Lorry Tanker

Due to a lack of other means for bulk transport of petroleum products, lorry tankers are widely used for distribution of petroleum products in Ghana. This requires less initial investment, but higher transport costs. This will cause damage to roads, since they are heavy. Long periods of driving will increase the emission of carbon dioxide.

4) Petroleum Transport from Tema to Burkina Faso

The governments of Burkina Faso and Ghana jointly conducted a feasibility study on construction of a multi-products pipeline between Bolgatanga and Bingo in 2015.

22.7.2 Issues Regarding the Oil Sector of Ghana

The petroleum sector has the following issues for distribution of petroleum products:

- Heavy lorry tankers that transport a large amount of petroleum products cause damage to the roads.
- A new pipeline between Tema and Akosombo has not been built yet to replace the old one.
- Low water level of the Volta Lake has been affecting oil barge operation.

The government of Burkina Faso conducted a feasibility study for construction of a multi-products pipeline between Bolgatanga and Bingo. However, a practical plan has not been made yet for the multi-products pipeline between Tema and Bolgatanga.

22.7.3 Objectives for Oil Sector of Ghana

The objectives for the oil sector of Ghana are as follow:

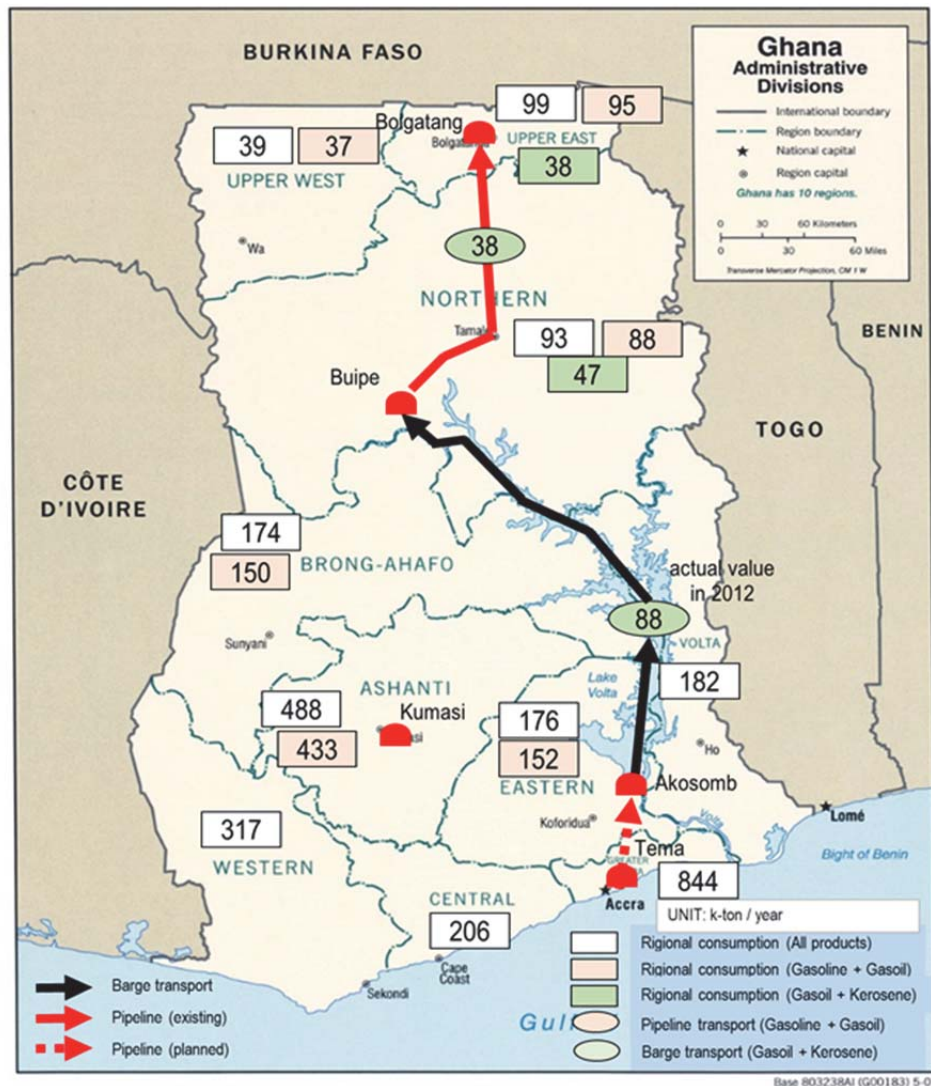
- Complete the transportation route for gasoil and kerosene to the Upper East and Northern Regions over the Volta Lake.
- Draw up a plan to construct and operate the multi-products pipeline between Tema and Buipe via Kumasi to connect with the existing pipeline between Buipe and Bolgatanga.
- Cooperate with the Government of Burkina Faso for realization of the multi-products pipeline project between Bolgatanga and Bingo.

22.7.4 Strategies for Oil Sector of Ghana

(1) Bulk Transportation of Petroleum Products to Northern Ghana via the Volta Lake

The following works are necessary to complete the transportation route for gasoil and kerosene to the Upper East and Northern Regions across the Volta Lake as shown in Figure 22.7.1:

- Replace the existing pipeline with a new pipeline with 6-inch diameter and 127km length
- Install a supervisory control and data acquisition (SCADA) system
- Install CCTV (closed circuit television)



Source: JICA Study Team

Figure 22.7.1 Bulk Transport over the Volta Lake

(2) Multi-products Pipeline between Tema and Buipe via Kumasi

It is recommended that the multi-products pipeline be developed between Tema and Buipe through Kumasi as shown in Figure 22.7.2. Since regional consumption of petroleum products is based on the data from 2012, they should be updated based on the development framework.

1) Tema-Kumasi Section (Phase-1)

A large volume of gasoline and gasoil, estimated at 722 ktons, which is more than 30% of the total in Ghana in 2012, is currently being transported by lorry tankers through Kumasi which is the hub for inland transportation in Ghana. This means that more than 16,000 lorry tankers in a year are bringing gasoline and gasoil from Tema to Kumasi, assuming 45 tons for the freight load of a lorry.

Construction of the multi-products pipeline is recommended for the section between Tema and Kumasi in phase-1. After the commencement of operation in this section, products will be transported by lorry tankers from the storage at Kumasi to markets in Ashanti, Brong-Ahafo, Northern, Upper East and Upper West regions. Road traffic between Tema and Kumasi will be reduced by more than 16,000 lorry tankers annually. This will result in reducing the cost of transportation, damage to the roads caused by a heavy lorry tankers, and carbon dioxide emissions.

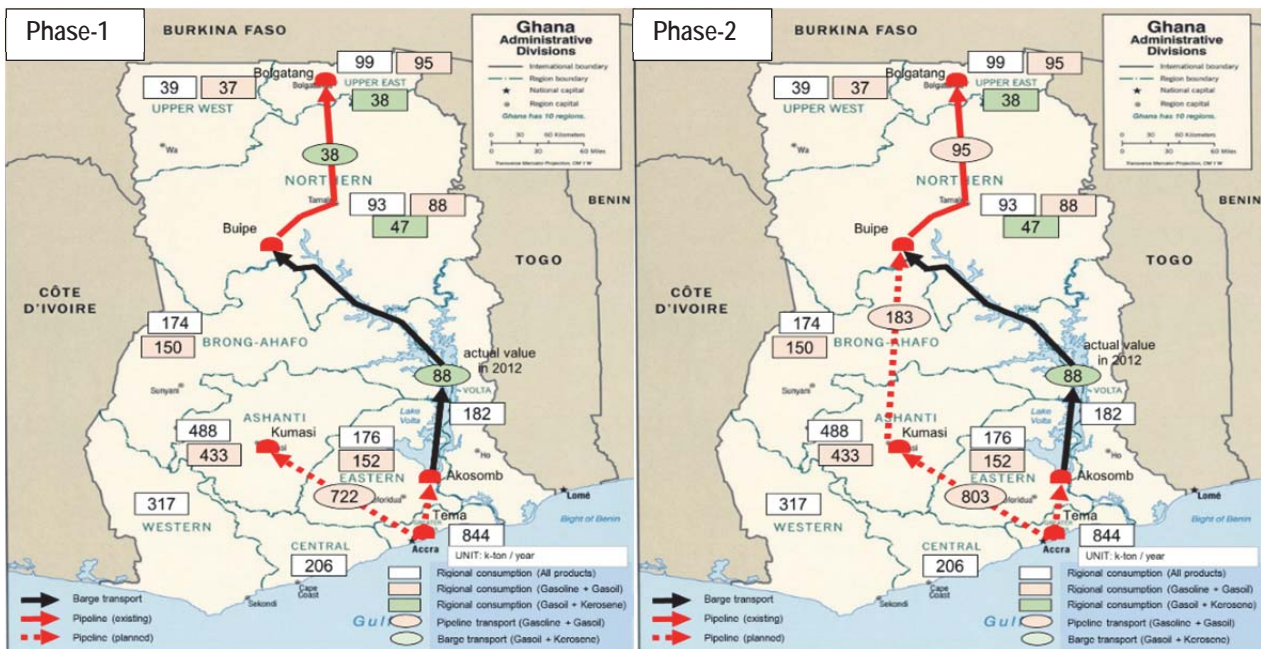
2) Kumasi – Buipe Section (Phase-2)

It is recommended that the multi-products pipeline be extended to Buipe to connect with the existing Buipe-Bolgatanga pipeline in phase-2. Since the flow rate of the existing Buipe-Bolgatanga pipeline

will be increased to 2.5 times its current flow rate, it is necessary to check the capacity of the pipeline system and modify it if necessary.

After the commencement of operation in the section between Tema and Bolgatanga, the transport volume of gasoline and gasoil for each section is estimated as follows:

- Tema - Kumasi: 803 ktons/year (the road traffic will be reduced by nearly 18,000 lorry tankers/year)
- Kumasi - Buipe: 183 ktons/year (the road traffic will be reduced by more than 4,000 lorry tankers/year)
- Buipe - Bolgatanga: 95 ktons/year (the road traffic will be reduced by more than 2,000 lorry tankers/year)



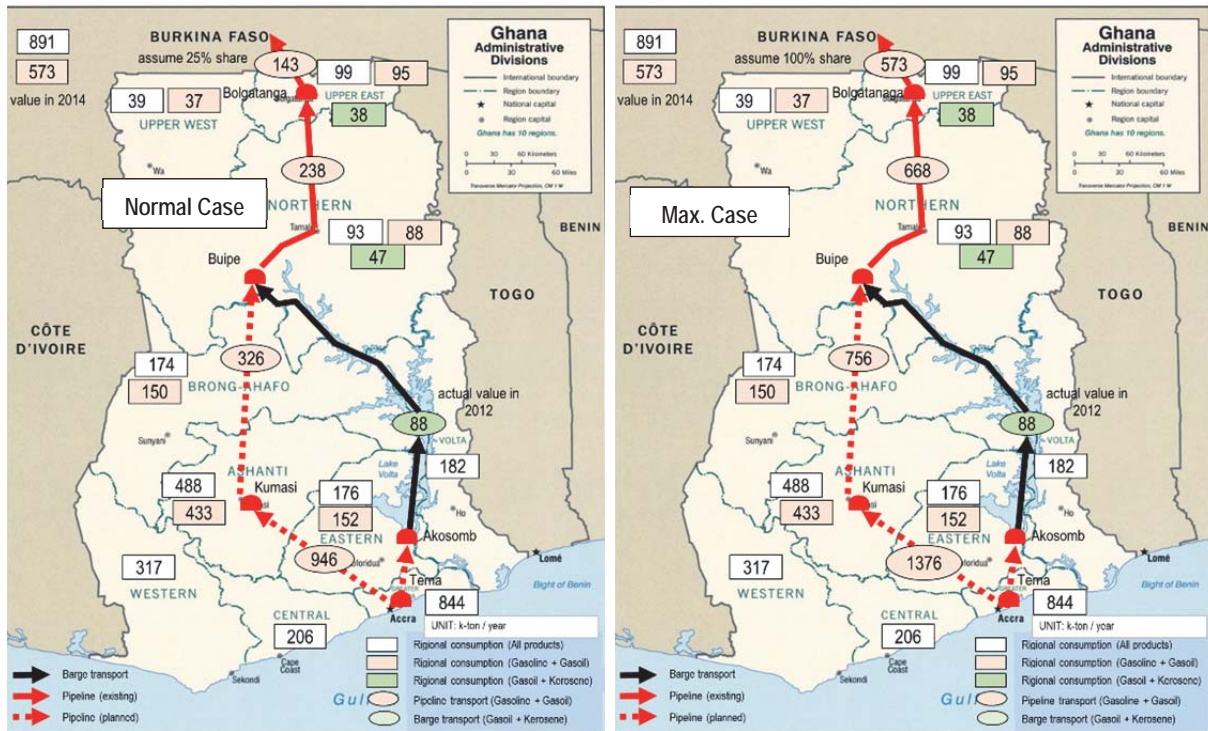
Source: JICA Study Team

Figure 22.7.2 Multi-products Pipeline between Tema and Buipe via Kumasi

3) The Multi-Products Pipeline Project between Bolgatanga and Bingo

The multi-products pipeline project to connect Ghana and Burkina Faso will be ready for implementation if the Ghana side pipeline between Tema and Bolgatanga is completed.

The normal case drawing in Figure 22.7.3 shows the flow rate of gasoline and gasoil in the pipeline assuming that 25% of the consumption in Burkina Faso is imported through the pipeline from Tema. The pipeline system needs to be designed at flow rates at the maximum case with assumption that 100% of the consumption in Burkina Faso is imported through the pipeline from Tema, since such operation may be required in the short term.



Source: JICA Study Team

Figure 22.7.3 Multi-product Pipeline between Bolgatanga and Bingo

22.7.5 Programmes and Projects for Oil Sector of Ghana

The pipeline projects in Table 22.7.3 are proposed.

Table 22.7.3 Projects for Petroleum Product Distribution

Project	Description	Contracting Authority
Replace Tema – Akosombo Pipeline	<ul style="list-style-type: none"> Complete the bulk transportation of petroleum products to Northern Ghana via the Volta Lake Bulk. Replace the existing pipeline with a new pipeline with 6-inch diameter and 127km length 	BOST
New pipeline between Tema and Kumasi	<ul style="list-style-type: none"> Construct a gasoline and gasoil pipeline between “the gateway city”, Tema, and “the hub for inland transport”, Kumasi. Improve the storage and distribution facilities at Kumasi as needed Project period: - 2023 	BOST and private partners
New pipeline between Kumasi and Buipe	<ul style="list-style-type: none"> Construct a new pipeline between Kumasi and Buipe to connect with the existing pipeline between Buipe and Bolgatanga. Improve the storage and distribution facilities at Buipe as needed Project period: 2024 – 2030 	BOST and private partners
The multi-product pipeline project between Bolgatanga and Bingo	<ul style="list-style-type: none"> Construct a new pipeline to import gasoline and gasoil directly from Tema. Construct facilities for storage and distribution Project period: 2031 – 2040 	SONABHY, BOST and private partners

Source: JICA Study Team

22.7.6 Profiles of Priority Projects for Oil Sector of Ghana

(1) Project for Construction of Oil Multi-Products Pipeline between Tema and Kumasi

Discussion has not been made yet with the relevant organization in Ghana for this project. The following description is only the proposal made by the JICA Study Team.

1) Rationale

It is supposed that more than 30% of gasoline and gasoil consumed in Ghana was transported through Kumasi by lorry tanker on the road based on the data in 2012. If a multi-product pipeline is installed between Tema and Kumasi, 946 ktons per year of gasoline and gasoil for markets in Ghana and Burkina Faso will be shifted from lorry tankers to this pipeline. This will eliminate more than 21,000 lorry tankers on the road in a year. This results in reducing transport costs, avoiding damage to the roads, and mitigating CO₂ emissions.

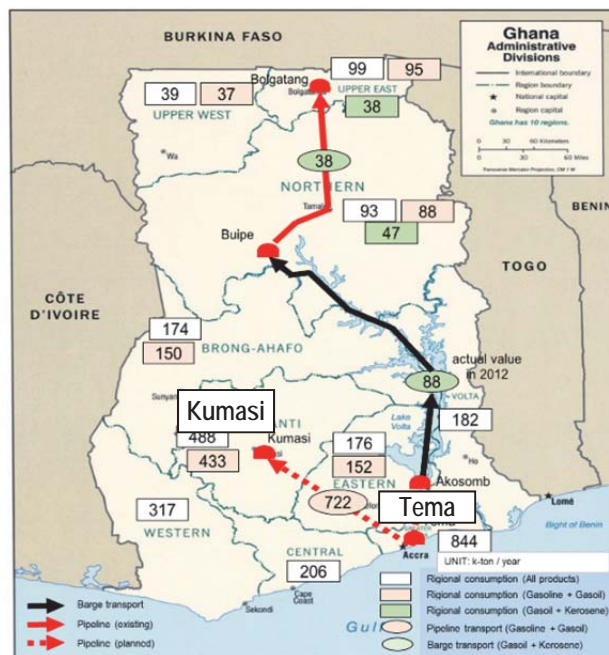
2) Objectives

The objectives of the project are as follows:

- To achieve modal shift of petroleum products from lorry tankers to a pipeline,
- To create the foundations of pipeline transport of petroleum products from Ghana to Burkina Faso

3) Project Description

The project is to construct a pipeline between Tema and Kumasi, and to improve facilities for storage and distribution at Kumasi.



Source: JICA Study Team

Figure 22.7.4 Project Location for Multi-Product Pipeline between Tema and Kumasi

4) Expected Benefits

The following benefits are expected in this project:

- Reduce the transport cost of petroleum products
- Reduce lorry tanker traffic on roads
- Lower maintenance expenses of roads
- Reduce CO₂ emissions

5) Executing Agency and Related Institution

A joint venture will be established by BOST and private partners.

6) Estimated Project Cost

- Construction Cost: to be studied.

- Land Acquisition/Compensation: to be studied.

7) Implementation Schedule

The Project is to be implemented by the following phases:

- Phase 1: FEED Phase (2018)
 - Front-end engineering design
 - EIA
- Phase 2: Land acquisition and resettlement (2019-2020)
- Phase 3: Tendering for Selecting EPC Contractor (2020)
- Phase 4: EPC Phase (2021-2022)
- Phase 5: Operation and Maintenance Phase (2023-)

The implementation schedule for this project is shown in the table below.

Table 22.7.4 Implementation Schedule for the Multi-Product Pipeline between Tema and Kumasi Project

Item/Activity	2018	2019	2020	2021	2022	2023
FEED						
Land acquisition and resettlement						
Tendering for Selecting EPC Contractor						
EPC						
Commencement of O&M						

Source: JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Land acquisition for the right of way for the pipeline

9) Related Projects

Related projects are listed as follows:

- Multi-product Pipeline between Tema and Buipe (the Kumasi – Buipe section)
- Multi-product pipeline project between Bolgatanga and Bingo

10) Social and Environmental Impacts

To be considered.

22.8 Gas Sector of Ghana

22.8.1 Current Situation and Future Prospects of Gas Sector of Ghana

Demand and supply forecast for natural gas has been updated in line with the changing capacity of thermal power generation. The Gas Master Plan will be revised based on the updated balance of demand and supply for natural gas during the period from December 2016 to January 2017, according to verbal information from GNGC.

Recently in Ghana, the potential for hydropower has been decreasing. Therefore, the increase in demand for electricity needs to be covered mostly by adding to the capacity of thermal power stations. Since the locations of such thermal power stations will be concentrated in Tema and Takoradi, rapid growth in gas demand is predicted in these cities as shown in Table 22.8.1 and Table 22.8.2.

The thermal power stations in the tables will start burning gas by the beginning of 2018. Since the construction period of a combined cycle power plant is nearly three years, construction of such thermal power stations must be started by the beginning of 2015. All the thermal power stations in these tables, therefore, appear to be existing or under construction now.

For example, Cenpower Generation Co. Ltd. in Table 22.8.1, for an independent power producer (IPP) project, started construction of a 350 MW combined cycle gas turbine (CCGT) power generation plant at Tema in January 2015, and will complete the plant construction by late 2017. Taking gas shortage into account, its CCGT is designed to be able to use either gas, diesel oil, or light crude oil. Table 22.8.1 indicates that gas will be in demand at this thermal power station in 2018 and subsequent years.

Table 22.8.1 Gas Demand for Power Generation at Tema

Unit: mmscfd

Thermal Power Station	2016		2017	2018	2019	2020	2021	2022
	Q1/2	Q3/4						
Sunon Asogli	40	40	40	40	40	40	40	40
TT1	30	30	30	30	30	30	30	30
TT2	15	15	15	15	15	15	15	15
CENIT	30	30	30	30	30	30	30	30
MRP	20	20	20	20	20	20	20	20
Karpower Barge I (2015)		60	60	60	60	60	60	60
Trojan Power Limited		6	6	6	6	6	6	6
KTPP (2015)		60	60	60	60	60	60	60
Sunon Asogli Phase II (2016)		60	60	60	60	60	60	60
VRA TT2 addition			15	15	15	15	15	15
Cenpower (2018)				60	60	60	60	60
Tema Total	135	321	336	396	396	396	396	396

Source: Data received from GNGC in March 2016

Table 22.8.2 Gas Demand for Power Generation at Takoradi

Unit: mmscfd

Thermal Power Station	2016		2017	2018	2019	2020	2021	2022
	Q1/2	Q3/4						
T1/TAPCO	60	60	60	60	60	60	60	60
T2/TICO	60	60	60	60	60	60	60	60
Ameri Energy (2016)	60	60	60	60	60	60	60	60
Karpower Barge II (2016)		60	60	60	60	60	60	60
Amandi Energy Limited		30	30	30	30	30	30	30
Jacobsen		60	60	60	60	60	60	60
WUTA Energy		40	75	75	75	75	75	75
Aggreko International Projects		40	40	40	40	40	40	40
Aboadze T4			30	30	30	30	30	30
Takoradi Total	180	410	475	475	475	475	475	475

Source: Data received from GNGC in March 2016

Table 22.8.3 compares the gas demand estimate based on data of the power sector and also that based on data of the gas sector. There is an obvious difference in the two forecasts of gas demand for power generation. Growth of gas demand that is forecast based on the gas sector data is more rapid than that based on the power sector data. Further clarification is required on the latest gas demand that has been mutually agreed upon by the power and gas sectors. The gas demand forecast based on the gas sector data is, for the time being, used in the interim report.

Table 22.8.3 Gas Demand for Power Generation in Ghana

	Unit	2016	2017	2018	2019	2020	2021	2022
Forecast based on the Power Sector data								
CCGT Capacity at the end of year	MW	1,540	1,990	2,290	3,010	3,430	3,780	4,130
GT Capacity at the end of year	MW	320	520	320	120	120	120	120
Estimated Gas Demand at all gas-fired operations	mmscfd	337	462	462	532	602	660	718
Estimated Gas Demand (Tema+ Takoradi)	mmscfd	731	811	871	871	871	871	871

Source: Data received from GNGC in March 2016

22.8.2 Issues on Gas Sector of Ghana

The Government of Ghana calls for urgent attention to electricity supply. Under these circumstances, many gas-fired thermal power plants are being built and will consequently need natural gas for cost-effective operation.

The gas sector needs to focus on the issue of infrastructure development for production, collection, and processing of natural gas, importation of natural gas and LNG, and transmission pipelines to meet the growing gas demand and the future prospects.

22.8.3 Objective for Gas Sector of Ghana

The objective for the gas sector of Ghana is to ensure that sufficient volume of natural gas is supplied for the thermal power stations at Tema and Takoradi.

22.8.4 Strategies for Gas Sector of Ghana

(1) Supply of Natural Gas

1) To Increase the Supply of Domestic Gas

Natural gas, called domestic gas, will be produced at oil and gas fields in Ghana as shown in Table 22.8.4. It is notable that oil and gas fields in Ghana have been discovered only in the offshore area in the west.

A large investment and a long period of time are necessary for exploration and development of oil and gas fields. Once such activities are successfully carried out and ensure the supply of natural gas, it will be a fairly reliable supply of natural gas. The Sankofa field, for example, will be able to supply a plateau flow of 170mmscfd non-associated gas for over 17 years.

The price of domestic gas is not uniform since it is settled by negotiation between the supplier (operator / partners for each field) and buyer (maybe a state organization like GNPC). Domestic gas, however, should be cheaper than imported gas either through the West Africa Gas Pipeline (WAGP) or as LNG.

An increase in domestic gas production is recommended as base load gas to supply to users. It is necessary to develop gas infrastructure such as subsea pipelines to onshore gas facilities, gas processing plants, and transmission pipelines.

Table 22.8.4 Forecast of Domestic Gas Supply

Unit: mmscfd

Name of Oil and Gas Fields	2016		2017	2018	2019	2020	2021	2022
	Q1/2	Q3/4						
Jubilee	110	110	110	110	110	110	110	110
TEN1			27	27	27	27	27	27
TEN2				18	18	18	18	18
Sankofa (ENI)				170	170	170	170	170
Greater Jubilee					90	90	90	90
HESS							90	90
Total West Supply	110	110	137	325	415	415	505	505

Source: Data received from GNGC in March, 2016

2) Increase the West African Gas Pipeline (WAGP) gas to the contract volume

- West African Gas Pipeline Company (WAPCo) is a limited liability company that owns and operates the West African Gas Pipeline (WAGP) to transport natural gas from Nigeria to customers in Benin, Togo and Ghana. Prior to the discovery of natural gas resources in Ghana, WAPCo was the sole source of natural gas for the country. WAPCo is owned by Chevron West African Gas Pipeline Ltd (36.9%), Nigerian National Petroleum Corporation (24.9%), Shell Overseas Holdings Limited (17.9%), Takoradi Power Company Limited (16.3%), Societe Togolaise de Gaz (2%), and Societe BenGaz S.A. (2%).
- Contract volume of WAGP is 120 mmscfd or 123,000 million BTU/day for Ghana. Actually, the supply of WAGP gas is not stable and is for less than the contract volume due to gas shortage or accidents. WAGP gas appears to be, therefore, not a reliable source of gas. The price of WAGP

gas is more expensive than domestic gas but cheaper than LNG imports.

- It is necessary to maintain negotiations for increasing WAGP gas supply to the contract volume, since domestic gas is not enough to meet the growing gas demand. WAGP gas will be used at Tema where the existing and planned thermal power stations are concentrated.

3) To Start the LNG imports to make up the deficiency in gas supply

LNG imports are more expensive than domestic gas or WAGP gas, and need a certain capacity for using dedicated storage and regasification facilities. However, LNG imports are an effective measure, if domestic gas and WAGP gas will not be able to sufficiently meet the demand. Examination of LNG imports is necessary to make up the deficiency in gas supply.

GNPC and Quantum Power, the pan-African energy infrastructure investment platform, announced in February, 2016 that they have signed Head of Terms for the construction and operation of LNG storage, regasification and delivery facilities at Tema (the “Tema LNG Project”).

According to information on the GNPC’s website, the Tema LNG Project will have the scalable ultimate capacity to receive, store, regasify and delivery of about 500 mmscfd, utilizing a state-of-the-art dedicated floating storage and regasification unit (FSRU) moored offshore of Tema. The Tema LNG Project will provide GNPC with the flexibility to manage volatility in power demand and fluctuations in domestic gas supply, while mitigating the effect of unpredictable shifts in Ghana’s power balance.

It is forecast that both WAGP gas and LNG will be supplied at Tema as shown in Table 22.8.5.

Table 22.8.5 Forecast of WAGP Gas and LNG Supply

Unit: mmscfd

Source of Gas	2016		2017	2018	2019	2020	2021	2022
	Q1/2	Q3/4						
WAGP	120	120	120	120	120	120	120	120
LNG Required		300	300	300	300	300	300	300
Total East Supply	120	420	420	420	420	420	420	420

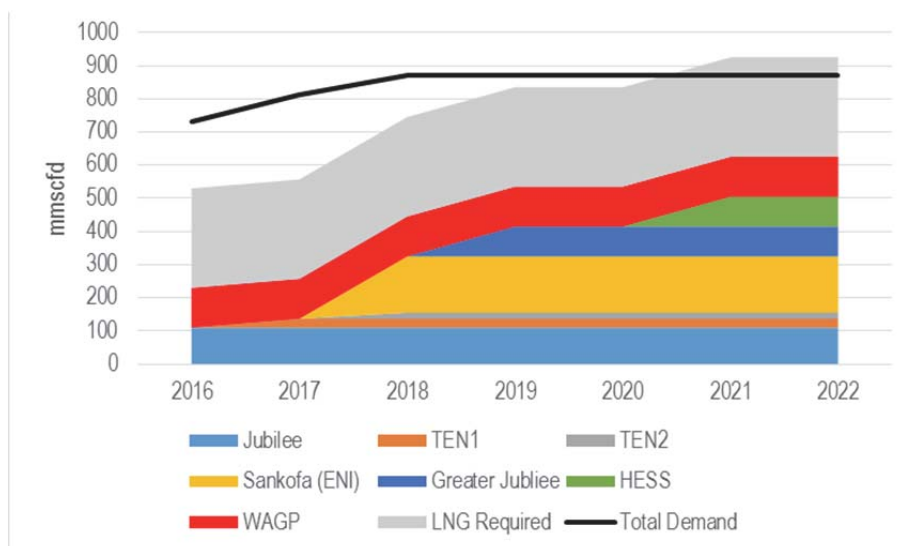
Source: Data received from GNGC in March, 2016

(2) Supply and Demand Balance of Natural Gas

1) To Seek Solutions to Make Up the Short-term Deficiency in Gas Supply

Figure 22.8.1 illustrates the supply and demand balance of natural gas in Ghana based on the latest plan of GNGC. It is forecast that supply will be short by 200mmscfd in 2016 but the shortage will be gradually decreased and resolved in 2021.

For the period 2016-2021, a short-term deficiency in gas supply seems to be covered by the use of light crude oil (LCO) or diesel oil for power generation.



Source: Data received from GNGC in March, 2016

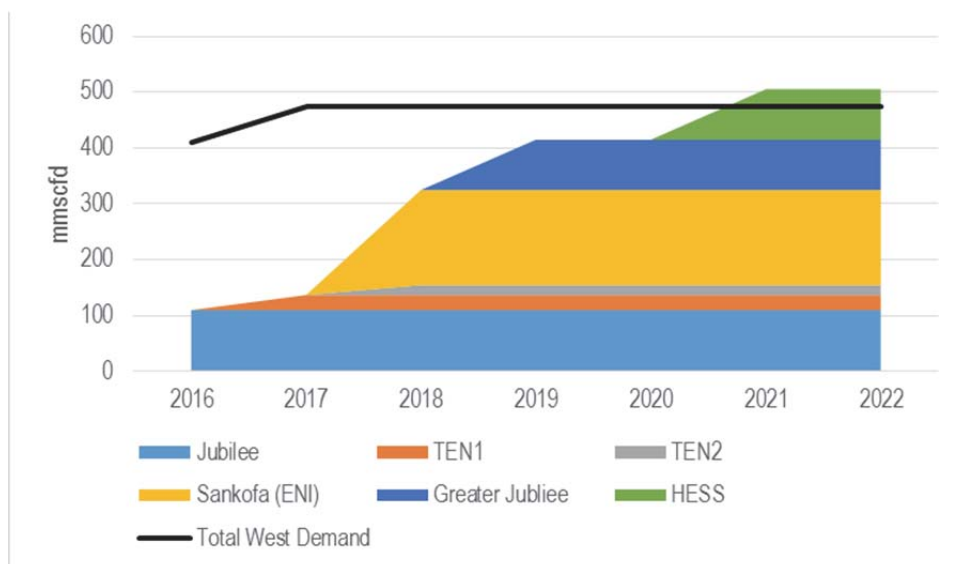
Figure 22.8.1 Supply and Demand Balance of Natural Gas in the whole of Ghana

2) To Seek Solutions to Make Up the Regional Gaps

Figure 22.8.2 indicates that gas supply will be short by more than 300 mmscfd in 2016 and 2017 in West Ghana. While Figure 22.8.3 indicates nearly 100 mmscfd of excess supply in East Ghana in the same period.

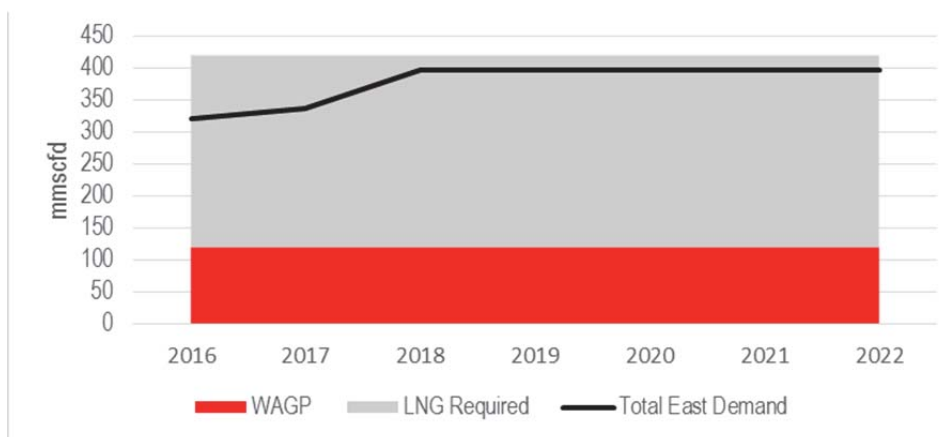
Sending natural gas from East Ghana to West Ghana is necessary to make up this regional gap of gas supply. Excess gas may be sent to the Western Region through the WAGP between Tema and Takoradi.

A transmission pipeline that interconnects East and West Ghana is required for ensuring a stable supply of gas in the medium and long term.



Source: Data received from GNGC in March, 2016

Figure 22.8.2 Supply and Demand Balance of Natural Gas in West Ghana



Source: Data received from GNGC in March, 2016

Figure 22.8.3 Supply and Demand Balance of Natural Gas in East Ghana

3) To Seek Solutions to Ensure Security of Gas Supply

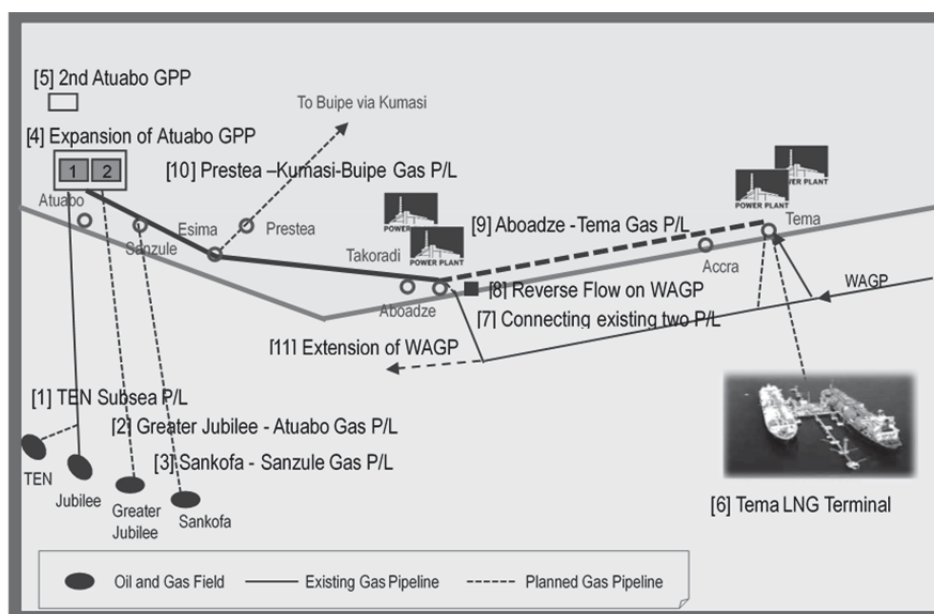
It seems to be that there are risks such as reduction or disruption of WAGP gas supply, a delay in commercial production of a field, shutdown of production facilities for domestic gas, shutdown of regasification of LNG at FSRU, and unpredictable changes in gas demand. It is required to seek solutions to ensure the security and reliability of gas supply. The following measures are examples of such solutions:

- Increase LNG imports and gasification,
- Increase WAGP gas supply within an allowable range,
- Sending gas through the transmission pipeline to interconnect East and West Ghana, and
- Substitute LCO or diesel oil for gas in a part of the thermal power station

22.8.5 Programmes and Projects for Gas Sector of Ghana

(1) Project Map

Figure 22.8.4 shows the locations of projects listed in this sub-section. Numbers at the top of the project name indicate the project number in Table 22.8.6.



Source: JICA Study Team

Figure 22.8.4 Project Map for Gas Infrastructure Development in Ghana

(2) Projects for Gas Infrastructure Development in Ghana

Projects for gas infrastructure have been proposed based on the strategies mentioned above and discussions with GNGC as shown in Table 22.8.6.

Table 22.8.6 Projects for Gas Infrastructure in Ghana

Project	Description	Developer
[1] TEN Subsea Pipeline Project	<ul style="list-style-type: none"> Bring associated gas from TEN to onshore Subsea equipment, flowlines, and pipeline to connect with Jubilee subsea pipeline 	GNPC/GNGC
[2] Greater Jubilee – Atuabo Pipeline Project	<ul style="list-style-type: none"> Bring raw gas from Greater Jubilee to onshore Subsea equipment, flowlines, and pipeline to connect with Jubilee subsea pipeline 	GNPC/GNGC
[3] Sankofa – Sanzule Gas Pipeline Project (as a part of Sankofa Gas Field Development)	<ul style="list-style-type: none"> Bring non-associated gas from Sankofa to onshore FPSO, subsea equipment, flowlines, pipeline to shore, and onshore receiving facilities (ORF), installation 	ENI/Vitol
[4] Atuabo GPP Expansion Project	<ul style="list-style-type: none"> Process raw gas from Greater Jubilee and extract NGL FEED and EPC 	GNPC/GNGC
[5] 2nd Atuabo GPP Project	<ul style="list-style-type: none"> Process raw gas from the Tano and other river basins. GNPC signed a MOU with Mitsui and Co. Ltd for the gas processing in August 2015. Mitsui will become a facilitator and advisor on the infrastructure development to send gas to the market centre. 	Not available
[6] Tema LNG Terminal Project	<ul style="list-style-type: none"> GNPC and Quantum Power announced they have signed a head of terms for construction and operation of FSRU in February 2016. This is to be executed under BOOT. Assets will be transferred to GNPC after the project 20-year term A pipeline to send gas to onshore is necessary. 	Quantum power
[7] Project for Connecting the Two Existing Pipelines at Aboadze	<ul style="list-style-type: none"> Provide 1.8 km pipeline to connect with Atsuabo-Aboadze pipeline and WAGP 	GNPC/GNGC
[8] Reverse Flow on WAGP Project	<ul style="list-style-type: none"> Send domestic gas from the West to the East through the reverse flow on WAGP Install a compressor station After starting gas supply from Sankofa in the 3Q of 2018, an investment decision for the project will be made. 	GNPC/GNGC
[9] Aboadze – Tema Gas Pipeline Project	<ul style="list-style-type: none"> Connect the East and the West to balance supply and demand across the regions (230-250km pipeline) FEED will be completed by Penspen by the end of 2016 BOST signed the contract for FEED in December 2015. GNGC suggested to the Minister of Petroleum that GNPC/GNGC should undertake this project. 	GNPC/GNGC
[10] Prestea –Kumasi – Buipe Gas Pipeline	<ul style="list-style-type: none"> Send gas from the West to Kumasi and further north (400-450km pipeline) BOST signed the contract for the FEED in December 2015. This may be a medium or long term project, since no demand is forecast before 2022. 	BOST
[11] Extension of WAGP to West Africa (FS)	<ul style="list-style-type: none"> Conduct FS for examining the current WAGP system performance and its possible future network extension to other ECOWAS states 	ECOWAS

Source: JICA Study Team

22.8.6 Profiles of Priority Projects for Gas Sector of Ghana

(1) Project for Construction of Aboadze-Tema Natural Gas Pipeline

1) Rationale

Natural gas is urgently demanded by the power generation now in Ghana. The demand centres of natural gas are focused at Tema and Takoradi where both existing and under construction gas-fired power generation plants are gathered.

With significant growth in demand, gas infrastructure developments are needed for increasing domestic gas production and importing LNG. In addition to these infrastructure, a transmission gas pipeline between the East and the West to balance supply and demand across the regions in Ghana is needed.

2) Objectives

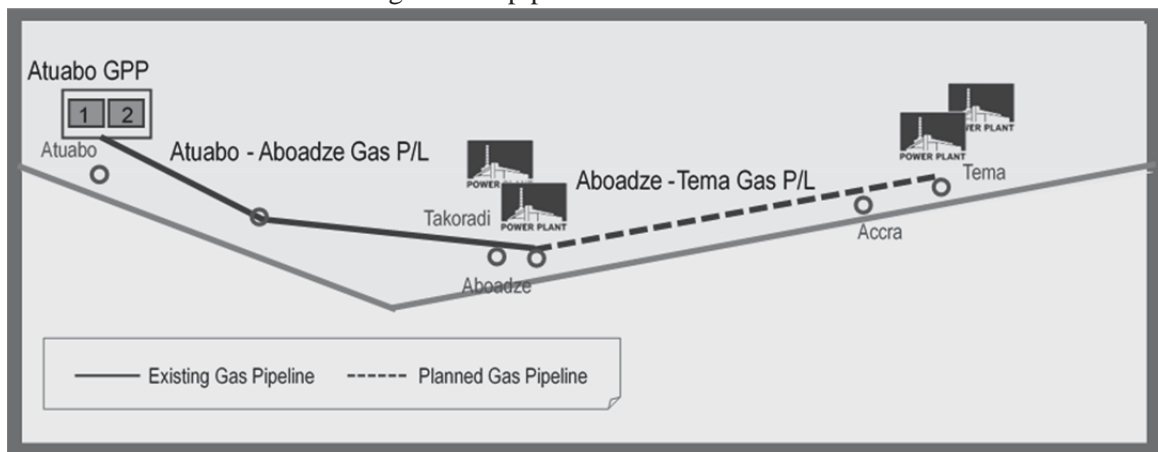
The objectives of the project are as follows:

- To supply gas from domestic fields in the West to major demand centres in the East.
- To supply gas to meet possible gas demand along the coast line.
- To ensure the security of gas supply for the flow in both directions by combination of the planned pipeline and WAGP.

3) Project Descriptions

The project descriptions are as below.

- The project is to extend the Atsuabo - Aboadze transmission pipeline to Tema that runs from the West to the East. The length of the pipeline will be 230 -250 km.



Source: JICA Study Team

Figure 22.8.5 Aboadze – Tema Gas Pipeline Project

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Keep the gas supply balance between the East and the West Ghana.

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- For the Phase 1 which is described in 7) Implementation Schedule, BOST signed the contract for FEED with Penspen (a UK base engineering firm) in December 2015.
- GNPC with its subsidiary GNGC would be the executing agency for the Project. GNPC/GNGC is responsible for land acquisition and resettlement (Phase 2) and tendering for selecting EPC contractor (Phase 3).
- Under the EPC contract, the successful contractor would perform all required activities for EPC (Phase 4). GNPC/GNGC would select the Operation and Maintenance contractor by negotiation with that for the existing Atsuabo – Aboadze pipeline. Under the O&M contract, the successful contractor would provide O&M services.

6) Estimated Project Cost

- Construction Cost: USD 400 million (assumed by GNGC): To be reviewed
- Land Acquisition/Compensation: To be considered.

7) Implementation Schedule

The Project is to be implemented in the following phases:

- Phase 1: FEED Phase – ongoing, to be completed at the end of 2016
 - Front-end engineering design of the transmission pipeline
 - EIA
- Phase 2: Land acquisition and resettlement (2017-2018)
- Phase 3: Tendering for Selecting EPC Contractor (2018)
- Phase 4: EPC Phase (2019-2020)
 - Engineering work for the transmission pipeline
 - Procurement work of equipment and materials for the project
 - Construction work for the transmission pipeline
- Phase 5: Operation and Maintenance Phase (2021-)

Required time frame for the program/project is estimated as follows;

Table 22.8.7 Implementation Schedule for the Aboadze – Tema Gas Pipeline Project

Item/Activity	2016	2017	2018	2019	2020	2021
FEED						
Land acquisition and resettlement						
Tendering for Selecting EPC Contractor						
EPC						
Commencement of O&M						

Source: JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary action for implementing this priority project is as follows:

- Land acquisition for the right of way for the pipeline

9) Related Projects

Related projects are listed as follows:

- Revised Gas Master Plan to be published in December 2016 or January 2017
- Atsuabo – Aboadze Gas Pipeline Project
- Deliverables of FEED made by Penspen (to be submitted at the end of 2016)

10) Social and Environmental Impacts

To be considered.

22.9 Investment Promotion of Ghana

22.9.1 Present Situation of Investment Promotion of Ghana

The Ghana government has passed new laws to encourage foreign investment and has replaced regulations perceived as unfriendly to investors. The Ghana Investment Promotion Centre (GIPC) Act regulates investments in almost every sector except minerals and mining, oil and gas, and the industries within Free Zones, the latter of which are regulated by the Ghana Free Zone Board (GFZB) Act. Foreign investors are not subject to differential treatment on taxes, prices, or access to foreign exchange, imports or credit. The GIPC Act requires foreign investors to satisfy a minimum capital requirement. The GIPC Act provides incentives for foreign investors such as tax holidays, capital allowances, location incentives and other inducements. There is also custom duty exemption for agricultural and industrial plant and machinery and equipment imported for investment purposes.

The GIPC is a government agency founded under the GIPC Act, 2013 (Act 865) and is responsible for promotion of investments in the country through the creation of an attractive incentive framework and a transparent, predictable and facilitating environment for investors. The GIPC coordinates and monitors all investment activities by connecting between investors and ministries,

government departments and agencies, institutional lenders and other authorities concerned with investments. Moreover, the GIPC has established a one-stop-shop for investment registration and has become the official and most accurate information hub for investors in Ghana by providing seamless “one stop shop – high value added” services.

22.9.2 Issues on Investment Promotion of Ghana

The following points are determined as issues for investment promotion in Ghana:

- Operational problems, partly because of ambiguous rules
- Not a close enough relationship among investment-related organizations, leading to no integrated database for domestic/foreign enterprises in Ghana
- Limited expertise for investment promotion in GIPC
- Difficulty of attracting FDI because of limited market size in Ghana

22.9.3 Objectives for Investment Promotion of Ghana

The objectives of the investment promotion for Ghana are as follows:

- To create more favourable investment environment for Ghana and WAGRIC Sub-Region
- To take advantage of the integrated and expanded sub-regional markets, especially coastal markets for attracting investment to economic sectors of Ghana targeting the growing coastal markets
- To attract investment to the mining sector

22.9.4 Strategies for Investment Promotion of Ghana

The basic strategies for the investment promotion are the following:

- To remove restrictions on investment for improving the business climate
- To offer more appropriate services to potential investors by capacity building of GIPC
- To promote private investment with strategic focuses on specific economic sectors, which are agriculture, livestock and agro-processing sectors targeting growing sub-regional markets
- To attract FDI to economic sectors oriented to sub-regional markets by utilizing the merit of customs union under ECOWAS, which is establishment of integrated and expanded sub-regional markets
- To attract investment to the mining sector, at the same time attracting investment to necessary transport development for mining development

22.9.5 Possible Measures for the Investment Promotion

The following measures are proposed:

- Policy arrangement for a stable business climate
- Strengthening of the institutional capacity of the GIPC and other public agencies in charge of investment promotion and business climate policy
- Promotion of investment to priority projects for Ghana, such as Development of Nyinahin Bauxite Mine, Development of Shieni Iron Mine, Manufacturing Industries in Sekondi-Takoradi, Manufacturing Industries in Greater Kumasi, and ICT-BOP Industries in Greater Kumasi

22.9.6 Programmes and Projects for Investment Promotion of Ghana

(1) Projects for Investment Promotion for Growth Economic Sectors

Investment promotion projects in the table below should be implemented in Ghana to take advantage of integration and expansion of sub-regional markets as well as to increase the number of middle income population.

Table 22.9.1 Priority Projects for Investment Promotion for Growth Economic Sectors in Ghana

Sector	Project	Short Term (2018-25)	Mid Term (2026-33)
Manufacturing	Investment Promotion for Manufacturing Industries in Sekondi-Takoradi	●	●
	Investment of Promotion for Manufacturing Industries in Greater Kumasi	●	●
	Investment Promotion for Manufacturing Industries in Tamale		●
Mining	Investment Promotion for Development of Nyinahin Bauxite Mine	●	
	Investment Promotion for Development of Shieni Iron Mine	●	
ICT	Investment Promotion for ICT-BOP Industries in Greater Kumasi	●	
	Investment Promotion for ICT-BPO Industries in Tema, Cape Coast and Greater Kumasi		●

Source: JICA Study Team

(2) Capacity development programmes for GIPC

1) Programme for Strengthening Information Services of GIPC for the Private Sector

- Provision of information and services on the investment climate (e.g. Cooperation with Japan External Trade Organization (JETRO))
- Promotion of mutual exchanges of information regarding investment (e.g. organizing investment seminars, dispatching investment missions, creating local company database)

2) Programme for Formulation of Investment Policy and Implementation of Law Enforcement by Expanding the Capacity of Investment Promotion Institutions in Ghana

- Clarification of investment promotion policy (e.g. periodically assess the impact of foreign direct investment and instigate policy change, where necessary, to improve performance or to deal with a changing environment)
- Revision of investment-related laws and regulations (e.g. Revision of the registration system for domestic or foreign companies. Currently there are two systems, that of the GIPC and that of the GFZB)
- Strengthening of the capacity the staff of the GIPC (e.g. dispatching experts who are working as advisors on investment promotion to organize investment seminars and plan and manage investment missions)
- Strengthening of cooperation among related to organizations to correspond with investors' needs (e.g. establishing a coordinating committee to support a policy dialogue with related organizations for provision of necessary infrastructure)

22.9.7 Profiles of Priority Projects for Investment Promotion of Ghana

(1) Investment Promotion for Economic Sectors targeting Sub-Regional Markets

1) Project Outline

In 2013, the Ghana Investment Promotion Centre (GIPC) was established. It has tried to attract investment to infrastructure development, as well as to the mining sector. However, it has not paid much attention to the growth potential of Ghana's economic sectors targeting coastal markets in the sub-region.

By taking advantage of the possibility to integrate and expand the size of sub-regional consumers' markets, it is possible for GIPC to attract investment to economic sectors targeting sub-regional consumers' markets. Such target economic sectors include those of agriculture and fisheries and agro-processing.

The project aims to making a clear shift of investment promotion toward economic sectors orientated to sub-regional markets. For this purpose, the project will prepare new promotion materials, provide training to related agencies and personnel and implement actual activities for investment promotion.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

US\$ 4 million

Chapter 23 Development Strategies for Infrastructure Sectors of Ghana

23.1 Roads and Highways of Ghana

23.1.1 Present Situation of Road Sector in Ghana

(1) Institutional Framework of the Road Sector

The Ministry of Roads and Highways (MRH) and three agencies under the Ministry, the Ghana Highways Authority (GHA), the Department of Urban Roads (DUR) and the Department of Feeder Roads (DFR), are responsible for road construction and maintenance in Ghana. The Road Fund (RF) is responsible for the collection of toll fees to provide fund for the road maintenance.

(2) Framework for Road Planning and Development in Ghana

Ghana Shared Growth and Development Agenda (GSGDA) II 2014-2017 indicates the development policy for transport infrastructure as the upper-level national development plan.

National Spatial Development Framework (NSDF) 2015-2035 proposes the future road networks including expressways, trunk roads, and urban roads.

The National Transport Policy formulated in 2008 is a guiding document for the development of Transport in Ghana.

The following sectorial policies and plans on road development are set out based on the National Transport Policy and upper-level plans as follows:

- Sector Medium-Term Development Plan (SMTDP) 2014-2017
- Highway Network Master Plan 2001-2020
- Integrated Transport Plan for Ghana 2011-2015
- Ghana Highway Authority's Strategic Plan 2015-2017

MRH and GHA have a development plan for each of the following expressways, which are high-standard 4-lane roads in Ghana:

- Accra-Kumasi expressway
- Kumasi-Paga expressway
- Sunyani loop (Techniman-Sunyani-Kumasi)
- An upgrade of TAH7
- Accra city-region expressway system
- ECOWAS Trans-West African Coastal expressway

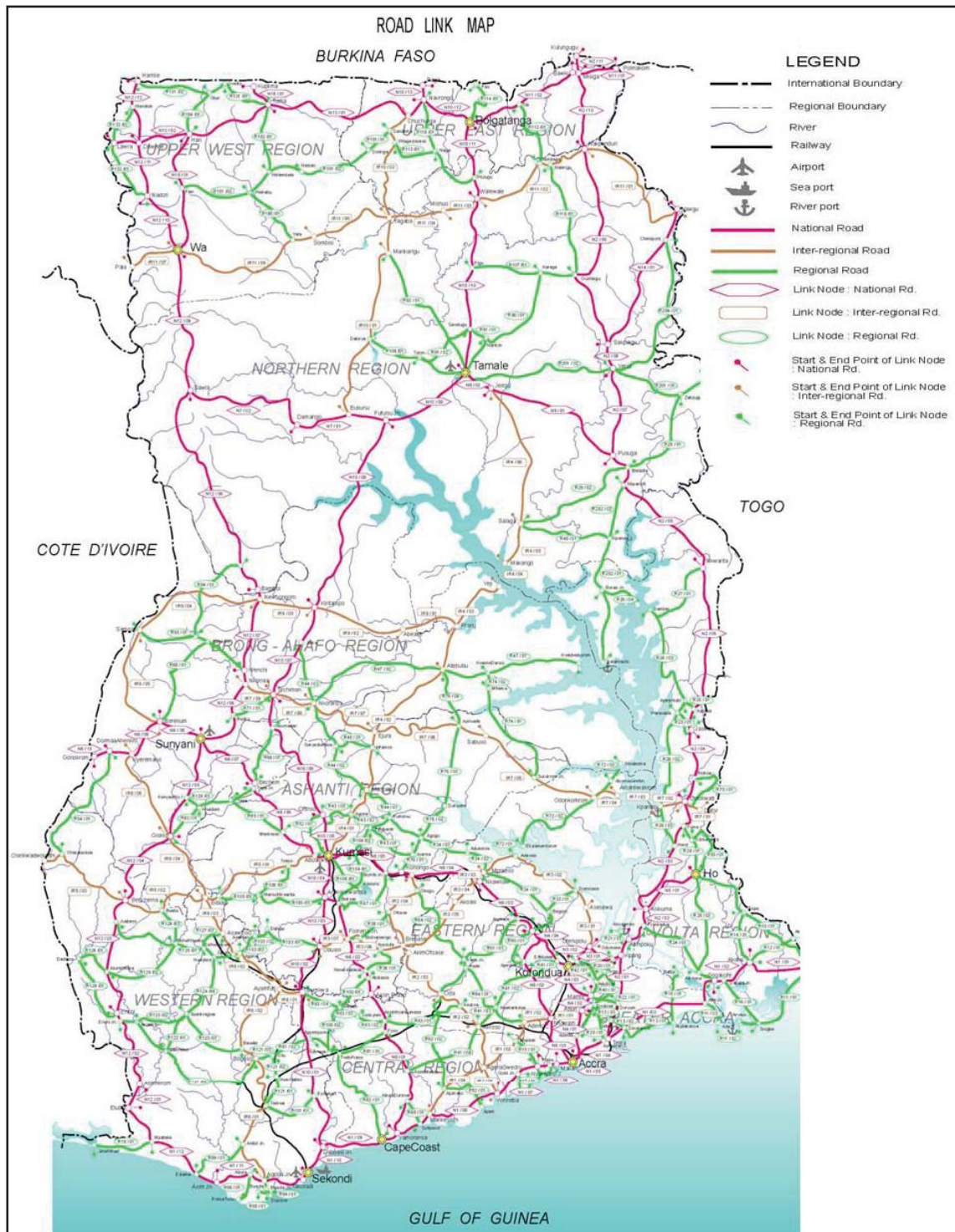
(3) Existing Conditions of Roads and Highways in Ghana

1) Existing Network of Roads and Highways

Ghana currently has a road network consisting of about 71,003km of roads across the country. Ghana's road system has three road types, namely trunk roads, urban roads and feeder roads. There are about 14,903 km of trunk roads, 14,000 km of urban roads, and 42,100 km of feeder roads (See Table 23.1.1).

The trunk road network is divided into national roads, inter-regional roads and regional roads. There are about 4,500 km of national roads, 2,600 km of inter-regional roads, and 7,700 km of regional roads. Figure 23.1.1 shows the trunk road network, which connects major cities and regional capitals and are typically referred to as road corridors: Central Corridor, Eastern Corridor, Western Corridor and Coastal Corridor. Urban roads serve main urban centres such as Greater Accra, Greater Kumasi and Sekondi-Takoradi. Feeder roads connect to small towns and rural areas.

Feeder roads make up about 60% of the network, while trunk roads and urban roads have an even share of about 20% each. The conditions of feeder roads are poor. The percentage of paved roads is only 5 % (See Table 23.1.2).



Source: GHA

Figure 23.1.1 Trunk Road Network in Ghana

Table 23.1.1 Road Network Size and Road Conditions in Ghana, 2014

Road Type & Responsible Agency	Network Size (km)	Conditions
Trunk Roads (GHA)	14,903km	52% Good, 34% Fair, 14% Poor
Urban Roads (DUR)	14,000km	40% Good, 32% Fair, 10% Poor
Feeder Roads (DFR)	42,100km	30% Good, 38% Fair, 32% Poor
Total	71,003km	45% Good, 25% Fair, 30% Poor

Source: JICA Study Team based on information from GHA, DUR, DFR, 2014

Table 23.1.2 Feeder Road Network Size and Road Conditions in Ghana, 2013

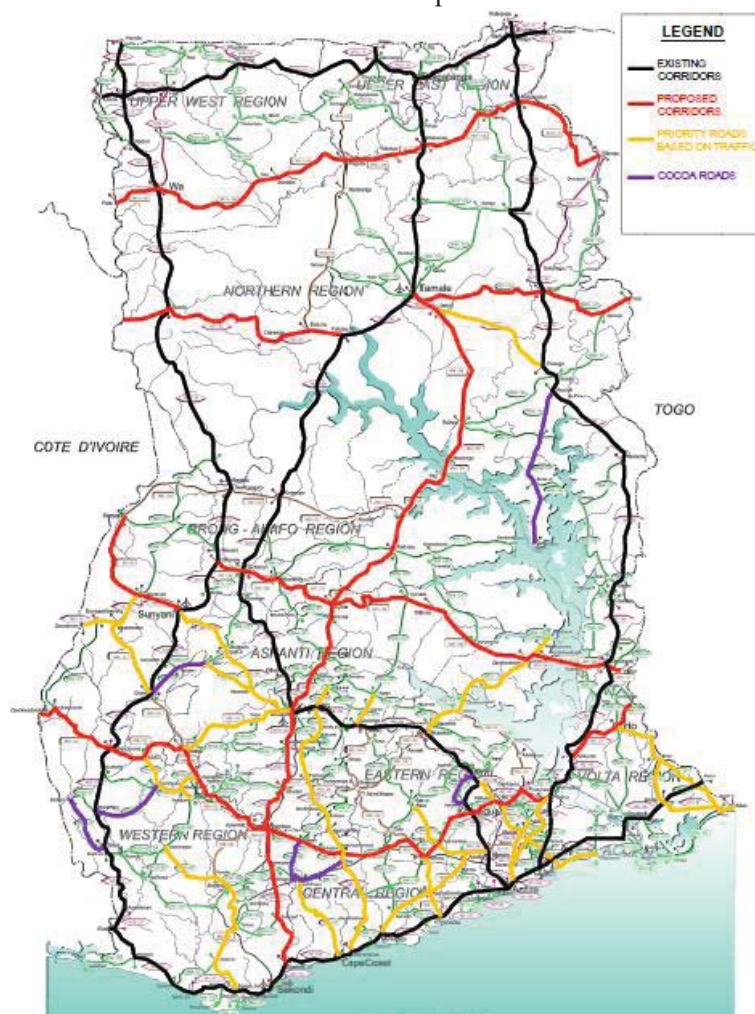
Type	Length (km)	Composition
Bituminous Surface	1,928.0	5%
Gravel Roads	27,231	65%
Earth Roads	12,941	30%
Total	42,100	100%

Source: DFR, 2013

2) Corridor Development in Ghana

The MRH is working on the following roads as the priority corridors under the corridor development policy of the government.

- Central Corridor: Accra-Kumasi-Techiman-Tamale-Bolga
- Eastern Corridor: Tema-Hohoe-Kejebi-Yendi-Kulungugu
- Western Corridor: Elubo-Enci-Sunyani-Bamboi-Wa-Hamile
- Northern Corridor: Lawra-Han-Tumu-Navrongo-Bolga-Bawku-Polmakon
- Coastal Corridor: Elubo-Takoradi-Accra-Noépé



Source: GHA, 2015

Figure 23.1.2 GHA Road Plan 2015-2035

Central Corridor

The central corridor links Accra/Tema, Kumasi, Tamale, Bolgatanga and the border crossing at Paga to Burkina Faso. And the axis between Sekondi-Takoradi and Kumasi is defined as a part of the central corridor (Route N6 and N10). The rehabilitation projects on N6 and N10 are almost completed. The improvement of road section between Buipe-Tamale is on-going and it will be finished in 2014.

MRH is giving high priority to the Accra-Kumashi highway dualisation project for upgrading the Central Corridor. The purpose of the project is to construct a toll road between the cities of Accra and Kumasi. The bypass of Nsawam, a part of this project, was constructed. The section of Kwafokrom- Apedwa is under construction and it is scheduled to be opened at the end of April 2016. This dualisation project has been promoted by the PPP scheme on BOT basis under a 30 year concession agreement. A ring road and a bypass that detour around the central cities of Kumasi and Tamale are also planned.

Eastern Corridor

The Ghana government has given high priority to the development of the Eastern Corridor. This corridor is composed of 700 km of the National Road No.2 traversing the Regions of Greater Accra, Volta, Northern and Upper East. The road upgrading project is expected to improve access to markets and enable farmers to increase the value of agricultural products and ultimately their incomes. It is the shortest distance between the southern and northern parts of the country, and holds huge economic importance not just for the communities it passes through, but the entire country. The north eastern part of Ghana is considered a bread basket of the nation and, therefore, deserves all the necessary attention to promote agricultural development.

Western Corridor

The Western Corridor links Elubo (a border town with Côte d'Ivoire), Sunyani, Sawla, Wa, and Hamile (Route N12). The South Korean government is committed to the development of this corridor.

Coastal Corridor

The coastal corridor links the urban settlements along the coast including Tema, Accra, Cape Coast and Sekondi-Takoradi. The corridor is 2-lane road except for the sections in the urban areas and their surroundings. The road between Mallam and Tema is planned as a 4-lane expressway. The other road sections are 2-lane road. With the expansion of urban areas of the Greater Accra to the east and west, the traffic volume is certainly increasing. If the development of Tema Development Corporation (TDC) area and the new airport progresses according to plans, it would be expected to cause a considerable traffic increase. As measures to solve these problems, improvement of intersections and construction of an outer ring road is planned. In addition, the extension and road widening of the existing motorway is also planned. It is considered to apply the PPP scheme for the extension and widening of Accra-Tema Motorway and construction of Accra-Takoradi Motorway. The necessity of a dual-carriageway from Accra to Cape Coast is mentioned in the National Tourist Development Plan 2013-27 to increase the potential for tourism. In the Takoradi city, the traffic is increasing, probably as a result of the investment in the oil development. The road condition of arterial roads is poor and rehabilitation is needed in the city.



Source: JICA Study Team

Figure 23.1.3 Road Condition on Coastal Corridor in Ghana

(4) Existing Projects and Future Plan

1) Central Corridor:

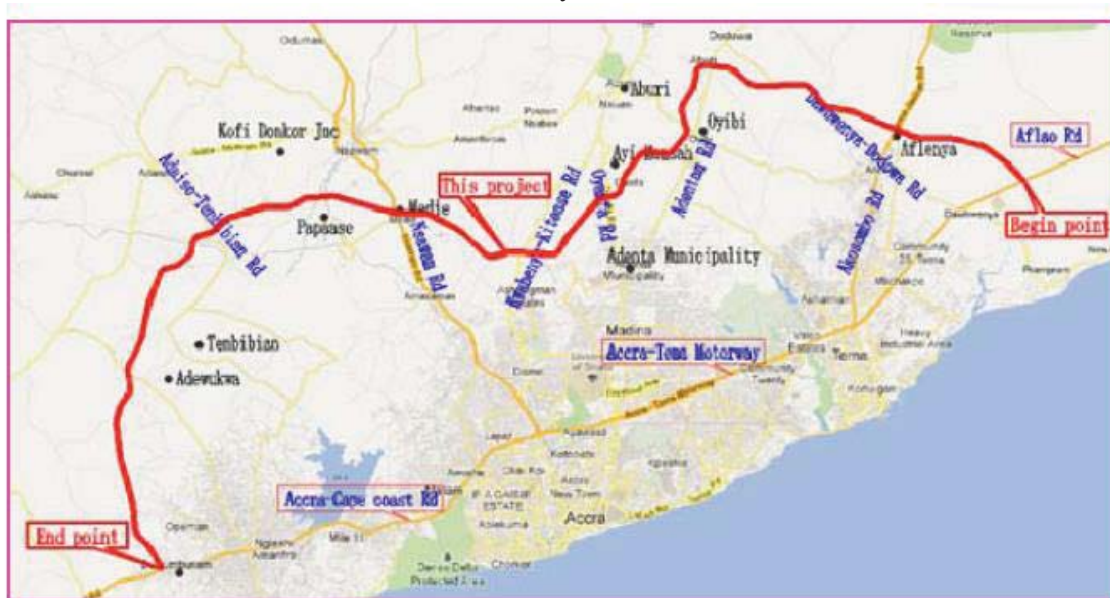
- Buipe-Tamale Road Rehabilitation and Strengthening Project

2) Eastern Corridor

- Tema roundabout-Atimpoku-Asikuma Junction : 91km
- Asikuma Junction-Nkwanta
- Nkwanta-Nakpanduri
- Nakpanduri-Kulungugu

3) Coastal Corridor

- Improvement of Tema motorway roundabout (Preparation study by JICA)
- Road rehabilitation project between Elubo and Esiam (World Bank)
- Expansion and widening of Accra-Tema Motorway
- Constriction of Accra-Takoradi Motorway



Source: DUR

Figure 23.1.4 Accra Outer Ring Road Project

23.1.2 Issues on Roads and Highways in Ghana

Issues on development and management for roads and highways in Ghana are summarized as follows:

- Lack of a urban transport plan for the Greater Accra in consideration of long-term development of the metropolitan area and the Tema Port as a node of the coastal corridor and north-south corridor and an international gateway.
- Traffic congestion and high cost of road maintenance caused by the lack of functional railway systems in the country and the high dependency of medium and long-distance transport on roads.
- Unplanned expansion of road network
- Inconsistent prioritization of road maintenance
- Over commitment of approved budget resulting in delayed payment for works
- Inadequate revenue to cover the cost of routine and periodic maintenance. The value of the fuel levy for the Road Fund has remained at GHs 0.06 per litre since 2005 eroding its value by more than 50%
- Inadequate project preparation and inappropriate packaging of works
- Inconsistent application of procurement procedures including difficulties with the authentication of bidders supporting tender documents and contractor register entries
- Non-adherence to contract conditions and lapses in documentation during contract execution
- Delays in execution of works due to scarcity of materials and capacity constraints of contractors
- Ineffective supervision and monitoring of works caused by large numbers of ongoing projects (over commitment), insufficient capability of staff and logistics constraints
- Non adherence to the use of consistent planning tools by the agencies

- Inadequate axle load control in the network

23.1.3 Objectives for Development of Roads and Highways in Ghana

The road network development in Ghana should aim at building the basic framework of the country and improving the accessibility to the neighbouring countries.

The road network should also work to increase not only socio-economic exchange within the country, but also socio-economic exchanges within the sub-region by improving road conditions and reducing travel time and costs. The overall goal of the road development is to promote socio-economic exchanges and socio-economic development, to improve global competitiveness and expand demand (both freight and passengers) for transportation.

The following objectives for road development are identified:

- Objective 1: To contribute to economic sector development and enhance socio-economic exchanges within the country and between countries, by establishing road and highway networks centring on Greater Accra and the Central Corridor (Accra-Ouagadougou Corridor).
- Objective 2: To establish a road and highway network for sub-regional and national integration by linking Abidjan - Sekondi-Takoradi – Accra/Tema - Lomé in the coastal belt zone and for enhancing the global gateway function of major cities and major ports in the coastal belt zone, thereby contributing to the acceleration of economic growth and improvement of the global competitiveness of Ghana.
- Objective 3: Enhancement of the hub functions of international and national corridors of Greater Accra (as the international gateway of Ghana).
- Objective 4: To promote development of inland areas which are relatively underdevelopment by strengthening north-south connectivity and providing better accessibility to agricultural potential areas in inland areas
- Objective 5: To develop the road environment for realization of smooth and safe road transportation.

23.1.4 Development Strategies and Possible Measures for Development of Roads and Highways in Ghana

Seven strategies are identified for road development in Ghana as shown below. Possible measures to implement each strategy are also described in this section.

- Strategy 1: Expansion of a high-standard road network for achieving high-speed transportation service on the Central Corridor (Tema-Accra-Kumasi-Tamale)
- Strategy 2: Development of the Coastal East-West Motorway for supporting the development of the East-West Coastal Economic Belt (part of Abidjan - Accra/Tema – Lomé – Cotonou - Lagos Corridor)
- Strategy 3: Enhancement of the hub function of international and national corridors of Greater Accra (as the international gateway of Ghana)
- Strategy 4: Development and reinforcement of the Secondary North-South Corridors
- Strategy 5: Strengthening of east-west roads by extending them from the major urban centres on the Central Corridor
- Strategy 6: Improvement of accessibility for promoting the utilization of development potential
- Strategy 7: Capacity building for the organizations in charge of road management

(1) Strategy 1: Expansion of a high-standard road network for achieving high-speed transportation service on the Central Corridor (Tema-Accra-Kumasi-Tamale)

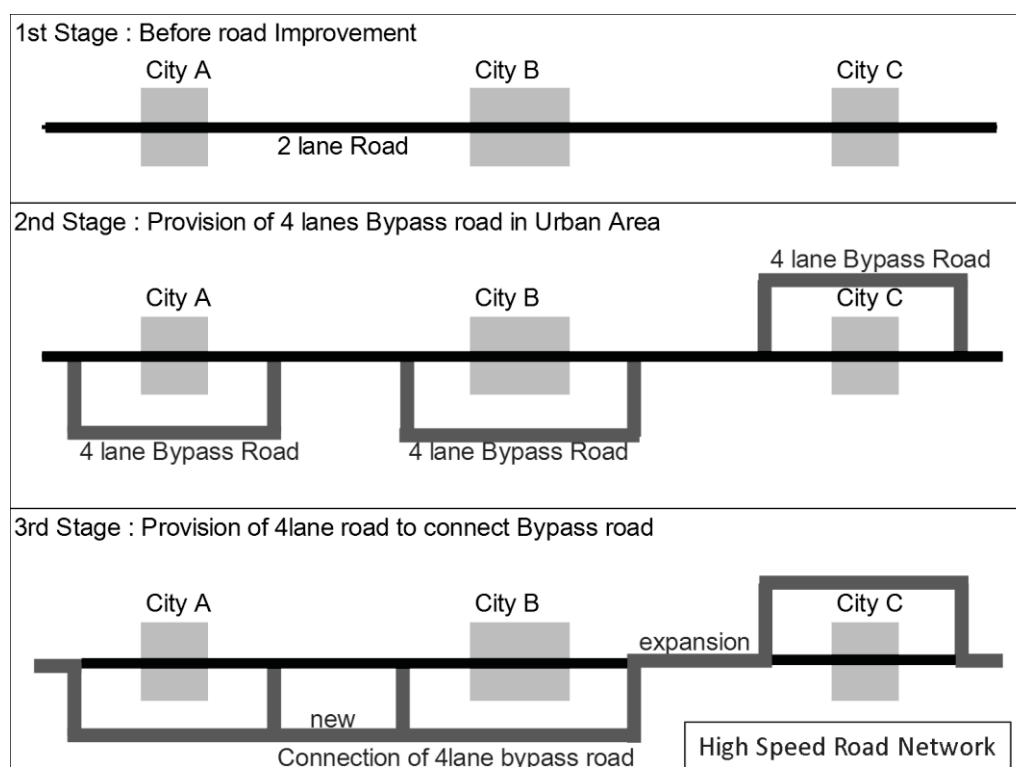
Considering that the Central Corridor is expected to serve as the development axis of Ghana, the development of high-standard roads and highways should be sought so that the transport corridor could realize high-speed transportation service. The figure shows the concept of upgrading from a general road to the high speed road

The target corridor for Strategy 1 is as follows:

- Tema/Accra - Kumasi - Techiman - Tamale - Border of Burkina Faso

Possible measures for Strategy 1 include the following:

- Road dualization between Accra and Kumasi, and extension of the road by advance investment rather than depending on the traffic demand increase,
- Construction of bypasses roads or ring roads in Kumasi, Techiman, Tamale and other towns on the corridor where the through traffic should be avoided
- Installation of bus bays and truck bays along the roads



Source: JICA Study Team

Figure 23.1.5 Concept of Upgrading from General Road to High Speed Road

(2) Strategy 2: Development of Coastal East-West Motorway for Supporting the Development of the East-West Coastal Economic Belt (part of Abidjan - Accra/Tema – Lomé – Cotonou - Lagos Corridor)

Construction of the Abidjan - Lagos Motorway forming the coastal growth belt should be initiated. As it will take time to construct all the sections of the motorways within Ghana, it is important to maintain and reinforce the existing coastal roads mainly between Takoradi-Accra-Tema for improvement of the road service level.

The target corridors for Strategy 2 are as follows:

- Abidjan - Lagos Motorway (Border of Côte d'Ivoire - Border of Togo)
- Agona - Takoradi - Accra

- Accra – Tema - Sogakope

Possible Measures for Strategy 2 include the following:

- Development of 6-lane motorway (Abidjan - Lagos Motorway)
- Road widening of existing roads and motorways
- Construction of bypasses or ring roads in cities on the corridor: Takoradi, Cape Coast
- Improvement of bottleneck intersections
- Reinforcement or replacement of aged bridges
- Road development with asphalt concrete pavement that can withstand the traffic of heavy vehicles

(3) Strategy 3: Enhancement of the Hub Function of International and National Corridors of Greater Accra (as the International Gateway of Ghana)

In order to respond to the increasing traffic demands and in order to provide smooth access to Tema Port and Kotoka International Airport, a network radial arterial roads and ring roads should be developed in the Greater Accra that would serve as the strategic node of the national road network in Ghana to promote smooth traffic and expansion of urban areas. Additionally, the efficient connecting to the development area; the new container terminal at Tema Port and new airport at Prampram should be considered. In addition to physical expansion of the road and motorway networks, measures to utilize smart traffic systems for improvement of the functionality of road infrastructure should be implemented.

The target area for Strategy 3 is Greater Accra.

Possible measures for Strategy 3 include the following:

- Development of arterial radial roads and outer ring roads, and improvement of bottleneck intersections for smooth connection between corridors
- Development of access road for linking the major north-south corridor and east-west corridor with major transport nodes, such as the new container terminal at Tema Port and the new airport
- Establishment of Intelligent Transport Systems (ITS) like Electronic Toll Collection (ETC), advanced traffic signal systems and road information system within cities

(4) Strategy 4: Development and Reinforcement of the Secondary North-South Corridor

For the purpose of promoting regional development in underdeveloped areas, “development” and “reinforcement” of roads that compose the Secondary North-South Corridors should be promoted.

The target corridors for Strategy 4 are as follows:

- Eastern Corridor: Tema - Ho - Yendi - Border of Ouagadougou
- Western Corridor: Elbo - Enchi - Wa - Border of Ouagadougou

Possible measures for Strategy 4 include the following:

- Road development with asphalt concrete pavement that can withstand the traffic of heavy vehicles
- Reinforcement or replacement of aged bridges together with widening of bridges for accommodating a four-lane, two lanes each way
- Widening of trunk roads to four-lane roads, two lanes each way, for inter-city sections where high transport demands are expected

(5) Strategy 5: Strengthening of East-West Roads by Extending them from Major Urban Centres on the Central Corridor

Upgrading or improvement of roads to connect regional core cities, such as Bolgatanga, Walewale, Tamale, Techiman and Dunkwa, on the Central Corridor, with surrounding areas, for providing basic urban services, should be done.

Target road links for Strategy 5 are as follows:

- Northern Corridor: Lawra - Bolgatanga - Nankpaduri - Polmako
- Upper East-West Corridor: Pala - Wa - Walewale - Yawgu
- Northern East -West Corridor: Sawla - Tamale - Yendi - Tatali
- Middle East Corridor: Sampa - Sunyani - Techiman —Kpando - Dafor
- Lower East Corridor: Ho - Kpong - Dunkwa - Benchema - Oseikwadwokrom

Possible measures for Strategy 4 include the following:

- Pavement of roads with asphalt concrete
- Rehabilitation of roads
- Reinforcement or replacement of aged bridges
- Development of feeder roads (simple pavement, construction of bridges, application of Labour-Based Technology)

(6) Strategy 6: Improvement of Accessibility for Promoting the Utilization of Development Potential

Access roads to potential development areas from major cities, which are consumer centres, as well as from Tema Port and Takoradi Port should be provided. Pavement of roads and construction of bridges for connecting roads to villages and farm lands should be promoted in order to provide access to major corridors.

Target development areas for Strategy 6 are as follows:

- Agricultural potential development areas in the central, northern, western and eastern parts of the country
- Mineral development areas, such as bauxite mines in the south-western part and iron ore mines in the north-eastern part of the country)
- Tourism development areas

Possible measures for Strategy 6 include the following:

- Development of access roads (pavement, construction of bridges)
- Development of access roads to railway cargo stations, major logistics bases (logistic centre, market, etc.)
- Development of roads within development areas
- Development of feeder roads (pavement, construction of bridges)

(7) Strategy 7: Capacity building for organizations in charge of road management

Establishment or strengthening of organizations in charge of road traffic safety and road management is important to ensure efficient and safe use of roads. Additionally, it is necessary to strengthen the road administration function for this aspect. Strengthening of the road administration function should be promoted.

Target roads and areas, as well as administrative organizations for Strategy 7 are all roads, cities, and road administrative organizations.

Possible measures for Strategy 7 include the following:

- Implementation of road safety measures including enforcement of road safety rules
- Implementation of Intelligent Transportation Systems (ITS) including traffic control systems, advanced traffic signal systems, and traffic information providing systems
- Strengthening of the administrative functions concerning road planning, design, construction and maintenance
- Strengthening of maintenance capabilities (maintenance planning capabilities, equipment, budgeting)
- Establishment of overload monitoring systems for heavy vehicles and strengthening of enforcement of axle load control
- Training of trucking companies to improve safe transport capabilities and to ensure compliance with regulations
- Designation of road routes and time in which large trucks are allowed to use them
- Application of engineering design of road structures responding to the weight increase of trucks
- Establishment of road management systems including a road inventory database

23.1.5 Programmes and Projects of Development for Roads and Highways

The road projects selected based on the road and highway development strategies are shown in Table 23.1.3 . However, projects shown here are essential road projects which should be tackled strategically for the development of WAGRIC. There are other road projects which should be promoted by the Government of Ghana for the development of the country.

Table 23.1.3 Long List of Road Projects in Ghana

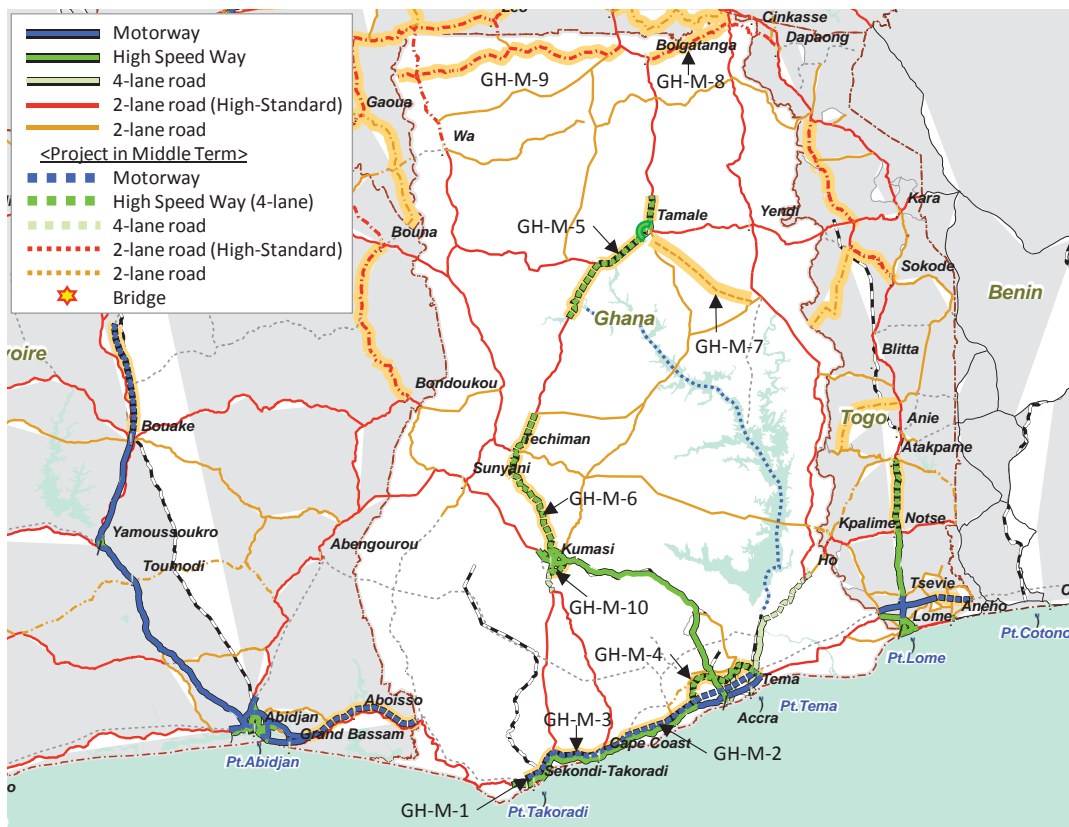
	Name of Priority Project	No. Lane	Length	Project Schedule		
				Short	Middle	Long
Ghana						
GH-S-1	Improvement of Inter-Regional Road between Yawgu and Wa	2	400	km		
GH-S-2	Improvement of Regional Road between Navrongo and Fian	2	183	km		
GH-S-3	Improvement of Inter-Regional Road between Navrongo and Banusu	2	230	km		
GH-S-4	Improvement of Inter-Regional Road between Tamale and Makango	2	145	km		
GH-S-5	Improvement of Inter-Regional Road between Yeji and Kintampo	2	144	km		
GH-S-6	Improvement of Inter-Regional Road between Salaga and Bimbila	2	76	km		
GH-S-7	Improvement of Inter-Regional Road between Techiman and Agordeke	2	302	km		
GH-S-8	Improvement of Inter-Regional Road between Kpando-Torkor and Golokwati	2	18	km		
GH-S-9	Improvement of Inter-Regional Road between Berekum and Banda Nkwanta	2	166	km		
GH-S-10	Construction of East-West Motorway in Greater Accra	6	20	km		
GH-S-11	Replacement of Ankobra Bridge (Coastal Corridor)	4	200	km		
GH-S-12	Replacement of Iture Bridge (Coastal Corridor)	4	60	km		
GH-S-13	Widening of Accra – Tema Motorway up to 6 Lanes (Abidjan - Lagos Corridor)	6	19	km		
GH-S-14	Construction of Motorway between Tema and Prampram (Abidjan-Lagos Corridor)	6	15	km		
GH-S-15	Upgrading of National Road No. 2 between Tema Roundabout and Atimpoku to 4-Lane Dualized Road	4	60	km		
GH-S-16	Improvement of Tema Intersection by Construction of Flyovers	4	-	km		
GH-S-17	Construction of High-Speed Way on National Road No.1 between Nkawkaw and Kumasi (Central Corridor) (Continuation of Widening of Accra - Kumasi Road)	4	200	km		
GH-S-18	Construction of Greater Kumasi Outer Ring Road North-East Section (Central Corridor)	4	25	km		
GH-S-19	Upgrading of National Road No.1 between Tamale-Yaipe and Tamale- Savelugu to 4-lane Road (Central Corridor)	4	70	km		
GH-S-20	Completion of North-East Section of Inner Ring Road in Tamale	4	4	km		
GH-S-21	Construction of Buipe Bridge (Replacement)	4	250	km		
GH-S-22	Construction of Yapei Bridge (Replacement)	4	250	km		
GH-S-23	Improvement of National Road No. 11 between Bolgatanga and Bawku	2	80	km		
GH-S-24	Improvement of National Road No. 13 between Lawra and Navrongo	2	250	km		
GH-S-25	Improvement of Regional Road between Tamale and the National Boarder with Togo (Nachemba)	2	70	km		
GH-S-26	Improvement of National Road between Sunyani and the National Boarder with Côte d'Ivoire (Gonnokron)	2	160	km		
GH-M-1	Construction of Outer Ring Road for Sekondi-Takoradi as part of Abidjan-Lagos Motorway (Coastal Corridor)	4	20	km		
GH-M-2	Construction of Abidjan-Lagos Motorway between Accra (Kasoa)- Cape Coast	6	110	km		
GH-M-3	Construction of Abidjan-Lagos Motorway Section between Cape Coast – Sekondi-Takoradi (Coastal Corridor)	6	70	km		
GH-M-4	Construction of Outer Ring Road for Greater Accra	6	108	km		
GH-M-5	Construction of 4-Lane High-Speed Way on National Road No.1 between Buipe and Savelugu including Bypass Road for Tamale as part of High-Speed Way (Central Corridor)	4	30	km		
GH-M-6	Construction of 4-Lane High-Speed Way on National Road No.1 between Kumasi and Kintampo including Bypass Road at Techiman and Kintampo (Central Corridor)	4	180	km		
GH-M-7	Upgrading of National Road No. 9 between Tamale and Bimbila	2	100	km		
GH-M-8	Upgrading of National Road No. 11 between Bolgatanga and Bawku to 2-Lane High-Standard Road	2	80	km		
GH-M-9	Upgrading of National Road No. 13 between Lawra and Navrongo to 2-Lane High-Standard Road	2	250	km		
GH-M-10	Construction of Greater Kumasi Outer Ring Road South-East Section	4	20	km		
GH-L-1	Construction of Abidjan-Lagos Motorway between Prampram - Sogakope (Coastal Corridor)	6	65	km		
GH-L-2	Construction of High-Speed Way between Kintampo and Buipe (Central Corridor)	4	92	km		

Source: JICA Study Team



Source: JICA Study Team

Figure 23.1.6 Locations of Priority Road Project in Short Term in Ghana



Source: JICA Study Team

Figure 23.1.7 Locations of Priority Road Project in Middle Term in Ghana



Source: JICA Study Team

Figure 23.1.8 Locations of Priority Road Project in Long Term in Ghana

23.1.6 Profiles of Priority Projects for Ghana

(1) Projects for the Improvement of Inter-Regional and Regional Roads for Providing Better Access to Potential Agricultural Areas from Central Corridor

1) Rationale

In response to growing coastal consumers' markets within the sub-region, it is possible to attract investment to the agricultural sector in inland areas of Ghana.

Many areas in Ghana have huge agricultural potential that needs connecting roads to major arterial roads because the time needed for agricultural produce to get to the market centres is very important to the survival of the agricultural sector. These projects are to facilitate easy transportation of agricultural produce to market centres in a timely manner.

2) Objectives

The objectives of these projects are as follows:

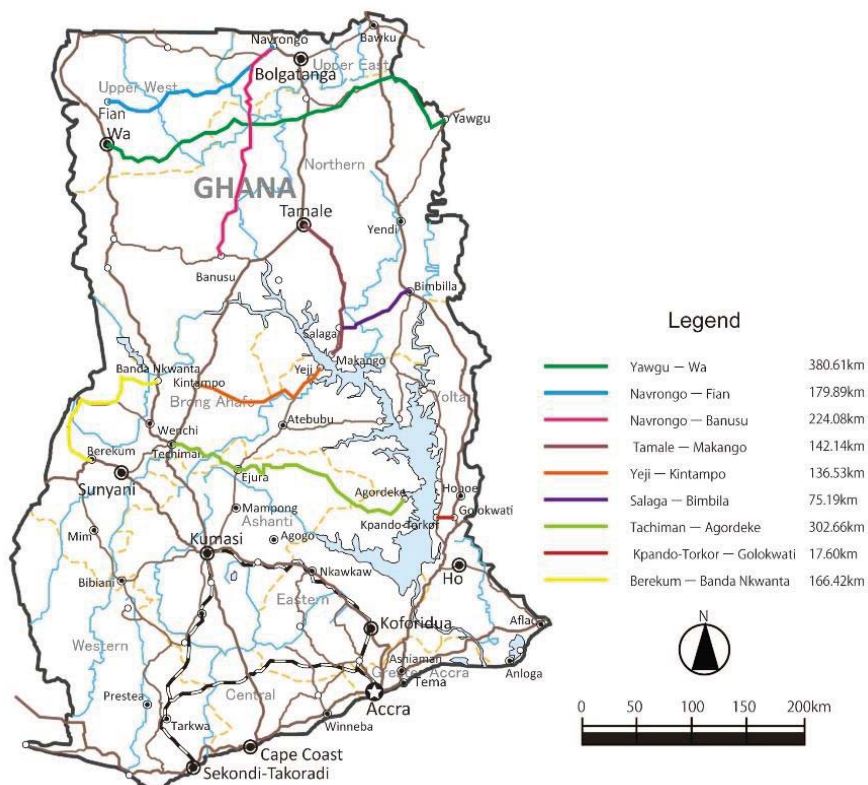
- To enhance the potential of potential agricultural potential areas to fully take advantage of market centres
- To facilitate easy movement of agricultural produce to market centres
- To improve existing minor and unmotorable roads to meet future demands
- To provide accessible alternative routes to major arterial roads

3) Project Description

The projects include:

- Improvement of Inter-Regional Road between Yawgu and Wa
- Improvement of Regional Road between Navrongo and Fian

- Improvement on Inter-Regional Road between Navrongo and Banusu
- Improvement of Inter-Regional Road between Tamale and Makango
- Improvement of Inter-Regional Road between Yeji and Kintampo
- Improvement of Inter-Regional Road between Salaga and Bimbilla
- Improvement of Inter-Regional Road between Tachiman and Agordeke
- Improvement of Inter-Regional Road between Kpando-Torkor and Golokwati
- Improvement of Inter-Regional Road between Berekum and Banda Nkwanta
- Improvement of National Road No. 11 between Bolgatanga and Bawku
- Improvement of National Road No. 13 between Lawra and Navrongo



Source: JICA Study Team

Figure 23.1.9 Projects for the Improvement of Inter-Regional and Regional Roads for Providing Better Access to Agricultural Potential Areas from Central Corridor

4) Expected Benefit

- Easy movement of people and agricultural produce to market centres and other areas
- Providing prompt delivery of goods and services
- Providing alternative options for transportation routes
- Increasing serviced road stock of the country

5) Executing Agency and Related Institution

- Ministry of Roads and Highways
- Ministry of Transport
- Feeder Road Department
- Urban Roads Department
- The Ghana Cocoa Board (COCOBOD)
- Metropolitan, Municipal, and District Assemblies (MMDAs)

6) Estimated Project Cost

US\$ 2,000 million

7) Implementation Schedule

Not Available

(2) Project for Construction of East-West Motorway in Greater Accra (100km)

1) Project Outline

Greater Accra had a population of 4.8 million in 2015. It is expected to increase to 9.2 million by 2040. Greater Accra will be one of the important coastal metropolitan areas along the Abidjan-Lagos Corridor. Greater Accra occupies the important junction between the two important economic corridors, namely the coastal Abidjan-Lagos Corridor and the north-south Central Corridor. At the same time, Tema Port and Accra International Airport are located within Greater Accra. Therefore, it is very essential for Greater Accra to continue to secure high urban mobility not only within its urban area, but also between its urban area and surrounding areas, for the purpose of maintaining the function and performance of the two economic corridors.

The East-West Motorway is one of the important solutions for enhancing the urban mobility both within Greater Accra and between its urban area and surrounding areas. Therefore, it is necessary to identify a possible route for the East-West Motorway through the urban area of Greater Accra in order to connect Kasoa (in the east) and Prampram (in the west) within Greater Accra. For identification of a feasible route of the East-West Motorway, it is necessary to conduct the Study Project for Urban Transportation Master Planning for Greater Accra.

The project aims to construct an urban motorway connecting the eastern part and western part of Greater Accra. There are two possible routes for the East-West Motorway. The one is on the route of National Road No.1 and the Accra-Tema Motorway. The other is the route for running through northern areas of the Greater Accra using parts of the proposed Outer Ring Road.

This project will be implemented by government budget (ODA loan) or PPP scheme.

2) Funding Scheme

ODA Loan or partly PPP

3) Estimated Project Cost

US\$ 683 million

(3) Project for Construction of Motorway between Tema and Prampram (16 km)

1) Project Outline

The project aims to extend the existing Accra-Tema Motorway up to Prampram along the National Road No.1.

Tema Municipality has not only the most important sea port of Ghana, but also has the first export processing zone (EPZ) of Ghana. The number of factories and warehouses is increasing along the National Road No.1 between Tema and Prampram. Because of this situation, traffic congestion on the section between Tema and Prampram has become serious.

The Accra-Tema Motorway and prospective Tema-Prampram Motorway could contribute to the enhancement of the connectivity between the central area of Greater Accra and the eastern part of the coastal area of Ghana on the Abidjan-Lagos Corridor. The prospective Tema-Prampram Motorway could help to attract investment to factories and warehouses in Prampram area and further eastern areas within Greater Accra.

2) Funding Scheme

ODA Loan

3) Estimated Project Cost

US\$ 109 million

(4) Projects for the Upgrading of National Road No. 2 between Tema Roundabout and Atimpoku to 4-Lane Road (Eastern Corridor)

1) Rationale

The Tema Roundabout and Atimpoku road forms part of the Eastern Corridor road which stretches from Tema in the Greater Accra Region through Atimpoku to Kulungugu in the Upper East Region. Socio-economic importance and increasing traffic demand and activities along the Tema Roundabout and Atimpoku road give reasons to appreciate the need for improvement of the road from current 2-lane road to 4-lane to meet current and future demands.

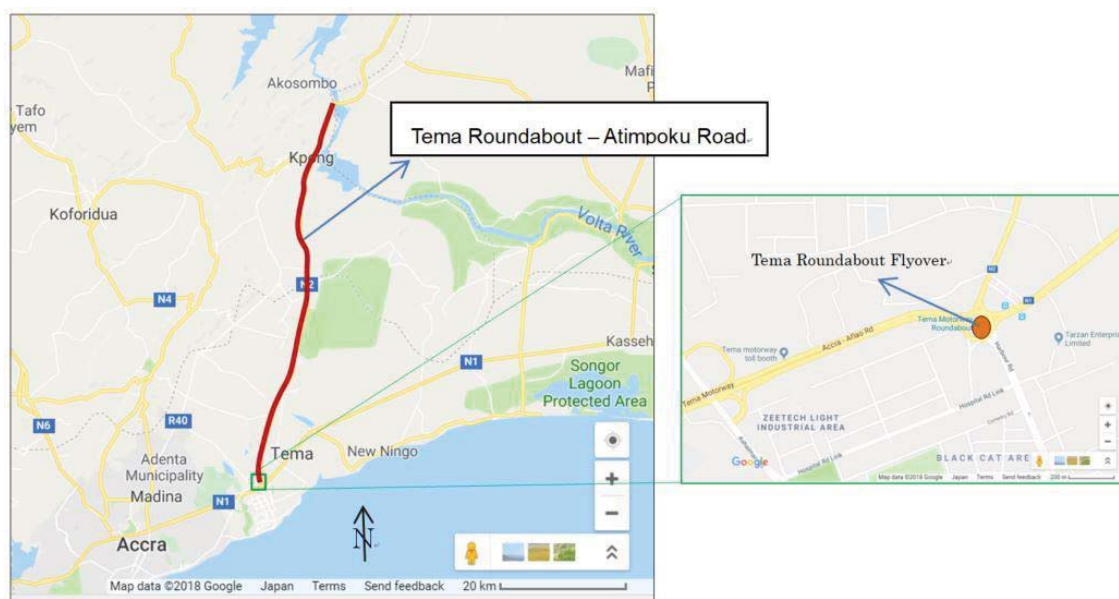
2) Objectives

The objective of this project is to:

- Improve and promote efficient, safe, and convenient transportation of goods, services and people along the route and provide transportation systems that meet both current and future demand

3) Project Description

- The project description involves the upgrade of the existing 2-lane road from Tema roundabout to Atimpoku to a 4-lane road.
- Improvement of Tema Intersection by construction of flyovers



Source: JICA Study Team

Figure 23.1.10 Projects for the Upgrading of National Road No. 2 between Tema Roundabout and Atimpoku to 4 Lane Road (Eastern Corridor)

4) Expected Benefit

The project has the potential to reduce vehicular traffic which eases movement and reduce travelling time.

5) Executing Agency and Related Institution

- Ministry of Roads and Highways
- Ministry of Transport
- Feeder Road Department

- Urban Roads Department

6) Estimated Project Cost

Not available

7) Implementation Schedule

Not available

(5) Projects for the Strengthening of North-South Central Corridor Road

1) Rationale

The need to improve socio-economic activities and develop improved trade opportunities in Ghana requires meeting the demand and support from existing and proposed roads. However, with the central corridor being the main transportation route connecting the North and South and going through a number of cities and towns, much effort needs to be expended to strengthen it to achieve its full functionality.

2) Objectives

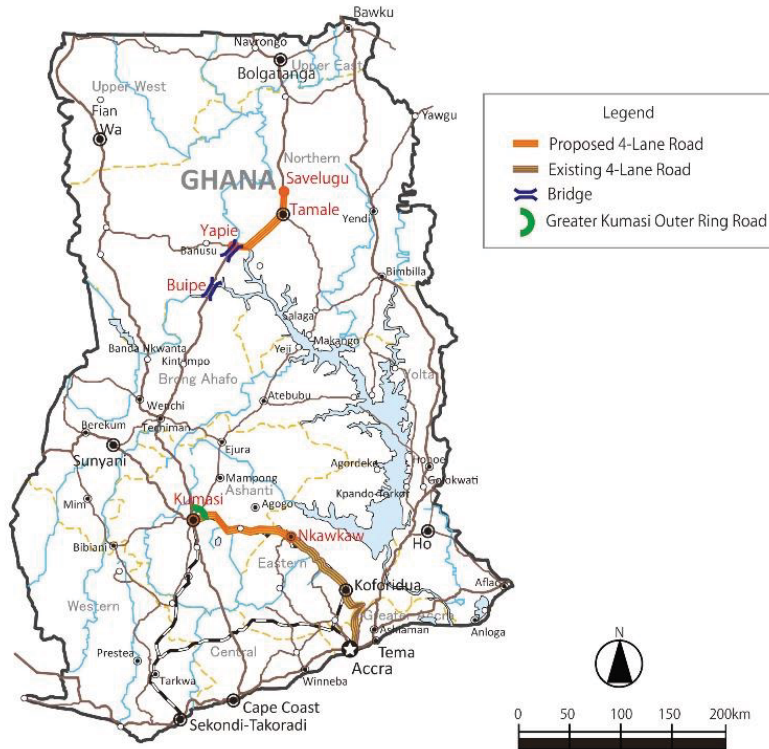
These projects seek to:

- Reduce vehicular traffic congestion on the corridor
- Provide safe and convenient transport between the North and South
- Enhance connectivity to major and small towns
- Reduce travelling time and cost
- Provide alternative route of transportation

3) Project Description

The scope of projects includes the following:

- Improvement of Tema Intersection by Construction of Flyovers
- Construction of 4-Lane High-Speed Way of National Road No.1 (Juaso, Yawkwei and Konongo Bypass Roads, 15km)
- Project for the construction of Greater Kumasi Outer ring Road North-East Section (Central Corridor)
- Upgrading of National Road No. 1 between Tamale-Yaipe and Tamale-Savelugu to 4-lane road (Central Corridor)
- Completion of North-East Section of Inner Ring Road in Tamale
- Replacement of Buipe Bridge (Central Corridor)
- Improvement of Yapei Bridge (Central Corridor)
- Improvement of National Road No. 1 between Bolgatanga and Bawku
- Improvement of National Road No. 13 between Lawra and Nagrongo



Source: JICA Study Team

Figure 23.1.11 Projects for the Strengthening of North-South Central Corridor Road

4) Expected Benefits

Expected benefits are as follows:

- Enhance safe reliable and efficient intra and inter-city transport movement of people and goods
- Promote and enhance socio-economic activities amongst town and cities along the corridor
- Ease and promote trade and investments activities within Ghana and the neighbouring countries

5) Executing Agency and Related Institutions

- Ministry of Roads and Highways
- Ministry of Transport
- Ghana Highways Authority (GHA)
- Department of Urban Roads

6) Estimated Project Cost

Not available

7) Implementation Schedule

Not available

(6) Projects for Construction of 4-Lane High-Speed Way of National Road No.1 (Juaso, Yawkwei and Konongo Bypass Roads, 15km)

1) Project Outline

The WAGRIC Master Plan recommends establishing high-speed transportation in the north-south corridor for strengthening the connectivity between inland areas and coastal areas. The north-south high-speed transportation is important for attracting investment to economic sectors targeting sub-regional markets, while the establishment of efficient and low-cost cargo transportation in the north-south corridor is required for establishing an enabling environment for competitive business operation.

The government of Ghana started upgrading national roads to high-standard four-lane roads between Accra and Kumasi, including providing by-pass roads. By having taken this action, the travel time between Accra and Kumasi has reduced largely to around 4 hours by road.

In response to the prospective increase of road traffic on the Central Corridor of Ghana, it will be necessary to increase the 4-lane high-speed sections between Accra and Kumasi. The project aims to construct bypass roads for Juaso, Yawkwei and Konongo. The total length of those three bypass roads would be about 15km.

3) Funding Scheme

ODA Loan

4) Estimated Project Cost

US\$ 79 million

(7) Project for Construction of Greater Kumasi Outer Ring Road North-East Section (25km)

1) Project Outline

The WAGRIC Master Plan recommends establishing high-speed transportation in the north-south corridor for strengthening the connectivity between inland areas and coastal areas. The north-south high-speed transportation is important for attracting investment to economic sectors targeting sub-regional markets, while the establishment of efficient and low-cost cargo transportation in the north-south corridor is required for establishing an enabling environment for competitive business operation.

The government of Ghana started upgrading national roads to high-standard four-lane roads between Greater Accra and Greater Kumasi, including providing by-pass roads.

Since the central area of Greater Kumasi is very congested by traffic, it takes a long time to go through Greater Kumasi, which is on the Central Corridor. In order to reduce the travel time and maintain the high speed on the roads of the Central Corridor, it is necessary to construct the Outer Ring Road of Greater Kumasi.

The project aims to construct the north-east section (25km) of the Greater Kumasi Outer Ring Road.

2) Funding Scheme

ODA Loan or ODA Grant

3) Estimated Project Cost

US\$ 171 million

(8) Projects for Improving East-West Road in Inland Areas

1) Rational

The demand for goods and services across borders and the need for regional integration have necessitated the need for border connectivity, trading and free movement of goods and services. With Ghana striving to promote trading activities between its neighbouring countries, improvement in the East-West Roads will not only promote and open up communities along it, but also promote the prospects of regional integration and connectivity.

2) Objectives

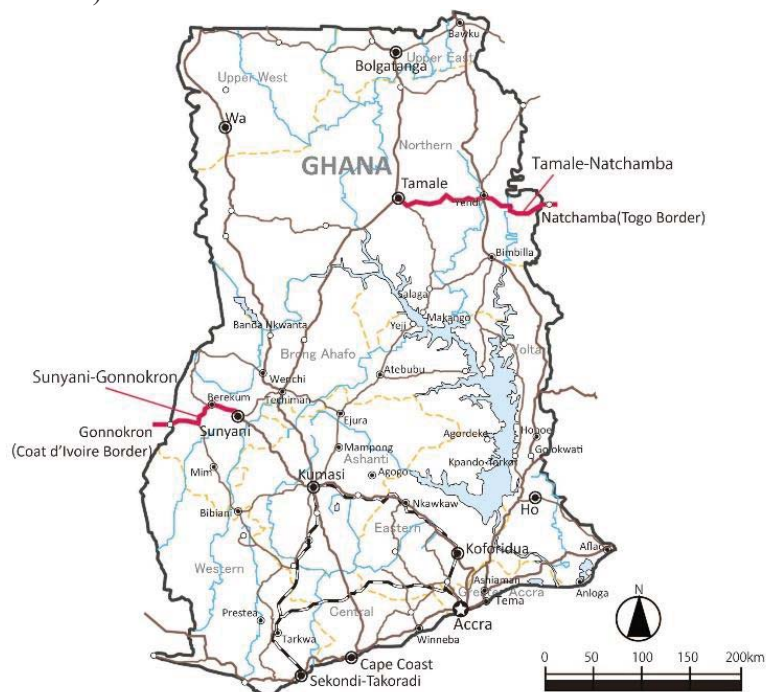
The objectives are to:

- Open communities to market opportunities by taking advantage of the road
- Enhance efficient movement of goods, services and people
- Promoted trade integration among Ghana the neighbouring countries

3) Project Description

Projects include the following:

- Improvement of Regional Road between Tamale and the National Border of with Togo (Natchemba)
- Improvement of National Road between Sunyani and National Border of Côte d'Ivoire (Gonnokron)



Source: JICA Study Team

Figure 23.1.12 Projects for Improving East-West Roads in Inland Areas

4) Expected Benefits

The expected benefits for these projects are

- Easy movement along the routes
- Promote economic activities and potential improvement in living standards

5) Executing Agency and Related Institutions

- Ministry of Roads and Highways
- Ministry of Transport
- Ghana Highways Authority (GHA)
- Department of Urban Roads

6) Estimated Project Cost

Not available

7) Implementation Schedule

Not available

(9) Project for Urban Transportation Master Planning for Greater Accra

1) Project Outline

Greater Accra had a population of 4.8 million in 2015. It is expected to increase to 9.2 million by 2040. Greater Accra will be one of the important coastal metropolitan areas along the Abidjan-Lagos Corridor. Greater Accra occupies the important junction between the two important economic

corridors, namely the coastal Abidjan-Lagos Corridor and the north-south Central Corridor. At the same time, Tema Port and Accra International Airport are located within Greater Accra. Therefore, it is very essential for Greater Accra to continue to secure high urban mobility not only within its urban area, but also between the urban area and surrounding areas, for the purpose of maintaining the function and performance of the two economic corridors.

For this purpose, the formulation of a strategic and comprehensive master plan for urban transportation is required for Greater Accra. This urban transportation master plan is very significant not only for Greater Accra but also for the Abidjan-Lagos Corridor and the Tema-Ouagadougou Corridor. That is, it is very critical for effectively implementing the WAGRIC Master Plan.

A Greater Accra Spatial Development Framework was formulated covering the Greater Accra Region by the Department of Town Planning under the assistance of the World Bank. A transportation master plan was formulated for management of public transportation including Bus Rapid Transits (BRTs) covering part of Greater Accra under the technical assistance of KOICA. An outer ring road is proposed for Greater Accra under the assistance of a Chinese Private Company. Unfortunately, Greater Accra has no urban transportation master plan so far.

The project aims to formulate a comprehensive urban transportation master plan for guiding short-term, mid-term and long-term investment in urban transportation infrastructure, as well as traffic management.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

US\$ 9 million

23.2 Railways of Ghana

23.2.1 Present Situation of Railways in Ghana

(1) General Situation of Railways

The total route length of all the railway lines in Ghana is 947km. The most of the railway lines are located in the southern part of the country. However, due to insufficient revenues and budgets of Ghana Railway Company Limited (GRCL) for operation and maintenance, the operations for most parts of the railway lines were stopped around the early 2000s. This has resulted in lack of and/or loss of railway systems, such as rolling stocks (locomotives/coaches/freight cars), tracks, signalling systems, communication systems, station facilities, and so on. Currently, only three short sections of railways are operating. The track is not electrified, and it is single track and its gauge is 1,067mm.

Ghana Railway Development Authority (GRDA) was established by the government in 2008 as a government organization for privatization of the railway. GRDA manages railway infrastructure, such as tracks, station buildings and other facilities and the rolling stocks, which are the property of the Government of Ghana. The current number of staff of GRDA is 50 persons. GRCL (HQ is located in Takoradi) and has been operating the railway since 2008 as the concessionaire, but an official concession contract with the government has not been concluded yet. The number of staff of GRCL is 1,650 persons.

To overcome this situation, the Ministry of Transport has adopted a development policy for railway transport with two basic features. One is the privatization and separation of management of railway infrastructure and management of train operation. The other is to change the gauge of the railway from 1,000 mm to the Standard gauge (1,435mm).



Source: JICA Study for Safety Operation and Management of Railway in Ghana, July 2014

Figure 23.2.1 Existing Railway Routes and Stations in Ghana

(2) Passenger Trains

1) Tema~Accra (35km)

The operation of the passenger train was resumed in 2011, using 2 sets (1 set = 6 cars) of DMU (Diesel Multiple Unit) made in China, one round trip a day (one one-way trip from Tema to Accra in the morning and another one-way trip from Accra to Tema in the evening) between Accra Station and Tema Community 1 Station.

2) Accra~Nswan (40.5km)

Two round trip passenger trains per day have been operating with locomotives since 2002.

3) Takoradi~Nsuta (65km)

In the Western Line, the train operation for passengers was closed in 2007, and the operation of freight trains was closed in 2009. The train operation of the branch line for bauxite between Awaso and Takoradi was closed in 2011. At present, passenger trains are operated between Takoradi and Kojokrom, one round trip a day (one one-way trip from Kojokrom to Takoradi in the morning and another one-way trip from Takoradi to Kojokrom in the evening). Freight trains for manganese operate about two round trips a day between Takoradi and Nusta.

(3) Connection between Ports and Railways

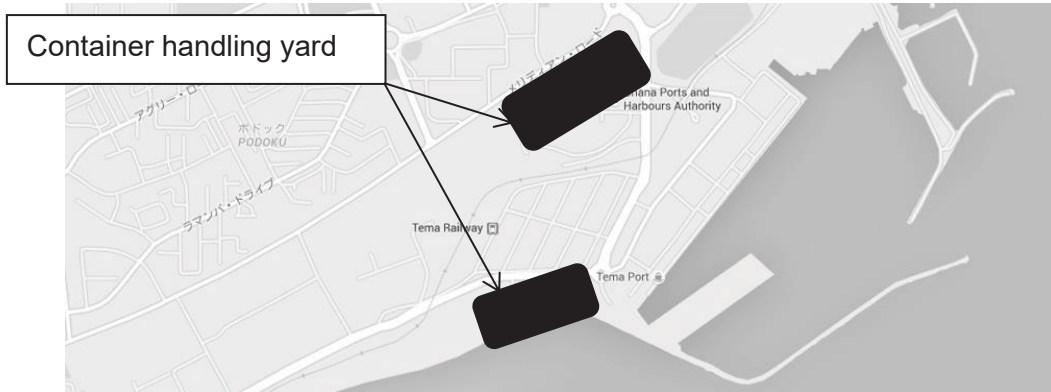
1) Tema Port

At Tema Port, there is no railway connection for freight. Only passenger train operation was resumed in 2010, using 2 sets (1 set = 6 cars) of DMU (Diesel Multiple Unit) between Accra Station and Tema Station.

The Feasibility Study (FS) for resumption of freight (mainly container) transportation on the Eastern Line between Tema and Kumasi (340km) including the construction of Boankra Inland Port (near Kumasi) is proceeding by Pricewaterhouse Cooper Ghana (local consultant). In this feasibility study,

BOT (Build Operation Transfer) and PPP (public private partnership) are considered for project implementation for freight transportation.

According to GRDA at the time of the study, the GRDA had not yet discussed the future plans for a new container handling yard with Ghana Ports and Harbours Authority (GPHA). Figure 23.2.2 shows locations for Tema Port’s container handling yards as proposed by GRDA.

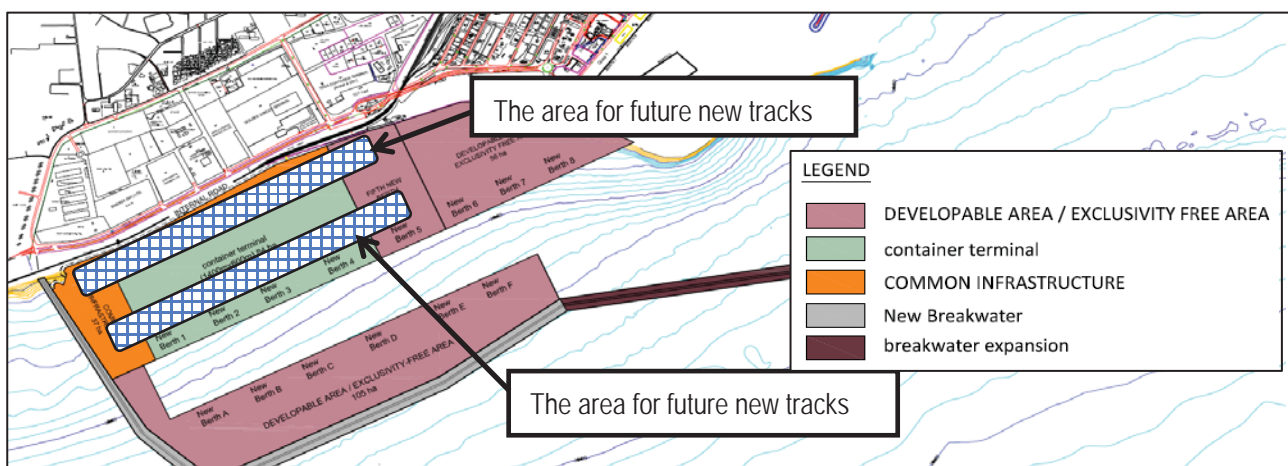


Source: GRDA

Figure 23.2.2 Proposed Locations for Container Handling Yards at Tema Port

GPHA has made a Final Report for the Master Plan and Feasibility Study for a New Container Port of Tema, which was prepared for GPHA in 2014. In this report, it is stated that a rail connection should be considered in the initial planning phase by assessing the following aspects:

- Container volumes using rail
- Average/maximum train length
- Handling/arriving/departing block trains
- Necessity of an onshore shunting yard
- Rail standards
- Designating the rail operator



Source: GPHA

Figure 23.2.3 Future Plan of Tema Port

2) Takoradi Port

Takoradi Port is the terminal station of the Western Line for freight transport. The train operation on the branch line for Awaso’s bauxite transport has been stopped since 2011 because of deterioration of the track. Now bauxite is transported to Takoradi Port by truck. On the other hand, passenger trains are operated between Takoradi Port and Kojokrom, one round trip a day (one one-way trip from Kojokrom to Takoradi in the morning and another one-way trip from Takoradi Port to Kojokrom in the evening). Therefore, bulk freight transportation is only manganese. About two

round trips a day are operated between Takoradi Port and Nusta. Figure 23.2.4 shows the present railway connection for manganese and bauxite.

As the GRDA announced its intent to change the gauge of the railway from narrow gauge to standard gauge, all tracks inside the port have to be renewed as well. The railway access to the port is from the north. The bauxite yard can be accessed directly from the north of the yard and the manganese yard will be reached from the northwest corner of the port. The manganese yard and bauxite yard have to be equipped with tracks that allow the unloading of a train with the maximum length of 800m. If it is not possible to install one track of a sufficient length an additional track has to be installed where half of the train can wait until the unloading of the first part is finished. Both tracks have to be connected by an intersection to allow shunting between tracks. If additional shunting is necessary, this should be done in a yard outside the port. Figure 23.2.5 shows the port layout included by the Takoradi Port Master Plan which was prepared for the GPHA in 2012.



Source: JICA Study Team

Figure 23.2.4 Present Railway Connection at Takoradi Port

(4) Ghana Railway Master Plan

In December of 2013, the Government of Ghana established a master plan for railway development for target years (2030 and 2047) covering the whole territory of Ghana. This master plan study was prepared by Team Engineering, an Italian consulting firm. The railway master plan covers not only medium-long distance railways but also suburban commuter railways. The railway master plan includes not only rehabilitation and upgrading but also construction of new lines.



Source: Railway Master Plan of Ghana, December 2013

Figure 23.2.5 Extension of New Railway Lines in Railway Master Plan (Phase 1 - Phase 6)

In February 2017, the Ministry of Railways Development was established for ensuring the rapid development of the railway network in Ghana and has identified the following five railway lines as their priority projects:

- Takoradi - Kumasi (Western) Line (339 km) (with branch line from Dunkwa to Awaso)
- Accra - Kumasi (Eastern) Line (300 km)
- Kumasi-Paga (Central Spine) Rail (595 km)
- Kumasi - Nyinahin Line (58 km)
- Tamale - Yendi Line. (102 km)

23.2.2 Issues regarding Railways sector in Ghana

The following issues are identified on railways in Ghana:

- No availability of railway networks to connect northern areas with coastal areas
- Aging of railroad tracks, infrastructures, rolling stock and equipment
- Low-level transportation service in terms of transport capacity, frequency, travel speed, time

reliability and comfort

- Low-level transit service in terms of cargo handling, storage function, procedure of documentation, access roads from the transit terminal to arterial roads in Ouagadougou
- Insufficient volume of transport demand to support rehabilitation and upgrading of the railway and expansion of new lines
- Weakness of the government regulatory body (GRDA) in reforming the existing railway operator
- Insufficient volume of transport demand to support rehabilitation of the railway
- Absence of railway for operational mines in the Western Region
- Absence of urban railway system in Greater Accra

23.2.3 Objectives for Railways Development in Ghana

The objectives for railway development in Ghana are as follows:

- To upgrade railway cargo transport services not only for providing cheaper, more rapid and higher security transport services, but also for providing a larger volume of long-distance cargo transport services
- To extend the railway network to northern areas for creating the business environment for economic sectors targeting coastal markets within the sub-region
- To resume the railway system for supporting and revamping existing operational mines by linking to Takoradi Port
- To upgrade the railway passenger transport services for providing a larger volume of long-distance passenger transport services and large volume passenger travel in urban areas
- To promote private investment for railway development

23.2.4 Strategies for Railways Development in Ghana

The following are the general strategies for railway development in Ghana:

- To revitalize the Eastern Line by rehabilitation and revival of the railway line between Tema Port and Greater Kumasi, and development of Boankra Inland Port for strengthening of its transit function to realize multi modal transport systems from the port
- To revitalize the Western Line by private sector operation of the line between Takoradi-Nsuta-Asowa for the purpose of supporting the existing mines (bauxite and manganese) and promoting investment for extension of the railway to Nyinahin to activate the mining sectors
- To extend the railway system to the northern part of the country based on the revamping of the existing, but not operational, railway lines
- To establish an urban railway system in Greater Accra and Sekondi-Takoradi in response to rapid urbanization and for improvement of airport access
- To strengthen and reform the regulation function of the public sector

23.2.5 Programmes and Projects for Railways Development in Ghana

The projects for railway development in Ghana are listed below.

(1) Short-Term Projects

- Upgrading of Tema – Accra Railway (Under operation, 35 km)
- Rehabilitation and upgrading of the section between Takoradi and Sekondi (Under rehabilitation work, 15km)

- Rehabilitation of Takoradi - Awaso Section of Western Railway Line
- Construction of Railway from Tema Port to Akosombo Port (Eastern Corridor)
- Project for Rehabilitation of Tema Port – Boankra Section of Eastern Railway
- Rehabilitation of Boankra - Kumasi Section of Eastern Railway
- Strengthening and Reform of Regulation Function of Railway Sector

(2) Mid-Term Projects

- New construction of the section between Awaso and Nyinahin
- New construction of the section between Kumasi and Paga

(3) Long-Term Projects

- New construction of the section between Nyinahin and Wa
- New construction of the section between Tema and Prampram including passenger railway to new Prampram urban area and new international airport

23.2.6 Priority Projects for Railways Development in Ghana

The projects below were selected as priority projects for railways development in Ghana.

- Project for Strengthening and Reform of Regulatory Function of Railway Sector
- Project for Rehabilitation of Takoradi - Awaso Section of Western Railway Line
- Project for Upgrading of Tema - Accra Railway
- Project for Construction of Railway from Tema Port to Akosombo Port (Eastern Corridor)
- Project for Rehabilitation of Tema Port – Boankra Section of Eastern Railway
- Project for Contraction of Railway between Nyinahin-Wa
- Project for Rehabilitation of Boankra - Kumasi Section of Eastern Railway

23.2.7 Profiles of Priority Projects for Ghana

(1) Project for Rehabilitation of Takoradi - Awaso Section of Western Railway

1) Rationale

Besides easing the pressure on the road corridor in the country, the rail line will also significantly reduce the cost of transportation of bulk commodities as well as offer an alternative and cheaper means of transport for passengers.

The Takoradi-Awaso section of the Western Railway used to be operational for transporting bauxite from Awaso to Takoradi Port. At that time, the Awaso-Kumasi section was also operational. Coco beans were transported from Kumasi to Takoradi Port. However, deterioration of railway track and rolling stock had become too serious to continue its railway operation. It is necessary for the government to start rehabilitating this Takoradi-Awaso section of the Western Railway in order to revive the railway in Ghana.

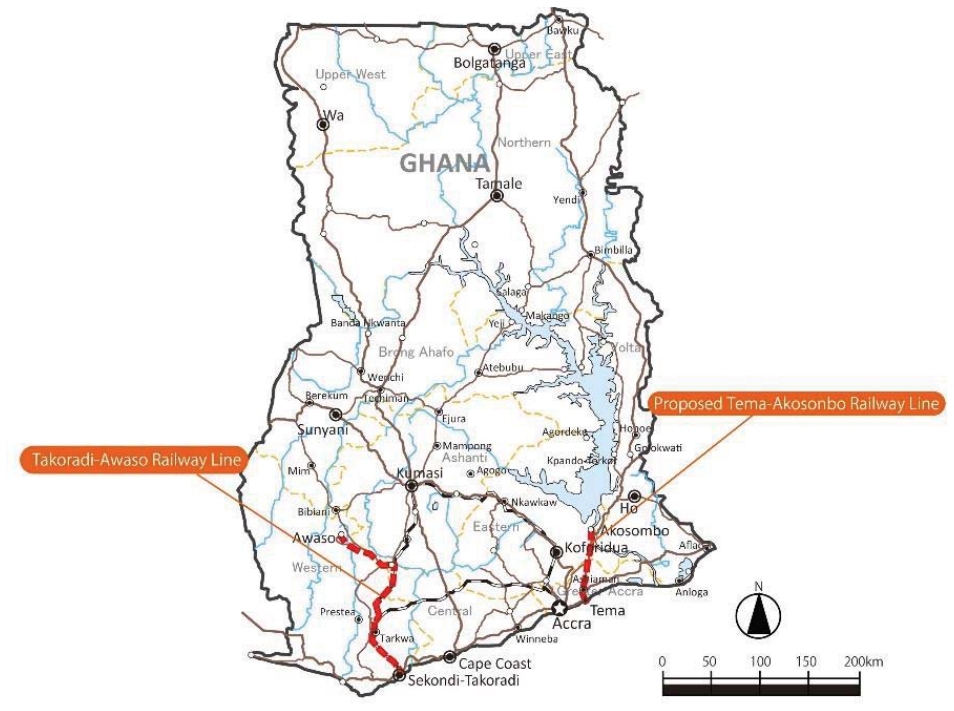
There is a possibility to extend this railway line to Nyinahin for developing another bauxite mine, which has a huge deposit, and further to Wa for developing a manganese mine. Therefore, the rehabilitation of this Takoradi-Awaso section is very important to attract private investment to mining in Nyinahin and rail transport between Nynahin and Takoradi.

2) Objectives

To undertake repair works on the line to facilitate movement of bauxite and other cargo from Takoradi to Awaso.

3) Project Description

Repair work is to be undertaken on some sections of the 267km Takoradi-Awaso line.



Source: JICA Study Team

Figure 23.2.6 Projects for Railway Development

4) Expected Benefit

The project is to reduce damage by heavy vehicles on the Awaso – Kumasi – Yamorasa - Takoradi trunk road.

5) Estimated Cost

US\$ 1,085 million

6) Executing Agency and Related Institution

- Ghana Railway Development Authority (GRDA)
- Ghana Railway Company Ltd.

7) Implementation Schedule

Not available

(2) Project for Construction of Railway from Tema Port to Akosombo Port (Eastern Corridor)

1) Rationale

The Tema-Akosombo line is seen as important in the movement of containers and other cargo including fuel products, cement etc along the 88km line to Akosombo port on the lower end of the Volta River. From there, products can be transported across the Volta Lake to the port of Buiepe and onwards to the three northern regions of Ghana or even Burkina Faso, Mali and other countries.

2) Objective

The railway line is to facilitate the carting of containerized cargo and agricultural produce from the SADA enclave to the Tema Port for export

3) Project Description

The Tema-Akosombo rail project is a 84km railway that will include the construction of rail tracks of standard gauge, railway maintenance facilities for locomotives and wagons, the building of stations at specific locations with communications and signal equipment and capacity building for personnel in all aspects of the railway system.

4) Expected Benefit

The project is to facilitate efficient transportation of goods and cargo from south to north of Ghana and vice versa.

5) Estimated Cost

The expected to cost US\$398,330,000

6) Executing Agency and Related Institution

- Ghana Railway Development Authority (GRDA)
- Ghana Railway Company Ltd.

7) Implementation Schedule

The construction work is scheduled to complete in 36 months from commencement.

(3) Project for Rehabilitation of Tema Port-Boankra-Kumasi Section of Eastern Railway

1) Project Outline

The WAGRIC Master Plan points out the potential of developing economic sectors targeting sub-regional markets, especially coastal consumers' markets both in inland areas and coastal areas. The Eastern Railway used to be operational in the 2000s for connecting Tema and Kumasi through Accra. However, it is not operational between Accra and Kumasi due to its rail track deterioration.

The project aims to rehabilitate the rail section (330 km) between Kumasi and Tema Port through Accra and Boankra. The project will also establish a multi-modal dry port (inland container depot) at Boankra, which is located 28km from central Kumasi, for the purpose of decongesting the Tema Port.

Ghana Shippers Authority has secured land of 161 ha in Boankra for establishing the inland container depot just along the National Road and the Eastern Railway Line. Ghana Shippers Authority is inviting private investors for rehabilitation of the railway and development of the inland container depot.

A feasibility study on this project was conducted by a private management consulting firm for inviting private sectors' investment for development and operation for the project.

However, the length of the 330-km cargo railway is too short for users of cargo railway to be attractive, and it is also too short for the cargo railway operator to be profitable. Therefore, the investment in the extension of the Eastern Railway Line up to the northern areas of Ghana and furthermore to Burkina Faso (800 km between Tema Port and Bolgatanga in total) is essential so that users of cargo railway feel it attractive and operators of the cargo railway consider it profitable. Therefore, this project for the rehabilitation of the Eastern Railway Line between Tema Port and Kumasi is very critical eventually for extending the railway toward the northern areas of Ghana and further to Burkina Faso in the long-term or in the super-long term (beyond 2040).

2) Funding Scheme

PPP

3) Estimated Project Cost

US\$ 1,080 million

23.3 Sea Ports of Ghana

The two major international sea ports in Ghana are Tema Port and Takoradi Port. In this section, strategies and projects for these two ports are discussed.

23.3.1 Present Situation of Tema Port

Tema Port is the largest port in Ghana, situated 30 km to the east of the capital city, Accra. Currently the site area is around 3.9 million square metres. However, a 1.5 billion USD project to expand the port is currently undergoing, and with this project, the port is set to be the largest cargo port in West Africa.

Tema Port, along with Takoradi Port, is managed by Ghana Ports and Harbours Authority (GPHA), a public enterprise that falls under the Ministry of Transport. The port is wholly owned by the Government of Ghana, however, since 2002 the Government policy allowed for the participation of the private sector in port operations. With the introduction of this policy, GPHA is allowed to handle 25% of stevedoring with the remaining 75% shared among five private stevedoring companies in the port. Shore handling activities of non-containerized cargoes, excluding oil/gas cargoes, are 100% handled by a private operator. Scanning of containers and bulk cocoa loading operations are also handled by the private operators.

Inland transport is mainly transported by truck. Main transport routes are the roads from the port to Kumasi, and further connection northwards to the Burkina Faso border (N6 & N10) in the south-north direction and the route of Abidjan – Takoradi - Accra - Lomé (N1) in the east-west direction. In view of increasing future cargo flows for the inland areas, the rail transport and the river transport by the Volta Lake should be developed in parallel with road improvements in order to cope with the increasing traffic.

The present conditions of Tema Port are summarised below:

- The transaction volume of cargo at Tema port was around 11 million tons in 2014. A total of 80 % of the total volume was import cargo, and 13% was export cargo. The cargo for transit only accounted for 5 % of the total handled volume.
- In 2014, more than 8.9 million tons of import cargo was handled. The most handled cargo type was the containerized cargo with around 4 million tons. This was around 46% of the total transaction volume. The second was dry bulk which accounts for 27% of total.
- In 2014, around 1.5 million tons was handled as export cargo. The largest volume was the containerized cargo which accounts for 83% of the total transaction volume.
- The transaction volume by container at Tema port in 2014 was 732,382 TEU. The export was 48% which is a little larger than the import volume at 45%.
- Amongst the transshipment cargo volume, the largest was the cargo to/from Burkina Faso, 463,339 tons in 2014, which accounts for 80% of the total transit cargo. The following is the transit cargo to/from Niger that accounts for only 9% of the total volume, and has almost halved since 2007. The largest transit volume by packing type is container.
- Inland transport is mainly transported by truck. Main transport routes are the roads from the port to Kumasi, and further connection northwards to the Burkina Faso border (N6 & N10) in the south-north direction and the route of Abidjan – Takoradi - Accra - Lomé (N1) in the east-west direction.
- In view of increasing future cargo flows, the rail transport and the river transport by the Volta Lake will have to be developed in parallel with road improvements in order to cope with the increasing traffic.

Table 23.3.1 Transshipment Cargo to Inland Countries at Tema Port (2007 – 2014)

Category	2007	2008	2009	2010	2011	2012	2013	2014
Import:	691,369	841,282	494,548	436,705	594,760	516,633	609,561	564,621
<i>Burkina Faso</i>	352,622	350,484	245,763	248,961	411,412	357,977	454,563	451,415
<i>Mali</i>	211,649	207,092	124,306	55,153	52,356	44,403	49,606	26,449
<i>Niger</i>	120,473	241,417	45,697	76,036	65,727	51,722	47,974	50,217
<i>Other Countries</i>	6,625	42,289	78,782	56,555	65,265	62,531	57,418	36,540
Export:	56,990	23,025	14,576	10,365	19,318	13,420	11,107	12,606
<i>Burkina Faso</i>	56,358	22,235	13,066	8,591	15,090	12,206	9,541	11,924
<i>Mali</i>			40		799			
<i>Niger</i>	632							
<i>Other Countries</i>		790	1,470	1,774	3,429	1,214	1,566	682
Total:	748,359	864,307	509,124	447,070	614,078	530,053	620,668	577,227
<i>Burkina Faso</i>	408,980	372,719	258,829	257,552	426,502	370,183	464,104	463,339
<i>Mali</i>	211,649	207,092	124,346	55,153	53,155	44,403	49,606	26,449
<i>Niger</i>	121,105	241,417	45,697	76,036	65,727	51,722	47,974	50,217
<i>Other Countries</i>	6,625	43,079	80,252	58,329	68,694	63,745	58,984	37,222

Source: GPHA Statistics Department

23.3.2 Issues regarding Tema Port

The following challenges regarding development of Tema Port are identified:

- To improve the quality of services to customers
- To reduce costs of handling cargo at the port
- To enhance port sector competitiveness by integrating stakeholders into strategy development and implementation
- To encourage sustained growth in the port industry
- To generate more private capital for re-tooling and modernization
- To ensure that the GPHA is financially sound and self-sustaining
- To implement practices that minimize or eliminate environmental hazards and health risks of port operations and their impact on employees, port users and the community
- To ensure a safe and secure environment for the people, vessels, cargo and facilities
- To operate an efficient organization that fosters an inclusive, transparent and team oriented culture,
- To promote good corporate citizenship

23.3.3 Objectives for Development of Tema Port

There are two basic aspects regarding the roles and functions of Tema Port:

- To import and export a reasonable amount of goods at more competitive charges for cargo handling by reducing transportation cost and time
- To contribute to development of local communities to create an international gateway on the international corridors

Tema Port is located on a strategic node of the international corridor. Its importance is very high not only from the point of view for efficient logistics on corridors, but also from the point of view of industrial development. Based on the basic role and function of the port, major objectives of reform and development of the port are set as follows:

- To provide good services and efficient service performance to port users: namely shippers, shipping companies, transporters and other users related to the logistics businesses
- To increase revenues not only from handling domestic cargo, but also from collecting more cargos in transit from / to Burkina Faso, Mali and Niger countries and coastal neighbouring countries, and transshipment cargo by expanding service areas

- Support promotion to attract industry and the creation of employment in port related industries

Regarding the port performance, the following points should be improved for increasing the port competitiveness:

- Port / Terminal operation efficiency level; opening time, reliability, lead time, cargo damage, accuracy of information
- Price reduction of charges; port charge, cargo handling charges, port facilities usage fee, etc.
- Safety improvement; compliance, number of accidents, accident prevention
- Customer orientation; responsiveness, flexibility, reducing claims
- Adaptability to the changing market environment
- Landside accessibility

Especially, the lack of surface area of the port area and traffic congestion on the roads surrounding the port are pointed out by many port users. Additionally, the promotion of the large scale new container terminal construction plan by a maritime shipping company is very important for the growth of Tema Port and the preparation to support this plan should be started immediately such as the access road that connects to the Coastal Corridor and a railway connection are urgent issues.

23.3.4 Strategies for Development of Tema Port

The following strategies are formulated for development of Tema Port:

- To improve a logistics supply chain within the port including road network improvements, improvement of the layout of the port area and surrounding areas
- To improve the efficiency of the logistics supply chain by improving interfaces between berths and railway lines and between berths and roads for smooth access to the Central Corridor and Coastal Corridor. Mainly the creation of new access roads to the new container terminal to expand the service area of Tema Port
- To upgrade port performance by making maximum use of existing facilities and equipment
- To support the development of cargo handling capacity and infrastructure that supports shipping demands, industry advances and changing technologies
- To promote the development of new and innovative berth infrastructure and equipment including a new container terminal and additional berths
- To provide value-added services responding to port user demands
- To promote the expansion in land area of the port including development of truck parking, container depots and dry ports for reducing traffic congestion and for effective utilization of the land in the port area
- To develop business opportunities for increased trade, including diversification, new commodities, new revenue streams and new pricing
- To promote the development of logistics parks to attract related industries and to promote better integration of port areas with the strategic industrial areas. Land could be created by landfill

Regarding the value-added services, the following services should be considered for increasing the customer service and for increasing the port competitiveness.

Table 23.3.2 Proposed Value-added Service to Increase Customer Service and Port Competitiveness

Value-added Logistics Services	Loading/unloading, Stripping/stuffing, Bulk storage, Tank storage, General warehousing, Air conditioned warehousing, Distribution centres
Logistics chain Integration Services	Quality control, Repacking, Customizing, Assembly, Testing, Repair, Re-use
Value-added Facilities	Parking facilities, weighbridges, customs facilities, truck maintenance and repair facilities, container repair and maintenance, cleaning facilities, tanking facilities, trailer renting and leasing, Information and communication, safety and security services, offices, hotels, restaurants, shops

Source: JICA Study Team

23.3.5 Programmes and Projects for Development of Tema Port

The projects for development of Tema Port are listed below.

(1) Short-Term Projects

- Construction of the new jetty in the existing port area
- Construction of a Truck Terminal outside of the Port
- Construction of Vanpool located outside of the Port

For new terminal:

- Land Reclamation work (Phase 1)
- Construction of Breakwater revetment
- Dredging Works
- Construction of Container Berth and yards: Berths 1st-4th (84ha)
- Construction of General/Break Bulk Cargo Berth and yards; Berth 5th (28.5ha)
- Construction of additional access roads
- Administration area including the customs area
- Installation of utilities and equipment
- Access roads to motorway and road within port area
- Railway Terminal and linkage line
- Passenger Terminal (Ferry service is opened)

(2) Mid-Term Projects

- Re-assignment of area of existing port

For new terminal

- Land Reclamation work (Phase 2)
- Construction of General/Break Bulk Cargo Berth: Berth 6th- Berth 8th (56ha)

(3) Long-Term Projects

- Construction of a new oil berth in existing port area

For new terminal:

- Land Reclamation work (Phase 3)
- Construction of Breakwater (Expansion)
- Construction of General/Break Bulk Cargo Berth: Berth A-Berth F (105ha)

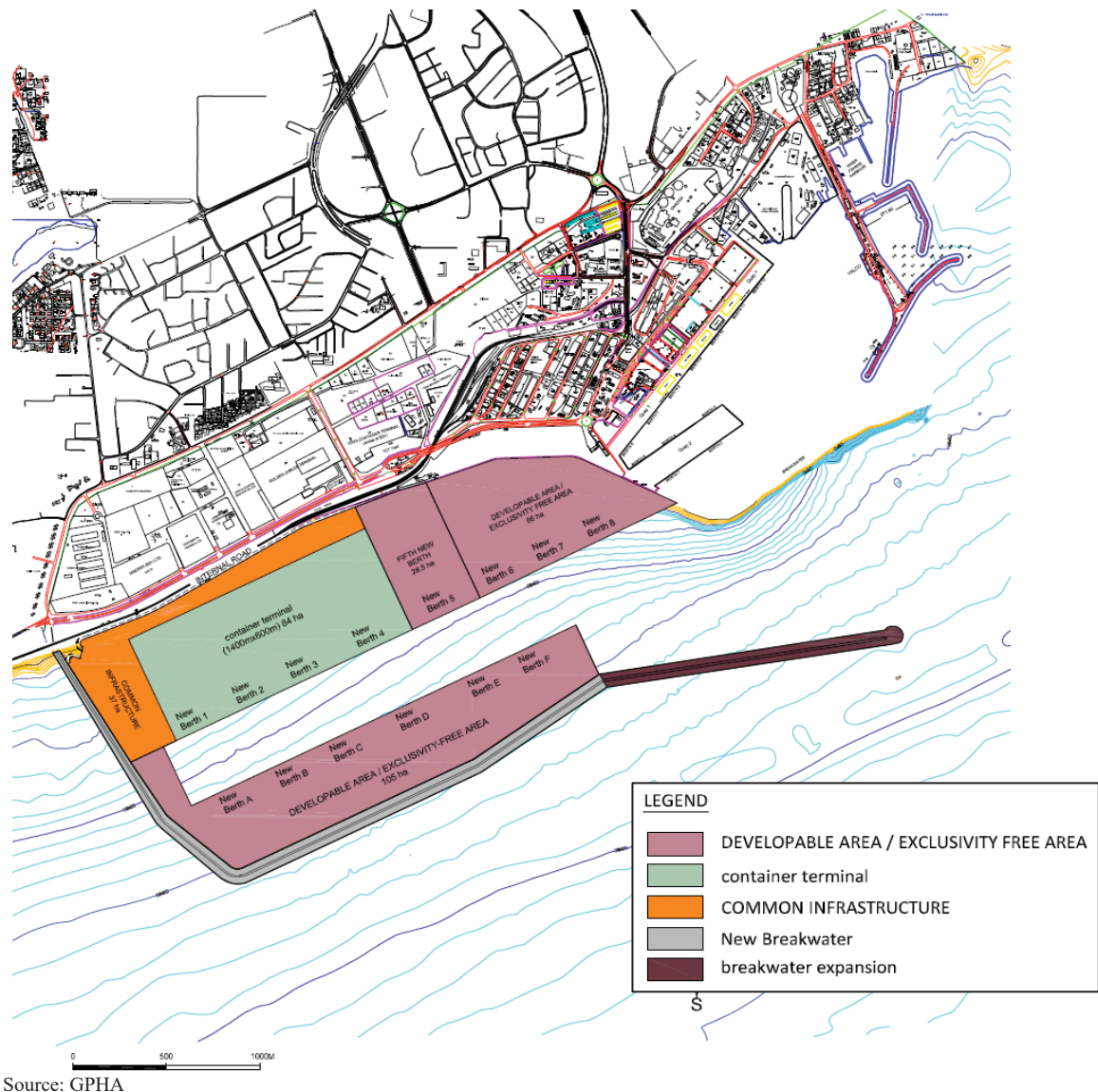


Figure 23.3.1 Proposed Layout of Tema Port

23.3.6 Present situation of Takoradi Port

Takoradi Port is located 230 km to the east of Accra, close to the South Eastern border of Ghana. It's location is advantageous to connect to international markets such as Europe, America and Asia. Domestically, the port is strategically located close to operating mining sites such as Awaso Bauxite mine and Nsuta Manganese mine, and other mining depots.

In terms of facilities, the port consists of 4 multipurpose berths and three dedicated berths for manganese, clinker and oil. The access to the port is 150m long and 10.5m in depth.

The present cargo throughput of Takoradi Port is summarised below.

- A total of 63 % of the total cargo throughput at Takoradi Port was export cargo and 34 % was import cargo. The transaction volume for cargo in Takoradi Port was around 4.8 million tons in 2014. The transaction volume for containers in 2014 was 63,243 TEU.
- In 2014, Takoradi Port handled more than 1.7 million tons of import cargo. The commodity with the largest volume was clinker, which accounted for 47% of the total import volume. The second was petroleum products which accounted for 17%.
- In 2014, more than 4.7 million tons of export cargo was handled in Takoradi Port. The commodity with the largest volume was manganese which accounted for 29% of the total export

volume. The second was bauxite which accounted for 19% of the total export volume.

- The roads to and from the port are in fairly good condition. As part of the port expansion projects, there are plans to construct two new roads to and from the port to ease the flow of traffic.
- The railways are not fully functional. Currently less than 10% of bulk manganese and bauxite which hitherto were exclusively transported by rail are carried by trucks into the port. The railroad tracks outside of the port and within the metropolis are currently being rehabilitated. The development and rehabilitation of rail lines into the port has been incorporated into the port's master plan.

Table 23.3.3 Import Commodities of Takoradi Port (2007 – 2014)

Unit: ton

Cargo Type	2007	2008	2009	2010	2011	2012	2013	2014
20' Full	59,105	59,471	59,255	64,994	72,317	71,950	68,467	63,655
40' Full	34,158	39,456	45,452	52,736	67,794	72,420	56,728	46,851
Soda					6,012			
Rice	24,925	134,184	13,350		20,950		4,102	
Sugar	42,471	65,740	7,008					
Soya Beans				6,356	7,070	6,022		
Cement (Barite)			15,285	8,864	29,081	24,738	14,942	29,378
Calcium Chloride		609	1,403	2,683	6,051	5,748	1,027	1,818
Ammonium Nitrate	55,377	67,209	64,512	76,815	69,052	93,469	117,123	82,231
Quicklime (Bags)				1,200	5,201			
Chemicals			594	918	80			
Clinker	707,202	765,295	599,594	850,965	1,073,460	1,221,678	923,875	801,832
Limestone								16,201
Wheat	156,541	135,741	142,461	163,261	164,233	169,271	155,895	143,684
Quicklime (Bulk)	72,451	119,739	122,917	123,056	125,972	134,360	130,518	133,685
Coal							30,280	41,899
Machinery / Equipment	4,658	4,441	2,967	15,969	16,998	10,700	10,232	3,304
Rods / Pipes	3,953	13,336	14,633	3,556	22,085	47,139	9,127	16,572
Plates	1,318	139	613	841	645	579	2,710	438
Steel / Wire Coils	333	1,413	7	328	5	356	150	22
Frozen Fish	19,704	26,019	12,962	3,269	43,707	18,808	8,756	28,949
General Cargo	62,685	32,279	4,325	6,507	8,741	17,246	11,489	6,405
Cars	300	113	113	199	500	888	622	293
Mini Vehicles	514	337	218	275	489	728	516	276
Utility Vehicles	4,748	4,441	3,620	5,483	8,681	10,444	6,525	1,956
Trailers	1,798	1,966	2,053	1,961	3,286	3,346	3,750	1,991
Bulldozers / Graders	3,010	2,684	1,309	2,284	2,375	1,716	3,416	936
Sawn Timber	1,675	896	90	29	2		88	
Pine / Teak Poles			5,976	5,674				
Pet. Product	254,978	209,467	138,863	325,573	379,473	426,296	411,266	290,277
LP Gas						9,180	26,000	4,401
Drilling Mud				500	4,382	5,986	2,221	3,269
Total	1,511,904	1,684,975	1,259,580	1,724,296	2,138,642	2,353,068	1,999,825	1,720,323

Source: GPHA

Table 23.3.4 Export Commodities of Takoradi Port (2007 – 2014)

Unit: ton

Cargo Type	2007	2008	2009	2010	2011	2012	2013	2014
20' Full	151,556	190,581	191,326	209,805	153,322	130,053	126,860	175,477
40' Full	149,642	169,344	83,597	93,626	116,975	142,630	118,326	179,518
Cement			387		536	21	1,674	27
Cocoa Beans	22,367	15,542	15,697	50,251	27,288	30,892	38,393	37,019
Palm Kernel Shells		6,000	17,682			35,797	34,505	17,359
Wood Chip						105,900	54,134	82,391
Ammonium Nitrate			7,207		1,500			
Shea nut		12,795	20,739	7,200	15,426	18,999		
Bauxite	748,285	610,940	525,074	512,998	404,880	752,529	815,383	924,435
Manganese	1,175,493	1,099,068	1,022,899	1,212,193	1,821,236	1,523,747	2,050,755	1,385,845
Wheat	15,790	998	5,322	6,763	8,631	2,774	7,365	
Cocoa Beans (Bulk)	236,710	199,658	202,063	159,750	210,000	200,550	185,732	216,000
Machinery / Equipment	100	591	219	809	2,194	1,722	4,504	4,352
Rods / Pipes	164	222	836	694	1,050	839	4,619	1,597
Palm Kernel Cake	1,038	891		14,493	31,757			
General Cargo	15,001	261	3,275	444	1,522	1,395	4,114	2,366
Cars	7							
Mini Vehicles		2	7	2		2		
Utility Vehicles			19		193		9	
Trailers		133	465	118	21	3	107	21
Bull Dozers / Graders	71	127	750	21	188	20	256	146
Sawn Timber	25,524	24,685	14,836	18,129	13,172	9,756	5,464	3,037
Petroleum Product				567				
Total	2,541,748	2,331,838	2,112,400	4,012,159	4,948,533	5,310,697	5,452,025	4,749,913

Source: GPHA

23.3.7 Issues regarding Takoradi Port

Most of the main export products of Ghana, such as bauxite, manganese, wood, and cocoa are shipped from Takoradi Port. Mining companies have specialized facilities dedicated to their export of manganese ore and bauxite in the port area. Additionally, volumes of clinker and other cement raw materials are imported. These volumes are expected to increase due to the existing expansion plans of the mining industry and increasing demand in the region for construction materials.

However, despite the efforts to improve major bulk operations, they suffer high operating costs. Conditions in the port are characterized by draft restrictions that lead to time consuming barge operations. These conditions compose considerable impediments for cost efficient dry bulk handling.

In recent years oil was discovered off-shore at a distance of approximately 100 nautical miles from Takoradi. To satisfy the needs of the oil and gas industry, part of Takoradi Port was made available for supply vessels, storage areas etc. The port has to provide adequate berthing, mooring, wharfs, warehousing and large open space facilities at the waterfront in response to the demands of the oil industry. This has led to considerable bottlenecks and development impediments in the port.

Moreover, when future prospects of Takoradi Port are considered, a new role of Takoradi Port as a container handling port is important. The importance of import and export of containers should be considered for the future.

23.3.8 Objectives for Development of Takoradi Port

There are two basic aspects regarding the roles and functions of Takoradi Port:

- To import and export a reasonable amount of goods at more competitive charges for cargo handling by reducing transportation cost and time
- To contribute to development of local communities as an international gateway on the international corridors

Especially, Takoradi Port is expected to play a role mainly as an export port of local products, such as cacao in the Western Region of the country and also as a commercial port complimenting Tema Port and Abidjan Port. Takoradi Port has the potential to expand its service area to the eastern region of Côte d'Ivoire.

In addition, Takoradi Port is located at a strategic location for mining development, but it will have to function as an industrial port to support the oil industry and to promote the mining development that is a key sector to contribute to the development of the local communities. Based on the expected basic role and function of Takoradi Port, the major objective of reform, development of the port is set up as follows:

- To provide the good service and efficient service performance to port users: namely shippers, shipping companies, transporters, and other users related to the logistic businesses
- To increase revenues not only from handling domestic cargo, but also from collecting more cargos in transit from / to Burkina Faso, Mali and Niger and coastal neighbouring countries including Côte d'Ivoire, and transshipment cargo by expanding service areas.
- To support promotion to attract industry and the creation of employment of port related industries.

Regarding the port performance, the following points should be improved for increasing the port competitiveness:

- Port / terminal operation efficiency level; opening time, reliability, lead time, cargo damage, accuracy of information,
- Price reduction of charges including port charges, cargo handling charges, port facilities usage fee, etc.
- Safety improvement; compliance, number of accidents, accident prevention
- Customer orientation; responsiveness, flexibility, reducing claims
- Adaptability to changing market environment
- Landside accessibility

23.3.9 Strategies for Development of Takoradi Port

The following strategies are formulated for the development of Takoradi Port:

- To promote the development of new and innovative berth infrastructure and equipment including a new container terminal and berths for the mining and oil industries
- To improve the efficiency of the logistics supply chain by improving the interfaces between berths and railway lines and between berths and roads for smooth access to the Central Corridor and Coastal Corridor
- To upgrade port performance by making maximum use of the existing facilities and equipment
- To support the development of cargo handling capacity and infrastructure that supports shipping demands, industry advances and changing technologies
- To provide value-added services responding to port user demands
- To develop business opportunities for increased trade, including diversification, new commodities, new revenue streams and new pricing
- To promote the development of logistics parks near the port area to attract related industries and to promote better integration of the port area with industrial areas

23.3.10 Programmes and Projects for Development of Takoradi Port

The projects for development of Takoradi Port are listed below.

(1) Short-Term Projects

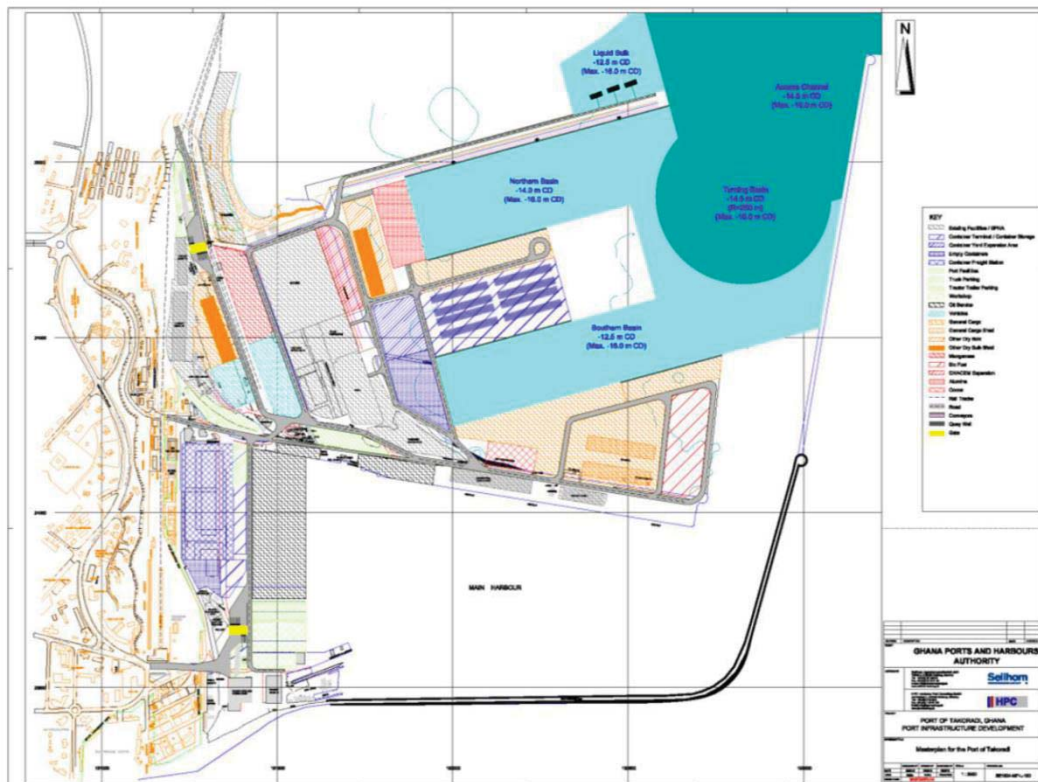
- Modernization of infrastructure and equipment
- Renewal of railway terminal
- Development of access roads

(2) Mid-Term Projects

- Dredging of Access Channel to 16.0m
- Reclamation of 53,000 ha of land
- Extension of Breakwater 1.75 km northward
- Construction of Bulk Terminal with 16.0 m depth
- Construction of Oil Services Terminal and Jetty
- Construction of Open Storage Area for Oil field, Plants and Machinery, Pipe line
- Construction of Dual Access Roads to the Port

(3) Long-Term Projects

- Construction of Container Terminal and Yard



KEY			
	Existing Facilities / GPHA		Workshop
	Container Terminal / Container Storage		Oil Service
	Container Yard Expansion Area		Vehicles
	Empty Containers		General Cargo
	Container Freight Station		General Cargo Shed
	Port Facilities		Other Dry Bulk
	Truck Parking		Other Dry Bulk Shed
	Tractor Trailer Parking		Manganese
			Bio Fuel
			GHACEM Expansion
			Alumina
			Cocos
			Rail Tracks
			Road
			Conveyors
			Quay Wall
			Gate

Source: Master Plan for the port of Takoradi, GPHA (2012)

Figure 23.3.2 Proposed Layout of Takoradi Port

23.4 Logistics Infrastructure of Ghana

23.4.1 Present Situation of Logistics Infrastructure in Ghana

(1) Present Situation

The country has made significant advancement as far as simplification of trade procedures is concerned through its GNet system operating in its major ports. This positive step is complemented by the innovative system of employing GPS in tracking truck movement in its international corridor servicing transit cargoes. Likewise, improvements on the infrastructure that are critical for the flow of international cargoes are notable. These improvements include further expansion of Tema Port and a major upgrade on Ghana's corridor that links to Burkina Faso. When other infrastructure projects in the pipeline such as improvement of Tema Motorway roundabout and construction of Transit Truck Village are realized coupled with further evolution of GNet, this will further cement the position of the country as one of the most advanced countries in the sub-region in trade facilitation.

There are however some aspects of the international logistics operation that hurt the position of the country. These include an excessive number of check-points along its corridor which resulted in a significant amount of bribes and delay of the cargoes, inadequate enforcement of axle load control, inefficient cross-border procedures including strong presence of informal intermediaries (Goro boys), double execution of guarantee funds (at Tema Port and at the cross-border), and an old vehicle fleet, among others. All of the above bottlenecks in the logistics chain contribute to the excessive cost in transporting cargoes from ports of the country into the land-locked countries. For instance, in the 2012 USAID-assisted study (Trends in Transport and Logistics on the Tema-Ouagadougou-Bamako Corridor), it was reported that transport costs and delays in West Africa (from Tema Port to Ouagadougou) were almost 2.5 times more expensive and delays were 2-3 times longer than those in North America (from Newark Port to Chicago).

(2) Legal Framework

There have been several legal instruments enacted to govern trade between and among the ECOWAS countries. The major legal instruments are as follows:

1) Transit Traffic and Interstate Transport

- 1982 ECOWAS Convention A/P.4/5/82 (Inter-State Road Transit of Goods - ISRT). This protocol calls for single carnet (guarantee) system involving payment (single payment on departure) and sharing of guarantee fees among sureties (guarantor) of countries of transit. This means that guarantee fee of 0.5% will be paid at the port (assuming imported goods) and a mechanism to split the fee between the coastal country (entry point) and the land-locked country (final destination point) will be established. Currently, only Côte d'Ivoire and Mali agreed to implement a single guarantee system.
- Axle Load control: 1982 ECOWAS IST Convention on Inter-State Road Transport: This regulation basically established an axle load limit among the member countries which sets a limit of 11.5 tons per axle. For instance, maximum weight of cargoes to be loaded on a 6-axle truck is only 51 ton. Of the four governments, only the Togolese government is currently compelling truckers to observe the regulation.
- Cargo Quota System or Freight Sharing: The ECOWAS Inter-State Road Transportation Convention (No. A/P2/82) allows pairs of member states to conclude bilateral treaties that set quotas in terms of specific percentages of the freight passing through a coastal country's port en route to a landlocked country to the truckers of each of the two countries. Several such bilateral treaties exist, usually dividing imported goods into "strategic" goods and nonstrategic goods. Strategic goods are 100 percent allocated to the landlocked country and nonstrategic goods are allocated 2/3 to the landlocked country and 1/3 to the coastal country. (Impact of Road

Transport Industry Liberalization in West Africa, USAID, 2012)

2) Trade Facilitation

- ECOWAS Regional Road Transport and Transit Facilitation Programme (RRTTFP) - adopted in January 2003 in support of intra-community trade and cross-border movements.
- Joint Border Posts: Supplementary Act /Sa.1/07/13. This relates to the Establishment and Implementation of the Joint Border Posts Concept within Member States of ECOWAS and it establishes, among other things, the legal framework of Joint Border Posts.

3) Trade Policy

- ECOWAS Trade Liberalization Scheme (ETLS) and its various instruments - ECOWAS operational tool for promoting the West Africa sub-region as a Free Trade Area.
- ECOWAS Common External Tariff - this is one of the instruments for harmonizing ECOWAS Member States and strengthening its Common Market.

(3) Existing Development Plan for Logistics Infrastructure

The 2014-2017 Ghana Shared Growth and Development Agenda (GSGDA) II revealed the policies and strategies of the country toward Logistics Infrastructure. It was categorized under the umbrella of Infrastructure and Human Settlement Development in the said plan. The GSGDA II recognized that the pace of socio-economic development of the country is directly linked to the quality of the available infrastructure and the state of the nation's infrastructure determines the level of economic activity in all sectors of the economy. The overall goal of transport and logistics is to make Ghana a transport hub and gateway to the West Africa sub-region. To realize this goal, the key constraints in road, rail, air, maritime and inland water transport have to be addressed in an integrated manner.

Basically, the strategies encompass all transport modes. But there are four strategies in the list which would have significant impact on the Logistics Infrastructure which are:

- Introduce integrated truck staging and management systems: this is like an integrated truck terminal to be located in the proximity of the port where the following services are likely offered:
 - Services for cargo: check in/dispatch, GPS monitoring/control, container storage, smart seals, consolidation/deconsolidation, warehousing, customs clearance
 - Services for trucks: truck repair , sales of tires, fuel, spare parts, parking, GPS monitoring/control
 - Services for the truck drivers: electronic bulletin boards for freight bookings, cafeteria, hotel, communications centre, dispatch
 - Other services: banking, office of logistics services
- Highlight the logistics sub-sector as a critical part of any modern transportation system
- Develop, rehabilitate and modernise the rail-based mass transport system in major urban areas including Accra-Tema, Kumasi-Ejisu, Accra-Nsawam, and Sekondi-Takoradi-Kojokrom
- Develop and enforce safety standards and regulations regarding provision of transport services

23.4.2 Issues regarding Logistics Infrastructure in Ghana

The critical issues that need to be addressed by the Ghana side to push forward the industry are presented in the table below.

Table 23.4.1 Major Issues affecting the Logistics Infrastructure in Ghana

Grouped Issues	Details
a. Weak (or lack) compliance on the laws and regulations enacted by regional bodies	<p>Level of compliance on the different enacted major laws by the regional bodies (ECOWAS and UEMOA) is as follows:</p> <ul style="list-style-type: none"> • 2005 Number of control points along the corridor by UEMOA—all controls must be limited to the point of departure, border crossings and the point of arrival. Compliance on this directive is very weak as evident by the multiple check points along the Tema/Accra-Ouagadougou corridor. • 2005 Axle load control by ECOWAS and UEMOA – of the four governments, only the Togolese government is currently compelling truckers to observe the regulation. • ECOWAS protocol on Inter-State Road Transit of Goods (ISTG) – the envisioned single guarantee fee of 0.5% to be paid at the port (assuming imported goods) and a mechanism to split the fee between the coastal country (entry point) and the land-locked country (final destination point) will be established is still not completely realized. Currently, only Côte d'Ivoire and Burkina Faso have agreed to implement a single guarantee system. At Lome Port, the two (2) chambers of commerce (guarantors) of Togo and Burkina Faso have signed an MOU in late 2015 to allow the two (2) customs bounds fees to be charged once at Lomé port however this has not been implemented yet. No progress is reported at the Tema/Accra- Ouagadougou corridor.
b. Operational-related Issues	<ul style="list-style-type: none"> • It's the second most expensive corridor to transport cargoes after the Abidjan-Ouagadougou both for container and bulk (2016 JICA's Logistics survey). • Likewise, Tema Port is the second most expensive port among the competing ports (Abidjan Port=USD1,514; Tema Port=USD1,045; Lomé Port=USD872 for the case of 40-ft import container). Port cost includes terminal handling charges, stevedoring fee, port dues, shipping line fee, clearance fee and other fees inside the port. • Among the three competing corridors, the amount of harassment fee is highest at the Tema/Accra-Ouagadougou corridor (0.7% for Lomé corridor, 1.4% for Abidjan corridor and 3.8% for Tema corridor of the total inland transport cost). Prevalence of overloaded trucks is also reported. • Like the other two corridors, a GPS tracking system is offloaded at the border thus there is a need to advocate for a common use of GPS tracking (from port to Ouaginter) which should not be offloaded at the border. This will simplify the process (paying to single GPS provider) and completely remove the escort system which slows down the flow of cargo movement. • For export cargoes coming from Burkina Faso, compared with the other corridors, the Tema/Accra-Ouagadougou corridor is particularly affected by the high cost for various fees imposed on export cargo (certification, shippers council, etc.) plus the USD 200 transit fee for transit (transit VAT) cargo imposed by Customs and being collected per truck at the border. Other corridors don't have this cost.
c. Infrastructure-related Issues	<ul style="list-style-type: none"> • Shortage/lack of logistics facilities including truck terminals, logistics centres. Construction of Kpone Container Devanning Terminal by GPHA is almost complete and about to commence its operation and this could contribute in addressing this issue. This lack of logistics terminals contributes to the poor access to the port. • Old vehicles are used to transport cargoes, thus they are susceptible to frequent breakdowns and accidents • Lack of truck rest area along the corridors • Lack of OSBP between Ghana and Burkina Faso resulting in complicated and inefficient transit procedures
d. Institutional-related Issues	<ul style="list-style-type: none"> • Cargo sharing agreement between land-locked countries and coastal countries (Freight Sharing) • Weak implementation of axle load control resulting in road damage and accidents • Lack of single guarantee fund (Regional Guarantee system) • Lack of regional insurance/guarantee scheme for containers • Insufficient effort by concerned authorities to end road harassment

Source: JICA Study Team

23.4.3 Objectives for Logistics Infrastructure in Ghana

(1) Overall Objective

The overall goal for the logistics sector in this study is the reduction of transport and transaction cost through the establishment of an efficient multi-modal logistics system in the region. This bold target naturally calls for upgrading the logistics infrastructure (terminals and links), modernization of logistics operation (mechanization of remaining activities that are currently being done manually), promotion of logistics human resources (that would contribute to professionalization of the industry) and gradual abolition of the outdated systems governing the industry.

(2) Specific Objectives

The specific objectives for logistics infrastructure in Ghana are as follows:

- To provide high quality logistics infrastructure to strengthen economic relations with land-locked countries
- To establish a multi-modal logistics system to capitalize on the strength of each mode (all modes work together to satisfy customer demand)

- To modernize logistics operation (removing manual systems and unnecessary barriers) to take advantage of the available modern technologies
- To promote professionalization of logistics industry in the country

23.4.4 Strategies for Logistics Infrastructure in Ghana

The strategies are designed to achieve the four objectives enumerated above. The strategy is divided into five categories which touch infrastructure, logistics operation, and human resources development.

- To pursue strengthening of logistics links (road and rail) and nodes (logistics platform)
- To pursue integration of logistics infrastructure for seamless transfer of cargoes from one mode to another by establishing multi-modal dry ports
- To pursue provision of cross-border facilities, utilization of modern ITS and data standardization for seamless flow of information not only at border crossings of north-south corridors, but also at border crossings of the coastal east-west corridor
- To pursue promotion of containerization, especially for supporting intermodal logistics operation
- To pursue promotion of human resources development for the logistics industry (to contribute to professionalization of the industry)

23.4.5 Infrastructure Programmes and Projects for Logistics Infrastructure in Ghana

The list of projects is presented in the table below.

Table 23.4.2 Proposed Projects on Logistics Infrastructure in Ghana

Project Name	Project Type	Expected Responsible Organization	Term	
			Short-Mid 2025	Long 2040
Transit Truck Village (Ashaiman Truck Terminal)	Logistics Terminal	GPHA	x	
Completion of Boankra Dry Port	Logistics Terminal	GSA	x	
Takoradi Logistics Platform	Logistics Terminal	GSA		x
*Rehabilitation of Eastern Railway	Rail	GRDA	x	
*Rehabilitation of Western Railway	Rail	GRDA	x	
*Kumasi-Tamale-Paga Railway	Rail	GRDA		x
Paga OSBP (Ghana-Burkina Faso border)	Cross-border facility	Customs of Ghana and Burkina Faso as lead agency	x	
**Elubo-Noé OSBP (Côte d'Ivoire-Ghana border)	Cross-border facility	Customs of Côte d'Ivoire and Ghana as lead agency	x	

Note1: GPHA=Ghana Ports and Harbours Authority; GSA=Ghana Shippers Authority; GRDA=Ghana Railway Development Authority

Note2: * =Discussed in Railway sector (Chapter 24)

Note3: ** =Discussed in Côte d'Ivoire section (Chapter 17)

23.4.6 Programmes and Projects for Professionalizing Logistics Services and Trade Facilitation in Ghana

Equally important are the non-infrastructure projects that would complement the infrastructure-based projects. These measures would address concerns on existing outdated systems that currently govern how cargoes are transported.

Table 23.4.3 Programmes and Projects for Professionalizing Logistics Services and Trade Facilitation in Ghana

Project Name	Explanation
1. Institutional Strengthening and Capacity Building Support for Freight Transport Stakeholders both in the Public and Private Sectors	<p>This project aims to strengthen the capacity of the Government and of professional associations in the transport, transit and trade sector to effectively provide efficient support and services to private operators operating primarily on the three corridors. This will also support activities that promote the professionalization of the road transport industry, as well as accompanying measures for the transport and logistics operators. It should be noted that the same project is about to commence in Côte d'Ivoire with the support of the World Bank. The project may include the following:</p> <ul style="list-style-type: none"> a.) Strengthening the institutional capacity of the ministries involved in logistics operation and other related agencies. b.) Support to transport operators by (i) building capacity for professional transport sector associations through the development of public and private training capacity for the transport and logistics profession, (ii) supporting informal transport operators which cannot comply with possible new regulatory requirements to convert them to other transport related activities or retrain them. c.) Support to joint initiatives and formalization of public-private dialogue to facilitate trade on the corridor by (i) supporting communication campaigns on transport and trade reforms to build broad ownership and support, (ii) supporting regional dialogue among the countries on transport and transit facilitation issues on the corridors and (iii) supporting monitoring of transport conditions on three corridors through road users' survey, logistics costs measurements, and studies of pricing in the trucking industry.
2. Development of Fleet (Truck) Renewal Scheme	<p>This project aims to support the development of a fleet renewal scheme that will allow truck companies to access credit lines to renew their old trucks. It will also support the institutional strengthening of the authority that will be tasked by the government to handle the scheme to ensure that it would gain adequate capacity in managing the activities of the project including the relationships between commercial banks and trucking companies. The project may include the following:</p> <ul style="list-style-type: none"> a.) Support to the development of a self-sustaining Fleet Renewal Scheme and institutional strengthening for the agency that is assigned by the government in an effort to ensure that the agency has adequate institutional and management capacity to administer and manage the truck renewal scheme on behalf of the Government. These supports may include (i) designing of institutional and implementation arrangements for the involved stakeholders (commercial banks, truck operators and other stakeholders) to qualify for the credit line, (ii) selection of commercial banks to host the line of credit and the selection of operators qualified for truck renewal, including clear flow of funds, and (iii) support in competitive selection of a contractor to manage the truck scrapping system. b.) Capacity building and technical assistance for the designated agency by the government to more effectively manage truck renewal scheme.
3. Support to Customs Modernization and Trade Facilitation along the Corridors	<p>This project aims to improve efficiency of trade and transit procedures between Burkina Faso and Ghana, Burkina Faso and Côte d'Ivoire, and Burkina Faso and Togo. The primary activities are (i) ensuring efficient connection of customs information systems within the country (i.e. dry ports to border for the case of land-locked countries; ports to borders for coastal countries) and (ii) between the countries (i.e. inter-connection of two customs systems at the border). The proposed project may include the following components:</p> <ul style="list-style-type: none"> a.) Supporting the interconnection of the existing customs' management system on the four corridors (Ouagadougou-Tema/Accra, Ouagadougou-Abidjan, Ouagadougou-Lomé, Abidjan-Lagos) and implementation of new ICT systems to facilitate regional trade by unifying customs procedures. b.) Modernization of customs' clearance procedures and promotion of coordination between customs departments to reduce congestion at gateway ports (Tema Port, Abidjan Port, Lomé Port) and border posts on the corridors and capacity building for customs officials. c.) Training of customs officials and external users of customs systems, including support to professionalization of the clearing and forwarding industry through capacity building. d.) Anti-harassment campaign including information drive to different freight transport operators both from the public and private sectors.
4. Enhancement of Government's Road Safety Program	<p>This project aims to focus on activities to improve the safety of road users including truck transport operators along the three corridors. It will also support the institutional strengthening and capacity building of the primary agency which has the overall mandate for road safety oversight. The following activities may compose the project:</p> <ul style="list-style-type: none"> a.) Capacity building for the primary agency tasked for road safety and monitoring of road safety on the three (3) corridors including effective enforcement of axle load control b.) Launching of traffic safety campaigns on the three (3) corridors via television, radio, social activities and other means. c.) Identifying accident blacks spots along the three (3) corridors. d.) Provision of training equipment and other materials needed by the primary agency for road safety.
5. Driving Enhancement Training for Truck Drivers Plying the International Corridors	<p>This type of project was started in December 2015 in Côte d'Ivoire through the support of the European Union (EU). The plan for this project is to expand its coverage to the other countries, i.e. Ghana, Togo and Burkina Faso. The objective is to enhance truck driver's skills in driving and understanding of traffic laws, rules and regulations to facilitate the orderly and timely flow of traffic. The training would have two components: (i) theoretical and (ii) practical driving. The former would involve study of traffic rules and regulations while the latter would deal with actual driving of trucks and trailers.</p>
6. Management Enhancement Training for the Managers of Trucking Companies	<p>This type of project has been introduced as well in Côte d'Ivoire through the support from the EU. The target for this proposed project is to expand it to the other three (3) countries: Ghana, Burkina Faso, and Togo. The project includes training of managers (the person running the day-to-day activity of the truck company) in legislation covering domestic laws, regional trade regulations as well company management which covers book keeping, cost calculations, insurance, and human resources development among others.</p>

Source: JICA Study Team

23.4.7 Profiles of Priority Projects for Ghana

Although all the projects are selected from the view point of regional development and corridor development, there are some projects which have greater impact in terms of accelerating regional development hence given a priority. Likewise, project readiness (e.g. FS has been conducted), urgency from the government side to pursue the project, and significant impact into the international logistics chain were also given weight in coming up with the priority list.

(1) Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders

1) Project Outline

In addition to export of primary commodities, such as minerals and agricultural products, it is necessary for Ghana to diversify economic sectors. The WAGRIC Master Plan recommends paying attention to the potential of the economic sectors both in coastal areas and inland areas by targeting growing sub-regional markets and taking advantage of the customs union which has been institutionalized by UEMOA and ECOWAS. For this purpose, it is necessary to strengthen the implementation of the customs union by taking advantage of the customs union, which has been institutionalized by the member countries of UEMOA and ECOWAS.

The project aims at enforcement of implementation of the customs union and trade facilitating for sub-regional products with neighbouring countries of the sub-region, especially with Cote d'Ivoire and Togo, along Abidjan-Lagos Corridor. The project will also be applied to the national border with Burkina Faso on Tema-Ouagadougou Corridor.

The project will establish new materials for training and also train related agencies and personnel. Campaigns for customs union trade facilitation of sub-regional products will also be implemented together with WAGRIC countries and their surrounding countries under this project.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

US\$ 4 million

(2) Project for Construction and Operation of One Stop Border Post (OSBP) in Paga (National Border between Burkina Faso and Ghana)

1) Rationale

The positive gained of the country through diversion of freight from Abidjan Port to ports of Ghana due to the socio-political crisis in Côte d'Ivoire requires constant improvement of the logistics system of the country to keep hold of this new diverted freight traffic. One area where improvement would result significant improvement on the flow of freight traffic is by construction of OSBP coupled with simplification of cross-border procedures. Based on the 2010 USAID-assisted study (Transport and Logistics Costs on the Tema-Ouagadougou Corridor), it takes 9.6 hour to cross the border in Paga (processing time=4.2 hr; delay=5.4 hr) which is a significant delay on the cargoes in a single bottleneck of the logistics system. Accordingly, this substantial delay is partly due to general inefficiency of procedure, non-harmonization of working hours, limited of computer to process customs declaration and others.

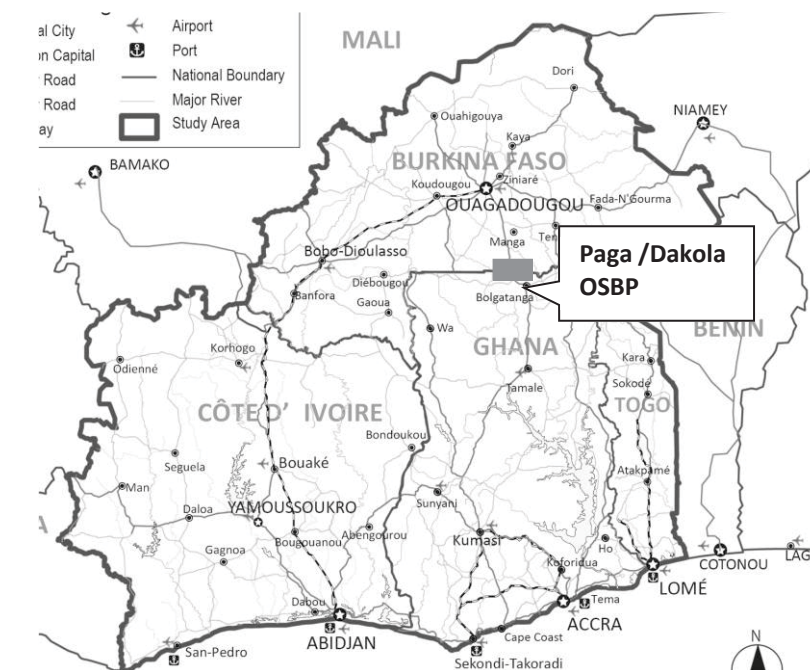
2) Objective

The following are the objectives of the project:

- To reduce border crossing time, harassment and cost
- To reduce transport and logistics costs
- To promote trade and economic development amongst countries in the region

3) Project Description

The project involves construction of OSBP in the border of Ghana and Burkina Faso. The facility would sit on an area of about 57 acres (about 23 hectares). During the meeting with concerned government agencies in March 2016, it was learned that the land has been secured by the government and it is currently active in securing financial support.



Source: JICA Study Team

Figure 23.4.1 Project Location Paga-Dakola OSBP

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Ease crossing between Ghana and Burkina Faso for people and goods
- Increase regional trade and reduce transport costs
- Contribute in regional integration

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- Customs and Immigration of Ghana and Burkina Faso
- Ministry of Roads and Highways (Ghana)

6) Estimated Project Cost

- To be determined

7) Implementation Schedule

- To be determined

8) Necessary Actions for Implementation / Critical Factor

Accordingly, ECOWAS commission has completed the architectural and technical engineering design studies of the facilities thus the next step is to secure funding.

9) Social and Environmental Impacts

Minimal environment impact is expected due to cutting of trees and minimal land filling since the area is generally flat. Social impact is minimal since the area is generally not inhabited.

(3) Project for Construction of Ashaiman Truck Terminal along Accra-Tema Motorway

1) Rationale

Recently, there has been an increase in transit cargo throughout Ghana's Ports from or to Burkina Faso, Niger and Mali. This positive development posed a challenge to Ghana Ports and Harbours Authority (GPHA) on how to accommodate the increasing number of transit trucks in view of limited port space. Aside from increasing the efficiency of cargo handling inside the port, another conceived strategy is to construct a truck facility outside the port for transit cargo-laden trucks arriving or leaving the Port of Tema. In essence, this facility serves as fully secured extension of the Tema Port dedicated to transit cargo-laden trucks – import and export.

2) Objective

To facilitate the smooth flow of transit cargo in and out of Tema Port by construction of a truck facility or park outside the port for transit cargo-laden trucks arriving or leaving the Tema Port.

3) Project Description

Currently, trucks servicing transit cargoes from Tema Port are accommodated at the Transit Platform and Transit Park of the said port. The sequence of activities is into two stages:

- The first stage is at the Transit Platform which is the facility serves as temporary holding place for trucks until required cargo is obtained. According to the 2013 study (Technical and Economic Feasibility Studies, Detailed Design, Preparation of Bidding Documents for a Transit Truck Village (TTV) near Tema Port-Ghana), the capacity of the facility is about 400 vehicles.
- The second stage is at the Transit Park with a capacity of about 90 according to the same study. Trucks then move to the Transit Park area for the above documentation, after which they depart to their destinations. At the said facility, the following are carried out:
 - Transit Documentation by the Customs
 - Tracking devices on the Transit trucks by the GCNet
 - Insurance issues by the SIC (Insurance company)
 - Provision of Waybill by the GPHA

The project involves construction of Transit Truck Village in a vacant area with a size of about 80 acres (see Figure below). A technical and economic study of the project was carried out for GPHA in August 2013. The intention is to transfer the operations carried out at the two facilities above (Transit Platform and Transit Park) into the new Transit Truck Village.



Source: JICA Study Team

Figure 23.4.2 Project Location of Ashaiman Transit Truck Village

4) Expected Benefits

The following benefits are expected:

- Decongestion of Tema Port due to relocation of activities related with transit cargoes
- Improved traffic circulation in the city due to reduced number of trucks parked along the roadsides
- Improved efficiency in logistics operation due to concentration of logistics services

5) Executing Agency and Related Institution

- Ghana Ports and Harbours Authority (GPHA)

6) Estimated Project Cost

- USD 34.1 Million (based on the 2013 FS)

7) Implementation Schedule

- To be determined

8) Necessary Actions for Implementation / Critical Factor

- Interview with government officials reveal that the target funding mechanism is by Public-Private Partnership (PPP). Thus the next critical challenge is how to package the project into a viable and attractive PPP project.

9) Related Projects

- Preparatory Survey on the Project for the Improvement of the Tema Motorway Roundabout in the Republic of Ghana: an on-going JICA-assisted project expected to be completed by October 2016.

10) Social and Environmental Impacts

Possible Social and Environmental Impacts are as follows:

- Social impacts are expected to be minimal since the area is generally not inhabited
- Minimal impacts on the environment include cut and fill of soil and other construction activities related to clearing of the area.

(4) Project for Completion of Boankra Inland Port

1) Rationale

In line with the effort of the government to decongest the primary ports of the country, the Boankra Inland Port was conceived. The facility would serve the important city of Kumasi and surroundings as well those land-locked countries further north. Since the facility would be connected by railway to the primary ports, it would contribute in shifting freight traffic from road to rail.

2) Objective

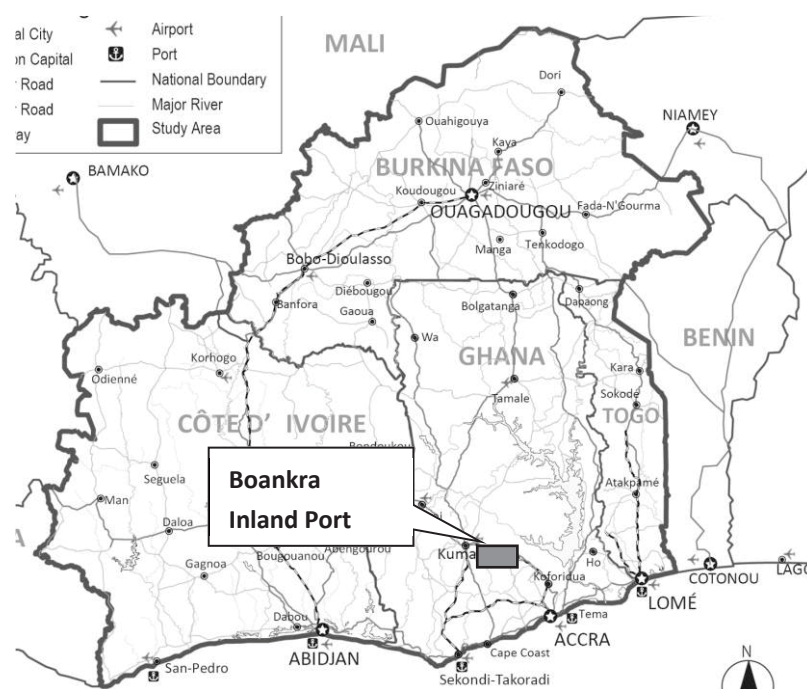
Accordingly, the main objectives of Boankra dry port are:

- To contribute in the reduction of congestion at Takoradi and Tema ports;
- To reduce transport cost of international cargo to importers and exports from the middle and northern parts of Ghana as well as from landlocked countries;
- To promote the establishment of export zones in the vicinity of the dry Port and to create job opportunities for unemployed youth living in and around Boankra.

3) Project Description

Located at Boankra in the Ejisu-Juaben municipality of the Ashanti region, the project involves completion of the Boankra Inland Port. It has been partially built by the GSA which includes fencing and erecting of administrative building. Further development of the facility should move with caution however since full utilization of the facility largely depend on the ability to deliver the railway line connection to the ports of Tema and Takoradi. The facility is about 28 km from central Kumasi. Obviously the impact of this facility in terms of decongesting ports of Ghana is huge.

The plot of land earmarked for the facility is about 400 acres (161 hectares) which was obtained by the government through compensating the original owners. An interview by the JST with GSA on September 2016 revealed that there's has been halt of activities related with the dry port as they waiting for further progress on the side of railway sector.



Source: JICA Study Team

Figure 23.4.3 Project Location of Boankra Inland Port

4) Expected Benefits

The expected benefits are as follows:

- Improved efficiency of Tema Port and Lomé Port due to decongestion as a result of containers to automatically depart the port and formalities will be carried out at the dry port
- Reduction of transport cost due to several improvement including improved traffic flow along arterial roads as a result of shifting of freight traffic from road to railway
- Contributes in jobs creation as a result of demand from export processing zone and other newly created services
- Enhancement of Ghana's competitiveness for transit cargo to land-locked countries

5) Executing Agency and Related Institution

- Ghana Shippers Authority

6) Estimated Project Cost

- To be determined

7) Implementation Schedule

- To be determined

8) Necessary Actions for Implementation / Critical Factor

- Construction of railway connection from port to Boankra Dry Port is pre-condition on the efficient operation of the facility

9) Related Projects

- None

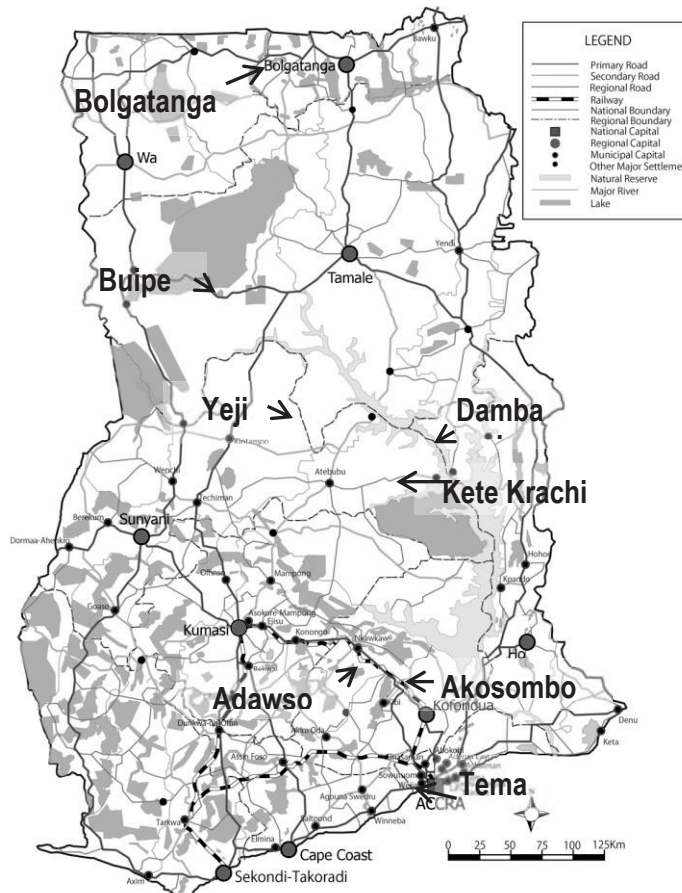
10) Social and Environmental Impacts

- Environmental impact involves cutting of trees, cut and fill to level the ground and other activities related to installation of utilities (power, water, etc) and construction of buildings.
- Social impact is deemed limited since the area is not inhabited

23.5 Inland Water Transport of Ghana

23.5.1 Present Situation of Inland Water Transport of Ghana

The Volta Lake was created by the construction of the Akosombo Dam in the early 1960's. It is the largest man-made lake in the world, spreading to 415 km in length from Akosombo to Buipe. Akosombo is located 101km north of the capital city, Accra while Buipe is located about 200km from Ghana's border with Burkina Faso. The major water inflows to the Volta Lake are the Black Volta River originating in western Ghana, the White Volta River originating from Burkina Faso, and also the Oti River originating in northern Togo. The Akosombo Dam on the Volta Lake, with its huge turbines generate electricity not only for Ghana but also for neighbouring countries.



Source: UN Cartographic Section
Figure 23.5.1 Volta Lake and Key Places related to Volta Lake

The annual rainfall is in a range between 1,000 and 1,140mm and the land is characterized by poor soil, generally made from Voltanian sandstone. The lake is navigable from Akosombo through Yeji up to Buipe located in the middle of the country, when the water level is normal.

The transport on the Volta Lake is the main inland water transport in Ghana. The Ministry of Transport of Ghana (MOT) is the regulatory body for operating inland water transport companies, including the Volta Lake Transport Company Limited (VLTC). There are two types of passenger transport services on the Volta Lake. One is a ferry-crossing service operated by the Volta Lake Transport Company Limited (VLTC) and the other is a cruise service operated by Volta Hotel owned by the Volta River Authority (VRA). The VLTC operates four ferry-crossing sites for lake-crossing services between 1) Dambai-Dodoikope, 2) Kete Krachi-Kojokrom, 3) Adawso-Ekye Amanfrom and 4) Yeji-Makango. These ferry services play an important role in connecting roads on both sides of the lake, forming parts of a national road network.

Besides the lake-crossing services by the VLTC, the company also transports both dry and wet cargo on the Volta Lake using pusher tugs with cargo barges. Dry cargo, such as lint cotton, cotton seeds, and shea nuts are shipped from the north of Ghana to the south for export and local markets. On the other hand, cement, industrial products and general cargo are also shipped from the south to the north. There is also a pusher tug with tanker barges which transports fuel regularly from the south to the north of Ghana for the Bulk Oil Storage and Transportation Co. Ltd. (BOST). Volta Lake also has tramper services for transporting passengers and agriculture products such as yams, beans, ground nuts, fish etc. to communities along the lake. The passenger/cargo vessel "MV Yapei Queen" is used for tramper services and has an air-conditioned cabin and open space room. It sails regularly from Akosombo to Yeji stopping at Kete Krachi and other ports and returns with agricultural products. There are a number of canoe fishermen on the Volta Lake but only a few fishermen use outboard motors to transport fish to Akosombo and further to Accra. The rest are for local direct sale using tramper services. The eastern, southern and northern parts of the lake have major roads passing through large towns where there are major lake side markets.

According to the statistical data of the MOT, passenger/cargo transport has increased steadily between 2009 and 2013. Cargo transport has been stagnant since 2013, especially in the north-south direction due to factors such as; unavailability of cargo for shipment on south bound trips, low-speed running due to weak engines, ageing and inappropriate cargo handling equipment which adversely affected port operation efficiency, especially stevedore activities.

In 2015, however, the Volta Lake was faced with a very unusual situation (once in every ten years situation) where rainfall was extremely low in the upper river areas. The largest impact of this on the Volta Lake freight services is the reduction of transported fuel products of the south-north route for BOST. The potential for carrying fuel products on the south-north link of the Volta Lake is dependent on water levels because low water level causes more navigation difficulties at Buipe. BOST is now carrying oil products on roads by tank truck from the Tema refinery to the northern regions. As a result, the volume of fuel transported on behalf of BOST by the VLTC has decreased significantly.

23.5.2 Issues regarding Inland Water Transport in Ghana

Issues related to inland water transport are identified as follows:

- Difficulty to get access to the Buipe Port when the water level is low, resulting in unstable transport
- Not enough cargo for shipment on south bound trips
- A lot of time required for transport cargo using the Volta Lake due to weak engines of ships
- Weak network connection from the inland port to major cities
- Ageing and inappropriate cargo handling equipment and shortage of the equipment needed for handling, such as large fork lifts
- Low safety standards of transport on the Volta Lake resulting in loss of lives and goods

23.5.3 Objectives for Inland Water Transport in Ghana

The objectives for inland water transport are determined as follows:

- To develop an upgraded, sustainable and safe inland water transport system on the Volta Lake by pursuing the following aspects:
 - To increase the amount of cargo shipments using inland water transport on the Volta Lake
 - To develop a sustainable shipping service on the Volta Lake
 - To implement safety measures for inland water transport on the Volta Lake
- To integrate the Volta Lake inland water transport with other transport modes to serve the corridor development in Ghana
- To coordinate the Volta Lake inland water transport with socio-economic development in the areas surrounding the Volta Lake

23.5.4 Strategies for Inland Water Transport in Ghana

The strategies for inland water transport in Ghana are proposed as follows:

- To develop an effective and integrated cargo system on Volta Lake by upgrading Debre Port and connecting a pipeline from Debre Port to the existing oil products pipeline between Bolgatanga and Beipe
- To upgrade roads connecting with Volta Lake inland water transport for providing access to agricultural potential in the areas surrounding the Volta Lake and fisheries potential on the Volta Lake
- To rehabilitate and upgrade pipelines for oil products connecting with Volta inland water transport for securing the north-south transport corridor
- To coordinate the Volta Lake inland water transport development with socio-economic development in the areas surrounding the Volta Lake, especially the agriculture and fisheries sectors
- To reinforce law enforcement concerning safety measures
- To establish an environmental monitoring system for the Volta Lake

23.5.5 Programmes and Projects for Inland Water Transport in Ghana

The programmes for inland water transport related to corridor development include the following:

(1) Programme for Improving Capacity, Efficiency and Reliability of North South Service

- Feasibility study for a north south integrated cargo service, including port infrastructures, logistics and processes, decide on an Eastern dry port system and ensure financing
- Planning and building of new installations at Akosombo, including port capacity, transshipment, logistics, warehousing, computerizing, customs, etc.
- Planning and building of new installations at Buipe, including port capacity, transshipment, logistics, warehousing, computerizing, customs, etc.
- Feasibility study regarding increase in capacity at Debre Port (comparing with dredging costs)
- Implementation of fully integrated transport logistics with Tema Port, trucking industry, Burkina Faso authorities, shippers and forwarding agents

(2) Programme for Improving Capacity, Efficiency and Reliability of Tramping Service

- Feasibility study for tramping service
- Updating boats including Buipe Queen and Volta Queen
- Upgrading of port and cargo installations at Adawso, Agordeke, Kpando-Torkor, Dambai, Kete

Krachi, Yeji and Makango in coordination with ferry services

- Planning and implementation of tramping installations at Dzemeni, Galelia, Ntoboma and Tapa Abotoase in coordination with ferry and informal services
- Planning and implementation of tramping installations at Fosu, Adakope, Akateng, Anyinamae-Begyemse and Hausakope-Asuoso, in coordination with ferry and informal services

(3) Programme for Coordinating Inland Water Transport and Economic Development

- Implement necessary measures for increasing the future demand of inland water transport for economic sectors such as agriculture, fisheries and tourism

(4) Programme for Development and Maintenance of Road Transportation in Connection to Lake Services

- Feasibility study for regional and feeder road connections to lake transport
- Planning and implementation of trucking access to new and upgraded lake infrastructure sites

(5) Programme for Defining Clear and Safe Routes on the Lake

- To create a detailed bathymetric chart of the Volta lake and to identify the most suitable navigation channels and routes
- To clear lanes of all obstacles, especially tree stumps in the Volta Lake for marking out appropriate routes between destinations

23.5.6 Profiles of Priority Projects for Inland Water Transport in Ghana

The projects below were selected as priority projects for Inland Water Transport in Ghana.

- Project for Construction of Debre Port at Volta Lake
- Project for Upgrading Akosombo Port at Volta Lake
- Study on Inland Water Transport between Damanko Port and Akosombo Port on Volta Lake for supporting Iron Ore Mining in Shieni Mine



Source: JICA Study Team

Figure 23.5.2 Location of Debre Port and Akosombo Port

(6) Project for Construction of Debre Port at Volta Lake

1) Rationale

The route of petroleum product transfer to Buipe has a major deficiency especially during the dry season, when the Volta Lake reduces in volume, resulting in shallow draft that does not support navigation on the Volta. To make up for this deficiency, this project is to allow river barges to dock at Debre during the dry season or shallow waters.

2) Objective

The project objective is to ease the passage of vessels on the Volta Lake to Buipe during dry season or shallow waters and to increase port efficiency.

3) Expected Benefit

The completion of the project will provide for navigation of vessels in all seasons.

4) Project Description

The scope of this project is to increase the capacity and efficiency of vessel landing by dredging and enhanced facility installations.

5) Estimated Cost

The estimated cost is listed in the table below.

Table 23.5.1 Landing Installations (In US\$)

Service type/Typical location	North South - Dabre
Landing facilities	6 928 000
Reception facilities	545 000
Accommodation facilities	
Access road	346 000
Navigation approach	157 000
Miscellaneous	1 645 000
Total	9 621 000

Source: ILAG, 2013

6) Executing Agency and Related Institution

- Bulk Oil Storage Transportation (BOST)
- Volta Lake Transport Company Limited (VLTC)

7) Implementation Schedule

Not Available

(7) Project for Upgrading Akosombo Port on Volta Lake

1) Rationale

Akosombo Port is the main inland port connecting to the Eastern Corridor in Ghana. For the utilization of inland water transport in Ghana, increasing the capacity of Akosombo Port is necessary. There is also a plan to construct a railway between Tema Port and Akosombo Port which will increase the handling amount of goods at Akosombo Port.

2) Objective

The objective of the Akosombo Port upgrading is to design the port as a container operation. It is also for the containerization or placement on container flats of all existing cargo.

3) Project Description

The upgrade of Akosombo Port will include the lake port and support facilities to enable storage of containers and other bulk commodities. It is also to have transfer capabilities that are able to transfer to and from rail cars, and transfer to and from lake vessels.

4) Expected Benefit

The new installations and upgrade will allow large ships to transport large cargo between the northern and southern ends of Volta Lake.

5) Executing Agency and Related Institution

- Ghana Port and Harbours Authority (GHPA)
- Volta Lake Transport Company Limited's (VLTC)

6) Estimate Project Cost

Not available

7) Implementation Schedule

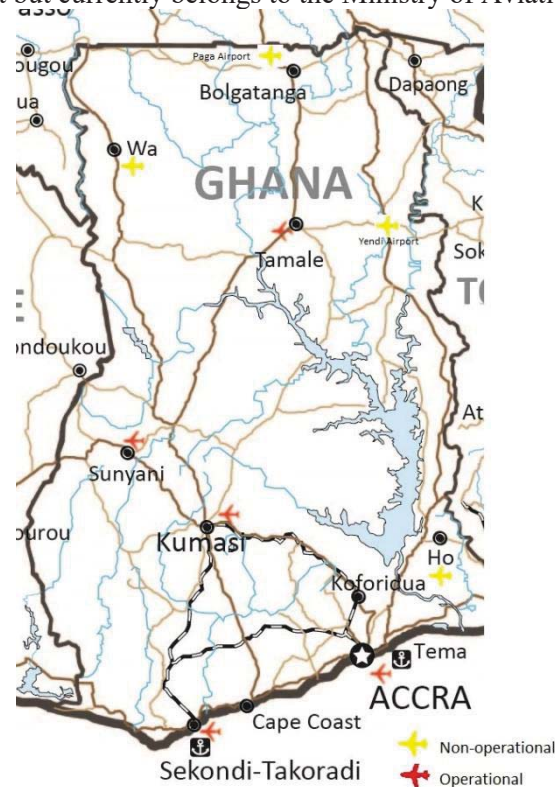
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23.6 Air Transport Sector of Ghana

23.6.1 Present Physical Situation of Air Transport and Airports in Ghana

(1) Present Air Transport in Ghana

In Ghana, there is one international airport with regular flights, four domestic airports with regular flights and four domestic airports without regular flights. The four operational domestic airports include Kumasi Airport, Takoradi Airport, Tamale Airport and Sunyani Airport. The non-operational are the Paga airstrip, Yendi Airport, Wa Airport and Ho Airport. The Ghana Civil Aviation is the regulatory body of air transport in Ghana established in in the 1930s. The Ghana Airports Company Limited on the hand is the body responsible for the maintenance, planning, development and management of airports in Ghana. The air transport sector was initially under the Ministry of Transport but currently belongs to the Ministry of Aviation after it was split in 2017.



Source: JICA Study Team

Figure 23.6.1 Location of Airports in Ghana

The international airport is Accra (Kotoka) International Airport, which has regular international and regional flights with the following 25 direct air destinations; Abidjan, Abuja, Addis Ababa, Amsterdam, Barcelona, Beirut, Cairo, Casablanca, Cotonou, Dakar, Frankfurt, Freetown, Istanbul, Johannesburg, Lagos, Lisbon, Lomé, London, Madrid, Malabo, Monrovia, Nairobi, New York, Ouagadougou, Sao Tome Is. (Source: OAG July 2015, Time Table)

The Accra International Airport has the following 4 direct domestic destinations; Kumasi , Takoradi, Tamale and Sunyani.

Takoradi Airport is fully operated and managed by the Military Force. Some domestic civil flights are accepted by Takoradi Airport. The government of Ghana in principle has also decided to build a new civil airport in Takoradi to move traffic from the current military airport but no location had been decided as at August, 2017. However, land has been acquired in the Central Region at Atabadze near Elmina for a new airport.

(2) Accra International Airport

1) Present Situation of Kotoka International Airport (KIA)

- Accra International Airport is the Gateway Airport of Ghana. The passenger traffic, 2,600,000 in 2014, of Accra airport was the largest passenger traffic among all airports of the 4 countries in the study regarding West Africa. The Accra Airport plays an important role as a hub airport in the region.
- In 2014, the volume of international passengers at Accra Airport was 1.65 million, while that of domestic passengers was 0.72 million and that of transit passengers was 0.18 million.
- The number of aircraft movements for both international and domestic flights at Accra Airport increased at an annual growth rate of 11.4% from 2010 to 2014. This very high increase took place due to the activation of domestic flights in 2012.
- The air traffic volume of international passengers at Accra Airport increased at an annual growth rate of 4.4% from 2010 to 2014. The air traffic volume of international cargos at Accra Airport increased at an annual growth rate of 4.3% from 2010 to 2014.

2) New Accra-Prampram International Airport Site

- Since the existing Accra International Airport is almost fully occupied by civil and military facilities and does not have much free space, it is necessary to secure a new airport site and to prepare its development plan to become the gateway for the future metropolitan air transport.
- Ghana Civil Aviation Authority has a plan to develop the new airport in Prampram area about 30km to the east from Accra, along the national road toward Togo.

23.6.2 Issues regarding Air Transport in Ghana

The following issues confront the air transport in Ghana. They include:

- No direct flights from domestic airports to other neighbouring countries. Although some domestic airport would seem closer in terms of distances to other surrounding countries, there is no direct flight to them, therefore, travellers from these airports have to fly to Accra before they can connect to places like Côte d'Ivoire or Burkina Faso.
- Limited operation hours at the Takoradi Airport. The Takoradi airport is a military airport partially operated for civilian use therefore there is a limited time period in which civilian flights can be made.

Issues of Accra International Airport are:

- Rapid increase of passenger demand causes the congestion of passengers in the terminal building and vehicle traffic in the road and car park. GACL will construct a new terminal building with a tent structure and expand the car park and rearrange the route of the circular road.
- The airside expansions are being carried out by GACL for taxiway development, apron expansion, ILS CAT-II improvement, etc. The existing terminal areas are almost fully occupied by civil facilities.
- Air force facilities are fully used on the opposite side of the runway.

23.6.3 Objectives for the Aviation Sector of Ghana

The broad goal of the transport sector is to establish Ghana as a transportation hub for the West African Sub-Region by creating and sustaining an efficient transport system that meets user needs, and integrates land use, transport planning, development planning and service provision. To achieve this goal, the aviation sector has the following objectives:

- To develop opportunities for domestic and international travel and trade
- To provide facilities to improve access to remote regions, enhance mobility and develop opportunities for travel within the country
- To facilitate efficient aviation operations
- To improve the scope and quality of aviation services
- To encourage strong sustainable growth in the aviation industry
- To maintain the highest standards of safety and security in the provision of air transport
- To develop aviation while preserving the environment

23.6.4 Strategies for the Aviation Sector of Ghana

Some strategies of the sector include:

- To encourage private sector participation in the aviation industry
- To improve the physical infrastructure at KIA, other regional airports and build new airports in all regional capitals

23.6.5 Programmes and Projects for the Aviation Sector of Ghana

- Feasibility study for the establishment of a National airline.
- Reconstruction and extension of the Tamale runway
- The 1st phase of the Kumasi airport
- Expansion and refurbishment of the International Arrival Hall of the Terminal 2 at KIA
- Construction of a new terminal.
- Construction of a southern apron at KIA for eight wide body aircraft.
- Construction of the 1st phase of the Wa Airports.

23.6.6 Project Profile of Priority Project for the Aviation Sector in Ghana

The project below was selected as priority projects for the aviation sector in Ghana.

- Construction of New Airport in Sekondi-Takoradi

(1) Construction of New Airport in Sekondi-Takoradi

1) Rationale

In an effort to ease the discomforts and conflicts of use of the Takoradi airport between the military and civilian use, the Ghana government has initiated a plan to build a new airport which would move traffic from the military air force base to a new location. However, as at mid-year 2017, no land had been acquired yet.

2) Objective

The objective of this is to ease air transportation to the Sekondi-Takoradi area and also separate military and civilian activities in airport operation and management.

3) Expected Benefit

- Provide comfort and reliability for passengers to the Sekondi-Takoradi areas
- Offer opportunity to the military to fully take control and use of the existing airport and also provide full management for the Ghana Airport Company limited
- Provide longer operation hours of the airport

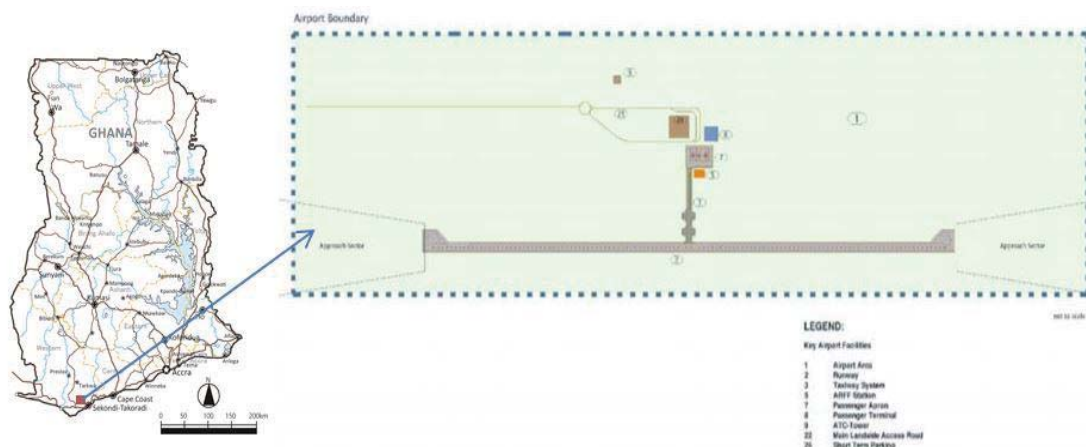
4) Project Description

The project description uses the Standard Airport specification per the role of this airport as a Category B (Regional Airport).

Table 23.6.1 New Airport Project Specifications

Runway	
Number	1
Orientation	To be determined
Dimensions	2,800m x 30m
Configuration	Single
Taxiway	
Dimensions	20m
Aircraft Parking Apron	
Total Apron Area	3,200 sqm / 80m x 40m / 2 C aircraft
NAVAIDS	
RWY Lighting Approach System	To be determined
Visual Approach Slope Indicator System	PAPI
Airport Rescue and Fire Fighting	
Level of Protection	RFF 7
Number of ARFF Stations	1
Terminal	
Facilities	<ul style="list-style-type: none"> - Floor area 3,400 sqm - 2 check-in positions - 1 security control position - Airside gate area - Baggage reclaim handout - Retail and F+B

Source: Ghana National Airport System Plan Final Report, 2014



Source: JICA Study Team based on Ghana National Airport System Plan Final Report, 2014

Figure 23.6.2 Layout of New Sekondi-Takoradi Airport (Greenfield)

5) Estimated Project Cost

USD 102,1M USD (based on Ghana National Airport System Plan Final Report, 2014)

6) Executing Agency and Related Institution

- Ghana Civil Aviation Authority
- Ghana Airports Company Limited

23.7 Electricity Supply of Ghana

23.7.1 Present Situation of Electricity Supply of Ghana

Ghana has the largest system capacity among the WAGRIC countries and its peak demand has been constantly growing at a rate of approximately 8 to 10% in recent years. In 2015, the peak demand, which is obtained by summing up the maximum demand of ECG, NEDCo, Customers of VRA and mines, was 1,777MW, and the system peak demand, which is obtained by adding the maximum load of VALCO and export load, was 2,087MW. The value of the system peak demand for 2015 was a historic all time high. It is expected that the economic growth in Ghana will continue and the system peak demand will increase accordingly. As of January 2016, the total of installed generation capacity is around 2,800MW. However, the dependable capacity is smaller than that of installed capacity due to unstable gas supply and shortage of water resources, and is estimated to be around 2,500MW. Furthermore, given the planned outages for the maintenance work and troubleshooting, the actual dependable generation capacity would be much smaller and the demand/supply balance is not always kept under the heavy load. For instance, as recorded on Mar.23, 2016, the domestic peak demand was 1,731.61MW, and on the other hand, the total generation at peak was 1,786MW according to the official web site of GRIDCo shown in Table 23.7.1.

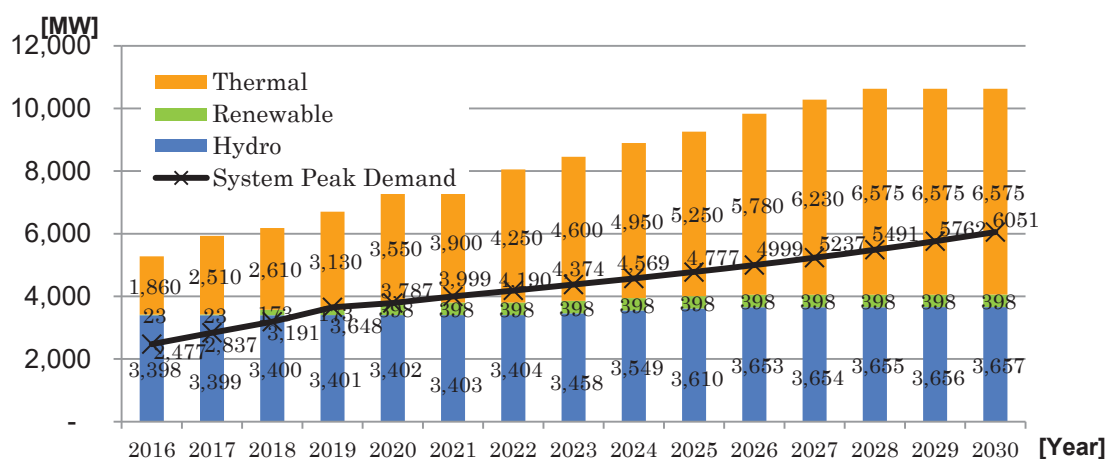
The spinning reserve is 54.79MW, which is quite small. Furthermore, considering the VALCO load and export to Togo, the peak demand was 1,830.4MW and this exceeded the total generation at peak. This means that there is a shortage of power supply. The Ghanaian power sector experienced a severe power crisis in 2015. In response to this circumstance, the president announced that an additional power plant of 800MW would be added to the power system in soon to satisfy the increasing power demand as a presidential commitment. Besides those additional power plants, more generation including the coal thermal power with a capacity of 2,000MW is planned according to the long term generation development plan in preparation for the future demand growth.

Table 23.7.1 Demand and Supply Balance for March 23, 2016

PEAK DATA	MW
TOTAL GENERATION AT PEAK	1,786.40
GHANA PEAK LOAD	1,830.40
GHANA/CEB SYSTEM PEAK LOAD	2,230.41
VALCO LOAD AT PEAK	68.40
DOMESTIC PEAK LOAD	1,731.61
EXPORT TO CEB AT PEAK	30.39

GENERATION BY FUEL TYPE	GWh
HYDRO	17.52
THERMAL	19.90
TOTAL GENERATION (GWh)	37.42

Source: GRIDCo Web Site



Source: Energy Commission

Figure 23.7.1 Generation Capacity (2016-2030) and Demand Forecast (2016-2025)

The power generation development plan includes several types of risk, such as termination of construction work caused by unforeseen trouble. However, if it proceeds smoothly and the Ghanaian power sector can be served with secure dependable generation capacity with a sufficient reserve margin, further economic development would be expected and Ghana might become a leading country playing an important role exporting power.

23.7.2 Issues regarding Electricity Supply of Ghana

The issues on the power sector are identified as follows:

- It is considered that new power plants will be constructed one after another on the basis of Ghana's power generation development plan. However, if development of transmission lines cannot satisfy the increase of transmission capacity in response to the continuous increase of power generation, the power produced at the power plants could not be fully transmitted.
- Some of the hydro power plants, especially Akosombo Hydro Power Plant and Kpong Hydro Power Plant, cannot run at the rated output when the water behind the dams is low caused by reduced precipitation.
- The power output of existing thermal power plants is not stable because of the unstable supply of natural gas from Nigeria. Natural gas is supplied through the pipeline installed between Ghana and Nigeria. Gas supply is not stable due to the fluctuation of procurement cost and amount of gas supply.
- The gas supply companies are under negotiation with regard to contracts with thermal power companies. However, it is uncertain if the contracts between the gas distribution companies and thermal power companies will be concluded successfully because some of the thermal power companies are in debt.
- There is a possibility that the development of power facilities cannot catch up with the demand growth brought on by the economic growth. One of the reasons is the shortage of financial resources required for development for power facilities.

23.7.3 Objectives for Development of Electricity Supply of Ghana

In the light of the issues on the power sector, the following objectives need to be set:

- To develop power generation plants to meet the growing demand all over the country
- To develop interconnection lines to import/export surplus power from/to adjacent countries for power trading
- To enable the bulk power to be transferred with high reliability to areas with high demand for power

23.7.4 Strategies for Development of Electricity Supply of Ghana

In order to ensure the reliable power supply in Ghana, it is important to prepare strategic plans based on the priority of the development as follows:

- Prior to the development of generation plants, it is desirable to establish and reinforce the transmission lines for responding to the increasing power demand not only for Greater Accra and Greater Kumasi, but also for areas along the north-south corridor. If the capacity of the transmission lines cannot be secured sufficiently, the power output is constrained by the conductors of the transmission lines with the least capacity.
- Considering that Ghana might become a leading country that can export power in the future, it is required to further reinforce the interconnection lines with adjacent countries, such as Burkina Faso and Côte d'Ivoire.

- In order to supply power along the potential economic corridor, the power facilities should also be established along or close to the economic corridor. It is effective to develop the eastern corridor transmission line in terms of the system stability.
- Along with the development of the transmission line, it is required to build substations with large capacity of transformers, called “BSP (Bulk Supply Power)”, at the point where the power is largely consumed. Even if the bulk power is transmitted through transmission lines that have sufficient capacity, planned outages would be required if the transformers were overloaded.
- In parallel with the development of the thermal power stations, the development of renewable energy would be required for reduction of CO² and NO_x from an environmental point of view.

23.7.5 Programmes and Projects for Electricity Supply of Ghana

The following projects are formulated and included in the development plans by power companies for power generation, power transmission and power distribution as follows:

(1) Hydro Power Plants

Year 2023

- Pwalugu Hydro Power Plant [53MW]

Year 2024

- Juale Hydro Power Plant [90MW]

Year 2025

- Hemang Hydro Power Plant [60MW]

Year 2026

- Ankobra Hydro Power Plant [42MW]

(2) Thermal Power Plants

Year 2017

- Takoradi Thermal Power Plant 4 [150MW]
- Cenpower Thermal Power Plant [300MW]

Year 2018

- General Electric Thermal Power Plant 1 [300MW]

Year 2019

- Kpong Thermal Power Plant (CC)※2 [420MW]

Year 2020

- Globeleq Thermal Power Plant (CC)※ [420MW]

Year 2021

- Aksa Power Plant (CC)※ [350MW]

Year 2022

- Tadi Thermal Power Plant (CC)※ [350MW]

Year 2024

- Chrispod Thermal Power Plant (CC)※ [350MW]

Year 2025

- Astro Thermal Power Plant [180MW]
- Domunli Thermal Power Plant [420MW]

Year 2026

- Amandi Thermal Power Plant [230MW]
- Jacobson Thermal Power Plant (CC)※ [300MW]

Year 2027

- General Electric Upgrade into CC※ [450MW]
- KATT Thermal Power Plant [300MW]

Year 2028

- Tema Thermal Power Plant 3 [345MW]

※CC: Combined Cycle

(3) Renewable Energy

Year 2018

- Savanna Solar Power Plant [150MW]

Year 2020

- Upwind Ayetepa Wind Power Plant [225MW]

(4) Projects for Development of Power System

Year 2017

- 330kV Transmission Line: Domunli Prestea (Double Circuit Line)

Year 2020

- 225kV Transmission Line: Bolgatanga- Ouagadougou
- 330kV Transmission Line: Prestea - Riviera (Cote d'Ivoire) Interconnection

The following plans suit the third bullet point in the objective described above.

Year 2016

- 330 kV Transmission Line: Aboadze - Domunli
- 161kV Collector Substation in Tema

Year 2017

- 161kV Transmission Line: Takoradi - Tarkwa (Upgrade)
- 161kV Transmission Line: Volta -Achimota Lines (Upgrade)
- 161kV Transmission Line: Achimota - Mallam Lines (Upgrade)
- Accra Central 161kV GIS Substation

Year 2018

- 330kV Transmission Line: Prestea-Kumasi
- 330kV Accra (Pokuase) Substation (A4BSP)
- Eastern Corridor Transmission (161kV Transmission Line: Asiekpe-Ho-Kpeve-Kpandu-Kadjebi-Yendi)
- 40MVar SVC in Kumasi

Year 2019

- 330 kV Transmission Line: A4BSP - K2BSP
- 161kV Transmission Line: Atebubu - Tamale

Year 2020

- 330 kV Substations (Kintampo, Tamale, Bolga) and Transmission Line: Kintampo - Tamale - Bolga
- 330 kV Transmission Line: Bolga - New Navrongo
- 161kV Kumasi Third Bulk Supply (K3BSP)

23.7.6 Profiles of Priority Projects for Electricity Supply of Ghana

In consideration of the corridor development in Ghana, priority should be given to the following projects, and profiles of those projects are prepared as follows:

(1) Project for Development of 330kV Interconnection Line (Dunkwa 2-Côte d'Ivoire)

1) Rationale

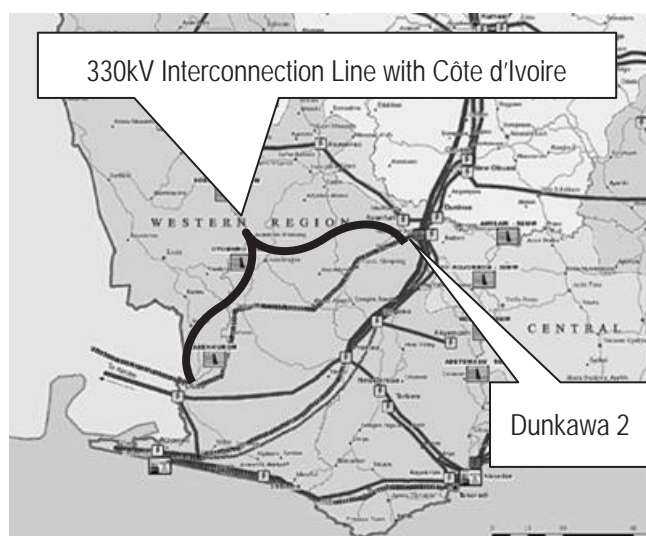
In the near future, it is expected that Ghana will become one of the countries that can export a great deal of power to the adjoining countries as well as Côte d'Ivoire. It would be important to further reinforce the interconnection line with Côte d'Ivoire along the coastal growth ring corridor to be able to import/export the power in terms of mutual power trading. Also, this contributes not only to the improvement of system stability for both Ghana and Côte d'Ivoire, but also to loss reduction for both countries.

2) Objective

The objective of this project is to reinforce the inter-connection line with Côte d'Ivoire and to allow transmission of bulk power from/to Côte d'Ivoire.

3) Project Description

This project was proposed in 2004 and revised in 2011 in order to ensure stable integration of the national electricity network in the ECOWAS region and facilitate optimal power exchanges and trading among ECOWAS countries. The total length of the interconnection line proposed is 296km, the Ghanaian section of which occupies 119km. Also, the construction of a new substation, "Dunkwa 2", which will become junction point where the interconnection line is connected with, is proposed. The project location is shown in Figure 23.7.2.

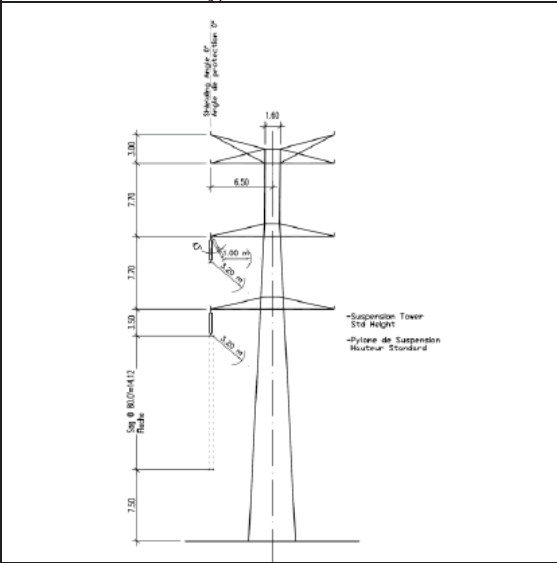
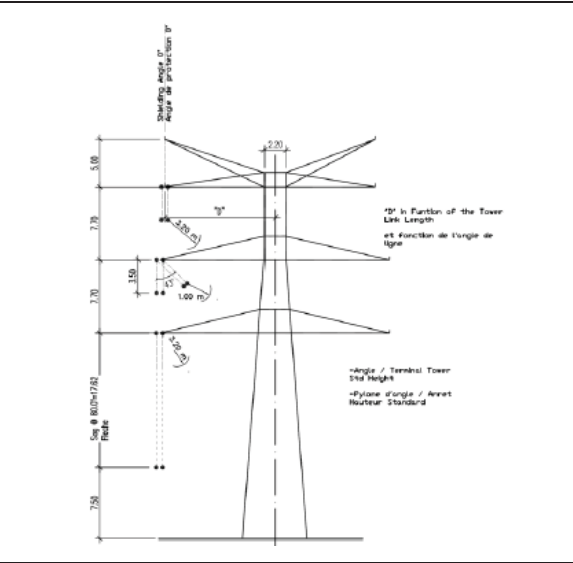


Source: GRIDCo

Figure 23.7.2 Location of 330kV Interconnection Line with Côte d'Ivoire

Typical project components are shown in Table 23.7.2.

Table 23.7.2 Outline of Proposed Component of Interconnection Line with Côte d'Ivoire

Transmission Lines					
Voltage	From	To	Length [km]	Ckt	Conductor Type
330kV	Dunkawa 2	Border between Ghana and Côte d'Ivoire	119	2	• ACSR 430.71 mm ² ×2 • Capacity: 644MW
Transmission Tower Type					
					
Suspension Tower			Tension Tower		
Substations					
Name of Substation	Capacity Addition of Transformers				
	Capacity [MVA]	Voltage Ratio	Nos		
Dunkawa 2	200	330kV/161kV	2		
Dunkawa 2	33	161kV/34.5kV	2		

Source: GRIDCo&CI-Energy, “Final Feasibility Study Report for 330kV Côte d'Ivoire – Ghana Interconnection Reinforcement Project”

4) Expected Benefits

The following impacts and benefits are expected in this project:

- To contribute to the improvement of the system reliability of the power grid in Ghana
- To make it possible for Ghana to receive/send bulk power from/to Côte d'Ivoire and to further activate power trade among the countries in WAPP
- To contribute to loss reduction
- To realize the reduction of reserve capacity requirements

5) Executing Agency and Related Institutions

Expected executing agency and related institutions for this project are listed below.

- Ministry of Power (MOP)
- Energy Commission (EC)
- Public Utilities Regulatory Commission (PURC)
- Environmental Protection Agency (EPA)
- GRIDCo
- CI-Energy (Côte d'Ivoire)
- CIE (Côte d'Ivoire)

6) Estimated Project Cost

Estimated project cost is shown in Table 23.7.3.

Table 23.7.3 Estimated Project Cost

Unit: Thousand EURO

Item	Cote d'Ivoire	Ghana	Total
Transformers	18,788	6,600	25,448
Switchyard	10,729	13,720	24,449
Switchgears MV	483	298	781
Loop-in of Existing Lines	460	240	700
Buildings and Other Civil Works	2,484	2,554	5,038
330kV OHL* + OHL Upgrade	56,093	35,454	91,548
Direct Project Cost	89,037	58,866	147,964

* OHL: Overhead Line

Source: GRIDCo, “330kV Côte d’Ivoire – Ghana Interconnection Reinforcement Project – Final Feasible Study Report 2015”

7) Implementation Schedule

The project implementation schedule is designed to be around seven (7) years

Table 23.7.4 Implementation Schedule

	2017				2018				2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Preliminary Studies																												
Final Line Routing																												
Permitting																												
Social and Environmental Impact Assessment																												
Engineering and Procurement																												
Preparation Bid Documents																												
Review Bid Documents, Bidders Pre-Qualification, and Launching of Bidding Documents																												
Conclusion of Contracts																												
Construction and Commissioning																												
Construction (Transmission Line)																												
Construction (Substation)																												
Commissioning and Hand-over																												

Source: GRIDCo, “330kV Côte d’Ivoire – Ghana Interconnection Reinforcement Project – Final Feasible Study Report 2015” and modified by JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Social and Environmental Impact Study
- Other necessary actions are to be considered.

9) Related Projects

Related projects are listed as follows:

- Project for construction of new 330kV interconnection line with Ghana in Côte d’Ivoire

(2) Project for Development of 330kV/161kV Eastern Corridor Transmission Line

1) Rationale

Out of the several proposed growth ring corridors, two growth ring corridors are proposed in Ghana, namely, the central growth ring corridor between Accra and Ouagadougou through Kumasi, and the eastern growth ring corridor going through the eastern part of Ghana. Especially, in the eastern regions, the transmission lines are not well established. It would be quite significant to establish the transmission lines along the eastern corridor in terms of the realization of a loop system that contributes to the improvement of the system stability and reliability, and of the establishment of the 2nd interconnection line with Togo at Yendi.

2) Objective

The objective of this project is to reinforce the system reliability in Ghana and to establish the backbone line to supply the power for the potential eastern economic corridor from Accra to Ouagadougou.

3) Project Description

According to the “Feasibility Study for the Eastern Transmission Line” conducted by financial support of the U.S Trade and Development Agency (USTDA), the project components proposed are

composed of upgrading of the existing two substations (Asikpe and Yendi), construction of four new substations (Juale, Nkwanta, Kadjebi, and Kpandu), and construction of new transmission lines which connect the respective substations. All the components are studied and designed from technical, geographical, environmental, economic, and legal points of view. The line route is located on the eastern side of Volta Lake and along the secondary corridor in Ghana connecting Accra to Ouagadougou in Burkina Faso. This line is expected to contribute to the development of the eastern region in Ghana by supplying the power along with the corridor.

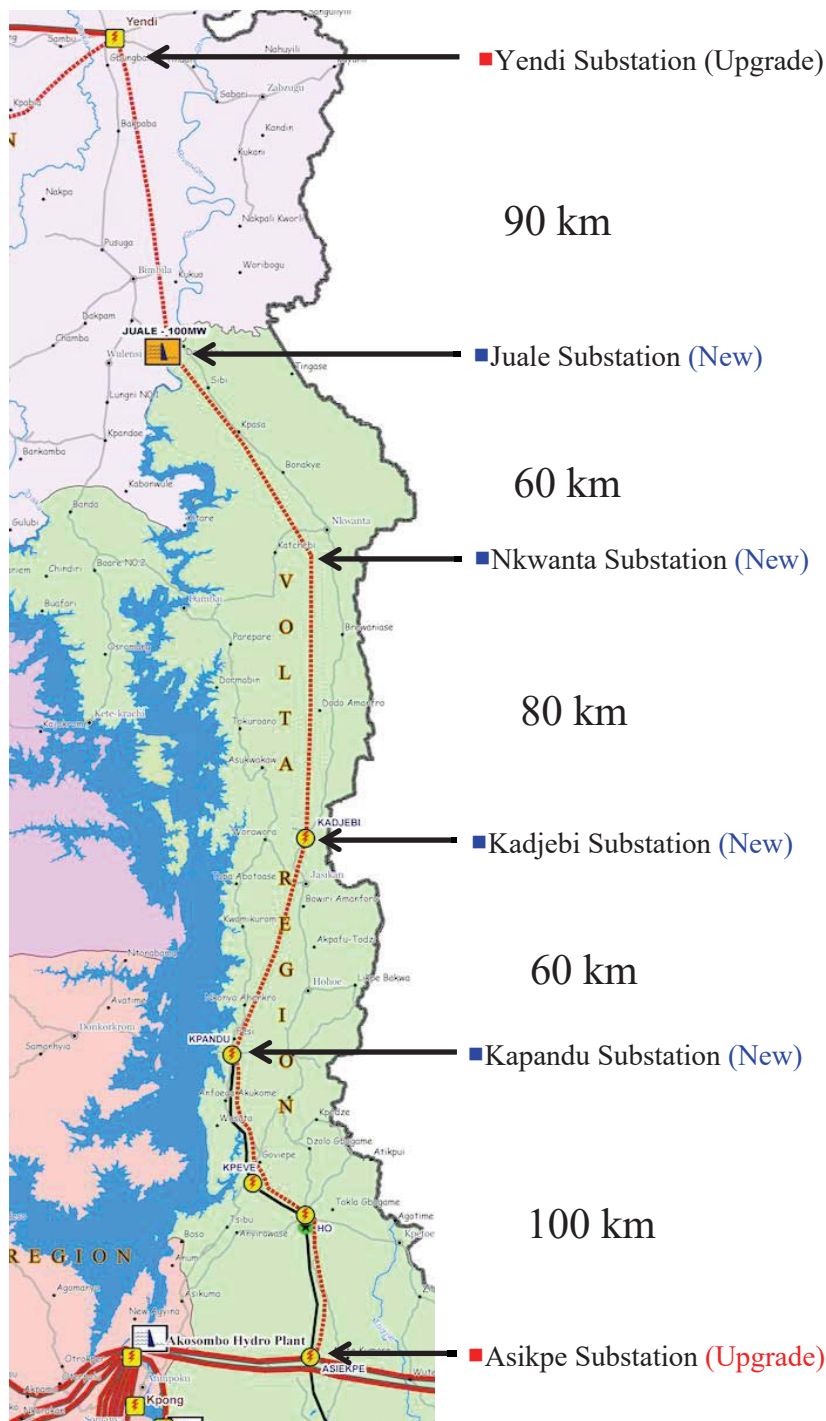
Table 23.7.5 represents the outline of the proposed components of the Eastern Corridor Transmission Line. Also, the shunt capacitors play an important role to keep the system voltage within the proper range and are incorporated into items of components so as to prevent voltage collapse caused by an outage of the line to Juale substation.

Table 23.7.5 Outline of Proposed Components of the Eastern Corridor Transmission Line

Transmission Lines					
Voltage	From	To	Length [km]	Ckt	Conductor Type
161kV	Asikpe	Kapandu	100	1	• ACSR (TOUCAN) 265 mm ² ×2 • Capacity: 364MVA
161kV	Kapandu	Kadjebi	60	1	
161kV	Kadjebi	Nkwanta	80	1	
161kV	Nkwanta	Juale	60	1	
161kV	Juale	Yendi	90	1	
Substations					
Name of Substation	Capacity Addition of Transformers				
	Capacity [MVA]	Voltage Ratio	Nos		
Asikpe	55	161kV/69kV	1		
Kapandu	25/24/8	161kV/69kV	1		
Kadjebi	25/24/8	161kV/34.5kV	1		
Juale	25/24/8	161kV/34.5kV	1		
Phase Modifying Facilities (Shunt Capacitors)					
Substation Where Capacitors are installed			Voltage [kV]	Capacity [MVar]	Nos
Yendi			161	20	3
Ho			69	5	5

Source: GRIDCo, "Feasibility Study on the Eastern Transmission Line in Ghana"

The estimated route for proposed transmission lines is shown in Figure 23.7.3.



Source: GRIDCo, "Feasibility Study on the Eastern Transmission Line in Ghana"

Figure 23.7.3 Proposed Eastern Corridor Transmission Line

4) Expected Benefits

The following impacts and benefits are expected in this project:

- To contribute to the improvement of the power system reliability in Ghana
- To contribute to the reduction of power loss
- Power infrastructure that can supply the power for the corridor is established.

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Power (MOP)

- Energy Commission (EC)
- Public Utilities Regulatory Commission (PURC)
- Environmental Protection Agency (EPA)
- GRIDCo

6) Estimated Project Cost

Estimated project cost is shown in Table 23.7.6.

Table 23.7.6 Estimated Project Cost

Item	Quantity	Unit	Total Investment Cost	Total Investment Cost
			(Million USD) [High]	(Million USD) [Low]
Transmission lines	483.42	km	75	63.2
Substations	23	Cells	17	11.4
Power Transformers	285	MVA	8.9	8.9
Capacitors	85	Mvar	2.6	2.2
Total (Million USD)			103.5	85.7

Source: GRIDCo, "Feasibility Study on the Eastern Transmission Line in Ghana"

7) Implementation Schedule

The project implementation schedule is designed to be around five years.

Table 23.7.7 Implementation Schedule

	2017				2018				2019				2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Preliminary Studies																				
<i>Final Line Routing</i>																				
<i>Permitting</i>																				
<i>Social and Environmental Impact Assessment</i>																				
Engineering and Procurement																				
<i>Engineering</i>																				
<i>Procurement of Equipment</i>																				
<i>Financing</i>																				
Construction and Commissioning																				
<i>Construction</i>																				
<i>Commissioning</i>																				

Source: GRIDCo, "Feasibility Study on the Eastern Transmission Line in Ghana"

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Social and Environmental Impact Studies

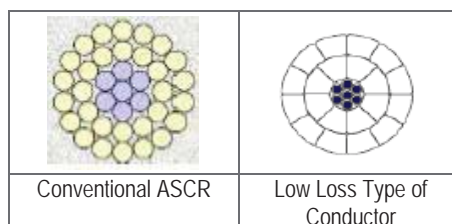
9) Recommendation

In order to achieve further loss reduction, the adoption of a low loss type of conductor is highly recommended for this transmission line. This conductor makes it possible to reduce the loss of transmitted power by 25%, compared to the conventional ACSR conductor. The adequate range of the application voltage is from 110kV to 220kV. The loss of the current can be obtained by the following formula:

$$P_{\text{loss}} = I^2 \times R$$

Here, P_{loss} : Power Loss [W], I: Current [A], R: Resistor [Ω]

Accordingly, the longer the length of the line becomes, the more loss reduction can be achieved. Therefore, if this type of conductor is adopted, it would be largely contributing to the loss reduction since the length of this transmission line is designed to be around 390km.



Source: Mitsubishi Corporation/Mitsubishi Corporation Machinery, Inc.

Figure 23.7.4 Comparison with Conventional ASCR and Low Loss Type of Conductor

23.8 Water Resources of Ghana

23.8.1 Present Situation of Water Resources of Ghana

(1) Water Resources Potential and Water Use

According to FAO-Aquastat, the total renewable water resources in Ghana is estimated at 56.2BCM/yr, of which 30.3BCM/yr are generated internally. The total reservoir capacity is 161.0BCM in 2015.

The estimated total volume of water use in 2000 was 982MCM/yr, which is about 1.8% of the total renewable water resources. The highest consumable water use is agricultural use (652MCM/yr), followed by domestic use (235MCM/yr) and industrial use (95MCM/yr).

(2) Legal Framework regarding Water

The existing water resources management and development is anchored on the following two documents:

- WRC Act 522 of 1996
- National Water Policy (NWP) of 2007

(3) Existing Plans and Programmes regarding Water

1) Water Sector in National Development Plan for Ghana

The Ghana Shared Growth and Development Agenda (GSGDA) II (2014-2017) is the latest national development plan in Ghana. The focus areas related to water in the GSGDA are as follows.

- Wetland and Water Resources Management in Accelerated Agriculture Transformation and Sustainable Natural Resource Management
- Water, Environmental Sanitation and Hygiene in Human Settlement Development

2) Water Sector Strategic Development Plan (WSSDP) for Ghana

Under the national development plan, the NWP (2007) in Ghana is a guiding policy for water sector planning. The NWP covers development of water supply and sanitation as well as the cross-sectoral water resources management part (IWRM).

The Water Sector Strategic Development Plan (WSSDP) is an implementing framework on the NWP which consists of three separate strategic planning components, namely i) The national IWRM Plan ii) The Urban Water Supply Strategy, and iii) The Rural Water Supply and Sanitation Strategy.

23.8.2 Issues regarding Water Resources of Ghana

The major issues on water resources management and development, which have been identified in relation to the corridor development, are shown in Table 23.8.1.

Table 23.8.1 Major Issues on Water Resources Management and Development in Relations to Corridor Development in Ghana

Major Issue	Description
Increasing water demand for urban water supply	It is expected that the urban centres along the growth corridor will be developed more intensively, according to the corridor development. It is necessary to address the increasing water demand for urban water supply in order to secure the appropriate urban environment for the regional growth. As shown in Table 23.8.2, the current bulk water supply capacity per capita in Greater Kumasi and Secondi Takoradi is less than 40liter per capita per day (lpcd), which is very low. For all major urban centres along major corridors, the bulk water supply capacity per capita in 2025 is expected to be reduced to about 50-70% of that in 2015 if there will be no additional water source development.
Undetermined optimum project scale for water resources development for proposed irrigation projects	There are proposed irrigation projects which require water resources development using dams. However, their optimum scales have not yet been fully studied considering the economic and socio-environmental impacts. This could cause difficulty in investing in irrigation projects.
Uncompleted IWRM plans at basin level	The pressure on water use will be increased by the corridor development. It is necessary to properly coordinate several kinds of water use by preparing and implementing IWRM plans at the basin level. In Ghana, the IWRM in some basins have been prepared. However, all river basins should have an IWRM plan.
Deterioration of water quality in urban catchments	Greater Accra and Greater Kumasi use the reservoirs located in their urban territory for their water source for municipal use. Recently, the water quality in such reservoirs has become bad due to urbanisation of the catchment area. In order to secure the water source, it is necessary to properly manage the urban watershed. The increase in sediment load and pollution due to illegal mining along the river course in Pra River causes severe problems for treatment of water for drinking purposes for Secondi-Takoradi. The illegal activity should be terminated immediately and the degraded flood plains in the Pea river should be rehabilitated.

Source: JICA Study Team

Table 23.8.2 Bulk Water Supply Capacity per Capita for Major Urban Centres along Major Corridors

	Current Capacity (m ³ /day)	Current Actual Production (m ³ /day)	Population (2015)	Production per capita (lpcd) (2015)	Population (2025)	Production per capita (lpcd) (2025) without additional water source development
Greater Accra	792,145	595,157	4,638,000	128.3	6,913,000	86.1
Greater Kumasi	151,727	102,873	3,217,000	32.0	4,718,000	21.8
Tamale	44,560	34,643	495,000	70.0	856,000	40.5
Secondi Takoradi	45,417	23,416	756,000	31.0	1,407,000	16.6

Source: Capacity and actual production – GWCL, Population –JICA Study Team

23.8.3 Objectives for Water Resources of Ghana

(1) Overall Objective

The overall objective of the water resources management and development in the present study is "Sustainable and secured water source for major urban centres along major corridors and other water needs such as agriculture and power generation to support promising regional economic growth."

(2) Specific Objectives

To fully discuss the water resources management and development for the whole of all the countries and covering all sub-sectors related to water is a big task which should be conducted by the appropriate responsible agencies as a separate study of the water sector. Instead, the present study specifically focuses on the following areas, on the basis of the existing water sector policy and plans.

- Water resources management for sustainable water use in relation to corridor development
- Water source development for urban water supply including conveyance, transmission and treatment for major urban centres along major corridors
- Large scale water resources development in relation to economic and infrastructure sector programmes and projects shown in the present study

On the basis of the overall objective as well as the above-mentioned considerations, the specific objectives of the water resources management and development are set as follows.

- Objective-1: Sustainable and secured water source for major urban centres along major corridors
- Objective-2: Effectively utilized water resources for the economic and infrastructure sectors to support promising regional economic growth
- Objective-3: Well-functioning Integrated Water Resources Management

As for the major urban centres along major corridors, the following urban centres are selected for discussion in the present study.

- Greater Accra
- Greater Kumasi
- Tamale
- Secondi-Takoradi

23.8.4 Strategies for Water Resources of Ghana

On the basis of the major issues as well as the current situation and future prospects described in the Progress Report, the strategies to achieve the specific objectives are proposed to be set as shown in Table 23.8.3.

Table 23.8.3 Strategies for Water Resources Management and Development in Ghana

Specific Objective		Strategy
Objective-1: Sustainable and secured water source for major urban centres along major corridors	1a: Greater Accra	Strategy 1a-1: Conservation and effective use of existing Weija dam Strategy 1a-2: Implementation of planned new water source development from Volta River Strategy 1a-3: Study and its implementation for new water sources with long-term perspective considering multiple water sources
	1b: Greater Kumasi	Strategy 1b-1: Conservation and effective use of existing Owabi and Barikese dams Strategy 1b-2: Study and its implementation for new water sources with long-term perspective in Pra river basin
	1c: Tamale	Strategy 1c-1: Effective use of existing intake and WTP Strategy 1c-2: Implementation of planned new water source development from White Volta River Strategy 1c-3: Study and its implementation for further expansion of water intake from White Volta River for new water sources with long-term perspective
	1d: Secondi-Takoradi	Strategy 1d-1: Effective use of existing intake and WTP Strategy 1d-2: Conservation of water resources in Pra River Strategy 1d-3: Study and its implementation for new water sources with long-term perspective considering proposed Hemang hydropower dam
Objective-2: Effectively utilized water resources for the economic and infrastructure sectors to support promising regional economic growth		Strategy 2-1: Effective use of existing reservoirs such as Akosombo, Kpong and Bui Strategy 2-2: Conduct detail study to clarify optimum project scale for water resources development for proposed irrigation projects considering the economic and socio-environmental impacts Strategy 2-3: Implementation of planned irrigation and hydropower projects
Objective-3: Well-functioning Integrated Water Resources Management		Strategy 3-1: Preparation of IWRM plans for all river basins in Ghana Strategy 3-2: Strengthening of water quality management and watershed conservation

Source: JICA Study Team

23.8.5 Programmes and Projects for Water Resources of Ghana

The programmes and projects based on these strategies are listed in Table 23.8.4.

Table 23.8.4 Programmes and Projects for Water Resources Management and Development in Ghana

Specific Objective	Programme and Project	Related Strategy	Expected Responsible Organization	Term	
				Short-Mid. 2025	Long 2040
Objective-1: Sustainable and secured water source for major urban centres along major corridors					
1a: Greater Accra	Expansion of WTP in Weija dam	1a-1	GWCL	x	
	China Gezhouba phase-2 (186,000m ³ /day)	1a-2	GWCL	x	
	Asutuare-Tema Accra Water Project (360,000 m ³ /day) by PPP	1a-2	GWCL	x	x
	Study for new water source development for Greater Accra water scheme considering several options such as desalination and further expansion of intake and conveyance from Volta River	1a-3	MWRWH/GWCL	x	
	Implementation of new water source development for Greater Accra water scheme	1a-3	MWRWH/GWCL		x
1b: Greater Kumasi	Expansion of WTP in Barikese dam	1b-1	GWCL	x	
	Study for new water source development including candidate dam sites in Pra river basin for Greater Kumasi water scheme	1b-2	MWRWH/GWCL	x	
	Implementation of new water source development for Greater Kumasi water scheme	1b-2	MWRWH/GWCL	x	x
1c: Tamale	Tamale Water Supply Project (45,000 m ³ /day)	1c-1 1c-2	GWCL	x	
	Study for new water source development with further expansion of water intake from White Volta River for Tamale water scheme	1c-3	MWRWH/GWCL	x	
	Implementation of new water source development for Tamale water scheme	1c-3	MWRWH/GWCL		x
1d: Secondi-Takoradi	Interconnection of Sekyere-Hemang Water Treatment Plant to the Secondi-Takoradi Water Supply System and the Aboadze Thermal Plant (10,000 m ³ /day)	1d-1	GWCL	x	
	Rehabilitation of Ichaban WTP	1d-1	GWCL	x	
	Study for new water source development for Secondi-Takoradi water scheme considering the effect of proposed Hemang hydropower dam in Pra River	1d-3	MWRWH/GWCL	x	
	Implementation of new water source development for Secondi-Takoradi water scheme	1d-3	MWRWH/GWCL	x	x
Objective-2: Effectively utilized water resources for the economic and infrastructure sectors to support promising regional economic growth^{*1}					
2	Accra Plain Irrigation Project	2-1	GIDA	x	
	Bui irrigation project	2-1	GIDA	x	
	Pwalugu multi-purpose project (70MW)	2-3	VRA	x	
	Juale Hydro Power Plant (90MW)	2-3	VRA	x	
	Hemang Hydro Power Plant (60MW)	2-3	MEP		x
	Ankobra Hydro Power Plant (42MW)	2-3	MEP		x
	Natia-Nabogo Valleys Irrigation Development Project	2-2, 2-3	GIDA	x	x
	Daka Valley Irrigation Project	2-2, 2-3	GIDA	x	x
Kattanga Area Irrigation Project	2-2, 2-3	GIDA	x	x	
Objective-3: Well-functioning Integrated Water Resources Management					
3	Implementation of IWRM action plan	3-1, 3-2	WRC	x	x

Source: Arranged by JICA Study Team based on information provided by relevant agencies

Note *1: The projects described in the agricultural sector and electricity supply sector in the present study are listed here.

23.8.6 Profiles of Priority Projects for Water Resources in Ghana

Among the programmes and projects listed in Table 23.8.4, the ones which are considered to be urgent or strategically important are preliminarily selected as priority projects as shown below.

(1) Expansion of Water Treatment Plant in Weija Dam for Greater Accra

1) Rationale

This project is in line with the Strategy 1a-1: Conservation and effective use of existing Weija dam.

The storage capacity of Weija dam is 130MCM. The current total capacity of the WTP at the Weija dam is about 264,000m³/day (97MCM/year). It is said that there is room for further abstraction for domestic water supply from the Weija dam since the planned irrigation area has been converted to urban area.

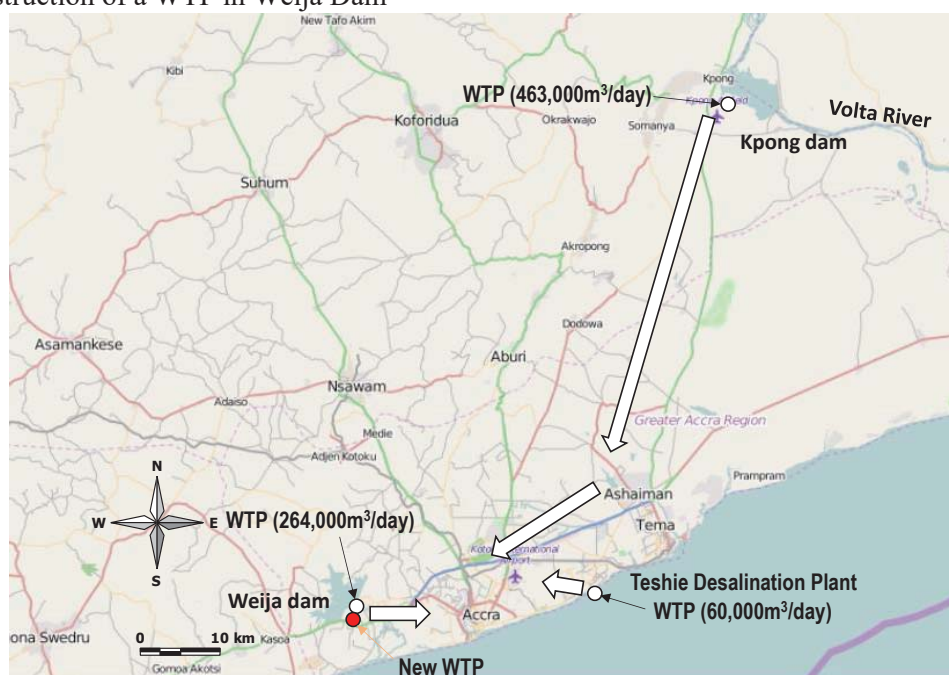
2) Objective

To secure enough water sources in mid-term (targeting at around 2025) for municipal water supply for Greater Accra.

3) Project Description

The project description is as below.

- Construction of a WTP in Weija Dam



Source: Prepared by JICA Study Team based on information provided by GWCL

Figure 23.8.1 Project Location for Expansion of WTP in Weija Dam

4) Expected Benefits

The following impact and benefit is expected in this project:

- Secured necessary water volume for urban water use in Greater Accra

5) Executing Agency and Related Institution

GWCL

6) Estimated Project Cost

US\$ 60 million

7) Remarks

The project is planned. No detail information on the project has been obtained.

(2) Expansion of Water Treatment Plant in Barakese Dam for Greater Kumasi

1) Rationale

This project is in line with the Strategy 1b-1: Conservation and effective use of existing Owabi and Barikese Dams.

The current total capacity of WTP at the Barikese Dam is about 136,000m³/day. It is said that the possible volume of abstraction for domestic water supply from the Barikese dam would be 218,000 m³/day in total if its reservoir is properly managed.

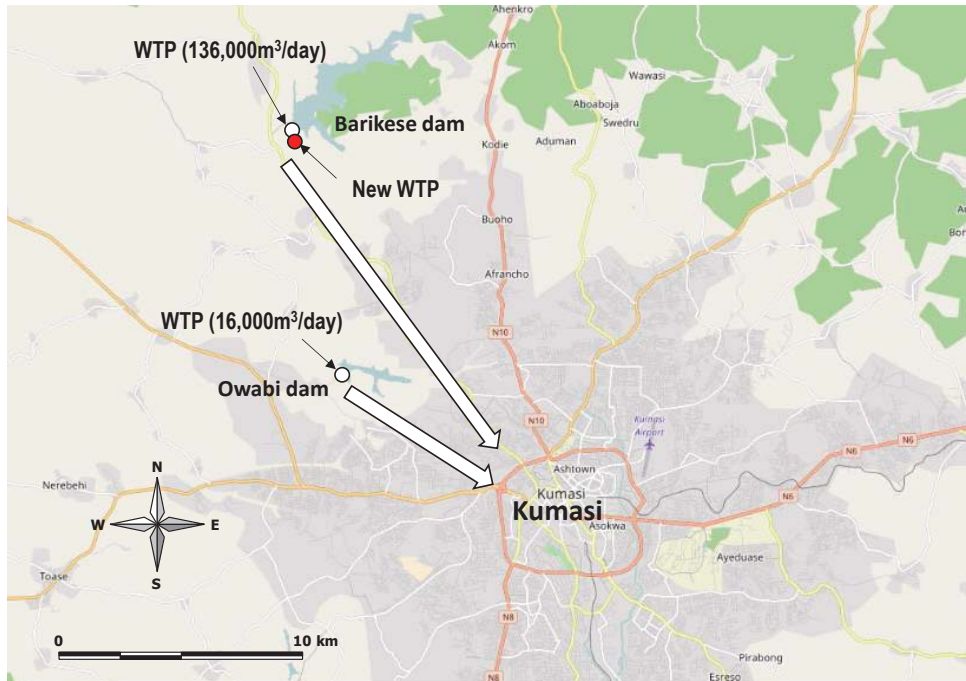
2) Objective

To secure an adequate water source in the mid-term (targeting at around 2025) for municipal water supply for Greater Kumasi.

3) Project Description

The project description is as below.

- Construction of WTP in Barikese dam



Source: Prepared by JICA Study Team based on information provided by GWCL

Figure 23.8.2 Project Location for Expansion of WTP in Barikese Dam

4) Expected Benefits

The following impact and benefit is expected in this project:

- Secured necessary water volume for urban water use in Greater Kumasi

5) Executing Agency and Related Institution

GWCL

6) Estimated Project Cost

US\$ 110 million

7) Remarks

The project is planned. No detail information on the project has been obtained.

(3) Tamale Water Supply Project

1) Rationale

This project is in line with the Strategy 1c-1: Effective use of existing intake and WTP and the Strategy 1c-2: Implementation of planned new water source development from White Volta River.

The existing capacity of the intake and WTP at Nuuni in White-Volta River is not adequate for the future water demand in Tamale. It is necessary to expand the capacities of the intake and WTP.

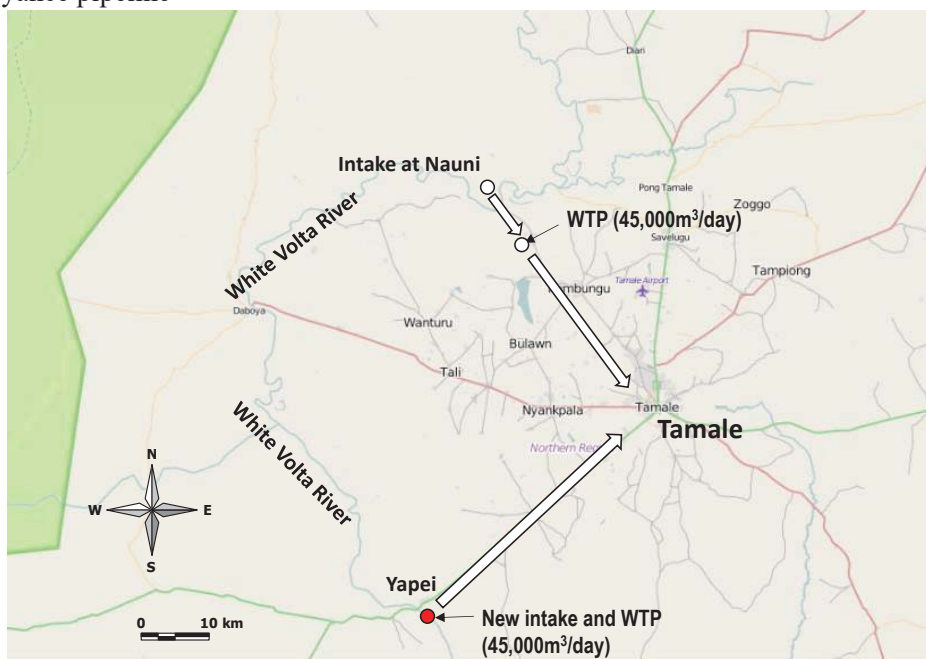
2) Objective

To secure an adequate water source in mid-term (targeting at around 2025) for municipal water supply for Tamale

3) Project Description

The project description is as below.

- i) Rehabilitation of existing WTP, ii) Construction of new intake, WTP (45,000 m³/day) at Yapei, which is located far downstream from Naumi in the White-Volta River, and a conveyance pipeline



Source: Prepared by JICA Study Team based on information provided by GWCL

Figure 23.8.3 Project Location for Tamale Water Supply Project

4) Expected Benefits

The following impact and benefit is expected in this project:

Secured necessary water volume for urban water use in Tamale

5) Executing Agency and Related Institution

GWCL

6) Estimated Project Cost

Euro 190 million

7) Remarks

A study at the feasibility level was completed in 2014.

(4) Interconnection of Sekyere-Hemang Water Treatment Plant to the Secondi-Takoradi Water Supply System and the Aboadze Thermal Plant

1) Rationale

This project is in line with the Strategy 1d-1: Effective use of the existing intake and WTP.

The existing Seleyke Heman WTP in Pra River (Total capacity = 30,000m³/day) is not fully utilized. This was originally planned to supply water to the Cape Coast water scheme. About 10,000m³/day can be sent to Secondi-Takoradi water system (both for domestic and thermal plant use) as an emergency measure.

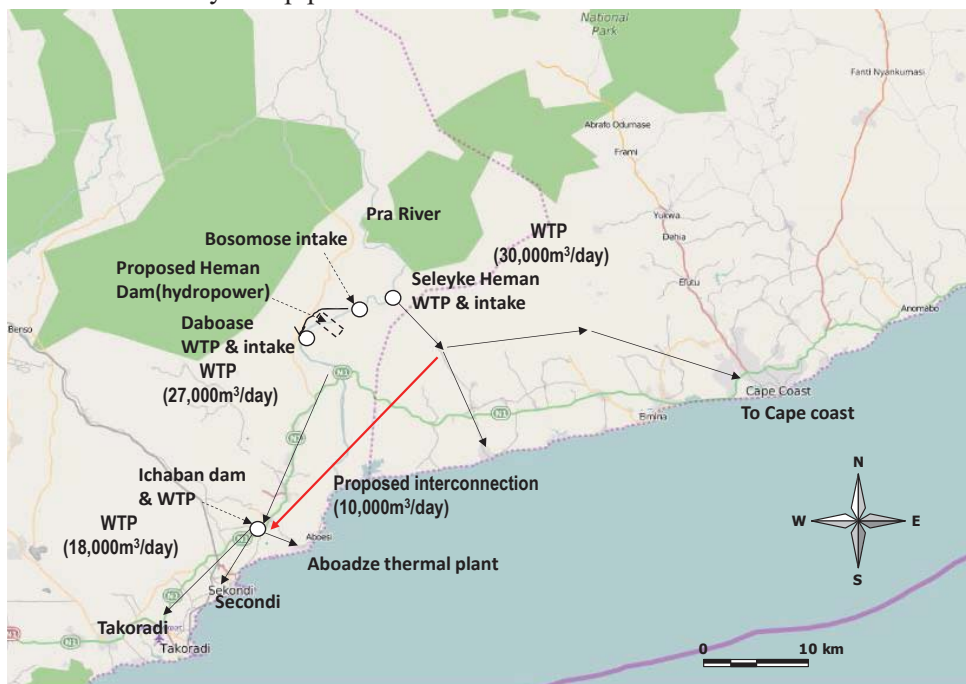
2) Objective

To secure an adequate water source in the mid-term (targeting at around 2025) for municipal water supply for Secondi-Takoradi.

3) Project Description

The project description is as below.

- Construction of conveyance pipeline



Source: Prepared by JICA Study Team based on information provided by GWCL

Figure 23.8.4 Project Location for Interconnection of Sekyere-Hemang Water Treatment Plant to the Secondi-Takoradi Water Supply System and the Aboadze Thermal Plant

4) Expected Benefits

The following impact and benefit is expected in this project:

- Secured necessary water volume for urban water use in Secondi-Takoradi

5) Executing Agency and Related Institution

GWCL

6) Estimated Project Cost

Not available

7) Remarks

No detail information on the project has been obtained.

(5) Study for New Water Source Development including Candidate Dam Sites in Pra River Basin for Greater Kumasi Water Scheme

1) Rationale

This project is in line with the Strategy 1b-2: Study and its implementation for new water source with long-term perspective in Pra river basin.

In 2013, the Study on the Comprehensive Urban Development Plan for Greater Kumasi was prepared under the support of JICA. The target year of the master plan is 2033. In the master plan, three candidate dam sites for new water sources have been identified, and further detail study was recommended.

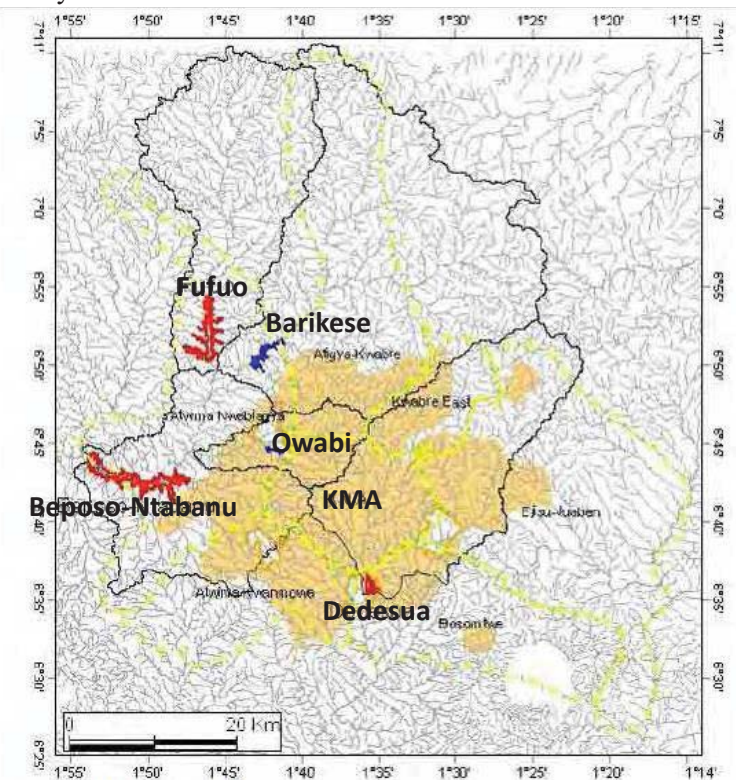
2) Objective

To secure an adequate water source in the long-term (targeting at around 2040) for municipal water supply for Greater Kumasi.

3) Project Description

The project description is as below.

- Feasibility study on candidate dam sites



Source: Study on the Comprehensive Urban Development Plan for Greater Kumasi (2013)

Figure 23.8.5 Project Location for Study for New Water Source Development including Candidate Dam Sites in Pra River Basin for Greater Kumasi Water Scheme

4) Expected Benefits

The following impact and benefit is expected in this project:

- Secured necessary water volume for urban water use in Greater Kumasi

5) Executing Agency and Related Institution

MWRWH/GWCL

6) Estimated Project Cost

Not available

7) Remarks

This was recommended by the Study on the Comprehensive Urban Development Plan for Greater Kumasi in 2013.

(6) Pwalugu Multi-Purpose Project

1) Rationale

This project is in line with the Strategy 2-3: Implementation of planned irrigation and hydropower projects.

This project is the most promising multi-purpose water resources development project for hydropower and irrigation in the White Volta river basin.

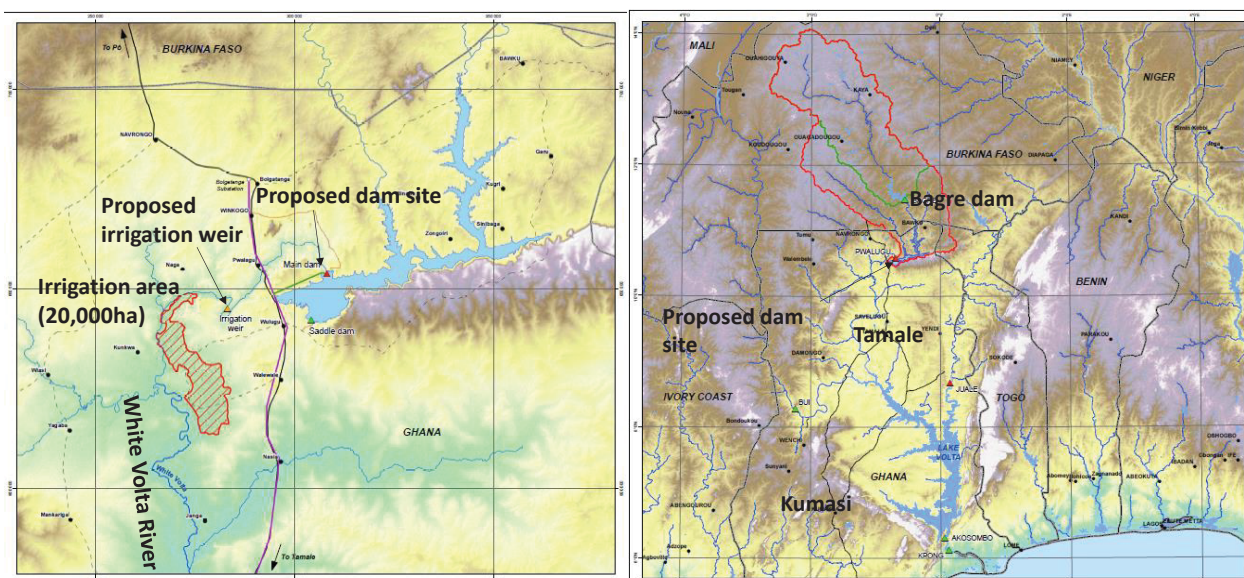
2) Objective

To develop water resources for both irrigation and hydropower generation.

3) Project Description

The project description is as below.

- a) Construction of dam (Main dam: Height =50m, Length =2,150m, Saddle dam: Height =6m, Length =2,100m) and reservoir with live storage volume of 3,476MCM, and reservoir area of 386km²
- b) Installation of hydropower plant (70MW) and transmission line (15km)
- c) Construction of irrigation scheme (Gravity scheme=20,000ha, future pump system =4,000ha)



Source: VRA, Pwalugu multi-purpose project, Feasibility Study Report (2015)

Figure 23.8.6 Project Location for Pwalugu Multi-purpose Project

4) Expected Benefits

The following impact and benefit is expected in this project:

- Hydropower generation (70MW) and developed irrigation area (20,000ha)

5) Executing Agency and Related Institution

VRA

6) Estimated Project Cost

US\$ 750million

7) Remarks

The feasibility study was completed in 2015.

(7) Feasibility Study on Water Resources Development for Natia-Nabogo Valleys Irrigation Development Project

1) Rationale

This project is in line with the Strategy 2-2: Conduct of detail study to clarify optimum project scale for water resources development for proposed irrigation projects considering economic and socio-environmental impacts.

The project for Natia-Nabogo Valleys Irrigation Development Project is proposed to be a priority project in the agriculture sector. However, the required water resource development has not yet been studied well.

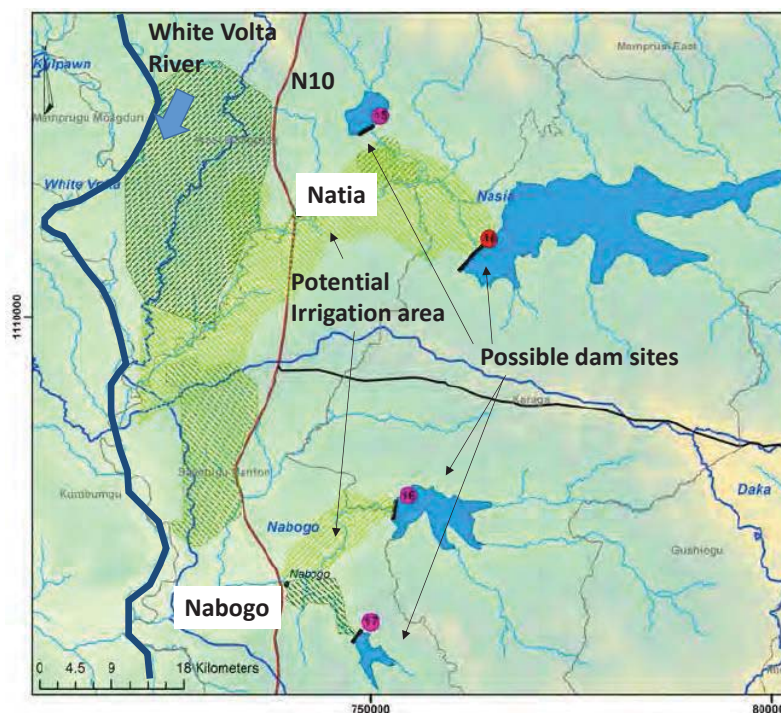
2) Objective

To clarify the optimum project scale for water resources development for Natia-Nabogo Valleys Irrigation Development Project in the proposed priority programme in the agricultural sector.

3) Project Description

The project descriptions are as below.

- Feasibility study for water resources development for Natia-Nabogo Valleys Irrigation Development Project which has potential irrigation area of 10,000ha.



Source: SADA, Commercial Agriculture Investment Guide: The Northern Savannah Zone of Ghana

Figure 23.8.7 Project Location for Natia-Nabogo Valleys Irrigation Development Project

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Necessary water resources development for the project for Natia-Nabogo Valleys Irrigation Development Project will be discussed and determined.

5) Executing Agency and Related Institution

GIDA

6) Estimated Project Cost

Not available

7) Remarks

No detail information on the project has been obtained.

(8) Feasibility Study on Water Resources Development for Daka Valley Irrigation Project and Kattanga Area Irrigation Project

1) Rationale

This project is in line with the Strategy 2-2: Conduct of detail study to clarify optimum project scale for water resources development for proposed irrigation projects considering economic and socio-environmental impacts.

The project for Daka Valley Irrigation Project and Kattanga Area Irrigation Project are proposed to be a priority project in the agriculture sector. However, the required water resource development has not yet been studied well.

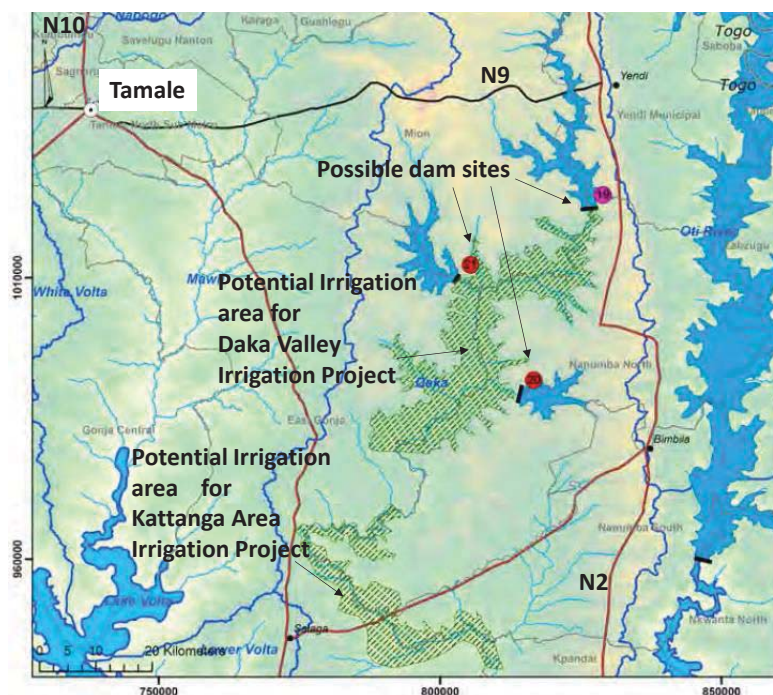
2) Objective

To clarify the optimum project scale for water resources development for Daka Valley Irrigation Project and Kattanga Area Irrigation Project in the proposed priority programme in the agricultural sector.

3) Project Description

The project descriptions are as below.

- Feasibility study for water resources development for Daka Valley Irrigation Project and Kattanga Area Irrigation Project which has potential irrigation area of 50,000ha.



Source: SADA, Commercial Agriculture Investment Guide: The Northern Savannah Zone of Ghana

Figure 23.8.8 Project Location for Daka Valley Irrigation Project and Kattanga Area Irrigation Project

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Necessary water resources development for Daka Valley Irrigation Project and Kattanga Area Irrigation Project will be discussed and determined.

5) Executing Agency and Related Institution

GIDA

6) Estimated Project Cost

Not available

7) Remarks

No detail information on the project has been obtained.

(9) Preparation of IWRM Plans for All River Basins in Ghana

1) Rationale

This project is in line with the Strategy 3-1: Preparation of IWRM plans for all river basins in Ghana.

It is necessary to properly coordinate several kinds of water use by preparing and implementing IWRM plans at the basin level. In Ghana, the IWRM in some basins have been prepared. However, all river basins should have an IWRM plan.

2) Objective

Proper management of water resources at the basin level

3) Project Description

The project description is as below.

- Preparation of the IWRM plans for Black Volta, Oti, Lower Volta, etc., Periodical review of the IWRM plans for all river basins

4) Expected Benefits

The following impact and benefit is expected in this project:

- Proper management of water resources at the basin level in Ghana

5) Executing Agency and Related Institution

WRC

6) Estimated Project Cost

Not available

7) Remarks

The preparation of an IWRM plan for the Black Volta river basin is on-going. Those for Oti and the Lower Volta river basins have not yet started.

(10) Project for Recovery of Degraded River Course and Flood Plains in Pra River Basin

1) Rationale

This project is in line with the Strategy 3-2: Strengthening of water quality management and watershed conservation and the Strategy 1d-2: Conservation of water resources in Pra River.

The degraded river course and flood plains in Pra river basin should be urgently rehabilitated in order to secure future sustainable use of water resources in Pra river basin.

2) Objective

To recover the river course and flood plains in Pra river basin, and to enhance the capacity for water pollution management

3) Project Description

The project description is as below.

- a) Determination and management of buffer zones to prevent further illegal activities
- b) Reclamation of degraded flood plain
- c) Restoration of river course and flood plains
- d) Enhancement of water quality monitoring,
- e) Strengthening of coordination among stakeholders

4) Expected Benefits

The following impact and benefit is expected in this project:

- Rehabilitated river course and flood plain in Pra river basin, and proper water pollution management

5) Executing Agency and Related Institution

WRC

6) Estimated Project Cost

Not available

7) Remarks

This is proposed at the conceptual level by the JICA Study team through discussions with WRC.

(11) Project for Strengthening of Water Quality Management of Major Reservoirs for Drinking Water Supply

1) Rationale

This project is in line with the Strategy 3-2: Strengthening of water quality management and is related to the Strategy 1a-1: Conservation and effective use of existing Weija Dam and the Strategy 1b-1: Conservation and effective use of existing Owabi and Barikese Dams.

Greater Accra and Greater Kumasi use the reservoirs located in their urban territory for their water source for municipal use. Recently, the water quality in such reservoirs has become bad due to urbanisation of the catchment area. In order to secure the water source, it is necessary to properly manage the urban watershed.

2) Objective

To enhance the capacity for water pollution management

3) Project Description

The project description is as below.

- a) Determination and management of buffer zones to prevent invasion of the reservoir area
- b) Education and awareness campaign
- c) Enhancement of water quality monitoring
- d) Introduction of technology to mitigate water quality deterioration in reservoir

4) Expected Benefits

The following impact and benefit is expected in this project:

Proper water pollution management

5) Executing Agency and Related Institution

WRC

6) Estimated Project Cost

Not available

7) Remarks

This is proposed at the conceptual level by the JICA Study team through discussions with WRC.

Chapter 24 Urban Development Strategies for Ghana

24.1 Urban Development in Ghana

24.1.1 Present Situation on Urban Development in Ghana

The urban population in Ghana has been increasing constantly in the past decades. Over 50% of the national population in Ghana lived in urban areas in 2010. Its number doubled from four million to eight million from 1984 to 2000.

Table 24.1.1 Changes in Urban Population in Ghana

Year	Total Population	Urban Population	Share of Urban Population	Annual Growth Rate of Urban Population
1970 ¹	8,559,313	2,472,456	28.9%	-
1984 ¹	12,296,081	3,938,614	32.0%	3.4%
2000 ¹	18,912,079	8,278,636	43.8%	4.8%
2010 ²	24,223,431	12,113,594	50.1%	3.9%

Source 1: UNFPA, 2005, Population Data Analysis Report Volume I Socio-economic and Demographic Trends Analysis, GSS

Source 2: GSS, 2013, 2010 Population and Housing Census Demographic, Social, Economic and Housing Characteristics

The urban population of Ghana is concentrated in the two major cities, Greater Accra and Greater Kumasi. These two metropolitan areas have over 50% share of the national urban population as of 2010. However, the next two large cities in Ghana, Sekondi-Takoradi and Tamale are increasing their population rapidly with annual growth rate of over 6% for over one decade.

Table 24.1.2 Population of Major Urban Centres in Ghana (1984, 2000 and 2010)

Region		Population			Share of Urban Population		
		1984	2000	2010	1984	2000	2010
Greater Accra Metropolitan Area ¹	Population	1,325,447	2,715,805	3,827,346	33.7%	32.8%	31.6%
	Annual Growth Rate	-	4.59%	3.49%			
Greater Kumasi Conurbation ²	Population	496,628	1,170,270	2,459,015	12.6%	14.1%	20.2%
	Annual Growth Rate	-	4.84%	4.62%			
Sekondi-Takoradi	Population	188,203	289,593	539,548	4.8%	3.5%	4.5%
	Annual Growth Rate	-	2.73%	6.42%			
Tamale	Population	135,952	202,317	371,351	3.5%	2.4%	3.1%
	Annual Growth Rate	-	2.52%	6.26%			

Note 1: The population of 1984 and 2000 does not include Ningo-Prampram District.

Note 2: The population of 1984 and 2000 are the population of only Kumasi Metropolitan Assembly.

Source: GSS, Population and Housing Census 1984, 2000 and 2010

24.1.2 Hierarchy of Urban Centres in Ghana

(1) National Urban Policy

Two following guiding principles were used for determining an urban settlement hierarchy in the National Urban Policy (NUP):

- Promote urban centres as engines of growth
- Facilitate balanced re-distribution of the urban population

Based on the above guiding principles, the hierarchy of urban centres in Ghana is as follows:

- Grade-1 centres comprise Accra, Kumasi, Sekondi-Takoradi and Tamale.
- Grade-2 centres comprise the remaining six regional capitals, namely, Cape Coast, Sunyani, Koforidua, Ho, Wa and Bolgatanga, as well as six large towns, namely Obuasi, Techiman, Yendi, Bawku, Nkawkaw and Tarkwa.
- Grade-3 centres are meant to serve as administrative centres and market towns.
- Grade-4 centres are meant to serve as rural service centres. Their populations vary between 5,000 and 10,000

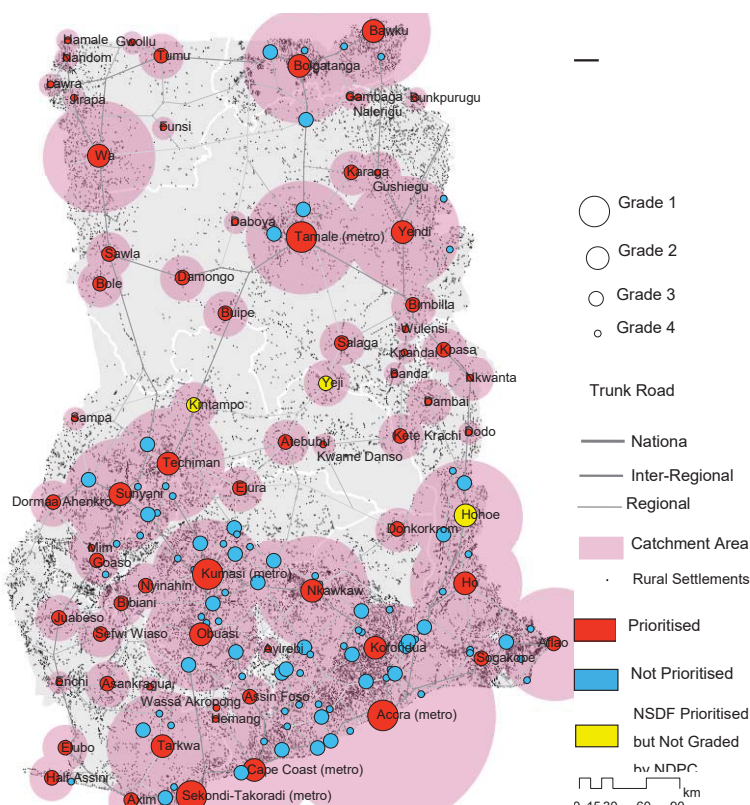
(2) Hierarchy of Urban Centres for the Corridor Development Plan

Based on the criteria and rules of NUP, the National Spatial Development Framework (NSDF) prepared a proposed hierarchy of urban centres consisting of 70 settlements, which are classified into four grades as shown in Table 24.1.3. Their locations are shown in Figure 24.1.1.

Table 24.1.3 Urban Centres under the NSDF Urban Hierarchy Category

Regions	Grade-1	Grade-2	Grade-3	Grade-4
Western	Sekondi-Takoradi	Tarkwa	Asankragua, Axim, Bibiani, Elubo, Half Assini, Juabeso, Sefwi Wiaso	
Central		Cape Coast	Assin Foso	Hemang, Twifo Praso
Greater Accra	Accra			
Volta		Ho, Hohoe, Aflao	Dambai, Kete Krachi, Kpasa, Nkwanta, Sogakope	Banda, Dodo
Eastern		Kofordia, Nkawkaw	Donkorkrom	Ofoase
Ashanti	Kumasi	Obwasi		
Brong Ahafo		Sunyani, Techiman	Atebubu, Dormaa Ahenkro, Goaso, Kintampo, Min, Yeji	Kwame Danso, Sampa
Northern	Tamale	Yendi	Bimbilla, Bole, Buipe, Damongo, Gushiegu, Karaga, Salaga, Sawla	Bunkpurugu, Daboya, Gambaga, Kpandai, Nalenigu, Wulensi
Upper East		Bolgatanga, Bawku		
Upper West		Wa	Tumu	Funsi, Gwollu, Hamale, Jirapa, Lawra, Nandom

Source: JICA Study Team based on COWI-ORGUT, Ghana National Spatial Development Plan 2015-2035, 2015, TCPD



Source: COWI-ORGUT, 2015, Ghana National Spatial Development Plan 2015-2035, TCPD

Figure 24.1.1 Locations of Urban Centres under the NSDF Urban Hierarchy Category

Urban centres selected for special attention in corridor development due to their current urban size are the four grade-1 urban centres. In consideration of the corridor development strategies, the following functions for major urban centres in Ghana are designated for the future:

- Greater Accra: First-class international city for business and administration centre
- Greater Kumasi: National centre for business, industry and commerce and gateway to inland areas
- Sekondi-Takoradi: Regional grow pole and service centre with support base for oil and gas sector
- Greater Tamale: Regional growth pole with agro processing industry base and service centre for Northern Savannah Ecological Zone (NSEZ)

24.1.3 Future Urban Population Framework for Ghana

The population of major urban centres in Ghana is expected to continue to increase rapidly. It is projected that the population of GAMA will exceed 10 million by 2040 while the population of Greater Kumasi, Sekondi-Takoradi and Tamale is expected to become to approximately 7.6 million, 2.8 million and 1.9 million respectively by 2040.

Table 24.1.4 Future Population of Major Urban Centres in Ghana

Region		2010	2015	2025	2040	Increase 2015-2040
Greater Accra Metropolitan Area	Population	3,827,346	4,637,780	6,913,138	10,242,576	5,604,797
	Annual Growth Rate		3.92%	4.07%	2.66%	3.22%
Greater Kumasi Conurbation	Population	2,459,015	3,216,737	4,717,865	7,592,003	4,375,266
	Annual Growth Rate		5.52%	3.90%	3.22%	3.49%
Sekondi-Takoradi	Population	539,548	755,692	1,407,294	2,755,162	1,999,470
	Annual Growth Rate		6.97%	6.42%	4.58%	5.31%
Tamale	Population	371,351	494,628	856,146	1,864,848	1,370,220
	Annual Growth Rate		5.90%	5.64%	5.33%	5.45%

Source: JICA Study Team

24.1.4 Issues regarding Urban Development in Ghana

With the increasing urban population, major urban centres in Ghana are facing the following issues:

- Lack of stable electricity and water supply for both residential usage and industrial usage
- Heavy vehicles passing through urban centres causing traffic congestion and disturbance to socio-economic activities
- Shortage of formal jobs: Since formal economic sectors have not developed as much in response to the increase of urban population, people engaged in informal sectors are of the majority.
- Shortage of infrastructure in the expanding outskirts of major urban centres: It is necessary to provide the expanding suburban residential areas with infrastructure for accommodating the increasing urban population

24.1.5 Overall Objectives for Urban Development for Ghana

The overall objectives for the urban development of Ghana are as follows:

- To make maximum use of economic development potential of major urban centres
- To upgrade functions of major urban centres so that they can plan their expected roles
- To take advantage of prospective transport corridor development by utilizing the new development potential to be generated due to corridor development
- To mitigate negative impact to be caused by transport corridor development

24.1.6 Strategies for Urban Development for Ghana

In order to accomplish the overall objectives for urban development, it is important for each urban centre to have a spatial development framework (SDF) and structure plan (SP) taking into consideration the following:

- Transformation of urban structure for accommodating further development in relation to corridor development
- Infrastructure development by taking into consideration development of potential economic sectors in major urban centres
- Construction of a ring road or bypass road to avoid congestion in a city centre and also to get land for economic sector development

24.2 Urban Development Strategies for Greater Accra

24.2.1 Present Situation of Accra and its Surrounding Area

(1) Urban Expansion of Greater Accra

The population of Accra Metropolitan Assembly and its surrounding districts have been growing their population rapidly as well as expanding the urban area in the past decades. The spatial plan prepared for Greater Accra in 1990 defined Greater Accra Metropolitan Area (GAMA) as Accra Metropolitan Assembly and the seven Metropolitan, Municipality and District Assemblies (MMDAs) surrounding Accra Metropolitan Assembly, namely, Accra, Tema, Ashaiman, Adenta, Lekma, Ga East, Ga West and Ga South. However, due to the current urbanization situation and divided MMDAs, the new definition of GAMA consists of up to 13 MMDAs. Although there are five more MMDAs in GAMA, the area which GAMA covers has only increased to the east slightly adding just one MMDA, Ningo-Prampram District. On the other hand urbanization to the west crossing the regional boundary into the Central Region is happening rapidly. Urbanization towards the north along the National Road No. 6 has also expanded into the Eastern Region.

To avoid future unplanned urban sprawl and respond to the rapidly increasing urban population in GAMA, Ningo-Prampram Planned City Extension Project is ongoing. This project includes formulation of a physical plan and strategies for the development of Ningo-Prampram District and its surrounding area.

The three remaining districts of Greater Accra Region have large reserve areas and the urbanization of GAMA should not go further east of Ningo-Prampram District nor beyond north of the reserve area in Shai Osudoku District. These districts are also important for promoting urban agriculture to provide fresh vegetables to the growing urban population.

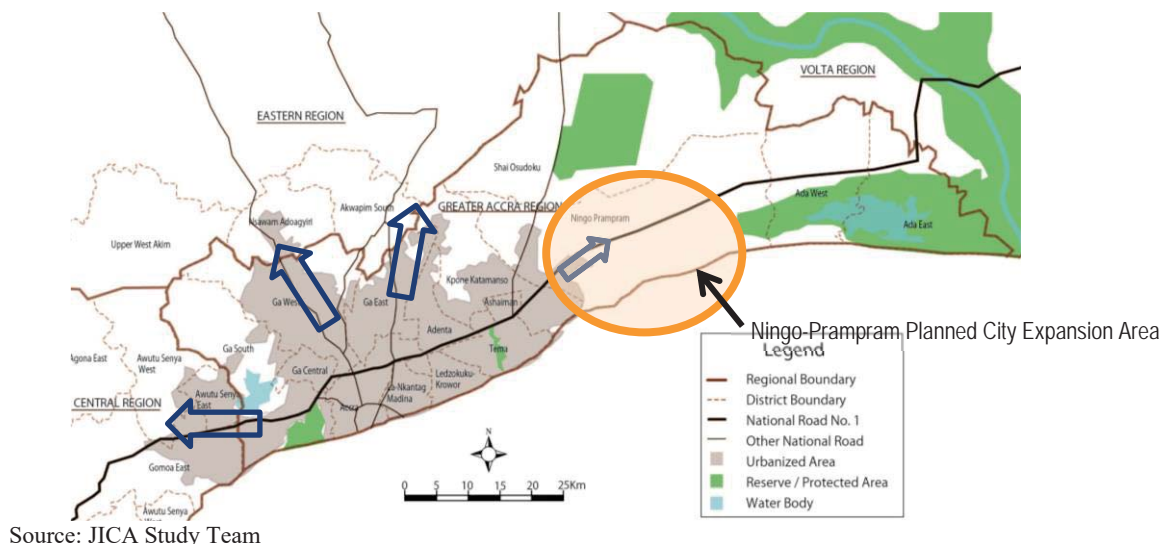


Figure 24.2.1 Urbanization in Greater Accra Metropolitan Area

(2) Demography of GAMA

The population of GAMA in 2010 was approximately 3,827 thousand. The MMDAs formally belonging to Accra and Tema increased their population at a rate of 2-3% per annum in the 10-year period between 2000 and 2010. On the other hand MMDAs in the north and west of Accra Metropolitan Assembly increased their population by over 6% per annum during the same period.

Table 24.2.1 Population in Greater Accra Metropolitan Area (2000 and 2010)

MMDAs	Population		Annual Population Growth Rate (%)	Area (km ²)	Population Density 2010 (persons/km ²)
	2000	2010			
Accra Metropolitan Assembly	1,658,937	1,665,086	2.27%	140	11,893
Ledzokuku-Krowor Municipal Assembly		227,932		48	4,749
La Dade-Kotopon Municipal Assembly		183,528		36	5,098
Adenta Municipal Assembly	506,400	78,215	2.87%	85	920
Tema Metropolitan Assembly		292,773		88	3,327
Kpone-Katamanso District Assembly		109,864		60	1,831
Ashaiman Municipal Assembly		190,972		45	4,244
La-Nkwantannang-Madina Municipal Assembly	550,468	111,926	6.24%	71	1,576
Ga East Municipal Assembly		147,742		86	1,718
Ga West Municipal Assembly		219,788		300	733
Ga South Municipal Assembly		411,377		342	1,203
Ga Central Municipal Assembly		117,220		49	2,392
Ningo Prampram District Assembly	-	70,923	-	622	114
Greater Accra Metropolitan Area	2,715,805	3,827,346	3.49%	3,832	2,301
Outside GAMA	189,921	182,708	-0.39%	1,582	115
Greater Accra Region	2,905,726	4,010,054	3.27%	3,245	1,236

Source: GSS, 2013, 2010 Population and Housing Census District Analytical Report of the MMDAs in GAMA

24.2.2 Future Prospects for Greater Accra

Greater Accra consists of Accra Metropolitan, which is the capital city of Ghana, and Tema Metropolitan, which has the main sea port for Ghana. Greater Accra is expected to develop as the first class international gateway city (a World City) for West Africa. Greater Accra is able to attract foreign investment due to its strategic location at the connecting point of three corridors, namely the Central Corridor, Eastern Corridor and Coastal Corridor.

There are also new developments planned to be implemented, such as a new international airport just north of Ningo-Prampram District, Abidjan-Lagos Motorway and an urban expansion project for Ningo-Prampram District. Such developments would restructure the space of Greater Accra. It is therefore necessary to prepare a new development plan for other related facilities and infrastructure by adjusting and modifying the existing development plans.

24.2.3 Issues regarding Urban Development of Greater Accra

The following issues are defined regarding the urban development of Greater Accra:

- Increasing population causing low-density urban sprawl
- Severe traffic congestion caused by heavy trucks using Tema Port
- Commuter rush hours caused by lack of urban road network and public mass transport
- Shortage and unstable supply of electricity and water for industrial development, as well as for residential needs
- Necessity of preparing an integrated spatial development plan for Greater Accra in order to accommodate emerging changes

24.2.4 Objectives for Urban Development of Greater Accra

The following objectives are determined for the urban development of Greater Accra:

- To make maximum use of the potential of Greater Accra as national capital and international gateway city in relation to the corridor developments (Coastal East-West Corridor, Central Corridor and Eastern Corridor)
- To perform and fulfil the roles as the first-class international city not only as a business and administration centre but also for industrial production
- To manage urban expansion and suburban centre development for managing the pressure of population increase, economic activity concentration and transport congestion in the city centre of Accra and Tema Port
- To develop necessary high-standard economic infrastructures and facilities, as well as high-standard social services, and recreational facilities, in order to make Greater Accra a World class City

24.2.5 Strategies for Urban Development of Greater Accra

The following are the strategies for urban development of Greater Accra:

- To develop an International Airport City in Prampram Area for accommodating increasing population and economic activities by formulating a master plan for the Airport City and by providing necessary infrastructures
- To upgrade roads and railways for responding to the planned upgrading of cargo handling capacity of Tema Port
- To strengthen and upgrade business functions within Tema City in relation to the Tema Port
- To construct an Outer Ring Road not only for managing urban and through traffic but also future urban land expansion including new towns
- To construct an east-west motorway as part of Abidjan-Accra-Lagos Motorway by providing efficient connection with the Outer Ring Road, the Central Corridor and the Eastern Corridor
- To prepare necessary plans in a timely manner to secure lands for new developments, such as new international airport and road network
- To implement the development of necessary urban road networks to ease the traffic pressure caused by motorization, population increase and development of transport corridors
- To implement necessary improvements and upgrading of public transportation for securing high urban mobility but also inter-city mobility for the poor and middle-income groups of people
- To provide enough electricity and water for the inhabitants and industries of Greater Accra
- To provide necessary residential areas for the future population by redeveloping areas within Accra Metropolitan and sub-centres
- To prepare facilities, such as advanced medical facilities and laboratories, and sophisticated recreation and cultural facilities to attract business persons and enterprise

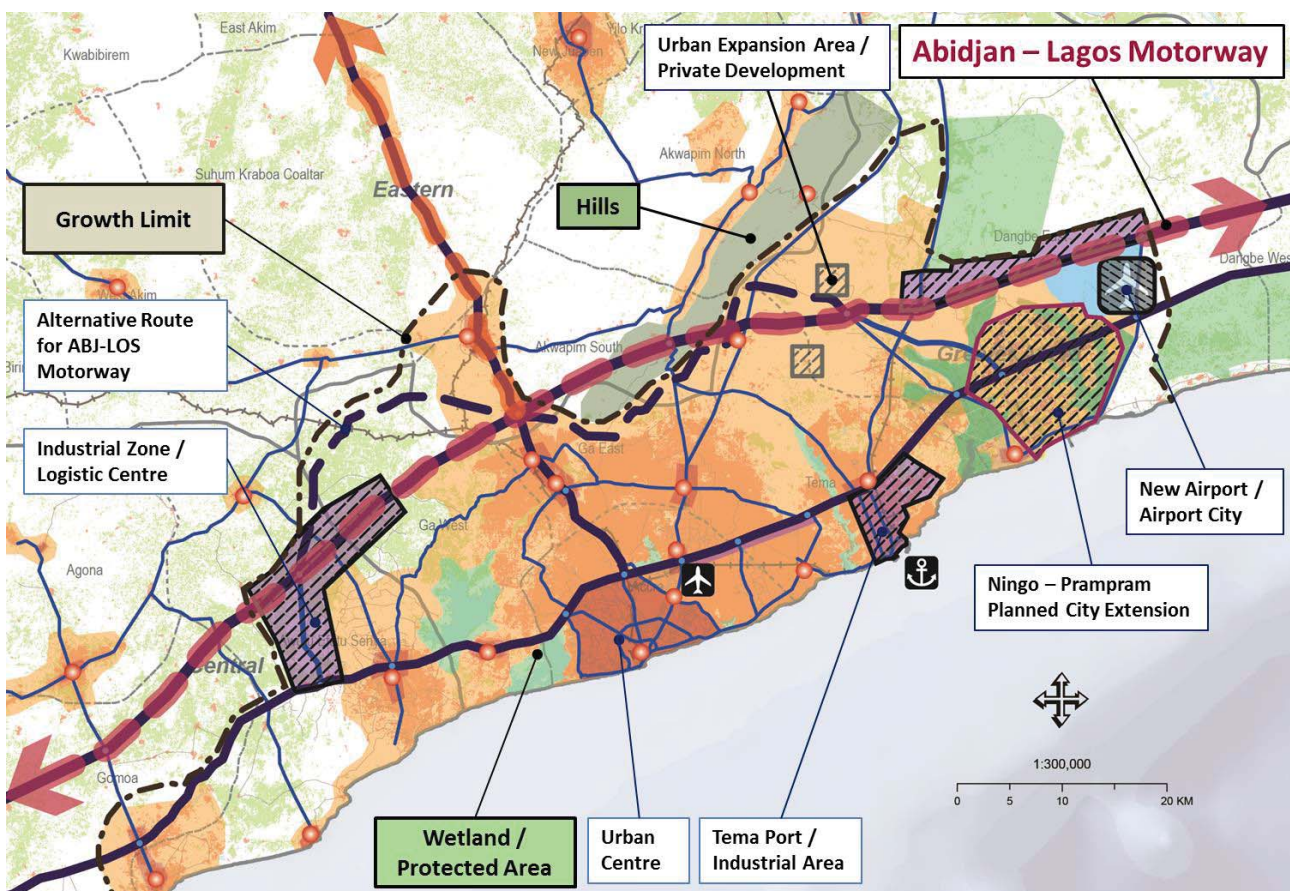
24.2.6 Conceptual Spatial Structure for Greater Accra

WAGRIC Project prepared spatial concepts for the coastal metropolitans by conducting preliminary analyses on the following points:

- Where to put an east-west motorway, as part of the Abidjan-Lagos Corridor Motorway, in each coastal metropolitan

- How to secure the connectivity between north-south corridors and coastal corridor within each of the coastal metropolitan
- How to secure a strong access to strategic sea ports which have plans for expansion within coastal metropolitans
- How to get access to new international airports planned within each of the coastal metropolitans
- Where to locate new industrial zones within each of the coastal metropolitans

The conceptual spatial structure for Greater Accra is shown in Figure 24.2.2. The future spatial structure contains the Abidjan-Accra-Lagos Motorway, a new international airport and airport city in the eastern part of GAMA in Prampram. The Abidjan-Accra-Lagos Motorway would also function as part of the outer ring road for Greater Accra. New urban development is also to happen in Ningo-Prampram District which is a suburban area to the west along the prospective extension of the motorway between Accra and Tema. It is necessary to secure a strong connection between Abidjan-Accra-Lagos Motorway and north-south corridors (Central Corridor and Eastern Corridor). It is also essential to secure an efficient connection between Tema Port and north-south corridors.



Source: JICA Study Team

Figure 24.2.2 Conceptual Drawing to Transform Spatial Structure for Greater Accra (Proposal by the WAGRIC Master Plan)

24.2.7 Programmes and Projects for Urban Development related to Corridor Development in Greater Accra

The following are programmes and projects for urban development related to corridor development in Greater Accra:

- Formulation of Spatial Development Framework and Structure Plan for Greater Accra Region and its Surrounding Urbanizing Areas or Project for Urban Transport Master Planning for Greater Accra

- Formulation of Master Plan for the Airport City in Prampram and its Surrounding Areas
- New Town Development in Ningo-Prampram
- Construction of Outer Ring Road for Greater Accra
- Construction of Abidjan-Lagos Motorway
- Construction of Bridge between Tema and Prampram
- Strengthening of Trunk Road from Tema to the Eastern Corridor

The following list of projects is sector priority projects of WAGRIC Master Plan for Greater Accra.

- Project for Establishment of Prampram Industrial Park
- Project for Establishment of Kasoa Industrial Park
- Tema ICT Park Expansion Project
- Project for Construction of Community Information Centre in Tema
- Expansion of Water Treatment Plant in Weija Dam for Greater Accra
- Construction of East -West Motorway in Greater Accra
- Widening of Accra – Tema Motorway up to 6 Lanes (Abidjan -Lagos Corridor)
- Construction of Motorway between Tema and Prampram (Abidjan-Lagos Corridor)
- Construction of Outer Ring Road for Greater Accra
- Project for Construction of Ashaiman Truck Terminal along Accra -Tema Motorway
- Upgrading of Tema - Accra Railway
- Project for Rehabilitation of Tema Port -Boankra-Kumasi Section of Eastern Railway
- Project for Upgrading of National Road No. 2 between Tema Roundabout and Atimpoku to 4-Lane Road
- Improvement of Tema Intersection by Construction of Flyovers

24.3 Urban Development Strategies for Greater Kumasi

24.3.1 Present Situation of Greater Kumasi

(1) Urbanization of Greater Kumasi

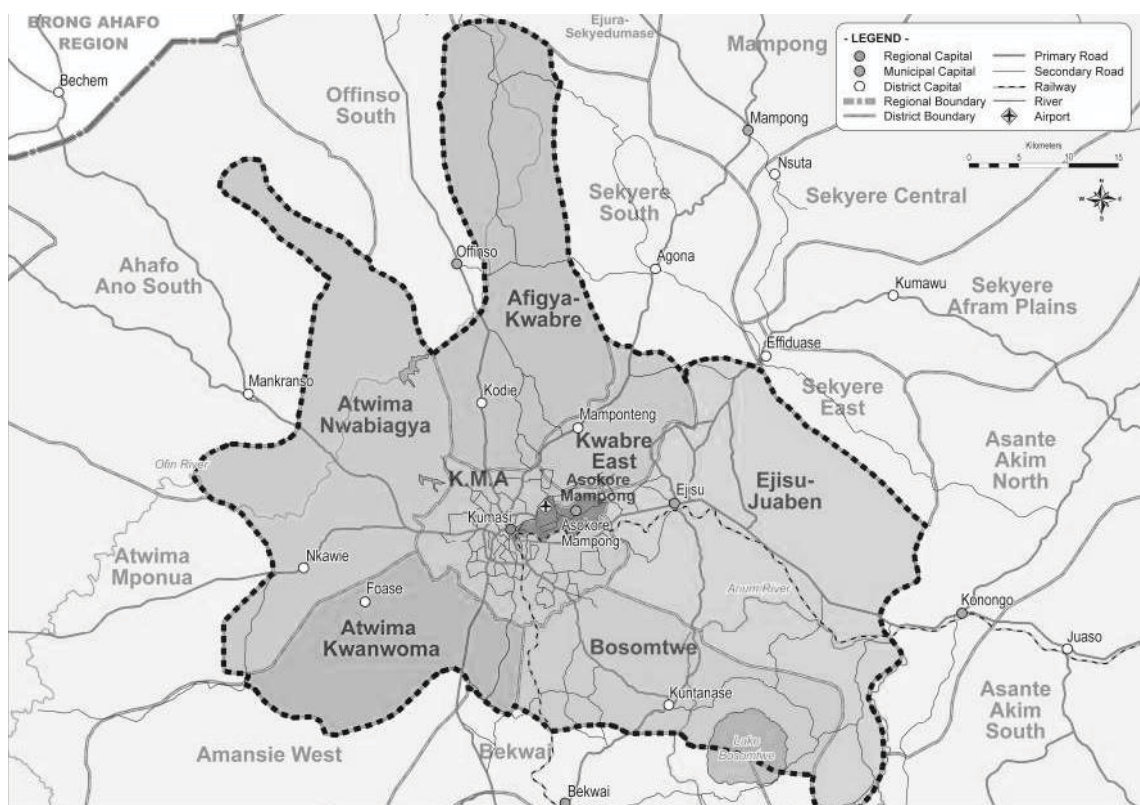
From 1984 until 2010, Kumasi showed a very high population increase with an average annual rate of over 5.6% reaching to almost two million by 2010. Spatially urbanized areas have expanded beyond the boundary of Kumasi Metropolitan Assembly into adjoining areas by a loose and low-density urban sprawl of a 30 km radius from the centre of Kumasi.

Highly active commerce, logistics and car repair and other small manufacturing sectors exist in Kumasi, however, the majority of these economic sectors are informal. Moreover, in the last ten years, the growth of the manufacturing sector in the Ashanti Region has been stagnant. The revitalization of the manufacturing sector requires infrastructure, such as roads, electricity and water, which is lacking like in other cities in Ghana.

The central north-south corridor of Ghana goes through Greater Kumasi and due to its location, Greater Kumasi has been playing the role of transport and logistics centre and a gateway to the northern area of Ghana. However, Kumasi has suffered from traffic congestion, similar to cases in most large urban areas. Heavy traffic congestion has been observed on the Inner Ring Road, which was constructed originally as a bypass.

(2) Demography of Greater Kumasi

Greater Kumasi Sub-Region consists of eight MMDAs which are Kumasi, Asokore Mampong, Ejisu-Juaben, Kuwabre East, Afigya Kwabre, Atwima Nwabiagya, Atwima Kwanwoma and Bosomtwe as shown in Figure 24.3.1.



Source: Oriental Consultants Co., Ltd. et al., 2013, The Study on the Comprehensive Urban Development Plan for Greater Kumasi in the Republic of Ghana, JICA

Figure 24.3.1 Greater Kumasi Sub-Region

The population of Greater Kumasi Sub-Region in 2010 was approximately 2,764,000. On the other hand, the population of Greater Kumasi Conurbation in 2010 was approximately 2,459,000. Greater Kumasi Conurbation is defined as KMA and its adjoining urbanizing areas within the Greater Kumasi Sub-Region.

From 2000 to 2010, the rate of population increase was very high within Kumasi and Asokore Mampong (as high as 5.69% per annum), while that of the surrounding districts were much lower.

Table 24.3.1 Population of Greater Kumasi Sub-Region (2000 and 2010)

MMDAs	Population		Annual Population Growth Rate (%)	Area (km ²)	Population Density 2010 (persons/km ²)
	2000	2010			
Kumasi Metropolitan Assembly	1,170,270	1,730,249	5.69%	230	7,523
Asokore Mampong		304,815			
Afigya-Kwabre	89,358	136,140	4.30%	517	263
Kwabre East	101,100	115,556	1.35%	135	857
Ejsu-Juaben	124,176	143,762	1.48%	723	199
Bosomtwe	66,788	93,910	3.47%	353	266
Atwima Kwanwoma	79,240	90,634	1.35%	291	312
Atwima-Nwabiagya	127,809	149,025	1.55%	597	250
Greater Kumasi Sub-Region	1,758,741	2,764,091	4.62%	2,616	963
Outside Greater Kumasi Sub-Region	1,854,209	2,016,289	0.84%	21,519	94
Ashanti Region	3,612,950	4,780,380	2.69%	24,389	196

Source: GSS, 2000 and 2010 Population and Housing Census

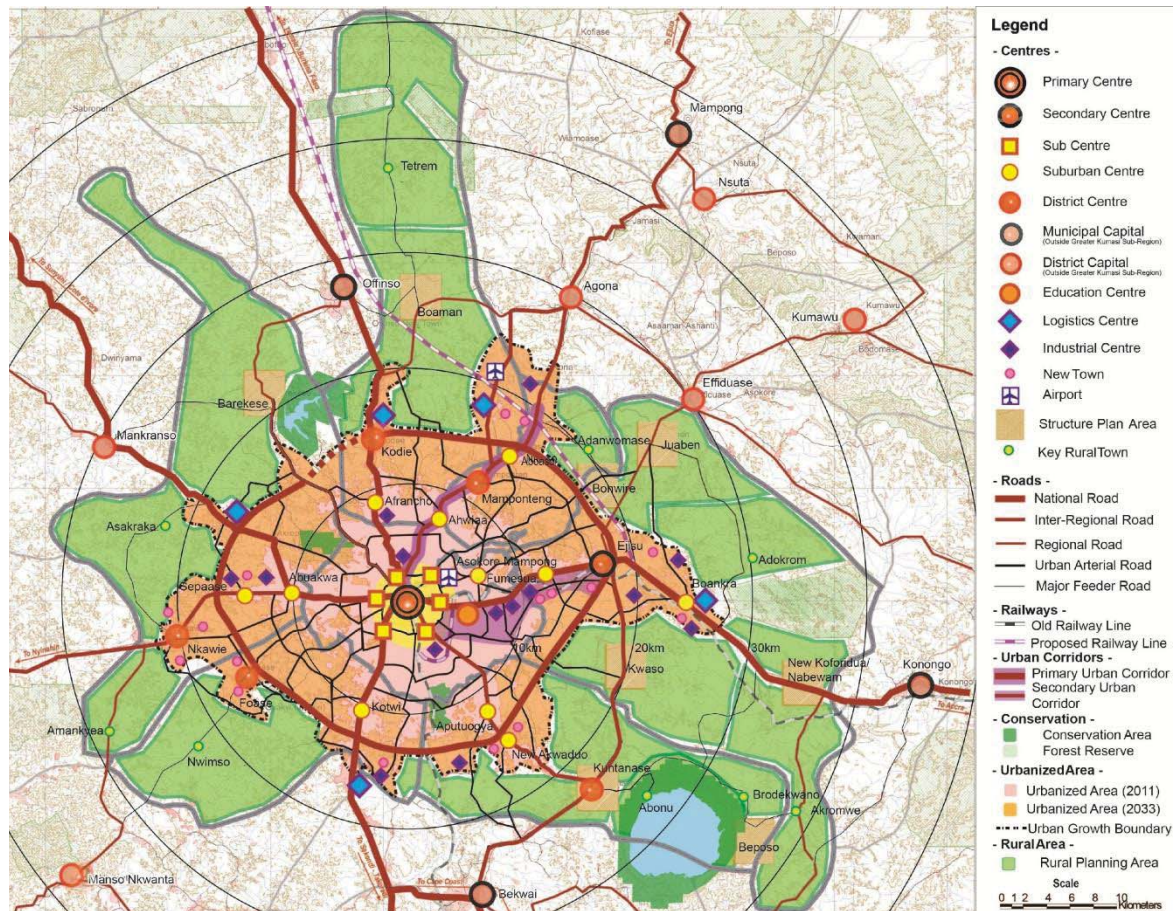
(3) Existing Urban Master Plans

To tackle the issues Greater Kumasi was facing, a spatial development framework (SDF) for Greater Kumasi Sub-Region targeting 2033 and a structure plan (SP) for Greater Kumasi Conurbation targeting 2028 were formulated by the TCPD with the technical assistance of JICA in 2013. These

two types of spatial plans for Greater Kumasi were approved by the Regional Co-ordinating Council of Ashanti Region by late in year 2013.

The vision for Greater Kumasi Sub-Region in the Greater Kumasi Sub-Region Master Plan is set “To become a pioneer to transform the current economy into a vibrant, modernized and diversified economy including commerce, logistics, manufacturing and knowledge-based industries, by creating a liveable, sustainable and efficient urban space, while maintaining the historical and cultural aspirations of the Ashanti Region.”

The diagram for the Greater Kumasi Sub-Region in the SDF for Greater Kumasi Sub-Region is shown in .



Source: Oriental Consultants Co., Ltd. et al., 2013, The Study on the Comprehensive Urban Development Plan for Greater Kumasi in the Republic of Ghana, JICA

Figure 24.3.2 Diagram for Greater Kumasi Sub-Region

24.3.2 Future Prospects for Greater Kumasi

To sustain its current roles as a regional gateway and regional centre for transport and logistics, it is necessary to construct an outer ring road for Greater Kumasi to prevent trucks from travelling through the city centre. Furthermore, it is important to utilize the outer ring road not only to strengthen the bypass transport function, but also to promote the development of urban centres and residential areas in suburban areas.

With the improvement of the electricity situation in Greater Kumasi, Kumasi will also have a chance to revitalize its manufacturing sector. The widening to 4-lane road and further upgrading to a motorway between Accra and Kumasi will also shorten the time distance between the two major cities in Ghana. This can help Greater Kumasi to take advantage of the corridor development and to become the national centre for business, industry and knowledge-based industries, as well as commerce and logistics.

24.3.3 Issues regarding Urban Development of Greater Kumasi

The following issues exist regarding the urban development of Greater Kumasi:

- Uncertain ability of economic growth of informal sectors
- Underdeveloped urban function in the city centre and suburban areas
- Underdevelopment of economic infrastructure and underutilization of human resources to support economic development
- Severe traffic congestion in Kumasi which is a weak point for a transport and logistics centre

24.3.4 Objectives for Urban Development of Greater Kumasi

The following objectives are determined for the urban development of Greater Kumasi:

- To make maximize use of its economic development potential as the second largest city and a national-level gateway city to inland areas by taking advantage of the further development of the Central Corridor connecting Tema, Greater Accra and the northern parts
- To perform and fulfil the roles as one of the national centres for business, industry and commerce
- To prepare necessary economic infrastructures and facilities in order to promote economic development including commerce, logistics, manufacturing, ICT-BPO and R&D
- To manage the pressure of concentrated economic activities and transport congestion in the city centre

24.3.5 Strategies for Urban Development of Greater Kumasi

The following are the strategies for urban development of Greater Kumasi:

- To develop a Knowledge Corridor between Kumasi City Centre and Ejisu for promoting research and development, as well as business, by taking advantage of the existing education and research centres such as Kwame Nkrumah University of Science and Technology (KNUST) and Crops Research Institute (CRI) of the Council for Scientific and Industrial Research (CSRI)
- To promote development of Ashanti Free Industrial Zone by taking advantage of the prospective construction of part of the Outer Ring Road and the dry port to be created in Boankra
- To implement necessary development for a sustainable development to make Greater Kumasi into a more liveable city
- To modernize the existing industries in Greater Kumasi
- To prepare facilities such as advanced medical facilities and higher education facilities to serve the increasing population
- To prepare necessary infrastructure for revitalizing the industrial area and developing new industrial areas
- To implement necessary urban road networks and the outer ring road to ease the traffic pressure caused by motorization, population increase and development of the transport corridor

24.3.6 Conceptual Spatial Structure for Greater Kumasi

After the approval of the Sub-Regional SDF for Greater Kumasi and Greater Kumasi Conurbation Structure Plan, situations changed regarding the new Kumasi airport. The plan for a new airport and airport city located in Kwabre East District of Greater Kumasi needs to be revised.

24.3.7 Programmes and Projects for Urban Development related to Corridor Development in Greater Kumasi

The following are programmes and projects for urban development related to corridor development in Greater Kumasi:

- Redevelopment of CBD and development of sub-centres
- Relocation of Suame Magazine and Central Market
- Implementation of BRT as urban public mass transport
- Development of a primary urban corridor between Kumasi and Ejisu
- Promotion of ICT-BOP business
- Promotion of formal companies' regional headquarters to be located in Kumasi
- Provide water and electricity to fulfil the demand of the residents and industry
- Development of regional hospitals
- Prepare necessary number of high schools for the increasing population and popularization of higher education
- Prepare layout plans to secure the land for the outer ring road

The following list of projects is sector priority projects of WAGRIC Master Plan for Greater Kumasi.

- Construction of 4-Lane High-Speed Way on National Road No.1 between KumaSi and Kintampo
- Projects for Construction of Greater Kumasi Outer Ring Road South - East Section
- Project for Establishment of Prampram Industrial Park
- Construction of High-Speed Way on National Road No.1 between Nkawkaw and Kumasi
- Project for Rehabilitation of Tema Port -Boankra-Kumasi Section of Eastern Railway
- Project for Construction of Kumasi-Paga Railway
- Project for Establishment of Boankra Multi -Modal Dry Port
- Project for Construction of Oil Multi -Products Pipeline between Tema and Kumasi
- Project for Construction of Oil Multi -Products Pipeline between Kumasi and Buipe
- Expansion of Water Treatment Plant in Barakese Dam for Greater Kumasi
- Investment Promotion for Manufacturing Industries in Greater Kumasi
- Investment Promotion for ICT-BPO Industries in Greater Kumasi
- Project for Establishment of Ashanti Technology Park in Ejisu

24.4 Urban Development Strategies for Sekondi-Takoradi

24.4.1 Present Situation of Sekondi-Takoradi

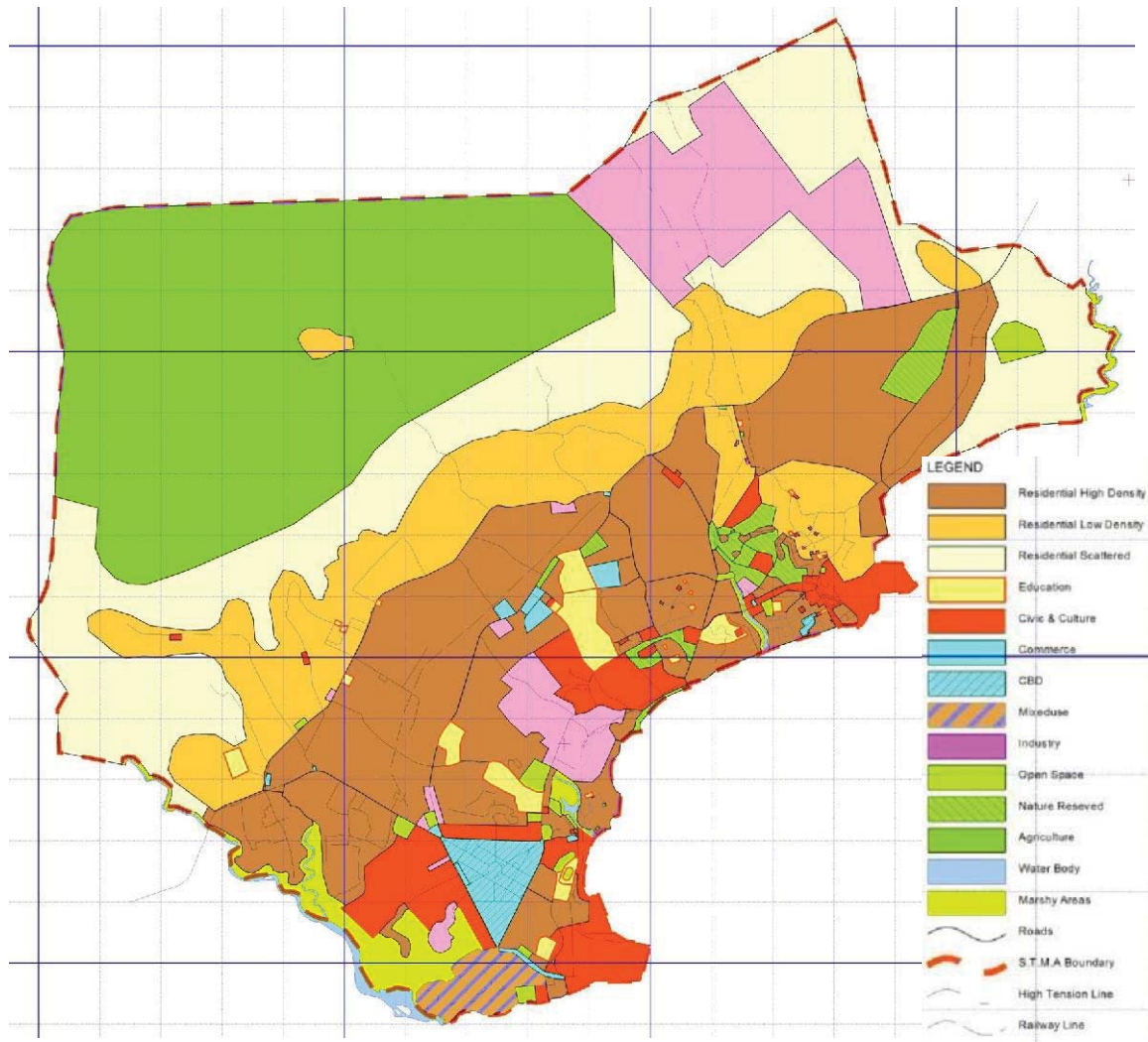
(1) Urbanization of Sekondi-Takoradi

Sekondi-Takoradi Metropolitan, regional centre for Western Region, is composed of Sekondi, administration centre, and Takoradi, commercial centre. Sekondi-Takoradi has grown largely with the discovery of oil and gas off-shore of the Western Region, as well as together with the development of the port.

Figure 24.4.1 shows the present land use in Sekondi-Takoradi. Urban areas have sprawled beyond the metropolitan boundary along the National Road No.1. As a result, the adjoining districts of Shama and Ahanta West are functionally being integrated with Sekondi-Takoradi. However, despite the rapid densification of the city center, there are still large government lands allocated for civic and cultural purposes.

As the nation's third largest urban centre, Sekondi-Takoradi is expected not only to serve the region as the administrative centre, but also to play an important role of a commercial centre of the region

by promoting strong economic sector development. With the associated oil and gas development, the city is expected to continue to grow rapidly by accommodating economic sector development.

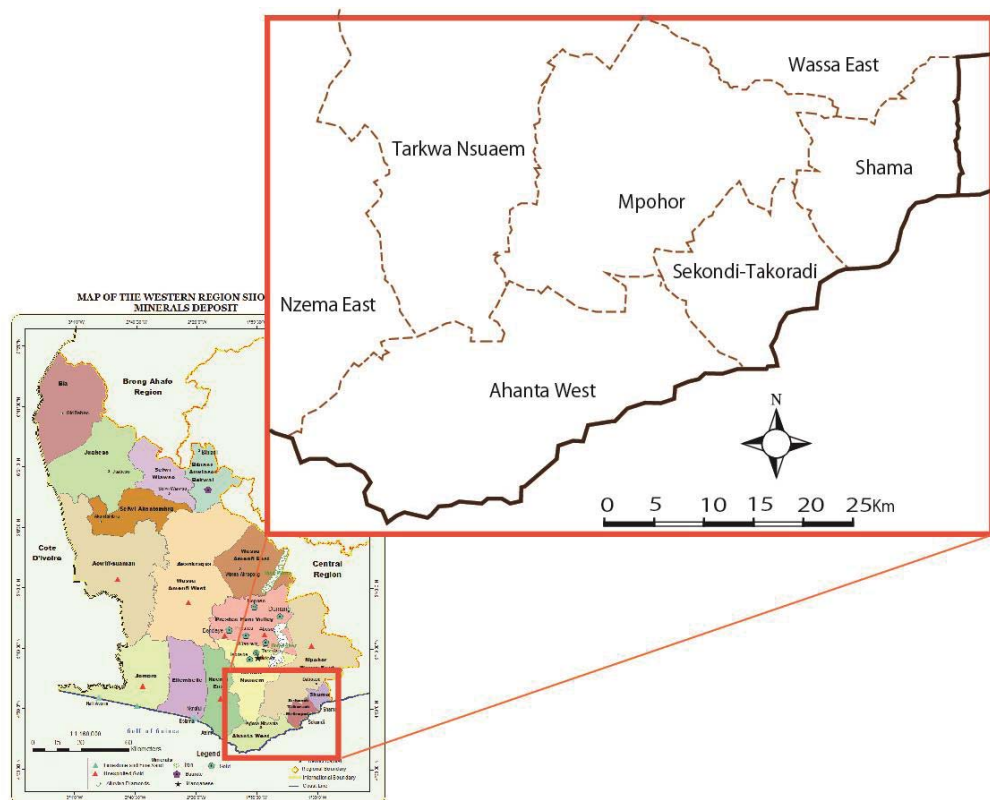


Source: The Consortium, 2012, Draft Structure Plan for Sekondi Takoradi, Jubilee Partners

Figure 24.4.1 Present Land Use of Sekondi-Takoradi

(2) Demography of Sekondi-Takoradi

Sekondi-Takoradi Metropolitan is one of the 17 MMDAs in the Western Region. It is surrounded by Shama District, Ahanta West District and Mpohor District. In the future, urban agglomeration of Sekondi-Takoradi will extend to these districts.



Source: JICA Study Team based on Western Region Regional Coordinating Council and GSS

Figure 24.4.2 Sekondi-Takoradi Metropolitan and its Surrounding MMDAs

The population of Sekondi-Takoradi in 2010 was approximately 560 thousand. On the other hand, the population in the surrounding MMDAs in 2010 was approximately 230 thousand. By 2040, the population of Sekondi-Takoradi is forecast to exceed 2 million. Therefore, to accommodate the increasing urban population, Sekondi-Takoradi will become a large conurbation with the adjoining districts. The analysis of annual population growth rates between 2000 and 2010 reveals that the neighbouring districts, Shama and Ahanta West, are increasing their population more rapidly compared with the regional average as shown in table below. With the planned bypass road and the new Abidjan-Accra-Lagos Motorway, the urban area for Sekondi-Takoradi will be expanded to the north to Mpohor District.

Table 24.4.1 Population of Sekondi-Takoradi and its Surrounding Districts (2000 and 2010)

MMDAs	Population		Annual Population Growth Rate (%)	Area (km ²)	Population Density 2010 (persons/km ²)
	2000*	2010			
Sekondi-Takoradi	289,593	559,548	6.42%	192	2,914
Shama	60,298	81,966	3.12%	194	423
Ahanta West	66,980	106,215	4.72%	554	192
Mpohor	39,313	42,923	0.88%	525	82
Outside Sekondi-Takoradi	1,634,984	1,816,473	1.06%	23,729	77
Western Region	1,924,577	2,376,021	2.83%	23,921	99

Note*: Population for 2000 is estimated based on the 2000 Population and Housing Census since the districts' boundary has changed after 2000.

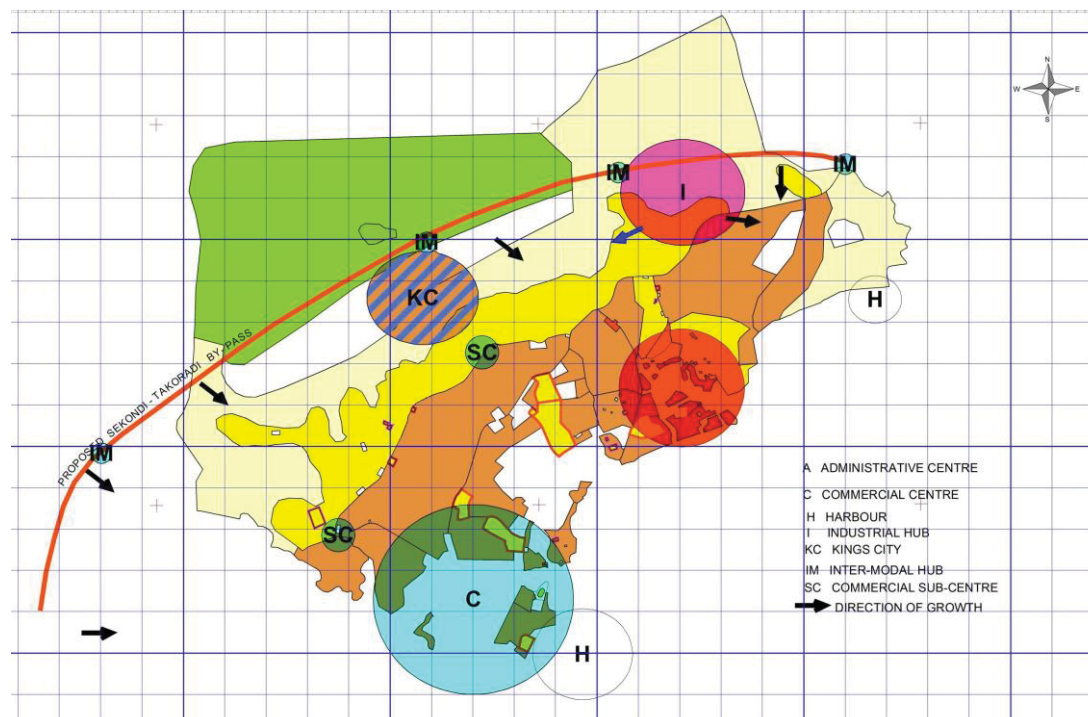
Source: GSS, 2000 and 2010 Population and Housing Census

(3) Existing Urban Master Plan

In 2012, after the formulation of SDF for Western Region, the SDF for Sekondi-Takoradi Metropolitan area was formulated for good urban governance and to prepare for development of the oil and gas industry.

The SDF for Sekondi-Takoradi sets the vision to become a preferred location for a variety of prime investments in industry, commerce, leisure, international transportation services and creative economies.

The special concept for Sekondi-Takoradi (composite plan) in SDF for Sekondi-Takoradi is shown in .



Source: The Consortium, 2012, Draft Structure Plan for Sekondi Takoradi, Jubilee Partners

Figure 24.4.3 Concept Plan for Sekondi-Takoradi in SDF for Sekondi-Takoradi

24.4.2 Future Prospects for Sekondi-Takoradi

Sekondi-Takoradi will have an advantage in economic development because of the sea port and oil and gas sectors.

The future population of the Western Region is forecast to more than double by 2040 beyond 5 million. As the regional centre for administration and business, it is necessary for Sekondi-Takoradi to be prepared to provide urban services to meet the future population's demand.

Fortunately, unlike Accra and Kumasi, Sekondi-Takoradi has a huge tract of land due to government land acquisition. Therefore, the redevelopment of the city centre on those lands is possible without difficulties in land acquisition. This situation would help the city to allocate land to necessary regional facilities to serve rapidly growing populations.

24.4.3 Issues regarding Urban Development of Sekondi-Takoradi

The following are existing issues regarding the urban development of Sekondi-Takoradi:

- The land in the city centre cannot be used efficiently for future growth of the city.
- There are not enough social facilities, such as hospitals and schools, for the future growing population. Although all other Grade-1 urban centres have a teaching hospital, Sekondi-Takoradi has only a regional hospital which is the tertiary referral hospital.
- Corridor development will increase cargo volume coming to Takoradi Port which will cause traffic congestion in the city.
- Only a limited number of flights can fly to and from Takoradi Airport. It is difficult to expand

the existing airport facilities since the airport uses the land and facilities of the air force. Therefore, it is necessary to develop a new airport for Sekondi-Takoradi.

24.4.4 Objectives for Urban Development of Sekondi-Takoradi

The following objectives are determined for the urban development of Sekondi-Takoradi:

- To maximize use of its economic development potential to be enhanced by oil and gas development and increasing cargo at Takoradi Port and to be upgraded by further development of the Abidjan-Accra-Lagos Corridor
- To perform and fulfil the roles as a regional growth pole and service centre with a support base for the oil and gas sectors
- To prepare necessary economic infrastructures and facilities in order to promote economic development including food processing industry (crops, vegetables, fish etc.) and the mining industry
- To prepare for the pressure of concentrated economic activities and transport congestion in the city centre

24.4.5 Strategies for Urban Development of Sekondi-Takoradi

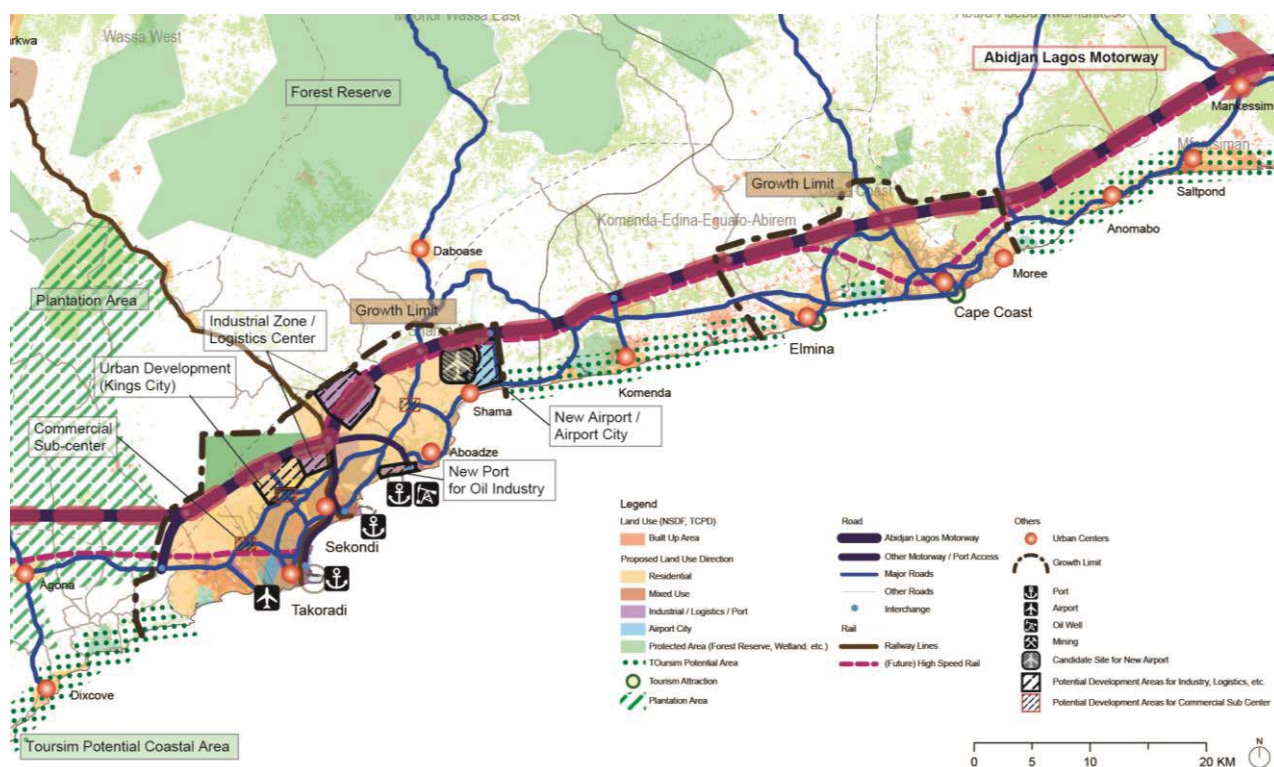
The following are the strategies for urban development of Sekondi-Takoradi:

- To secure land necessary for Abidjan-Accra-Lagos Motorway
- To increase the number of flights between Accra and Sekondi-Takoradi, and also to improve flight services between Sekondi-Takoradi and new flight destinations
- To promote development of Sekondi Export Processing Zone and Shama Export Processing Zone by taking advantage of industries related to the development of the oil, gas and mining sectors
- To promote food processing industries by taking advantage of the strategic location along the Abidjan-Accra-Lagos Corridor and upgrading of Sekondi Fishing Port
- To implement necessary measures for sustainable development to make Sekondi-Takoradi a liveable city
- To provide advanced social service facilities, such as advanced medical facilities and higher education facilities to serve increasing urban population
- To provide necessary infrastructure for developing new industrial areas
- To establish an urban road network to ease the traffic pressure to be caused by increasing motorization and population and transport corridor development

24.4.6 Conceptual Spatial Structure for Sekondi-Takoradi

The conceptual spatial structure for Sekondi-Takoradi is shown in Figure 24.4.4.

The Abidjan-Accra Motorway will change the structure of the city to grow towards the north.



Source: JICA Study Team

Figure 24.4.4 Future Spatial Concept for Sekondi-Takoradi (Proposal by WAGRIC Master Plan)

24.4.7 Programmes and Projects for Urban Development related to Corridor Development in Sekondi-Takoradi

The following programmes and projects are formulated for urban development related to corridor development in Sekondi-Takoradi:

- Development of the city centre and sub-centres
- Implementation of a commuters railway and BRT for future expansion of the city
- Promotion of development of the food processing industry
- New town development in Kings City
- Provide water and electricity to fulfil the demand of the residents and industries
- Development of a Teaching Hospital in addition to the existing regional hospital in order to cope with increasing patients
- Provision of the necessary number of high schools for the increasing population and also in response to popularization of higher education
- Provision of vocational schools for training people to work for industries to be promoted in Sekondi-Takoradi
- Formulation of a master plan for an airport city in Shama District
- Construction of Abidjan-Accra-Lagos Motorway
- Strengthening of a trunk road from Takoradi Port to Abidjan-Accra-Lagos Corridor

The following list of projects is sector priority projects of WAGRIC Master Plan for Sekondi-Takoradi.

- Development of Nyinahin Bauxite Mine with Construction of Railway between Awaso and Nyinahin
- Development of Shieni Iron Mine
- Project for Establishment of Sekondi Export Processing Zone

- Project for Establishment of Shama Export Processing Zone in Shama Ahanta District (Western Region)
- Investment Promotion for Development of Nyinahin Bau xite Mine
- Investment Promotion for Manufacturing Industries in Sekondi – Takoradi
- Project for Construction of Aboadze-Tema Natural Gas Pipeline
- Interconnection of Sekyere-Hemang Water Treatment Plant to the Sekondi-Takoradi Water Supply System and the Aboadze Thermal Plant
- Construction of Outer Ring Road for Sekondi -Takoradi as part of Abidjan-Lagos Motorway
- Construction of Abidjan-Lagos Motorway Section between Cape Coast – Sekondi-Takoradi
- Construction of New Airport in Sekondi –Takoradi

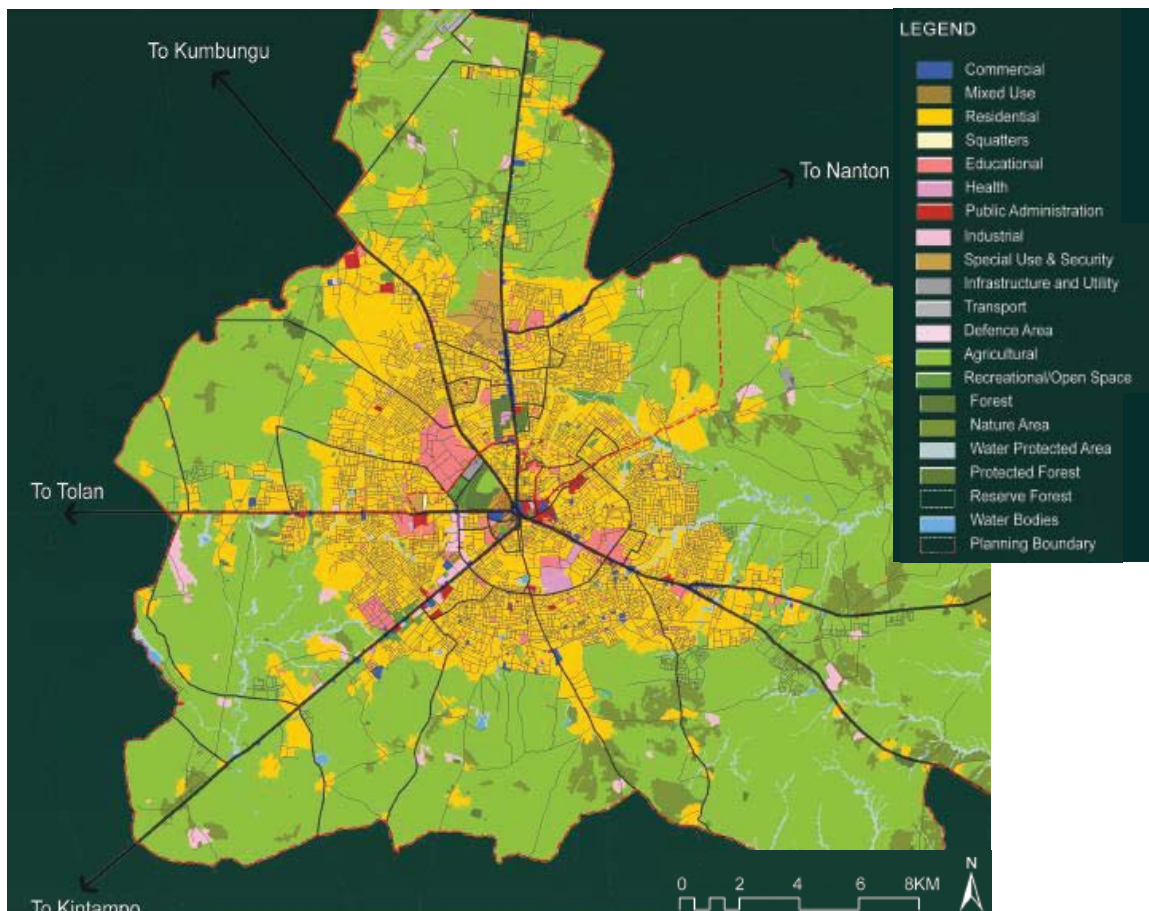
24.5 Urban Development Strategies for Greater Tamale

24.5.1 Present Situation of Greater Tamale

(1) Urbanization of Greater Tamale

Tamale Metropolitan, economic and administration centre not only for Northern Region but also for Northern Savannah Ecological Zone (NSEZ) which covers the northern half of Ghana. Tamale is the fourth largest city in Ghana and is one of the most rapid growing cities in Ghana. The residential area is spread to 5-8km radius area from the city centre surrounded by forest and agricultural area.

Commercial centre (central market) and administration centre are located in the centre of the city. Large land plot for education, health and industry are located along the inner ring road excluding the uncompleted north-east section.

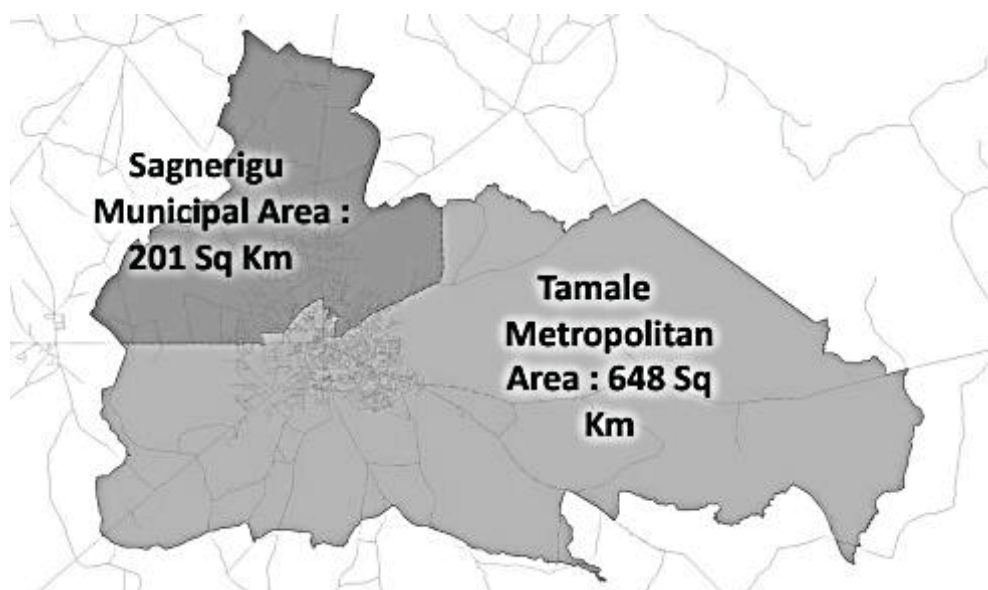


Source: Surbana Jurong Private Limited, 2017, SADA

Figure 24.5.1 Present Land Use of Greater Tamale

(2) Demography of Greater Tamale

The Structure Plan for Greater Tamale prepared by Savannah Accelerated Development Authority (SADA)¹ determined the area of Greater Tamale as the area covering Tamale Metropolitan and Sagnerigu Municipal.



Source: SADA, 2016, Implementation Plan for Tamale and Buipe Preliminary Stage

Figure 24.5.2 Districts Covering Greater Tamale

The population of Greater Tamale in 2010 was approximately 371 thousand. The population increased rapidly from year 2000 and the annual growth rate between 2000 and 2010 was over 6%. By 2040, the population of Greater Tamale is to reach 1.8 million. (See Table 24.1.4)

Table 24.5.1 Population of Greater Tamale (2000 and 2010)

MMDAs	Population			Annual Population Growth Rate (%)		Area (km ²)	Population Density 2010 (persons/km ²)
	1984	2000	2010	1984-2000	2000-10		
Tamale			223,252			648	345
Sagnerigu	135,952	202,317	148,099	2.52%	6.26%	201	737
Greater Tamale			371,261			849	437
Northern Region	1,164,583	1,820,806	2,479,461	2.83%	3.14%	70,383	35

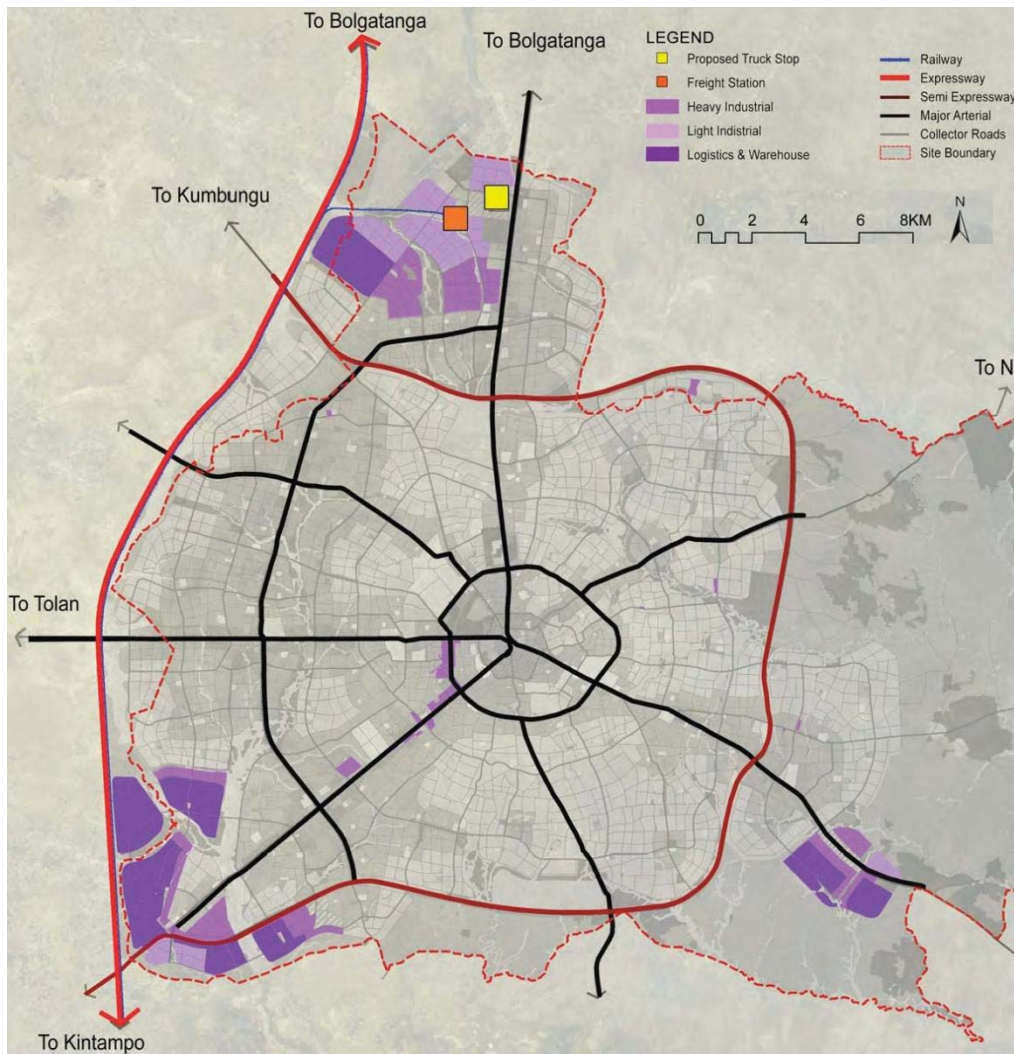
Source: GSS, 2000 and 2010 Population and Housing Census

(3) Existing Urban Master Plan

In 2017, a Structure Plan for Tamale was prepared by SADA following the Regional Concept Plan of the Northern Savannah Ecological Zone (NSEZ) targeting 2040. The plan envisions Greater Tamale “to become the Centre of Excellence of NSEZ as the leading commercial and services hub to catalyze the transformation of NSEZ as the gateway to Sahel Region.”

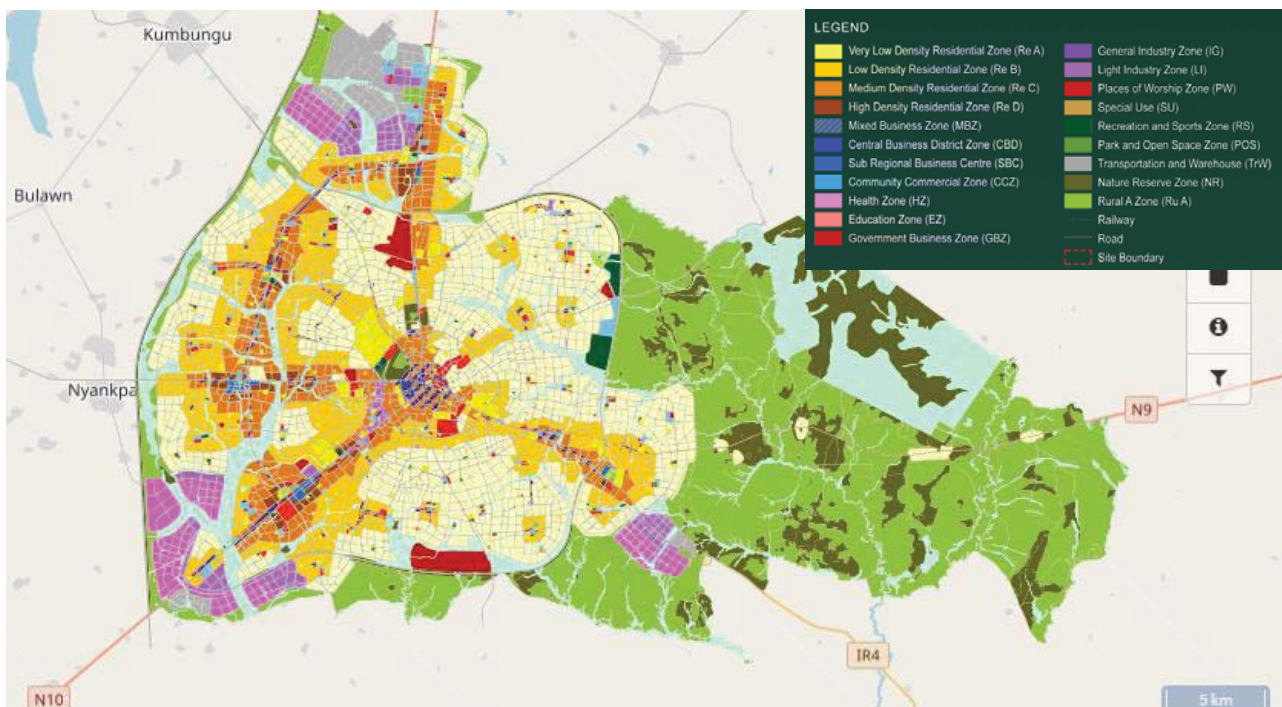
The plan includes sector plans for transportation, water supply, storm water, sewerage, solid waste and power supply as well as future land use plan.

¹ SADA has now changed to Northern Development Authority (NDA).



Source: Surbana Jurong Private Limited, 2017, Tamale Structure Plan Transportation, SADA

Figure 24.5.3 Freight Transport Plan in Structure Plan for Greater Tamale 2040



Source: Northern Development Authority HP (<http://www.ndamasterplan.org/tamale/>)

Figure 24.5.4 Future Land Use Plan for Greater Tamale

24.5.2 Future Prospects for Greater Tamale

Greater Tamale located at the hearth of NSEZ has a great advantage in economic sector development as a centre for agro processing based on WAGRIC Master Plan's strategies. The city should develop as the regional growth pole with agro processing industry base and service centre for NSEZ.

The future population of the Northern Region is forecast to more than double by 2040 beyond 5 million. As the regional centre for administration and business, it is necessary for Greater Tamale to be prepared to provide urban services to meet the future population's demand. The population of Greater Tamale is also to reach 1.8 million by 2040 and the city needs to prepare for such growth.

24.5.3 Issues regarding Urban Development of Greater Tamale

The following are existing issues regarding the urban development of Greater Tamale:

- The land in the city centre cannot be used efficiently for future growth of the city.
- Corridor development will increase cargo volume going through the city which will cause traffic congestion in the city.
- The infrastructure such as water supply and electricity is insufficient for the future population as well as industrial development.
- There are not enough social facilities, such as hospitals and schools, for the future growing population.

24.5.4 Objectives for Urban Development of Greater Tamale

The following objectives are determined for the urban development of Greater Tamale:

- To perform and fulfil the roles as a regional growth pole and service centre
- To prepare necessary economic infrastructures and facilities in order to promote economic development including food processing industry (crops, vegetables, fruits etc.)
- To prepare for the pressure of concentrated economic activities and transport congestion in the city centre

24.5.5 Strategies for Urban Development of Greater Tamale

The following are the strategies for urban development of Greater Tamale:

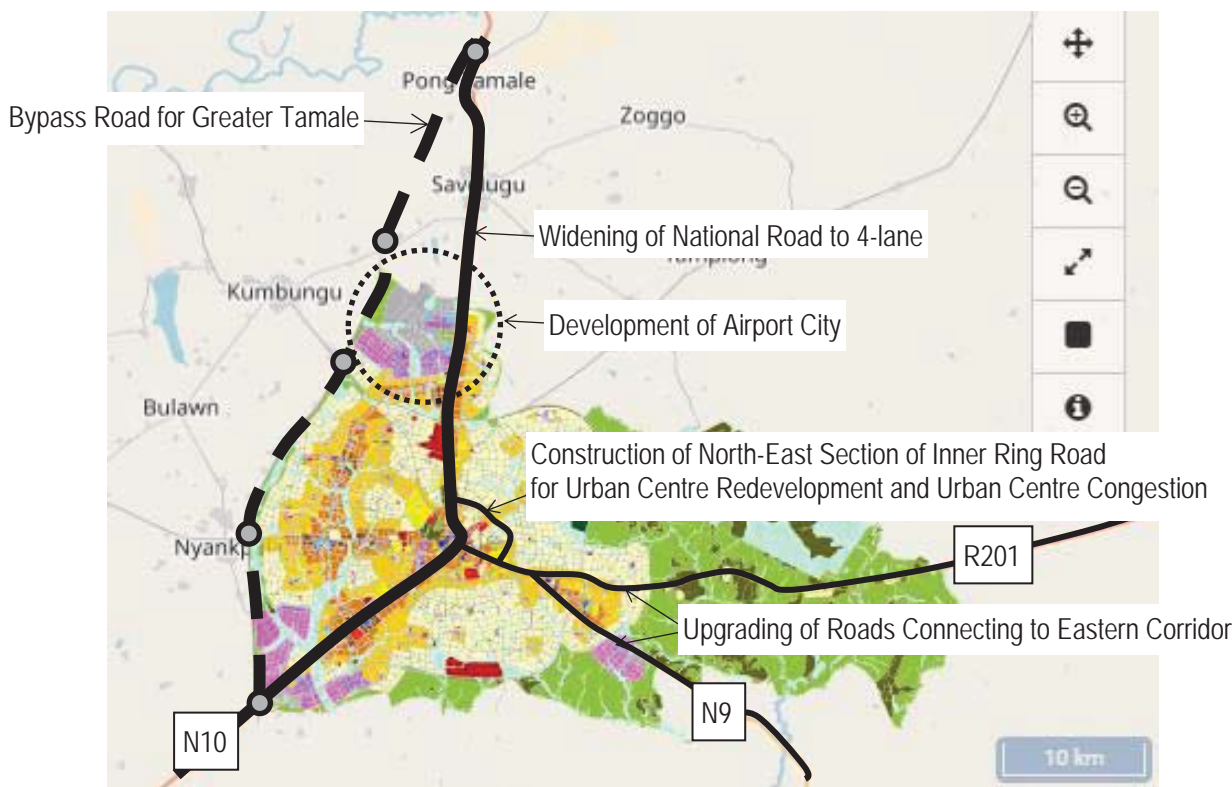
- To promote food processing industries by developing industrial areas along Tema-Ouagadougou Corridor
- To provide advanced social service facilities, such as advanced medical facilities and higher education facilities to serve increasing urban population
- To provide necessary infrastructure for developing new industrial areas
- To establish an urban road network to ease the traffic pressure to be caused by increasing motorization and population and transport corridor development

24.5.6 Conceptual Spatial Structure for Greater Tamale

The conceptual spatial structure for Greater Tamale is shown in Figure 24.5.5.

The bypass road for Greater Tamale should bypass the neighbouring settlements of Savelugu and Pong Tamale in the north of Greater Tamale.

Although the Structure Plan proposes to shift the urban centre to the western side of the city, it is also necessary to complete the inner ring road by constructing the remaining north-east section. This will assist in the short term, the traffic to and from the Eastern Corridor to bypass the city centre.



Source: JICA Study Team based on Northern Development Authority HP

Figure 24.5.5 Future Spatial Concept for Greater Tamale (Proposal by the WAGRIC Master Plan)

24.5.7 Programmes and Projects for Urban Development related to Corridor Development in Greater Tamale

The following programmes and projects are formulated for urban development related to corridor development in Greater Tamale:

- Development of the city centre and sub-centres
- Promotion of development of the food processing industry
- Provide water and electricity to fulfil the demand of the residents and industries
- Formulation of a local plan for airport city
- Construction of bypass road for Greater Tamale and Savelugu
- Strengthening of a trunk road between Buipe and Savelugu
- Construction of North-East Section of Inner Ring Road
- Development of a second regional hospital in order to cope with increasing patients
- Provision of the necessary number of high schools for the increasing population and also in response to popularization of higher education
- Provision of vocational schools for training people to work for industries to be promoted in Tamale

The following list of projects and programmes is sector priority projects of WAGRIC Master Plan related to Greater Tamale.

- Tamale-Mamprusi Agricultural Cluster Area Development Programme
- Improvement of Pong Tamale Livestock Breeding Station
- Project for the Study on Transportation of Iron Ore from Shieni Iron Mine considering Possibilities of Railway, Inland Water Transport and Truck transport
- Project for Establishment of Tamale Industrial Park

- Investment Promotion for Manufacturing Industries in Tamale
- Improvement of Inter-Regional Road between Tamale and Makango
- Tamale Water Supply Project
- Project for Construction of Kumasi-Paga Railway
- Upgrading of National Road No.1 between Tamale-Yaipe and Tamale- Savelugu to 4-Lane Road (Central Corridor)
- Improvement of Regional Road between Tamale and the National Boarder with Togo (Nachemba)
- Construction of 4-Lane High-Speed Way on National Road No.1 between Buipe and Savelugu including Bypass Road for Tamale as part of High-Speed Way (Central Corridor)
- Upgrading of National Road No. 9 between Tamale and Bimbila

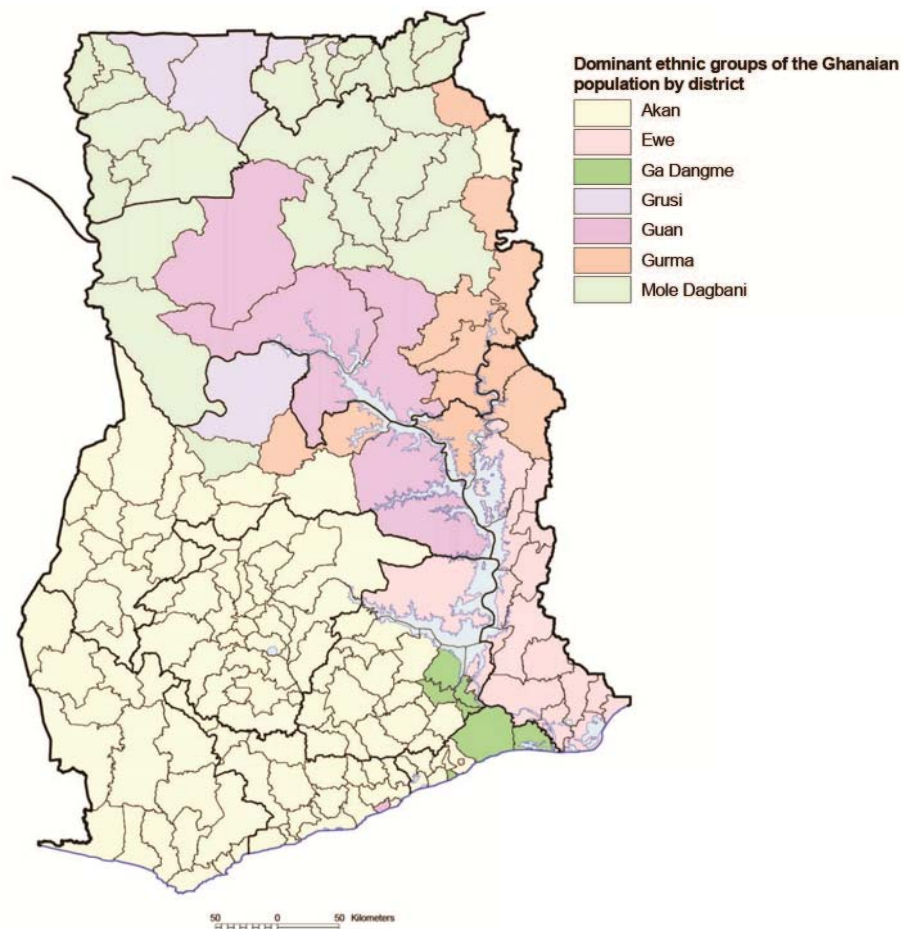
Chapter 25 Social Development Strategies for Ghana

25.1 Present Social Situation in Ghana

25.1.1 Present Situation of Social Structure in Ghana

(1) Ethnicity

There are more than 100 ethnic groups in Ghana. These ethnic groups can be classified into eight major groups. Akans are the predominant ethnic group with 47.5% of the population. They include the Ashanti and the Fanti people covering the Ashanti Region, Western Region and the surrounding areas. Other major ethnic groups in Ghana are Mole Dagbani (16.6%) in the northern area, Ewe (13.9%) mainly in Volta Region, Ga-Dangme (7.4%) mainly in Greater Accra Region, Gurma (5.7%) mainly in the border area of Togo in the Northern Region, Guan (3.7%) in the central area or Northern Region, Grusi (2.5%) mainly in the Upper West Region and the Mandé (1.1%). The following figure shows the map of the dominant ethnic groups in Ghana. The number of Mandé is not large. They are based in the northern area of Ghana.



Source: Ghana Statistical Service, 2013, 2010 Population & Housing Census -Census Atlas Ghana-

Figure 25.1.1 Dominant Ethnic Groups in Ghana by District (2010)

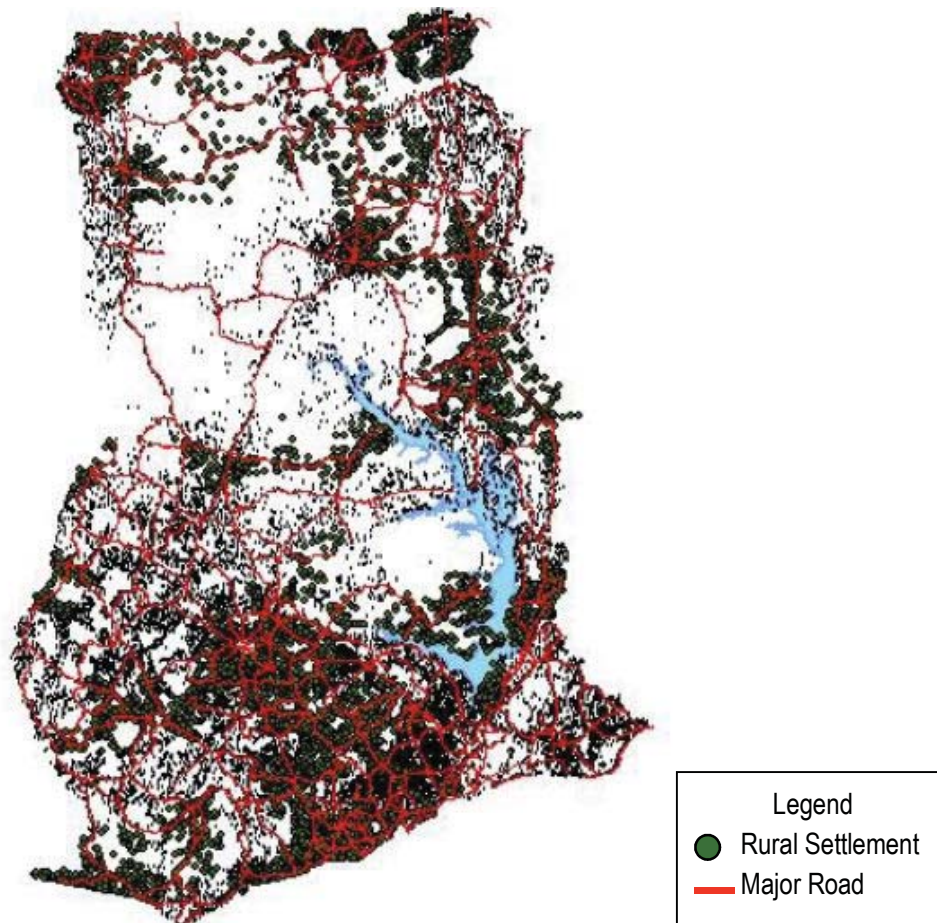
(2) Religion

In 2010, 71.2 percent of the population in Ghana were Christian, followed by Muslim with 17.6%. Only a small proportion of the population adhere to traditional religion (5.2%). The rest of the population are not affiliated to any religion (5.3%). Out of the 10 regions in Ghana, the Northern Region is the only region where Muslim is the dominant religion (60.0%). In the remaining nine regions, Christian shares the highest proportion of the population.

(3) Rural Settlement

Rural population ratio in Ghana as a whole country is 49.1%. By region, the Upper West Region has the highest rate of rural population with 83.7% followed by the Upper East Region with 79.0%. Both regions are located in the north at the border of Burkina Faso.

The figure below shows the locations of rural settlements and major roads in Ghana. Rural settlements are concentrated in the Ashanti Region, Central Region, Upper East Region and Upper West Region. On the other hand, the Brong Ahafo Region and Northern Region do not have such concentrations. There is a big area in the centre of Ghana where there are no settlements. In general, rural settlement population clusters are near to trunk roads.



Source: Ghana National Spatial Development Framework

Figure 25.1.2 Rural Settlements and Major Roads in Ghana

(4) Social Structure and Traditional Communities / Leaders

The Akan, the largest ethnic group in Ghana, are made up of various sub-groups (tribes). These comprise the Asante/Ashanti, Fante, Akuapem, Kwahu, Denkyira, Akyem, Bono, Ahafo, Sefwi, Assin, Wassa, Nzema and Akwamo. These sub-groups are predominantly found in the Ashanti, Eastern, Brong Ahafo, Central and Western regions of Ghana. All these sub-groups exhibit common social and traditional characteristics in terms of chieftaincy and other cultural practices such as the recognition of matrilineal lineage in which a child inherits his or her blood from the mother and

therefore land tenure and other lineage properties are inherited only by matrilineal kin. This makes queen mothers very important figures in chieftaincy affairs, especially with the selection of a chief.

The majority of Akan people believe in Christianity and traditional religion. They are engaged in gold mining and trading of farm products.

Chieftaincy is officially accepted in Ghana where the Headquarters of the National House of Chiefs is in Kumasi. Their mission is “To develop an effective interface between the government and civil society on matters relating to Chieftaincy and traditional Affairs, for the promotion of peace, good governance and international partnerships for the overall development of the country.” The highest ranked chief is the Paramount Chief. The Paramount Chief of Kumasi serves as an Emperor, and is called Ashantehene. Each chief (known as nana) has his own territory. Chiefs in Ghana are close to the local people since they are meant to be looking after the people on their land.

The Mole-Dagbani ethnic group on the other hand is the predominant group in the Northern Region of Ghana representing 52.2% of ethnic groups in the Region. The largest subgroups are the Dagombas, Mamprusis and the Nanumbas. Even though these groups represent distinct tribal groups, they still identify with each other and bond cohesively through oral culture woven around drums and other musical instruments. The Dagombas constitute about a third of the population of the region with their homeland in Dagbon and their paramount chief as the Yaa Naa based in Yendi. Unlike the Akan ethnic group, Mole-Dagbani inheritance is patrilineal. People from this ethnic group are mostly farmers. Dagomba society is polygynous where powerful chiefs tend to have many wives.

One of the important essences in life for Dagomba is marriage. Women in the Dagomba culture need the consent of their parents to get married. Interestingly, divorce is very rare in the Dagomba culture and it is a duty of parents on both sides to keep a marriage going.

In the recent years, there has been some unrest in the Dagomba society with the death of the Yaa Naa Yakubu Andani II, former king of Dagombas in March 2002 who was murdered due to a conflict between the two royal families of Dagbon Chieftaincy. Since the next ruler cannot be chosen without the funeral of the king at their palace in Yendi, and the Andani royal family is holding their stance against a funeral at the Gbewaa Palace, the successor to take his position has been undecided for over ten years. Although there is a regent who has acted as seignior of the kingdom, he cannot sign leases or process land sales. It is said that there are 20,000 leases pending in the region, which is stopping the development in north of Ghana.

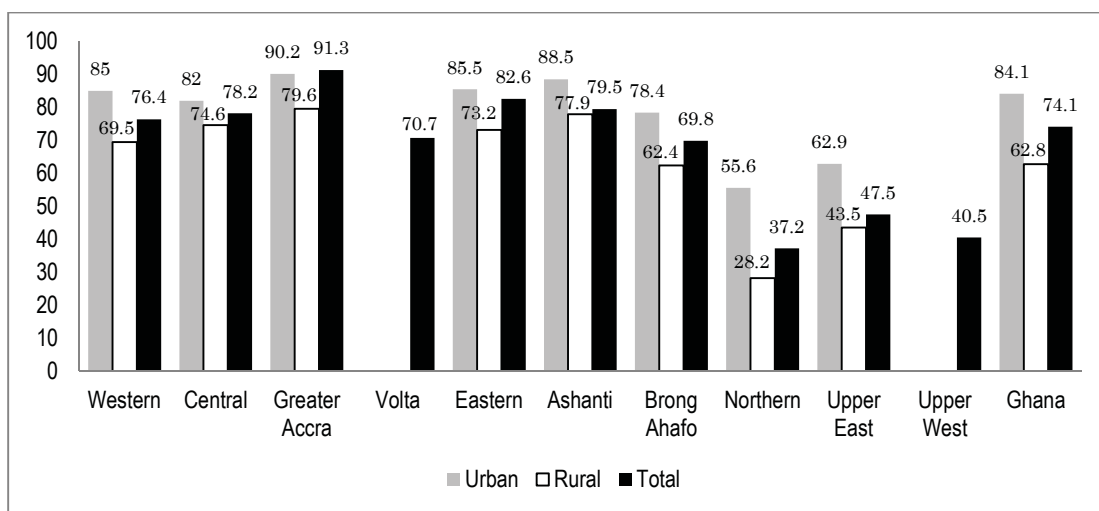
The third most dominant ethnic group in Ghana is the Ewes who are located in the Volta Region of Ghana and occupy the south eastern portion Ghana and the southern parts of neighbouring Togo and Benin. The sub-groups of the Ewes include the Anglo (Anlo), Bey (Be), and Gen on the coast, and the Peki, Ho, Kpando, Tori, and Ave in the interior. In the west, the Volta separates the Ewe from the Ga-Adangbe, Ga, and Akan. The Ewes basically speak a similar language although there are slight variations. The people are predominantly farmers and fishermen due to their closeness to the Volta Lake in their west and the Gulf Sea to their south. Just like the Mole-Dagbani ethnic group, inheritance is strictly by patrilineal lineage.

25.1.2 Present Situation of Social System in Ghana

(1) Education and Gender

Ghana is one of the countries in West Africa that has the highest primary school net enrolment rate at almost 90%. However, the gender gap and disparities between rural and urban areas, as well as between southern and northern parts of the country is still noticeable in the education sector.

Figure 25.1.3 shows the literacy rate in each region by urban and rural area. The literacy rates in the urban areas are relatively high. However, in the Northern Region, the literacy rate in the rural area is 28% which is extremely low even compared with the rural areas of the other regions in Ghana. The other regions which have low literacy rates are the Upper East and Upper West Regions with 47.5% and 40.5% respectively.



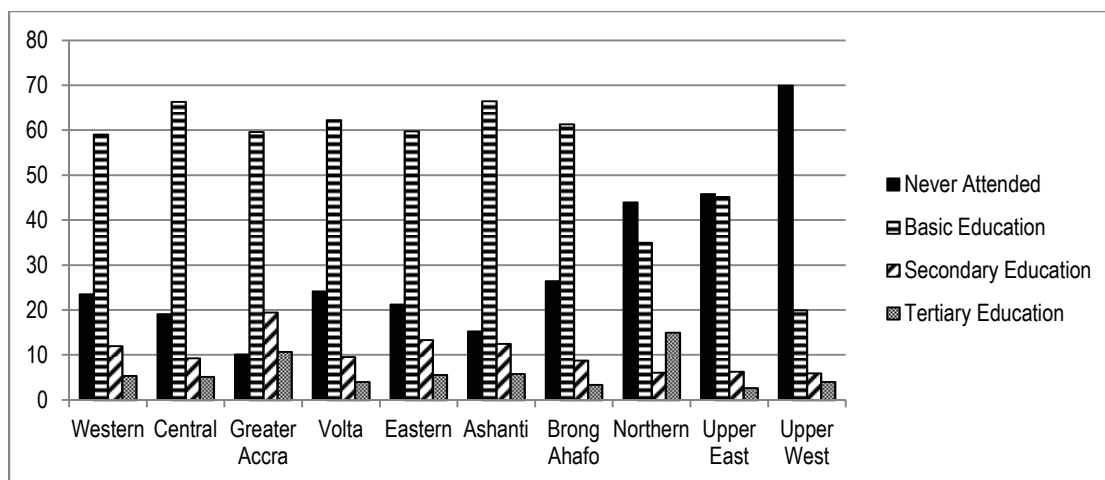
Unit: per cent

Source: Ghana Statistical Service, 2013, 2010 Population and Housing Census Regional Analytic Reports of all regions

Figure 25.1.3 Literacy Rate above 11 Years Old by Region in Ghana (2010)

Comparing the literacy rate between genders in Ghana, literacy rate of men is 80.2% while literacy rate of women is 68.5%. In the Greater Accra Region which has the highest literacy rate, literacy rate of men is 93.5% whereas it is 85.3% for women. On the other hand, in the Northern Region, which has the lowest literacy rate, only 44.2 % of the men and 30.3% of female are literate. Regardless of the economic status of the region, there is a gap between the literacy rate of men and women.

Figure 25.1.4 shows the ratios of the various levels of education attained by the residents in each region. This figure shows how much basic school education still needs to be promoted in the northern regions of the country, especially in the Northern Region, Upper East Region and Upper West Region. However, interestingly, although the share of people without basic education is almost 50% in the Northern Region, it also has the highest share of people with tertiary education which is almost 15% of the region's population.



Note: Basic education includes from pre-school to junior high school, Secondary education includes senior high school to vocational school, Tertiary education includes anything above secondary education.

Source: Ghana Statistical Service, 2013, 2010 Population and Housing Census Regional Analytic Reports of all regions

Figure 25.1.4 Highest Education Attained by Region in Ghana (2010)¹

¹ The figure only shows the number of people who have attended each level of education, not completed. For example, basic education includes people who have attended only pre-school or primary school. The age group also differs between each region as follows:

- Western Region, Volta Region, Northern Region and Upper East Region: Above 6 years old
- Central Region, Greater Accra Region, Ashanti Region and Brong Ahafo Region: Above 3 years old
- Eastern Region: Above 15 years old
- Upper West Region: EAP above 15 years old

(2) Health

The healthcare system in Ghana has five levels of providers. Health Posts are the first level primary care for rural areas followed by Health Centres and Clinics (or Polyclinics in urban areas), District Hospitals, Regional Hospitals and Tertiary Hospitals. There are also private hospitals and clinics, but they are concentrated in the Ashanti Region and Greater Accra Region. The number of healthcare facilities by region is shown in Table 25.1.1.

Table 25.1.1 Health Facility by Type and Ownership in Regions in Ghana (2009)

Region	Teaching Hospitals	Regional Hospitals	Other Hospitals			Polyclinic	Health Centres & Clinics		
	Gov't	Gov't	Gov't	Private	Others	Gov't	Gov't	Private	Others
Ashanti	1	0	22	48	22	0	141	161	43
Brong Ahafo	0	1	8	6	12	1	149	24	13
Central	0	1	10	7	6	0	80	75	11
Eastern	0	1	12	5	8	0	166	63	26
Greater Accra	1	1	9	79	11	7	44	232	23
Northern	1	1	9	0	8	0	122	20	36
Upper East	0	1	4	0	1	0	54	11	16
Upper West	0	1	3	1	4	0	60	4	17
Volta	0	1	11	7	9	1	192	23	9
Western	0	1	11	3	10	2	98	119	51

Source: The Health Sector in Ghana, Facts and Figures 2010

Healthcare varies through the country with urban centres having the most healthcare facilities, whilst in some rural areas patients either need to rely on traditional medicine or travel great distances for healthcare.

The issues of healthcare facilities also include the need to increase the number of urban centres where the population is increasing rapidly. In such area, regional hospitals and tertiary hospitals often also need to take care of people outside their region. It is crucial for such urban centres to find a suitable site for the next regional and teaching hospital to serve the increasing population in the future.

25.1.3 Present Situation of Economic Activities and Land Use in Ghana

(1) Economic Activities

The economic structure in Ghana has been changing in the last decade. Ghana used to have an agriculture based economy with over half of the economically active population (EAP) working in the primary sector in 2000. However, the country is shifting its economic structure from the primary sector to the tertiary sector and in 2010, the EAP in the tertiary sector surpassed the EAP in the primary sector.

Despite this change in the structure of EAP, and the country's will to grow the manufacturing sector, the share of EAP in the secondary sector has not been increasing. As of 2010, approximately 15% of the EAP was engaged in this sector. (Table 25.1.2)

Table 25.1.2 Changes of the Economic Structure in Ghana

Year	1960	1970	1984	2000	2010
Primary Sector	61.8%	57.0%	61.1%	53.0%	42.0%
Secondary Sector	15.1%	15.8%	12.9%	15.5%	15.2%
Tertiary Sector	23.1%	27.2%	25.0%	31.5%	42.8%

Source: Ghana Statistical Service, 2005, Population Data Analysis Report Vol. 2 and Ghana Statistical Service, 2013, 2010 Population and Housing Service National Analytical Report

In 2010, Ghana had approximately 14.0 million people in the age group between 15 and 64 years old which is known as the productive age. When we see EAP by sex, location and their status, out of the population in this age group, EAP was approximately 10.2 million. The share of EAP for males and females are similar in both urban areas and rural areas.

However, the employment sector differs greatly between sex and locality. Table 25.1.3 shows EAP by employment sector depending on the sex and locality. When looking at the number of EAP working as government officers or in private formal companies, the share for males in urban area is approximately twice that of the women in urban areas. On the other hand there are fewer men in urban areas engaged in the private informal sector. In the rural areas, there are also more women engaged in the informal sector than men.

**Table 25.1.3 Economically Active Population between 15 and 64 Years Old
by Employment Sector in Ghana (2010)**

		Public	Private Formal	Private Informal	Semi-Public/Private Informal	NGOs	Other International Organizations	Seeking Work for First Time
Urban	Number	307,650	410,809	1,791,058	7,814	25,701	2,876	114,270
	Male	Share	46.91%	56.39%	19.85%	55.00%	48.35%	59.42%
Urban	Number	187,740	186,248	2,360,987	3,050	10,981	1,255	125,463
	Female	Share	28.62%	25.57%	26.17%	21.47%	20.66%	25.93%
Rural	Number	108,139	93,298	2,340,525	2,282	9,476	545	46,046
	Male	Share	16.49%	12.81%	25.94%	16.06%	17.83%	11.26%
Rural	Number	52,355	38,155	2,530,322	1,061	6,994	164	54,019
	Female	Share	7.98%	5.24%	28.04%	7.47%	13.16%	3.39%
Total	Number	655,884	728,510	9,022,892	14,207	53,152	4,840	339,798
	Share	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: GSS, 2013, 2010 Population and Housing Census Demographic, Social, Economic and Housing Characteristics

The poverty ratio in Ghana decreased from 31.9% (2005-2006) to 24.2% (2012-2013). The poverty ratio has been decreasing in all regions of Ghana except the Eastern Region which increased slightly. Greater Accra had the lowest poverty rate in both periods whereas the Upper West had the highest rate.

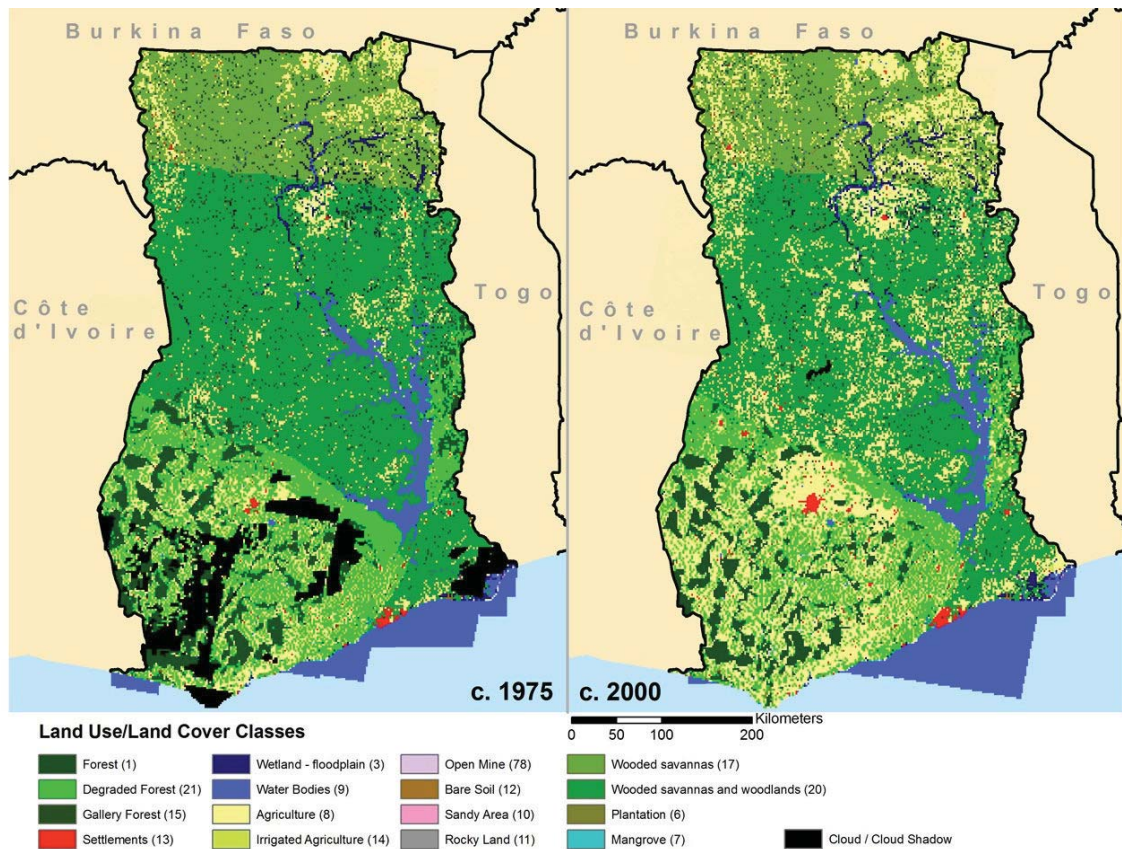
The Gini coefficients of Ghana in 2005-2006 and 2012-2013 were 41.9% and 42.3% respectively and it has slightly increased. Despite the reduction in inequality across the whole of Ghana, the Gini coefficient of the Volta Region and Upper West Region increased by almost 6% in 2012-2013 compared to 2005-2006. Looking at both the poverty rate and Gini coefficient, the Upper West Region is suffering from the worst poverty situation in Ghana.

In Ghana, there is a large regional disparity between the coastal, forest and savannah regions. All the indicators discussed above show that the regions in the north are left behind in the development in Ghana and need to implement actions which could help to rise the people above the current situation. These regions which need such actions are the Northern Region, Upper East Region and Upper West Region. In 2015, the Spatial Development Framework for the Northern Savannah Ecological Zone (2015-2035) was prepared to balance the development gap between the NSEZ (Northern Savannah Ecological Zone) and the south.

(2) Land Use

Ghana has more than 14 million ha of agriculture area, accounting for 59% of the total land area of the country. Only 56% of this area (7.8 million ha) is currently under cultivation, leaving 6.2 million ha of arable land for future development. Regarding the land use pattern of agricultural land, the approximate percentage share of annual crops, tree crops, bush fallow and other uses, and unimproved pasture area are 10%, 14%, 48% and 29% respectively according to the findings of the Medium Term Agricultural Development Programme (MTADP).

Like in many other developing countries, forest area has been rapidly changed into agriculture land in the past decades. On the other hand, in some areas such as Accra, Kumasi and Tamale, the agriculture land has been transformed into urbanized area. The agriculture land especially increased in the north east, around Kumasi and along the coast in the Western Region.



Source: USGS Land Cover Applications and Global Change

Figure 25.1.5 Changes of Land Use in Ghana from 1975 to 2000

(3) Land Disputes

The majority of lands in Ghana are still under the social system of the chieftaincy. The Ghana land system features a dualism with land governed by a pluralistic tenure system of statutory and customary law. Land rights and transactions (lease contracts) cannot be registered in the State land system (office) for securing the land right without a chief's allocation note and Asantehene's endorsement on it. As land rights are registered through this procedure, most stool land which is not yet developed is not registered in the land office of the government.

Chiefs who have the land rights are obligated to manage the land for the benefit of their people, who share a common ancestry. However, the chiefs' rights to transact in lands within their jurisdiction are not clearly stated in either statutory or customary law.

25.2 Social Development Strategies for Ghana

25.2.1 Issues regarding Social Development in Ghana

(1) Employment Creation and Industrial Promotion in Urban Areas

In urban areas of Ghana almost 70% of male EAP are engaged in informal sectors while that of females is even larger with over 80%. For the economy of Ghana to grow taking advantage of the corridor development, the transformation from informal sectors to formal sectors is important. As a result of industrial growth in urban areas, job opportunities will increase. However, it is at the same time, also important to have EAP with the skills necessary to work in the new economic structure.

(2) Basic Education Inequity

Although Ghana is one of the countries in West Africa that has the highest primary school net enrolment rate at almost 90%, the gender gap and disparities depending on the locality still exists.

While corridor development can bring development in the northern area of the country with more opportunity for work, the local people may not benefit from such development due to skills and educational backgrounds.

(3) Lack of Social Infrastructure

The rapid increase in national population is causing a lack of social infrastructure nationwide. In many urban centres, although they have some facilities, the number is not enough to support their increasing population with satisfying services. On the other hand, in the rural areas even less accessibility to social infrastructures still exists.

(4) Land for Development

Since most lands in Ghana are managed by traditional chiefs, the understanding about land use plans by chiefs is important. However, in some rapidly developing peri-urban areas, it is more attractive for chiefs to sell or lease their community lands to outsiders for personal gain, which would result in dispossession of small-scale farmers or to rapid urbanization. On the other hand, since it is only the chief who can give permission for the lease of stool land, development can be affected if there is any issue in the function of the chieftaincy.

25.2.2 Objectives for Social Development in Ghana

The following objectives are defined for the social development in Ghana:

- To increase the number of skilled workers for future development opportunities in major urban centres along the corridors
- To prepare necessary basic public facilities, such as schools and hospitals for the future increasing population
- To improve the accessibility of basic school education and health centres in rural areas

25.2.3 Strategies for Social Development in Ghana

The following strategies are formulated for social development in Ghana:

- To increase the number of secondary and tertiary education facilities in urban centres for improving the employability of EAP in the formal sectors
- To improve primary education services and primary health care services in less accessible areas by mobilizing both government and community resources and initiatives
- To establish a sufficient number of hospitals for the future population

25.2.4 Programmes and Projects for the Social Considerations in Ghana

The following projects and measures are proposed for social development in Ghana:

- Project for Strengthening Secondary Education and Vocational Education
- Project for Construction and Rehabilitation of Basic Schools and Classrooms in the Rural Areas
- Project for Health Infrastructure Development
- Project for Establishing Second Regional Hospitals in Ghana

PART VII

CORRIDOR DEVELOPMENT PLAN FOR TOGO

Chapter 26 National Development Strategies for Togo

26.1 Exiting National Development Plans

26.1.1 Review of the “Strategy on Accelerated Growth and Employment Promotion”- Stratégie de Croissance Accélérée et de Promotion de l’Emploi (SCAPE) 2013-2017

(1) Objectives of the SCAPE 2013-2017

The Strategy on Accelerated Growth and Employment Promotion (SCAPE: *Stratégie de Croissance Accélérée et de Promotion de l’Emploi*) of Togo offers a development framework for the medium term to achieve the General Political Declaration of the government, and the objectives of the Millennium Development Goals, as well as the vision of the authorities to make Togo into an emerging country within 15 to 20 years, respectful of human rights and promoting the rule of law. As such, the Togolese Government considers that there are four major challenges in the medium term for the period 2013-2017 to ensure the take-off of the Togolese economy and move towards the achievement of the Millennium Development Goals.

These are the challenges of accelerating economic growth, employment and greater regional and international integration of the Togolese economy; the challenge of governance; the socio-demographic challenge; and the challenge of urban development, spatial planning and environmental protection.

(2) Major Points of the SCAPE 2013-2017

The economic policy of the Government in the medium term for the period 2012-2016 focuses mainly on laying down and strengthening the foundations of the future emergence of Togo. For this, it moves towards establishing new priorities which are:

- Acceleration of growth;
- Employment and inclusion;
- Strengthening Governance
- Reduction of regional disparities and promoting grassroots development.

Five strategic areas have been identified for the implementation of this strategy. They complement and interact to achieve the political direction aiming at creating accelerated, inclusive and employment generating growth, these are:

- Development of high growth potential sectors;
- Strengthening economic infrastructure
- Development of human capital, social protection and employment;
- Strengthening governance;
- Promoting participatory, balanced and sustainable development.

Regarding the development of high potential growth sectors; agricultural sectors, trade, services, mining, manufacturing and tourism are considered as the main generators of strong and sustainable growth.

(3) Other Important Aspects

The SCAPE document is the result of a participatory process, and is structured around five chapters.

The first chapter traces the evolution of the economic and social situation in the past years and it draws lessons from implementation of development policies to lay the foundation for the formulation of the SCAPE.

The second chapter presents the new development strategy of Togo by identifying the five strategic areas listed above which constitute the backbone of the policy.

The third chapter presents the macroeconomic and budgetary framework, namely budgeting and funding strategy. To this end, it explores two scenarios: a moderate growth scenario said baseline scenario, which is in line with trends over the past three years and shares the same assumptions of the program negotiated with the IMF. Following this scenario the overall economic growth will strengthen over the period, with rates increasing from 5.8% in 2013 to 6.3% in 2017; an annual average of 6% over the period. An alternative scenario, named the accelerated growth scenario (6% in 2013 expected to reach 8.1% in 2017, with a 7.1% annual average over the whole period), is also envisaged. It outlines the medium-term policy that Togo must implement to be on a development path enabling it to realize its vision of economic emergence in 2030. This is the scenario of a strong and sustainable growth and shared social progress, marked by a significant decrease in underemployment, poverty and inequality.

The fourth chapter deals with the implementation of the strategy through different mechanisms and operational instruments, including priority action programmes. The fifth chapter describes the risks that could hamper the proper functioning of the development scheme.

Togo as a Corridor for development and trade

In another important aspect of the SCAPE related to the infrastructure sector, the government has strongly tried to utilize the comparative advantages of having a deep water seaport, which is the best in the sub-region, to realize a logistics corridor for development and trade. As such, Togo intends to optimize its geostrategic position in the sub-region of West Africa for more successful integration into the world economy. The development of the corridor is to be achieved through massive investment in modern infrastructure, efficient multimodal transportation between the southern zone (Lomé) and the northern zone (Cinkassé) consisting of shipping infrastructure (Lomé Autonomous Port, Port of Kpémé for phosphate loading); the road network, rail network and airports (Lomé and Niamtougou). As such, the North-South Corridor aims at transforming regions along the corridor into dynamic economic zones, prosperous and attractive.

This is a multi-sectoral project focused on the development of industrial, commercial, tourism and logistics services in addition to the development of agricultural crops following different eco-climatic areas.

Moreover, the SCAPE includes a number of cross-cutting issues among which are the population, gender, environment and AIDS. They are integrated, whenever possible, into sectoral strategies and policies.

26.1.2 Economic Growth Projected by National Development Plans for Togo

As highlighted previously, the SCAPE explores two alternative growth scenarios: a moderate growth scenario called the baseline scenario, which is in line with trends over the past three years and shares the same assumptions of the program negotiated with the IMF. Following this scenario, the overall economic growth will strengthen over the period, with rates increasing from 5.8% in 2013 to 6.3% in 2017; with an annual average of 6% over the period. The alternative scenario promoted by the SCAPE is named the accelerated growth scenario and projects an average annual economic growth of 7.1% over the whole period.

Table 26.1.1 Future GDP Growth Rates for Togo

(1) Baseline scenario						
	2012	2013	2014	2015	2016	2017
Primary sector	5.1	4.5	4.4	4.7	5.0	5.1
Secondary sector	12.4	12.3	9.9	10.9	11.1	11.2
<i>Manufacturing</i>	10.0	10.0	6.0	8.0	9.0	9.0
Tertiary sector	3.5	4.5	6.8	5.1	6.0	6.2
Real GDP	5.6	5.8	6.0	5.9	6.1	6.3

(2) Alternative scenario						
	2012	2013	2014	2015	2016	2017
Primary sector	5.1	5.3	6.1	6.5	6.6	6.9
Secondary sector	12.4	13.3	14.3	15.2	15.8	16.4
<i>Manufacturing</i>	10.0	11.5	11.8	12.1	12.1	12.2
Tertiary sector	3.5	5.9	5.9	6.4	6.4	6.5
Real GDP	5.6	6.0	6.6	7.2	7.6	8.1

Source: The Government of Togo, 2012, Accelerated Growth Strategy and Employment Promotion (SCAPE), 2013-2017

26.2 Long-Term Vision for Togo

(1) 20-Year Long-Term Vision for Togo

In accordance with the "Strategy on Accelerated Growth and Employment Promotion for the period 2013-2017" the vision for Togo is "to join the ranks of the emerging countries in 15 to 20 years' time". The main goals of the medium-term economic policy for the period 2013-2017 are "to lay and consolidate the foundations for Togo's future emergence".

To achieve this future vision, Togo will have to transform the structure of its economy significantly so as to: (i) allow the secondary sector to re-emerge, particularly the manufacturing industry; (ii) intensify the primary sector; and (iii) change the tertiary sector from being largely informal toward more profitable, professionalized services. In parallel, it will have to achieve the status of a middle-income country, in which employment and income are better distributed and poverty is no more than residual. This industrialization effort will naturally be based on development of infrastructure, improvement of business climate, reduction in input costs, and a financial system that is more innovative and open to the world and fully assumes the mission of offering financial intermediation.

(2) Vision Togo 2030

Togo government launched the process of developing a new vision for the Togolese future in September 2015. A Workshop was organized on the Development Process "VISION 2030 TOGO" in December 2015. The Executive Summary of Diagnostic Systems in Togo in the Framework of the Prospective Study "Vision Togo 2030" was published in December 2015. However, the final version of Vision Togo 2030 has not been published yet.

26.3 National-Level Spatial Development Initiatives

To ensure the durability of rapid economic expansion, the Government of Togo will seek to base the foundations of growth on development hubs that are better distributed across the country and to consolidate Togo's sub-regional economic integration by effective implementation of the strategic concept of the development corridor.

The corridor's operational objectives are in partnership with private sectors:

- To rehabilitate or upgrade the infrastructure network along the main corridor, including road and rail connections between Togo and its neighbours;
- To optimize investment in the corridor area through new opportunities to be created by the rehabilitation or upgrading of infrastructure

- To optimize opportunities for social development and for market outlets, while encouraging participation by traditionally disadvantaged communities
- To reduce regional disparities and promote grassroots development.

26.4 Population Framework for Togo

According to the 2010 population census, the national population of Togo was 6,191,155. The total population in Togo has grown rapidly in the past decades, doubling its population in the three decades between 1981 and 2010. The annual growth rate of population has been approximately 2.9% between 1981 and 2010.

Table 26.4.1 Past Population of Togo by Region (1981 and 2010)

Region	Population		Increased Population	Annual Growth Rate
	1981	2010	1981-2010	1981-2010
Maritime Region	1,040,241	2,599,955	1,559,714	3.21%
Plateaux Region	650,393	1,375,165	724,772	2.62%
Centrale Region	273,138	617,871	344,732	2.85%
Kara Region	426,651	769,940	343,289	2.06%
Savenes Region	329,144	828,224	499,080	3.23%
Total	2,219,567	6,191,155	3,471,588	2.88%

Source: Direction Générale de la Statistique et de la Comptabilité Nationale¹, 2011, Résultats définitifs du RGPH 2010

26.4.1 Future Population Projection by INSEED

The National Institute for Statistics and Economic and Demographic Studies (INSEED: *Institut National de la Statistique et des Études Économiques et Démographiques*) projects the total Ghanaian population to be 9.8 million (high variant), 9.6 million (medium variant) and 9.3 million (low variant) in 2030.

26.4.2 Two Patterns of Regional Populations for Spatial Development of Togo under the Selected Sub-Regional Corridor Development Scenario

Under the selected growth scenario (Corridor Development oriented to Sub-Regional Markets) for sub-regional corridor development, two patterns of future population by region are proposed for Togo.

- Pattern 1: Balanced Development of Major Cities along North-South Corridors and the Coastal Corridor
- Pattern 2: Concentrated Development in the Coastal Corridor

The first one is a pattern which promotes development not only in Greater Lomé, but also in major cities, such as Atapamé, Sokodé, Kara and Dapaong. The other pattern assumes that extreme concentration will occur along the coastal corridor including Greater Lomé. Based on these two patterns, two population frameworks by region for Togo are prepared as shown in Table 26.4.2.

¹ Currently known as Institut National de la Statistique et des Etudes Economiques et Démographiques (INSEED)

Chapter 27 Corridor Development Plan for Togo

27.1 SWOT Analysis for Togo in relation to Corridor Development

A SWOT Analysis for Togo was conducted in relation to corridor development as shown in the table below.

The result of the SWOT Analyses for WAGRIC countries is presented in Chapter 3.

Table 27.1.1 SWOT Analysis for Togo

Strength	Weakness
<ul style="list-style-type: none"> By taking advantage of the relatively small size of the country in terms of population (7.6 million in 2015) and territory (56,785 km²), it is possible for Togo to implement ambitious projects of port development and road development with a limited amount of budget. As a result, Togo has succeeded in formulating and implementing a logistics strategy in the context of the countries of Guinea Gulf. Under the logistics strategy, Togo has established the role of Lomé Port as one of the leading transshipment hub ports for Guinea Gulf countries. Together with the construction and operation of the highly modernized container terminal in Lomé Port, a "One Window System" is operational for import and export procedures, largely contributing to the reduction of corrupt conduct and reduction of time required for cargo handling. The trunk road of the north-south corridor connecting Lomé Port and inland countries has been steadily strengthened by improvement of the pavement and by construction of bypass roads in mountainous areas. With its proximity to Nigeria, as well as to Benin, Togo has developed inland fisheries and sales activities targeting at Nigeria's markets. Togolese people and businesses are interested in economic activities targeting at Nigeria's markets. Since Togo's cash crops, such as coffee, coco and cashew, are produced by small-scale farmers, rather than by plantations, it is possible for Togolese agriculture to use productive methods specially for targeting at special needs markets, for example, markets of organically cultivated agricultural products. Since Togo is located adjacent to Ghana, Burkina Faso, Niger and Nigeria, who compose a large consumer market of food crops, it is easier for Togo to produce and sell food crops to those neighbouring countries. 	<ul style="list-style-type: none"> Democratic elections for local assemblies have not been held yet in Togo. Establishment of a complete and stable democratic system might take time in Togo. As a result, foreign investors might not regard Togo as a stable and attractive country for their investment. Since the trunk road of the north-south corridor (Lomé-Ouagadougou Corridor) does not have much domestic cargo demand, it has to depend mostly on external cargo demand of Togo (either from inland countries or from overseas countries). Since neighbouring countries produce similar cash crops, such as cacao, coffee, oil palm and cashew, it is difficult for Togo to compete with them in terms of volume of production. Productivity of agriculture is relatively low since utilization of agricultural machines and animals for cultivation is not so popular at present. Since Togo does not have large cities and large-scale industries, it was not necessary to have large-scale power generation plants in the past. As a result, the cost for power generation within Togo is not low. Therefore, at present, stable and less costly power generation is not possible in Togo.
Opportunities	Threat
<ul style="list-style-type: none"> Greater Lomé is located within the Abidjan-Accra-Lomé-Cotonu-Lagos Corridor. After a 50km section of coastal motorway is completed, along with development of infrastructure for electricity supply and water supply, Togo's Greater Lomé could become a strategic industrial location to attract foreign investment targeting at sub-regional markets, like the other large cities of Côte d'Ivoire and Ghana. In the future, Greater Lomé would be able to play a role in manufacturing of intermediate products or spare parts to supply to Nigeria's large markets, especially Lagos, because some industrial products will be imported at Lomé Port and transported to Nigeria by road transport on the motorway. Since over a half of the arable lands are not yet cultivated in Togo, it might be possible to expand agricultural production by utilizing agricultural machines. It is possible to expand lands for agricultural production by effectively utilizing surface and ground water sources. 	<ul style="list-style-type: none"> Lomé Port has succeeded in becoming a leading hub sea port for transshipment and transit. There are possibilities for other ports of Guinea Gulf to adopt similar strategies like Lomé Port, including expansion of container terminals, strict adoption of a "One Window System." Because of such other ports' challenges, Lomé Port's position as a hub port might be threatened. There is a risk that Togo also might be targeted by terrorist attacks by West Africa interior's terrorist groups. Democratization movement against the present Togolese political system might destabilize the social and economic situation of Togo in the future. If the on-going implementation of logistics strategies (based on Lomé Port and Lomé-Ouagadougou Corridor) is not able to widely benefit the society and economy, especially inland regions of Togo, it might lead to social unrest in the future. As water demand increases due to population increase and economic growth, conflicts over water sources might increase in Togo.

Source: JICA Study Team

27.2 Objectives for Corridor Development in Togo

There are two types of corridor development that are possible in Togo. The one is north-south corridor development based on international transport corridors. The other is coastal corridor development based on the Abidjan-Accra-Lomé-Cotonu-Lagos transport corridor.

(1) Objectives for North-South Corridor Development in Togo

- To promote economic sectors development by utilizing north-south transport corridors
- To upgrade north-south corridor transport infrastructure in order to connect with Burkina Faso's transport corridor infrastructure in response to the increased corridor transport demand and for the purpose of promoting further development of the economic sectors in the northern part of the country
- To provide corridor infrastructure in order to widen the areas that can accommodate agricultural development in rural areas and manufacturing industrial development in inland regional cities
- To provide potential mineral sites with corridor infrastructure for the purpose of activating mineral resources development in inland Togo
- To contribute to wider spatial development by taking advantage of north-south corridor development within Togo

(2) Objectives for Coastal Corridor Development in Togo

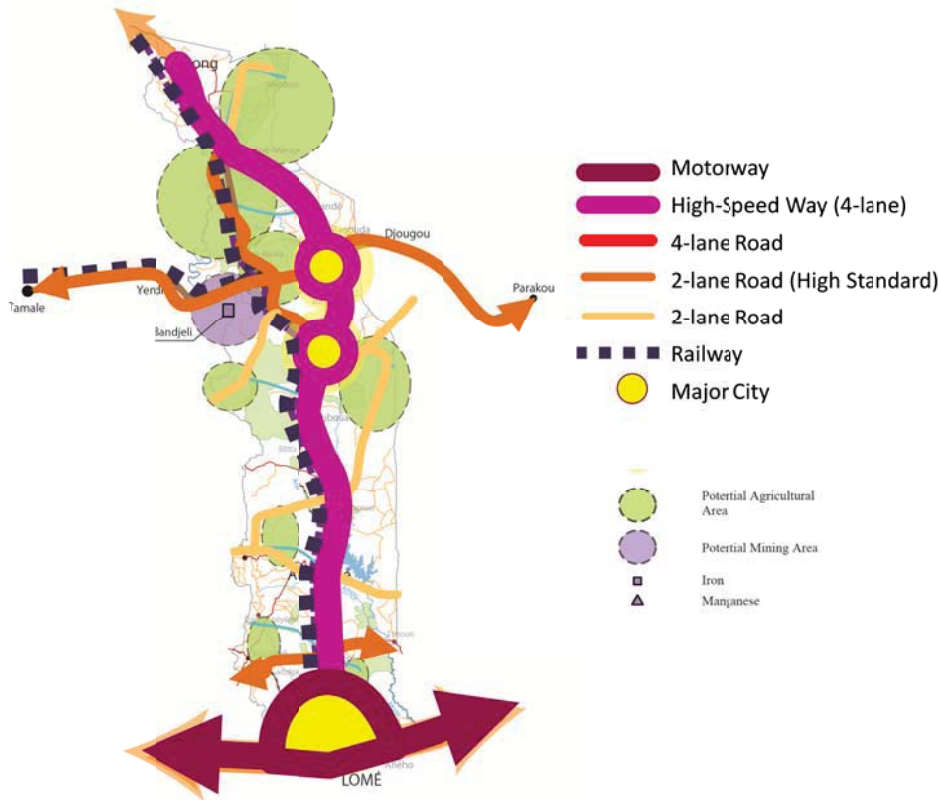
- To upgrade economic sectors development by utilizing the coastal Abidjan-Accra-Lomé-Cotonou-Lagos transport corridor by utilizing the benefits to be created by a customs union which will promote sub-regional economic integration
- To upgrade coastal corridor transport infrastructure in response to increased corridor transport demand and for the purpose of promoting further development of the economic sectors in metropolitan areas of Greater Lomé
- To provide infrastructure in order to widen areas that can accommodate not only manufacturing industrial development, but also ICT-BPO and other service sector developments in Greater Lomé
- To contribute to wider spatial development by taking advantage of coastal corridor development within Togo

27.3 Super-Long Term Pattern of Togo's Corridor Development

Based on the discussions through the meetings with Togo's stakeholders a corridor development pattern for the super long term (beyond year 2040) was prepared. The super-long term pattern of Togo's corridor development aims to achieve the following:

- Physical and economic sub-regional integration with Togo's surrounding countries including Benin
- Development of diverse economic sectors targeting both overseas markets and sub-regional markets
- Wide development in the country to improve the living standard of people in various areas of the country
- To secure high-speed transport corridors in order to attract investment in the various economic sectors

The infrastructures to be developed in the super long term are shown in the figure below.



Source: JICA Study Team

Figure 27.3.1 Togo's Super-Long Term Pattern of Corridor Development

27.4 Patterns for Corridor Development in Togo

Based on the super-long term corridor development pattern, alternative patterns for corridor development were prepared by selecting priorities to be achieved by the target year 2040

27.4.1 Patterns for Corridor Development in Togo for 2040

(1) Factors to Differentiate Corridor Development Patterns

In Togo, the following four types of factors to differentiate corridor development patterns are identified:

1) Types of Economic Sectors to be Promoted

- Economic Sectors Targeting Overseas Markets
- Economic Sectors Targeting the Markets of the Large Cities in the Neighbouring Countries
- Economic Sectors of Lomé (Advanced Services Sectors for National Markets and Manufacturing Sector targeting Sub-Regional Markets, as well as National Markets)
- Mining Sector and Agricultural Cash Crop Production Targeting Overseas Markets

2) Corridor Transport Infrastructure

- Development of corridor transport infrastructure to support the export to overseas.
 - Especially the north-south corridor connecting Ouagadougou and the Togolese hinterland in the north to Lomé Port and the coastal area.
- Development of corridor transport infrastructure to support the sales (export) to the large city markets in the neighbouring countries.

- Development of a coastal transport corridor connecting Togo with Côte d'Ivoire, Ghana, and Benin is required for promoting the sales to the large city markets in the neighbouring countries.
 - Development of urban infrastructure to support economic sectors in Greater Lomé
- 3) Economic Sector Development by Taking Advantage of Existing Corridor Infrastructure**
- Major types of agricultural sectors in the northern part of Togo
 - Both development of medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) and support to small-scale agriculture are to be equally promoted. The medium and large-scale agriculture businesses are based on foreign and domestic investment while promoting out-grower schemes.
 - Support to small-scale agriculture is emphasized with less reliance on foreign and domestic investment in the agricultural sector.
 - Major economic sectors for regional cities in the northern part of Togo:
 - Manufacturing industries and ICT and BPO industries in addition to commerce and service sectors in well-targeted regional cities, namely Kara and Sokodé
 - Mostly commercial and service sectors to support regional cities but also their surrounding rural areas, as well as additional economic sectors of ICT and BPO
 - Iron ore mining in Bandjeli is to be supported by railway development between Lomé and Kabou
 - Major economic sectors for coastal metropolitan areas along the coastal corridor, including Greater Lomé
 - To promote development of Greater Lomé by attracting and accommodating not only manufacturing industries and ICT and BPO sectors targeting sub-regional markets, but also advanced service sectors including sub-regional business functions, advanced financial services and international recreational services, in addition to the existing commerce and services

(2) Two Alternative Patterns for Corridor Development for Togo

In order to achieve development of the inland economic sectors (agriculture and agro-processing) and Greater Lomé's manufacturing and advanced services, the following two alternative patterns for corridor development in Togo are formulated:

- Togo's Corridor Development Pattern C-TG-1: Lomé-Kabou Railway Development for Iron Ore Exploitation and Lomé-Kara High-Speed Way Development, as well as Coastal East-West Motorway Development
- Togo's Corridor Development Pattern C-TG-2: Lomé-Cinkassé (National Border) Railway Development and Lomé-Sokodé High-Speed Way Development, as well as Coastal East-West Motorway Development

1) Togo's Corridor Development Pattern C-TG--1: Lomé-Kabou Railway Development for Iron Ore Exploitation and Lomé-Kara High-Speed Way Development, as well as Coastal East-West Motorway Development

Corridor Development Pattern C-TG-1 has the following characteristics in development of corridor infrastructure and economic sectors:

Economic Sectors

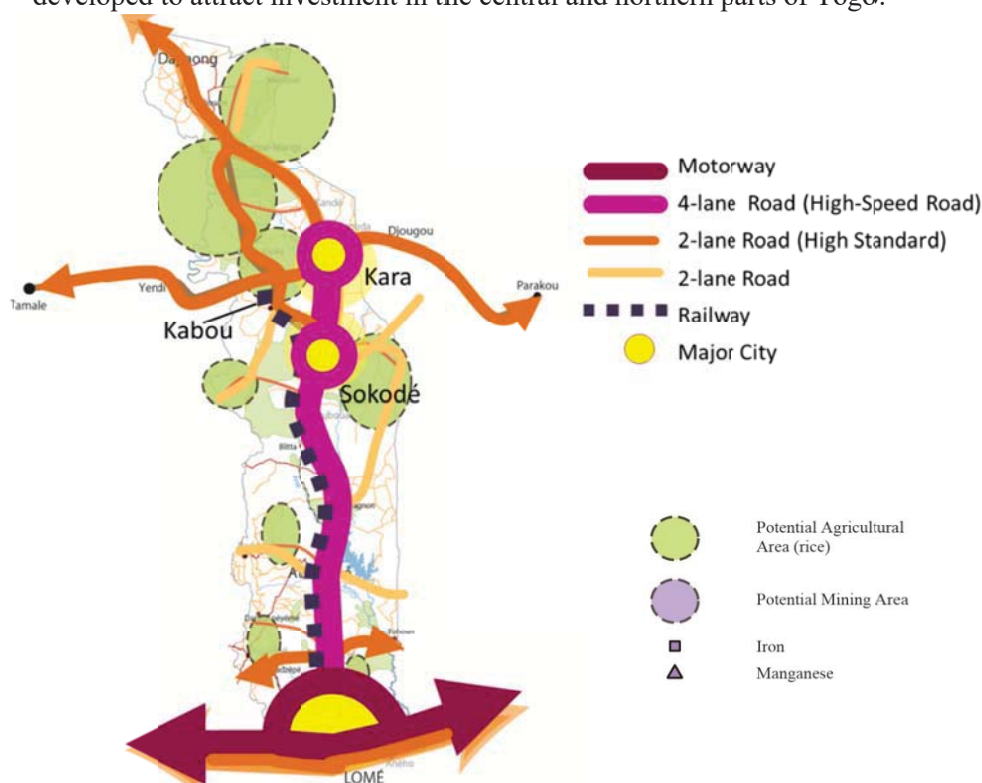
- Major types of agricultural sectors to be promoted in the central and northern parts of Togo: Medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) targeting not only domestic markets but also sub-regional markets,

especially those of neighbouring countries, such as Ghana, Benin and Nigeria, by promoting foreign and domestic investment, as well as small-scale agriculture

- Manufacturing industries in addition to commerce and service sectors in well-targeted inland regional cities, namely Kara and Sokodé
- Mining in an inland area: Iron ore exploitation in Bandjeli should be revitalized by promotion of investment in construction and operation of a north-south railway for iron ore transport.
- Major economic sectors to be promoted for the coastal metropolitan area of Greater Lomé: Not only manufacturing industries targeting sub-regional markets, but also sub-regional business functions and advanced financial services, in addition to the existing commerce and services

Development of Transport Corridor and Economic Sectors

- Development of these economic sectors targeting domestic markets and sub-regional markets is promoted by strengthening of the north-south transport corridor and coastal east-west corridor.
- The north-south transport corridor is strongly supported by construction and operation not only of a high-speed motorway between Lomé and Kara, but also of a railway between Lomé and Kabou (near Bandjeli). This north-south railway development is intended for iron ore exploitation in Bandjeli Mine. At the northern end of the railway in Kabou, a multi-modal dry port is to be established for connecting between the railway transport and truck transport not only for the northern part of Togo, but also for Burkina Faso and inland countries.
- On the other hand, a high-speed motorway between Greater Lomé and Sokodé is to be developed to attract investment in the central and northern parts of Togo.



Source: JICA Study Team

Figure 27.4.1 Togo's Corridor Development Pattern C-TG-1 in 2040

2) Togo's Corridor Development Pattern C-TG--2: Lomé-Cinkassé (National Border) Railway Development and Lomé-Sokodé High-Speed Way Development, as well as Coastal East-West Motorway Development

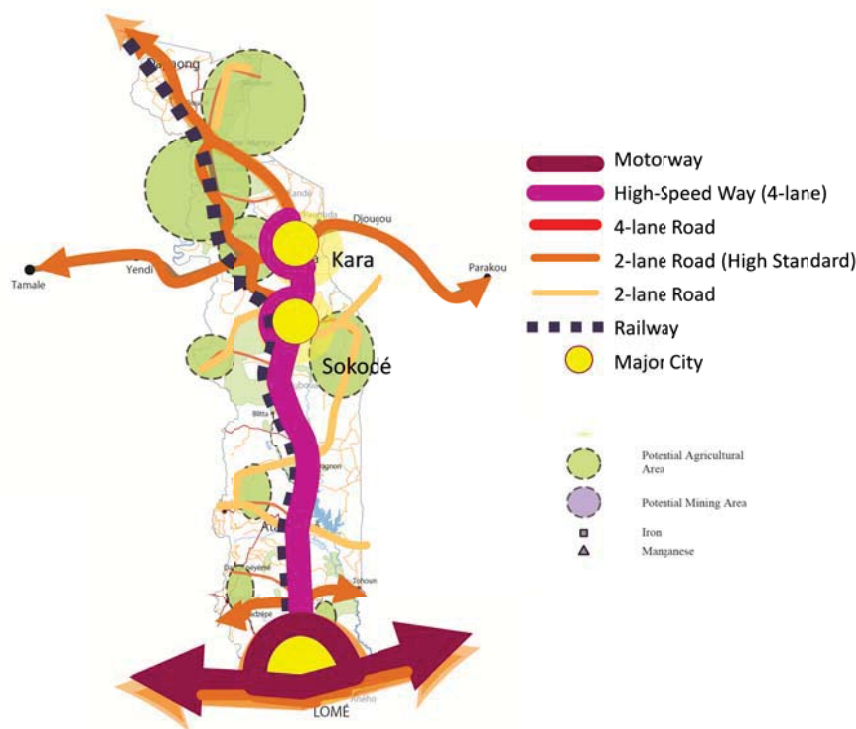
Corridor Development Pattern C-TG-2 has similar economic sectors to Pattern C-TG-1, as follows:

Economic Sectors

- Major types of agricultural sectors to be promoted in central and northern part of Togo: Medium and large-scale agriculture and agriculture-related sectors (agricultural production, processing and trading) targeting not only domestic markets but also sub-regional markets, especially those of neighbouring countries, such as Ghana, Benin and Nigeria, by promoting foreign and domestic investment, as well as small-scale agriculture
- Manufacturing industries in addition to commerce and service sectors in well-targeted inland regional cities, namely Kara and Sokodé
- Mining in an inland area: Iron ore exploitation in Bandjeli should be revitalized by promotion of investment in construction and operation of north-south railway for iron ore transport.
- Major economic sectors to be promoted for the coastal metropolitan area of Greater Lomé: Not only manufacturing industries targeting sub-regional markets, but also sub-regional business function and advanced financial services, in addition to existing commerce and services

In order to achieve the development of these economic sectors in inland and coastal areas, the following characteristics of spatial and corridor infrastructure:

- Railway is to be extended from Lomé Port up to Cinkassé (National Border). This railway development is intended to increase cargo demand for the railway, by connecting truck transport with rail transport. It is expected to increase cargo demand, including that of containers from Lomé Port to inland countries and live cattle from inland countries to coastal areas.
- High-speed Way is to be extended from Greater Lomé up to Sokodé, which is shorter than High-Speed Way of Scenario C-TG-1. This is because it is considered that it is possible to shorten travel time enough to attract investment by Lomé- Sokodé High-Speed Way.
- Coastal motorway connecting Lomé and its coastal neighbouring countries (Benin and Ghana) is to be established for expanding the economic zone reachable within 6 hours. This coastal transport corridor infrastructure could be the foundation to attract investment in manufacturing and advanced services sectors.



Source: JICA Study Team

Figure 27.4.2 Togo's Corridor Development Pattern C-TG-2 in 2040

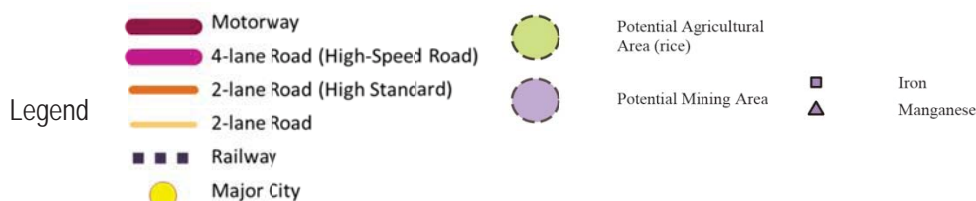
27.4.2 Comparison of Alternative Patterns for Corridor Development in Togo

The formulated alternative corridor development patterns (C-TG-1 and C-TG-2) in the previous section are compared from the following perspectives:

- Characteristics of Spatial Development
- Effect on Inland Development
- Cost Performance of Corridor Infrastructure Development for Promoting Target Economic Sectors Development

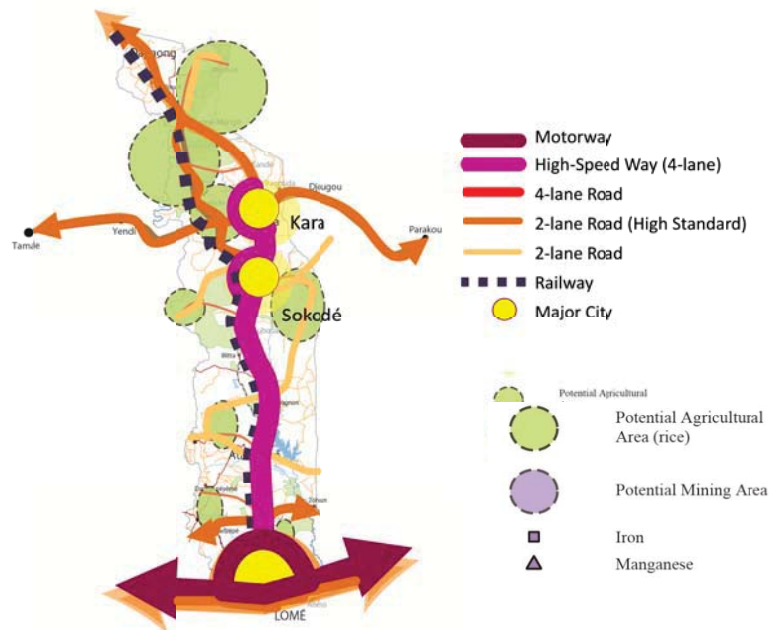
Table 27.4.1 Comparison of Alternative Patterns for Corridor Development in Togo

		Corridor Infrastructure	Target Economic Sectors
C-TG-1		<ul style="list-style-type: none"> • High-Speed Way between Greater Lomé and Kara • Strengthening of north-south transmission line (Lomé-Kara-Dapaong) • North-south railway between Lomé and Kabou (near Bandjeli) • Multi-modal dry port in Kabou • This scenario would promote inland development because iron ore mining is possible • <u>Cost performance of railway development for transporting iron ore to Lomé Port is medium because multi-modal dry port in Kabou cannot attract so much truck transport.</u> 	<ul style="list-style-type: none"> • Agricultural development is promoted in the central and northern parts by agricultural investment well supported by motorway. • Manufacturing industries (agro-processing) and commercial centre function in Kara and Sokodé (Industrial investment could be well supported by High-Speed Way.) • Iron ore mining in Bandjeli (<i>Mining development could be well supported by railway</i>) • Effect on inland development is supported by both high-speed road and railway. As a result, Scenario C-TG-1's effect on inland development is similar to that of C-TG-2.
C-TG-2		<ul style="list-style-type: none"> • High-Speed Way between Greater Lomé and Sokodé • Strengthening of north-south transmission line (Lomé-Kara-Dapaong) • North-south railway between Lomé and Cinkassé through Kabou (near Bandjeli) • Multi-modal dry port in Kabou • <u>Cost performance of railway extension from Kabou to Cinkassé is not good because the volume of container traffic related to inland countries is not large enough to make this railway extension feasible.</u> • <u>Cost performance of scenario C-TG-2 is better than Scenario C-TG-1 as railway is extended to the national border so as to attract more truck transport than C-TG-1.</u> 	<ul style="list-style-type: none"> • Agricultural development in the central and northern parts (<i>Agricultural investment could be well supported by motorway</i>) • Manufacturing industries (agro-processing) and commercial centre function in Kara and Sokodé (<i>Industrial investment could be well supported by motorway</i>) • Iron ore mining in Bandjeli (<i>Mining development could be well supported by railway</i>) • Effect on inland development is supported by both high-speed road and railway. As a result, Scenario C-TG-2's effect on inland development is similar to that of C-TG-1.



27.5 Selected Pattern for Corridor Development in Togo

Following the selected growth scenario for sub-regional corridor development (Growth Scenario 1) and based on the evaluation of alternative corridor development patterns, Corridor Development Pattern C-TG-2: “Lomé-Cinkassé (National Border) Railway Development and Lomé-Sokodé High-Speed Way Development, as well as Coastal East-West Motorway Development” has been selected for the long-term future of Togo.



Source: JICA Study Team

Figure 27.5.1 Selected Corridor Development Pattern for Togo in 2040

27.6 Phased Corridor Development Plan for Togo

(1) North-South Corridor Development

In line with the selected growth scenario for sub-regional corridor development (Growth Scenario 1), the following phased development strategies for corridor transport infrastructure and economic sectors are formulated:

- **In the short term (2017~2025) and medium term (2025~2033)**, to promote economic sectors development in inland areas of Togo by improving north-south corridor transport infrastructure based on relatively well developed main central corridor (road) and by providing additional necessary infrastructure and supporting measures.
 - In order to induce development of potential economic sectors including:
 - Improvement of east-west roads from the North-South Corridor for providing better access to agricultural potential areas
 - Investment promotion and implementation of support projects for agricultural development including Agropoles of Kara and Oti in inland areas
 - Investment promotion for manufacturing in Kara and Sokodé
 - Investment promotion and implementation of support projects for aquaculture at Nangbéto Dam and other potential areas
 - Rehabilitation of agricultural market places to facilitate linkages with neighbouring countries in inland areas

- By improving the following north-south corridor transport infrastructure:
 - Upgrading the existing road to High-Speed Way (4-lane) between Lomé and Notsé including Tsevié Bypass in order to shorten travel time from coastal areas to inland areas, so that investment to inland areas would be promoted
 - Construction of Sokodé Bypass Road in order to contribute to the speed-up of travel time to inland areas, together with Lomé and Notsé High-Speed Way
 - Improvement of east-west road connecting Kara with east side national border and west side national boarder for facilitating trade with neighbouring countries
 - Construction of fibre optic cable from Lomé to Cinkassé
 - Development of railway from Lomé to Blitta
 - Development of multi-modal transport system for combining the existing railway with track transport by construction and operation of Multi-Modal Dry Port in Blitta
 - Functionalization of Kara regional airport (Lomé- Kara line)
- By improving and constructing the following Infrastructure projects for economic sector development
 - Improvement of Road of Tchitcho - Leon – Guerin-Kouka for Kara Agropole
 - Improvement of Road of Mandouri – Sansanne and Road of Sansanne – Mango – Bauré via Gando Namoni for Oti Agropole
 - Construction of Industrial Free Zone in Sokodé
 - Construction of Connecting Line between Togo’s National Power Grid and Ghana’s national power grid
 - Expansion of Kozah Hydro Power Plant
 - Construction of Hydro Power Dam and Power Generation Plant in Adjarala
- By upgrading basic urban Infrastructure with better public services
 - Upgrading of Kara University
 - Upgrading of University Hospital of Kara
 - Upgrading of Sokodé Hospital
- So as to induce the increase of transport demand for north-south corridor transport infrastructure
- **In the medium term (2025-2033)**, to promote development of economic sectors targeting domestic markets within Togo by strengthening production, processing and marketing of crops (rice, soy bean and specialized crops marketable in the Greater Lomé area and the main cities along the central corridor)
 - In order to induce development of potential economic sectors by implementing the following:
 - Investment promotion for agricultural development including Agropoles in inland areas
 - Conducting support projects for
 - Support Project for Development for Mono Agropole (Water Resources Development and Logistics Centre)
 - Study on Development for Agropoles of Amou, Agou, Yoto and Bas-Mono
 - Investment Promotion for Manufacturing Industries in Sokodé and Kara
 - Investment Promotion for Aquaculture at Adjarala Dam
 - Support Project for Aquaculture Development at Adjarala Dam
 - Investment Promotion for Reactivating Bandjeli Iron Mine
 - Construction of Regional Markets at Kara and Sokodé
 - Development of Bandjeli Iron Mine

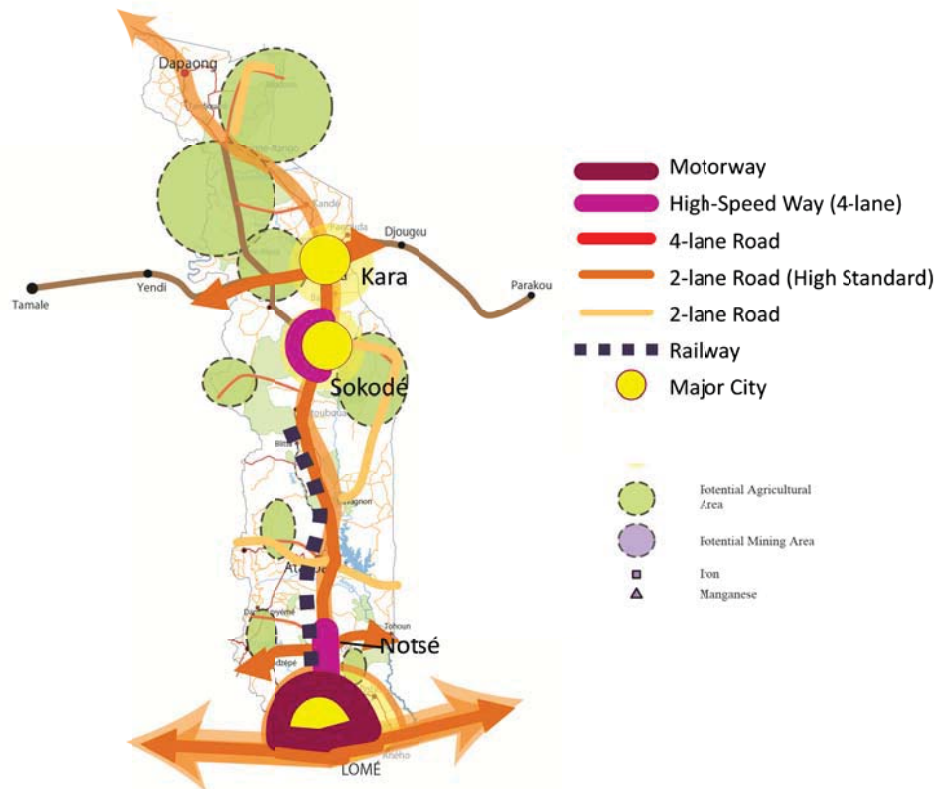
- Rehabilitation of Agricultural Markets Phase 2 (including Anié, Gaando Namoni and Cinkassé)
- By improving the following north-south corridor transport infrastructure:
 - Upgrading of North-South Road between Kara and Cinkassé
 - Upgrading of North-South Road between Sokodé and Mango via Blitta
 - Construction of Bypass Road for Kara
 - Construction of High-Speed Way from Lome to Atakpamé
 - Construction of Railway from Blitta to Kabou
 - Construction and Operation of Multi-Modal Dry Port in Kabou
 - Functionalization of Cinkassé OSBP
- By improving and constructing the following Infrastructure projects for Economic Sector Development
 - Improvement of Road of Kembole – Issati –Moretan for Mono Agropole
 - Construction of Industrial Free Zone in Kara
 - Implementation of New Water Source Development for Kara
- So as to induce the increase of transport demand for north-south corridor transport infrastructure
- **In the long term (2034-2040)**, to upgrade corridor transport infrastructure in response to transport demand to be increased by implementing strategies in the short and medium terms
 - By building the following north-south corridor transport infrastructure:
 - Construction of High-Speed Way from Atakpamé to Sokodé
 - Construction of Railway from Kabou to Cinkassé
 - Construction and Operation of Multi-Modal Dry Port in Cinkassé
 - To promote development of economic sectors targeted at sub-regional markets of the sub-regional coastal corridor (Abidjan-Accra-Lomé-Cotonu-Lagos Corridor) by upgrading coastal corridor transport infrastructure
 - In order to induce development of potential economic sectors including:
 - Investment promotion for development of agropoles in inland areas
 - Investment promotion of manufacturing in Kara and Sokodé

(2) Coastal Corridor Development

In line with the selected **growth scenario for sub-regional corridor development (Growth Scenario 1)**, the following phased development for corridor transport infrastructure and economic sectors is **Togo's coastal corridor development pattern**:

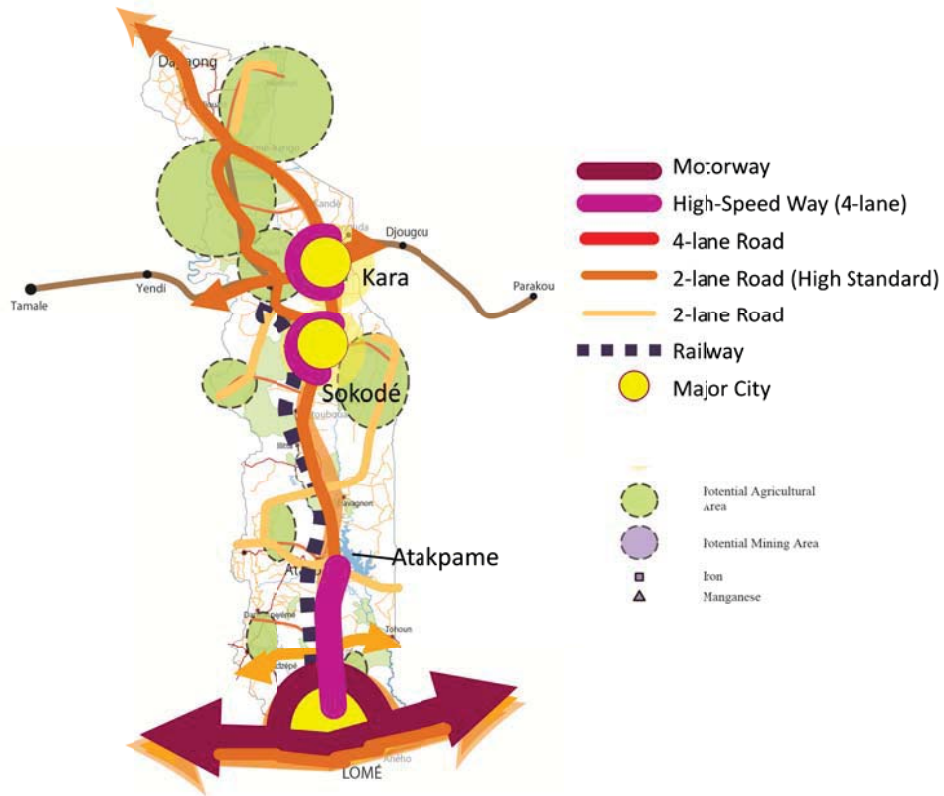
- **In the short and medium terms 2017-2025**, to promote economic sectors development in Greater Lomé area by improving coastal transport infrastructure based on relatively well developed coastal corridor (road) and by providing additional necessary infrastructure and supporting measures.
 - In order to induce development of potential economic sectors including:
 - Investment Promotion of Manufacturing and Logistics Industries in Greater Lomé
 - By improving the following north-south corridor transport infrastructure:
 - Promotion of land use restructuring of terminal and waterfront areas surrounding Lomé Port for effective port operation and for attracting enterprises of logistics industry and processing industry
 - Promotion of reduction of port charge at Lomé Port
 - Construction of logistic platforms (truck terminals) in a hinterland area of Lomé Port
 - Construction of Greater Lomé Sections of Abidjan-Lagos Motorway

- So as to induce the increase of transport demand for north-south corridor transport infrastructure
- **In the mid term 2026-2033**, to promote development of economic sectors targeted at domestic and sub-regional markets of the neighbouring countries along the coastal corridor by strengthening production, processing and marketing of crops (rice, soy bean and specialized crops marketable in the coastal corridor)
 - In order to induce development of potential economic sectors including:
 - Investment Promotion for Manufacturing and Logistics Industries in Greater Lomé
 - So as to induce the increase of transport demand for coastal corridor transport infrastructure
- **In the long term 2034-2040** to promote development of economic sectors targeted at sub-regional markets of the sub-regional coastal corridor (Abidjan-Accra-Lomé-Cotonu-Lagos Corridor)
 - In order to induce development of potential economic sectors including:
 - Investment Promotion of Manufacturing and Logistics Industries in Greater Lomé

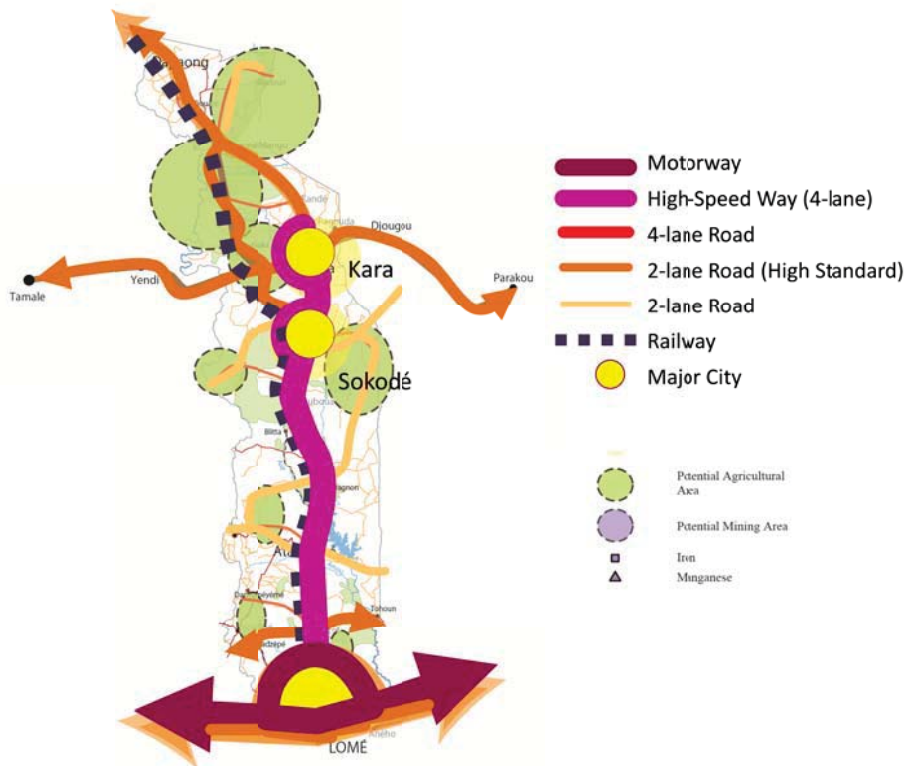


Source: JICA Study Team

Figure 27.6.1 Phased Development for North- South and Coastal Corridors in the Short Term for Year 2025



Source: JICA Study Team
Figure 27.6.2 Phased Development for North- South and Coastal Corridors in the Medium Term for Year 2033



Source: JICA Study Team
Figure 27.6.3 Phased Development for North- South and Coastal Corridors in the Long Term for Year 2040

27.7 Key Points for Togo's Corridor Development Plan

Togo's strength in corridor development is Lomé Port and Lomé-Ouagadougou Corridor. Lomé container terminal has attracted a large volume of transit cargo to landlocked countries since its open to the public in November 2014. In addition to the development of logistics businesses related to Lomé Port, Togo continues to develop a north-south road corridor of Lomé-Ouagadougou so as to develop logistics industries relying on road transport. However, countries of the Gulf of Guinea (Côte d'Ivoire, Ghana, etc.) have development plans for port expansion (Abidjan Port and Tem Port) in order to compete with the Lomé Container Terminal.

If the volume of cargo handling continues to increase at Lomé Port, traffic congestion might become more serious around the port. As a result, the competitiveness of both Lomé Port and the Lomé-Ouagadougou Corridor might be deteriorated.

However, although Togo's inland areas have agricultural development potential, it has been difficult for the inland areas to take advantage of Lomé Port and an improved road of Lomé -Ouagadougou Corridor.

Moreover, Greater Lomé is located the closest to Lagos among other major metropolitan areas along the Abidjan-Lagos Corridor, in addition to Lomé's competitive port. Therefore, Togo will be able to go beyond logistics and other service sectors, and to transform it to be a base for manufacturing sectors by taking advantage of its strategic location in the Abidjan-Lagos Corridor, when coastal metropolitan areas of Abidjan-Lagos Corridor participate in an international division of labour.

Given this situation, in order to initiate and drive corridor development, Togo should take the following measures by pushing the following three types of buttons:

[Button A]: By utilizing the strength of Lomé-Ouagadougou Corridor and Coastal Abidjan-Lagos Corridor, the development of economic sectors should be promoted in both inland areas and coastal areas, targeting sub-regional coastal markets, by making the following efforts:

- Promotion of agriculture in inland areas, targeting the sub-regional market by developing agro-poles in inland areas including infrastructure such as access roads and irrigation facilities to potential agricultural areas
- Promotion of agro-processing industries in inland areas by strengthening of infrastructure in Kara and Sokodé (major regional cities) including industrial parks
- Development of industrial and logistics parks in Greater Lomé by taking advantage of Abidjan-Lagos Coastal Motorway, which is to be developed

[Button B]: Sub-regional markets should be integrated and expanded for creating the enabling environment to attract investment to economic sectors oriented to sub-regional markets by taking the following actions:

- Strengthening of implementation of the Customs Union at national borders along Abidjan-Lagos Corridor
- Construction of strategically selected sections of the Coastal Motorway, especially the East-West Motorway in Greater Lomé, for strengthening of the logistics function and enhancing locational potentiality for manufacturing sectors in the mid and long terms

[Button C]: North-south connectivity should be strengthened for reducing transport costs and transport time for investment promotion to economic sectors in inland areas as follows:

- Improvement of traffic congestion in surrounding areas of Lomé Port for maintaining of the competitiveness of Lomé Port and Lomé-Ouagadougou Corridor
 - Development and operation of truck terminals near Lomé Port
 - Improvement of intersections near Lomé Port
 - Clearing of unnecessary land uses around Lomé Port

- Construction of a new motorway up to a new international airport
- Phased upgrading of the north-south corridor road to a 4-lane high-standard road including the construction of 4-lane bypass roads on Lomé-Ouagadougou Corridor
- Phased development of railway between Lomé (Togo) and Cinkassé (Burkina Faso) for reducing long-distance cargo transport costs and by utilizing private sectors' initiatives of iron ore mining and transport for Banjeli

27.8 Priority Projects and High Priority Projects for Togo's Corridor Development

27.8.1 Priority Projects

There is a total of 76 projects selected as priority projects to be implemented between 2018 and 2040 for Togo.

Priority projects to achieve the selected scenario by phases are listed in Table 27.8.1 through Table 27.8.3.

These priority projects are selected by using the following criteria:

- Those projects which are required for implementing the ten essential strategies
- Those projects which could initiate and drive corridor development in line with the selected growth scenario
- Those projects which needs proactive implementation, ahead of increased demand for infrastructure or production of economic sectors
- Those projects which are technically and institutionally implementable

By using these criteria, the priority projects are selected not only from newly formulated projects by WAGRIC Project, but also from existing prioritized projects by individual countries' governments.

Table 27.8.1 Short-Term Priority Projects for Togo (2018-2025)

Sector	Priority Project for Togo
Agriculture	Project for Reactivation of Planned Agricultural Zone Development (ZAAP)
	Project for Rehabilitation of Agricultural Markets Phase 1 (including Kétao and Guérin-Kouka)
	Support Project for Development for Kara Agropole (Water Resources Development and Logistics Centre)
	Support Project for Development for Oti Agropole (Water Resources Development and Logistics Centre)
	Support Project for Development for Mono Agropole (Water Resources Development and Logistics Centre)
Fishery	Support Project for Aquaculture Development at Nangbéto Dam
Manufacturing	Project for Construction of Industrial Park including Free Zone in Kara
	Project for Construction of Industrial Park including Free Zone in Sokodé
ICT	Project for Construction and Operation of Data Centre in Greater Lomé
	Project for Human Resourced Development for ICT Specialists
	Project for Improvement of ICT Connection (including Construction of Fibre Optic Cable from Lomé to Cinkassé)
Investment Promotion	Project for Promotion of Utilization of Principles of Responsible Investments to Agriculture, Livestock and Fisheries Sectors
	Investment Promotion for Development of Three Agropoles (Oti, Kara and Mono) in Inland areas
	Investment Promotion of Manufacturing and Logistics Industries in Greater Lomé
	Investment Promotion of Manufacturing in Kara and Sokodé
	Investment Promotion for Reactivating Bandjeli Iron Ore Mining and Railway Construction between Lomé and Kabou
	Investment Promotion for Aquaculture at Nangbéto Dam

Sector	Priority Project for Togo
Road	Projects for Improvement of Roads for Providing Better Access to Agricultural Potential Areas in Inland Areas <ul style="list-style-type: none"> • Improvement of Road of Borgou and Mango and Road of Baouré and Road of Mogou and Gando-Namoni for Oti Agropole • Improvement of Road of Tchitcho – Leon – Guérin-Kouka for Kara Agropole • Improvement of Road between Kambole – Bila - Goubi - Bagou - Issati –Moretan - Nyamassila for Mono Agropole • Improvement of Road between Kougnonhou and Atakpamé for Agricultural Potential Areas for Mini-Agropoles of Amou and Agou in Plateau Region • Improvement of Road between Atakpamé and Nangbéto Dam
	Projects for Construction of Abidjan-Lagos Motorway <ul style="list-style-type: none"> • Project for Construction of Greater Lomé Sections of Abidjan-Lagos Motorway
	Projects for Construction of Lomé New Airport Access Motorway <ul style="list-style-type: none"> • Project for Construction of Motorway between Lomé Bypass and New International Airport (including Tsévié Bypass)
	Projects for Upgrading to 4-Lane High-Speed Way in Lomé-Ouagadougou Corridor <ul style="list-style-type: none"> • Construction of 4-Lane High-Speed Way between Tsévié and Notsé • Construction of Sokodé Bypass Road as part of 4-Lane High-Speed Way
	Projects for Upgrading of East-West Roads <ul style="list-style-type: none"> • Project for Upgrading of East-West Road Connecting Kara with Kétau at East Side National Border (toward to Parakou of Benin) and with West Side National Border (toward to Yendi and Tamale of Ghana) • Project for Upgrading of East-West Road Connecting Notsé with East Side National Border (toward Bohicon of Benin) and with West Side National Border (toward to Ho of Ghana)
	Project for Reconstruction of Three Bridges of National Road No.1 for Strengthening of Lomé-Ouagadougou Corridor
Railway	Project for Construction of Railway from Lomé to Blitta
Sea Port	Promotion of Land Use Restructuring of Terminal and Waterfront Areas surrounding Lomé Port for Effective Port Operation and for Attracting Enterprises of Logistics Industry and Processing Industry
	Promotion of Reduction of Port Charge at Lomé Port
Logistics	Project for Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders
	Project for Operationalization of Cinkassé OSBP (National Border between Burkina Faso and Togo)
	Project for Operationalization of Noépé OSBP (National Border between Ghana and Togo)
	Project for Construction and Operation of Sanvee Condji – Hillacondji OSBP (National Border between Benin and Togo)
	Project for Construction and Operation of Logistic Platforms (Truck Terminals) in a Hinterland Area of Lomé Port
	Project for Construction and Operation of Multi-Modal Dry Port in Blitta
Air Transport	Project for Functionalization of Kara Regional Airport by Operationalizing Lomé- Kara Line)
Electricity	Project for Construction of 161kV Interconnection Line (Porga-Kompienga) with Burkina Faso
Water Resource	Sogakope – Lomé Transboundary Drinking Water Supply Project
	Study for New Water Source Development including Zio Dam and Conveyance from Mono River for Lomé Water Scheme
	Project for Expansion of Water Treatment Plant at Kozah Dam for Kara

Source: JICA Study Team

Table 27.8.2 Medium-Term Priority Projects for Togo (2026-2033)

Sector	Priority Project for Togo
Agriculture	Continuation of Support Projects for Development of Agropoles of Oti, Kara and Mono
	Study on Development for Agropoles of Amou, Agou, Yoto and Bas-Mono
	Support Project for Development of Agropoles of Amou, Agou, Yoto and Bas-Mono
	Rehabilitation of Agricultural Markets Phase 2 (including Anié, Gaando Namoni and Cinkassé)
Fishery	Support Project for Aquaculture Development at Adjarala Dam
Mining	Development of Bandjeli Iron Mine
Manufacturing	Project for Construction of Industrial and Logistics Zone along Motorway in Greater Lomé
Investment Promotion	Investment Promotion for Reactivating Bandjeli Iron Mine
	Investment Promotion for Development of Agropoles and Mini-Agropoles in Inland Areas
	Investment Promotion for Manufacturing Industries in Sokodé and Kara
	Investment Promotion for Manufacturing and Logistics Industries in Greater Lomé
	Investment Promotion for Aquaculture at Adjarala Dam
Road	Projects for Improvement of Roads for Providing Better Access to Agricultural Potential Areas <ul style="list-style-type: none"> Improvement of Road of Bassar – Mò – Tindjasse – the Western National Border with Ghana for Agricultural Potential Areas in Mò Valley of Central Region
	Projects for Improvement of North-South Road between Sokodé and Bassar
	Projects for Improvement of North-South Road between Kabou and Sansanné Mango
	Projects for Construction of Abidjan-Lagos Motorway <ul style="list-style-type: none"> Project for Construction of Togo's Central and Eastern Sections of Abidjan-Lagos Motorway
	Projects for Construction of 4-Lane High-Speed Way <ul style="list-style-type: none"> Construction of Kara Bypass Road as part of 4-Lane High-Speed Way Construction of 4-Lane High-Speed Way from Notsé to Atakpamé including Atakpamé Bypass
	Projects for Improvement of Road between Kougnonhou and Nyamassila for Agricultural Potential Areas in Plateau Region
Railway	Project for Construction and Operation of Railway from Blitta to Kabou
Logistics	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders
	Strengthening of Operation of Cinkassé OSBP (National Border between Burkina Faso and Togo)
	Strengthening of Operation of Noépé OSBP (National Border between Ghana and Togo)
	Strengthening of Operation of Sanvee Condji – Hillacondji OSBP (National Border between Benin and Togo)
	Strengthening of Operation of Noépé OSBP at the National Border with Ghana
	Strengthening of Operation of Sanvee Condji – Hillacondji OSBP at the National Border with Benin
	Project for Construction and Operation of Multi-Modal Dry Port in Kabou
	Strengthening of Operation of Cinkassé OSBP at the National Border with Burkina Faso
Electricity	Project for Construction of Adjarala Dam and Hydropower Plant
	Project for Construction of Tetetou Dam and Hydropower Plant
Water Resource	Project for New Water Source Development for Greater Lomé
	Project for New Water Source Development for Kara

Source: JICA Study Team

Table 27.8.3 Long-Term Priority Projects for Togo (2034-2040)

Sector	Priority Project for Togo
Agriculture	Continuation of Support Projects for Agropoles and Mini-Agropoles in Inland Areas
	Rehabilitation of Agricultural Markets Phase 3 (including Tchamba and Bassar)
Investment Promotion	Investment Promotion for Development of Agropoles and Mini-Agropoles in Inland areas
	Investment Promotion of Manufacturing and Logistics Industries in Greater Lomé
	Investment Promotion of Manufacturing in Kara and Sokodé
Road	Project for Construction of 4-Lane High-Speed Way from Atakpamé to Kara
Railway	Project for Construction and Operation of Railway from Kabou to Cinkasé of Burkina Faso
Logistics	Project for Construction and Operation of Multi-Modal Dry Port in Cinkasé of Burkina Faso

Source: JICA Study Team

27.8.2 High Priority Projects

Out of priority projects formulated and shown in the above sections, the thirty priority projects are selected as “High Priority Projects” for achieving the selected Scenario C-TG-2: “**Lomé-Cinkassé (National Border) Railway Development and Lomé-Sokodé High-Speed Way Development, as well as Coastal East-West Motorway Development.**”

Outlines, funding schemes and estimated project costs of the high priority projects are shown in Table 27.8.4.

Table 27.8.4 Outlines of High Priority Projects for Togo

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
1	A	1	Support Project for Development for Kara, Oti and Mono Agropoles (Water Resources Development and Logistics Centre)	ODA Technical Assistance & ODA Grant	US\$ 155 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan points out the importance of targeting sub-regional markets, especially the growing middle income populations in coastal areas.</p> <p>Togo's inland areas have potential agricultural areas, which are accessible from the road of the Lomé-Ouagadougou Corridor. Togo's Ministry of Agriculture, Livestock and Hydraulics (MAEH) has prepared integrated regional economic development projects with a focus on agriculture and infrastructure development for growth poles called “Agropoles.”</p> <p>The project aims to provide support to implementation of Agropole Development in the following three priority agropoles:</p> <ul style="list-style-type: none"> • Kara basin in Kara Region; • Oti basin in the Savannah Region; and • Headwaters of the Mono basin, located in the Central and Plateaux Regions. <p>The projects are to consist of four components, namely, i) infrastructure development, ii) support for private Initiative development, iii) reinforcement of capacities and iv) project management.</p> <p><u>Kara Agropole</u> has the following target crops, livestock and fish:</p> <ul style="list-style-type: none"> • Targeted Crops: Sesame, Ground nuts (for export), Rice (for domestic supply) • Targeted Livestock: Poultry (for domestic supply), Guinea fowl, Pigs • Target Fish: Catfish (for export) <p><u>Oti Agropole</u> has the following target crops and livestock:</p> <ul style="list-style-type: none"> • Target crops: Rice, Sugar cane, (mostly for domestic supply) • Target livestock: Guinea fowl (pintade), Cattle (for domestic supply) <p><u>Mono Agropole</u> has the following target crops:</p> <ul style="list-style-type: none"> • Target crops: Soy bean, Cashew nuts, Sesame (for export) <p>The rehabilitation or development of rural roads and irrigation are indispensable for the agropole development. This will be done by the government. On the other hand, development and improvement of extension service, post-harvest, processing and trading are expected to be implemented by the private sector. Other cross-sectoral activities, such as training and research, mobilization and awareness making of producers and establishment of service centres are also planned.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
2	A	1	Project for Construction of Industrial Park along the Motorway in Greater Lomé	ODA Loan or PPP	US\$ 70 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply, industrial parks and ICT.</p> <p>Considering the current economic and infrastructure situation, the government policies are based on the understanding that Togo should seek strengthening of service industries, including logistics. However, in accordance with the SCAPE (Togo's national development plan), development of the manufacturing sector is one of the pillars for national development.</p> <p>The Ministry of Commerce, Industry Private Sector Promotion and Tourism has a plan for developing industrial parks with export processing zones in the following locations:</p> <ul style="list-style-type: none"> • Adetikopé Free Zone (80 ha) : 18 km from Lomé • Tsévié Free Zone (100 ha): 32 km from Lomé • Kanykpedji Free Zone (200 ha): 55 km north of Lomé <p>The Agency for Investment Promotion and Free Zones (API-ZF. <i>Agence de Promotion des Investissements et des Zones Franches</i>) is in charge of implementation of the projects for construction and management of industrial parks, by utilizing a PPP scheme.</p> <p>Greater Lomé is one of the important industrial centres in the country. The population of Greater Lomé was 2.0 million in 2015. It is forecast that Greater Lomé's population is to be 5.0 million by 2040.</p> <p>The project aims to construct and manage an industrial and logistics park, which is to be located along the prospective sections of the Abidjan-Lagos Motorway. This project is based on the strategic location of Greater Lomé that is not only close to Greater Accra (197 km from Lomé), but also to Greater Lagos (273 km from Lomé).</p> <p>The project will start with land of 100 ha at the initial phase. Then this project will continue to expand its size of industrial park up to 500 ha or more, for the purpose of attracting manufacturing and logistics industries. The project will provide divided lots with adequate infrastructure including electricity, water drainage and telecommunications. The project will also provide management services for factories in the industrial park.</p>					
3	A	1	Project for Construction of Industrial Park in Kara	ODA Loan	US\$ 25 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply, industrial parks and ICT.</p> <p>The population of Kara City was 117,000 in 2015. It is forecast that Kara's population is to be 334,000 by 2040. Kara is located on the Lomé-Ouagadougou Corridor. By upgrading of the road of the Lomé-Ouagadougou Corridor, and by providing economic infrastructures, Kara will be able to play a role of one of the major regional centres and agricultural, industrial, logistical, and commercial centres in the northern areas of Togo.</p> <p>The project aims to construct and manage an industrial park in Kara for the purpose of attracting investment for manufacturing sectors including agro-processing industries utilizing local products. The project will provide divided lots</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
<p>with adequate infrastructure including electricity, water drainage and telecommunications. The project will also provide management services for factories in the industrial park.</p> <p>The Agency for Investment Promotion and Free Zones (API-ZF) will be in charge of developing the industrial park (35 ha) in Kara by promoting a PPP scheme.</p>					
4	A	1	Project for Construction of Industrial Park in Sokodé	ODA Loan	US\$ 25 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply, industrial parks and ICT.</p> <p>The population of Sokodé City was 119,000 in 2015. It is forecast that Sokodé's population is to be 343,000 by 2040. Sokodé is located on the Lomé-Ouagadougou Corridor. By upgrading of the road of the Lomé-Ouagadougou Corridor, and by providing economic infrastructures, Sokodé will be able to play a role of one of the major regional centres and agricultural, industrial, logistical, and commercial centres in the northern areas of Togo.</p> <p>The project aims to construct and manage an industrial park in Sokodé for the purpose of attracting investment for manufacturing sectors including agro-processing industries utilizing local products. The project will provide divided lots with adequate infrastructure including electricity, water drainage and telecommunications. The project will also provide management services for factories in the industrial park.</p> <p>The Agency for Investment Promotion and Free Zones (API-ZF) will be in charge of developing the industrial park (35 ha) in Sokodé by promoting a PPP scheme.</p>					
5	A	2	Investment Promotion for Economic Sectors targeting Sub-Regional Markets	ODA Technical Assistance	US\$ 4 million
<p><u>Project Outline</u></p> <p>Private investment has been attracted mostly to the mining sector in Togo. However, not much attention has been paid to the growth potential of Togo's economic sectors targeting coastal markets in the sub-region.</p> <p>By taking advantage of the possibility to integrate and expand the size of sub-regional consumers' markets, it is possible for the Agency for Investment Promotion and Free Zones (Agence de Promotion des Investissements et des Zones Franches, API-ZF) to attract investment to economic sectors targeting sub-regional consumers' markets. Such target economic sectors include those of agriculture, fisheries and agro-processing.</p> <p>The project aims to making a clear shift of investment promotion toward economic sectors orientated to sub-regional markets. For this purpose, the project will prepare new promotion materials, provide training to related agencies and personnel and implement actual activities for investment promotion.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
6	A	3	Projects for Improvement of Roads for Providing Better Access to Potential Agricultural Areas in Inland Areas (for Kara, Oti and Mono Agropoles)	ODA Grant	US\$ 475 million
<p><u>Project Outline</u></p> <p>The size of the coastal consumers' markets is increasing within Togo, and neighbouring coastal markets are expected to become integrated with Togo within the sub-region through the customs union. Because of this situation, Togo, as well as other WAGRIC countries, has the potential to develop economic sectors, both in coastal areas and inland areas, targeting these integrated and expanded coastal markets of the sub-region. Moreover, the roads of Lomé-Ouagadougou Corridor are relatively good and usable for promoting inland development, while the WAGRIC Master Plan strongly recommends the upgrading of the existing roads of Lomé-Ouagadougou Corridor to high-standard four-lane roads.</p> <p>The WAGRIC Master Plan points out the possibility to attract investment to agriculture by providing improved access roads to potential agricultural areas, as well as by providing other infrastructure, such as irrigation schemes.</p> <p>The projects aim to improve the following access roads to three agropoles (Oti, Kara and Mono agropoles), which are prioritized potential agricultural areas:</p> <ul style="list-style-type: none"> • Improvement of Road of Borgou and Mango and Road of Baouré and Road of Mogou and Gando-Namoni for Oti Agropole • Improvement of Road of Tchitcho – Leon – Guérin-Kouka for Kara Agropole • Improvement of Road between Kambole – Bila - Goubi - Bagou - Issati –Moretan - Nyamassila for Mono Agropole • Improvement of Road between Kougnonhou and Atakpamé for Agricultural Potential Areas for Mini-Agropoles of Amou and Agou in Plateau Region • Improvement of Road between Atakpamé and Nangbéto Dam • Improvement of Road of Bassar – Mô – Tindjasse – the Western National Border with Ghana for Agricultural Potential Areas in Mô Valley of Central Region <p>These projects are in line with the national policy on agropole development of Togolese government.</p>					
7	A	3	Project for Construction of Adjarala Dam and Hydropower Plant	ODA Loan	US\$ 400 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.</p> <p>The power demand in Togo has steadily increased due to Togo's economic growth. In fact, the annual growth rate of the peak demand for 2014 in Togo was approximately 12%. This was the highest level of annual growth rate among the WAGRIC countries.</p> <p>About 70% of power demand was satisfied by the Togolese power plants. Approximately 30% of the power demand is met by importing from Côte d'Ivoire through Ghana and Nigeria. However, due to the unstable power supply, especially from Nigeria, it is required for Togo to improve the quality of its power supply.</p> <p>Policies for development of Togolese power systems place great importance on attracting both foreign and domestic investors for establishing power plants. While an electricity company (CEB) supplies electricity to Togo and Benin, the national economies of the two countries are not large enough to build a large thermal power generation using imported fuels. Therefore, it is necessary for Togo to utilize its natural sources of energy for power generation and to reduce the financial burden on power consumers. The water resources that could be utilized are found in the mountainous areas</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
<p>located in the eastern part of Togo. Currently Togolese government's power development strategy focuses on the hydroelectric potential in the Mono river basin.</p> <p>The project aims to construct Adjarala Dam (40-meter-tall rock and earth dam) on the Mono River, a hydropower plant (147 MW) and a transmission line for increasing Togo's own power generation.</p>					
8	A	3	Project for Construction and Management of Data Centre in Lomé	ODA Technical Assistance & ODA Grant	US\$ 15 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan points out the importance of developing economic sectors targeting sub-regional markets, especially the growing middle-income populations in coastal areas. The WAGRIC Master Plan pays attention to both inland areas and coastal areas for developing economic sectors.</p> <p>Information and Communication Technology (ICT) is an important growth driver among the economic sectors to promote economic development, as well as to support various other sectors. ICT infrastructure is one of the most important corridor infrastructures when it comes to high speed transport and services for strengthening the north-south connectivity between inland areas and coastal areas. It is essential to attract investments to economic sectors in inland areas, as well as in coastal areas.</p> <p>The project aims to establish a data centre located in Greater Lomé. The data centre will provide a back-up of international standards of security and accommodate a large volume of data and computer applications in an environment with strict standards. The data centre is to provide various types of ICT services not only to the public sector, but also to private sector entities. The data centre will be the nerve centre of the government intranet, especially in the context of prospective development of e-Government.</p> <p>This type of ICT-related facility is also important for providing job opportunities for ICT specialists.</p>					
9	B	4	Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders	ODA Technical Assistance	US\$ 4 million
<p><u>Project Outline</u></p> <p>In addition to logistics industry and export of primary commodities (minerals and agricultural products), it is necessary for Togo to diversify economic sectors. The WAGRIC Master Plan recommends paying attention to the potential of economic sectors both in coastal areas and inland areas, by targeting growing sub-regional markets and taking advantage of the customs union which has been institutionalized by UEMOA and ECOWAS.</p> <p>For this purpose, it is necessary to strengthen the implementation of the customs union by taking advantage of the customs union, which has been institutionalized by the member countries of UEMOA and ECOWAS.</p> <p>The project aims at enforcement of implementation of the customs union and trade facilitating for sub-regional products with neighbouring countries of the sub-region, especially with Ghana and Benin, along Abidjan-Lagos Corridor. The project will be applied to the national border with Burkina Faso along Lomé-Ouagadougou Corridor.</p> <p>The project will establish new materials for training and train related agencies and personnel. Campaigns for customs union trade facilitation of sub-regional products will also be implemented together with WAGRIC countries and its surrounding countries under this project.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
10	B	5	Project for Construction of Greater Lomé Sections of Abidjan-Lagos Motorway	ODA Loan	US\$ 294 million
<p><u>Project Outline</u></p> <p>Togo's potential to develop economic sectors is limited in the case of targeting its own domestic consumers' markets. However, such potential would be enhanced greatly by targeting the sub-regional markets through integration with neighbouring countries' markets. This market integration will become possible by upgrading transportation along the coastal east-west corridor (Abidjan-Lagos Corridor), as well as strengthening of implementation of the customs union.</p> <p>The upgrading of transportation along Abidjan-Lagos Corridor would become possible by construction of strategically selected sections of the Abidjan-Lagos Motorway. The WAGRIC Master Plan strongly recommends locating the route of the Abidjan-Lagos Motorway Sections of Togo closer to the urbanization areas of Greater Lomé as much as possible.</p> <p>The most important section of the Abidjan-Lagos Motorway for Togo is the motorway sections between the national border of Noepe and northern part of Greater Lomé.</p> <p>The project aims to construct the sections (30km) of Greater Lomé of the Abidjan-Lagos Motorway for the following purposes:</p> <ul style="list-style-type: none"> • To connect the central area of Greater Lomé with Noepe, (national border with Ghana) on the Abidjan-Lagos Corridor • To connect the central area of Greater Lomé with Togo's eastern part of the coastal area on the Abidjan-Lagos Corridor 					
11	C	6	Investment Promotion for Reactivating Bandjeli Iron Ore Mining and Railway Construction between Lomé and Kabou (410 km)	PPP	US\$ 1,214 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan points out the importance of economic sectors targeting sub-regional markets for seeking balanced development between inland areas and coastal areas. However, at the same time, it is important for individual countries of the WAGRIC Sub-Region to expand the production of primary commodities, such as minerals and agricultural products.</p> <p>Bandjeli has 800 million tons of iron ore deposits. Annual production of iron ore from Bandjeli Mine might be 100,000 tons per year. Currently the exploitation of iron ore has been stopped due to low metal prices. The government has considered removing some portion of the exploitation license from the current concessioner.</p> <p>The project aims to attract private investment to revitalize the operation of Bandjeli Iron Mine and to facilitate a PPP scheme for constructing a railway between Lomé and Kabou and a railway between Kabou and Bandjeli Mine</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
12	C	7	Construction of Sokodé Bypass Road as part of 4-Lane High-Standard Road (10km)	ODA Grant	US\$ 53 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends establishing high-speed transportation in the north-south corridor for strengthening the connectivity between inland areas and coastal areas. The north-south high-speed transportation is important for attracting investment to economic sectors targeting sub-regional markets, while the establishment of efficient and low-cost cargo transportation in the north-south corridor is required for establishing an enabling environment for competitive business operation.</p> <p>The government of Togo started upgrading the national road to a high-standard four-lane road from Lomé toward Atakpamé, including providing by-pass roads.</p> <p>In response to the prospective increase of road traffic on the Lomé-Ouagadougou Corridor, as well as within Sokodé, it will be necessary to extend the four-lane high-standard road on the Lomé-Ouagadougou Corridor for shortening the travel time between inland areas and coastal areas. This kind of high-speed transportation is necessary to attract investment in the agriculture and agro-processing sectors in inland areas, especially those targeting coastal markets.</p> <p>The population of Sokodé was 119,000 in 2015. It is forecast to be 343,000 by 2040. Together with Kara, Sokodé is expected to play an important role as a major regional city and economic centre accommodating agro-processing industries and commercial/service functions.</p> <p>The project aims to construct a 4-lane high-standard bypass road (about 10km) for Sokodé. Along the Sokodé Bypass Road to be constructed by this project, land development is possible for industrial and logistics land use.</p>					
13	C	7	Project for Construction of Motorway between Lomé Bypass and New International Airport (including Tsévié Bypass)	ODA Loan or PPP	US\$ 153 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan recommends establishing high-speed transportation in the north-south corridor for strengthening the connectivity between inland areas and coastal areas. The north-south high-speed transportation is important for attracting investment to economic sectors targeting sub-regional markets, while the establishment of efficient and low-cost cargo transportation in the north-south corridor is required for establishing an enabling environment for competitive business operation.</p> <p>The government of Togo started upgrading the national road to a high-standard four-lane road from Lomé toward Atakpamé, including providing by-pass roads. In response to the prospective increase of road traffic on the Lomé-Ouagadougou Corridor, as well as within the Greater Lomé, it will be necessary to construct a motorway from Lomé to Tsévié for the following two purposes:</p> <ul style="list-style-type: none"> • To create another exit road from Greater Lomé to the north • To provide high-speed transportation from the central area of Lomé to the new International Airport, which is planned near Tsévié for the future <p>This kind of high-speed transportation is necessary to attract investment for the economic sectors in inland areas, especially those targeting coastal markets. In addition to reduction of travel time, the extension of a high-standard road could reduce vehicle costs.</p>					

No.	Buttons	Essential Strategies	Projects	Funding Scheme	Estimated Cost
14	C	7	Project for Construction of Optic Fibre Cable in the North-South Corridor	ODA Loan	US\$ 40 million
<p><u>Project Outline</u></p> <p>The WAGRIC Master Plan points out the importance of developing economic sectors targeting sub-regional markets, especially the growing middle-income populations in coastal areas. The WAGRIC Master Plan pays attention both to inland areas and coastal areas for developing economic sectors.</p> <p>Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply, industrial parks and ICT infrastructure.</p> <p>Moreover, ICT infrastructure is one of the important corridor infrastructures when it comes to high speed transport and services for strengthening of north-south connectivity between inland areas and coastal areas. It is essential to attract investments to economic sectors in inland areas, as well as in coastal areas.</p> <p>The project aims to extend and strengthen the optic fibre cable in the north-south corridor (Lomé-Ouagadougou Corridor).</p>					
			Total		US\$ 2,921 million

Chapter 28 Development Strategies for Economic Sectors of Togo

28.1 Agriculture Sector of Togo

28.1.1 Present Situation and Future Prospects of Agriculture Sector of Togo

Agriculture plays the most important role in the economy of Togo, which always produces over 40% of GDP and employs 70% of the economically active population in the country and 90% in rural areas. It is said that the agricultural production, in particular cereals and food crops, are in oversupply. Moreover, underused arable land still exists, so the agriculture still has a big potential to increase its production and even supply food to other neighbouring countries, but as yet, not many private investors have not participated. However, the traditional rain-fed and manual agriculture is still the majority, accounting for more than 85% of all crops grown. This means that the agricultural production is dependent on the environmental conditions and rainfall; some areas produce more crops than are consumed, while other areas always suffer from poor harvest. Some areas are isolated and it is hard for the producers to gain access to the markets due to lack of rural/regional roads.

Even though the country is conveniently located between big food consumer countries, it always happens that food produced in this country flows informally right after harvest time to the big consumer countries such as Côte d'Ivoire, Ghana and Nigeria due to the lack of accessible logistical infrastructure for trading agricultural products properly. Thus, the food supply is unbalanced in the country, and the related industry is hard to develop. In consequence, the sector has not contributed to the national and rural economic development sufficiently. In order to improve the current situation and to develop the agricultural sector rapidly, the government of Togo worked out a new agricultural policy for the period 2016-2030 called PA-PSTAT2030 (*Politique Agricole assortie d'un Plan Stratégique pour la Transformation de l'Agriculture à l'Horizon 2030*). Aiming at food security and properly balancing agricultural trade, the government is to create a favourable environment for agricultural production and business such as rural infrastructures, access facilitation of inputs and technology and set up related financial and informatics services.

As an important player, the private *sector* should be involved in the agricultural development to provide investment for production, processing, and marketing by creating related industries. This is how Togo envisages its modernised and sustainable, high value agriculture to contribute to economic growth, poverty reduction and living condition improvement in the country.

28.1.2 Issues regarding Agriculture Sector of Togo

The main issue to be improved is unbalanced food crops and underdevelopment of related industry in the country. Deepening the causal interdependence, three major correlation issues are raised as follows.

(1) Underdeveloped /Non-rehabilitated Infrastructures related to Agriculture Production and Trade

This is one of the major problems that impede agricultural development, which limits farming activities, especially in the value addition and marketing of agricultural products. The national road No.1 is developed relatively well crossing the country, however, regional roads and rural tracks which connect to the national roads are not well developed or need to be rehabilitated. For that reason, many rural areas are isolated and it is difficult to get access to agricultural inputs and

materials and technical information for better agricultural practice. The agricultural production is not sufficient to supply rural peoples' food.

On the other hand, some rural areas have an abundance of agricultural production but are isolated, and it is hard for them to access domestic food markets. Additionally, most of them or their cooperatives do not even have a warehouse to stock and condition agricultural products for marketing and shipment adjustment. As a consequence, they tend to sell their products right after harvest at a cheap price to the closest markets even if they are in a neighbouring country. Thus, the agricultural production, even in abundance, does not contribute to food security in the country or the generation of income as much as it could by utilising the market more efficiently.

(2) Limited Farming Activities

Outside of commercial farms, farming activities are limited because of several factors such as lack of inputs and modern technique application, lack of workforce, lack of meccanization and lack of appropriate water management methods and structures, especially irrigation facilities. These issues are described as follows:

- Lack of inputs and modern technique application: Like the neighbouring countries, agricultural inputs are too expensive to use every cropping season due to the transport cost in the less accessible areas. Unlike other countries, large ruminant animals, especially cattle and donkeys are scarce in Togo. Thus, animal manure is barely used as organic fertilizer.
- Lack of workforce and meccanization: Due to the small number of cattle and donkeys owned in Togo, animal powered ploughing is practiced on only 10% of farmlands. Agricultural producers can only cultivate 0.5-1.0 ha, with 0.8ha the average in the country, using hand tools powered by family members. As a consequence, the agricultural productivity is low and one hectare of Togolese farmland generates only 15,000FCFA per annum (equivalent to approximately 24USD).
- Lack of appropriate water management and structures, especially irrigation facilities: In recent years, the agricultural production has become unstable due to climate change, and the producers are not able to practice market-oriented agriculture including planning of production, trading and food processing.
- Regarding the processing, it is noted that value addition activities are restrained by lack of basic infrastructure like water and electric supply, logistic and financial services to start new activities and development of rural entrepreneurship etc.

(3) Information Gap ("Information Symmetry") between Famers and Market Traders

Since rural roads connecting to main roads are underdeveloped or not rehabilitated, the producers in less accessible areas cannot access information regarding market prices that the traders call 'Information Symmetry'. This hinders producers from 'Fair Trade', selling their products at appropriate prices and from recognizing the market demand in terms of quantity and quality.

However, food demand is high at certain times and in some places in and outside the country. For instance, Dapaong and Kara sometimes suffer from food shortage when drought comes. Ghana and Nigeria via Benin always imports a large amount of pulse crops. If the producers have access to such information, they may be able to sell their products at the best time when the demand and price are high, and gain reasonable income.

Also they are not able to produce what the market demands since they do not know what that is. With the lack of rural tracks and telecommunication (ICT) facilities, the agricultural products are sold after several days of transportation and do not meet the market demand. Thus, local products are traded with a reputation of low quality and cheap products, traders do not look for the certain quality of products, so called 'Adverse Selection'. In fact, urban consumers prefer imported products to local ones even when there are no differences in quality.

28.1.3 Objectives for Agriculture Sector of Togo

The overall objective for the agriculture sector is to correct the distribution balance of agricultural products within the country for food security in the first place. And then the agriculture related industry should also be developed for income generation and poverty reduction in rural areas. Under these overall objectives, detailed objectives are defined as follows:

- To enhance agricultural production and productivity of high demanded crops
- To improve/create a favourable environment for agricultural trade and related industry development
- To facilitate good distribution of agricultural products and processed ones which are oriented to domestic and sub-regional markets

These objectives are prepared to seek well-balanced development between inland and coastal areas.

28.1.4 Strategies for Agriculture Sector of Togo

In order to achieve the above mentioned objectives, the strategies and necessary measures by the government which utilise the strengths and opportunities of the agriculture sector of Togo are formulated as follows:

- To increase agricultural production and productivity of highly demanded food crops not only within Togo but also in the sub-region:
 - by improving accessibility to agricultural inputs, materials, and machinery service
 - by rehabilitating and developing irrigation facilities and introducing efficient water use
 - by enhancing public service/training for sustainable and environmentally-friendly production etc.
- To revitalise local agricultural markets which are connected to the sub-regional countries
 - by rehabilitating and developing regional and rural roads to connect with National Road No.1
 - by rehabilitating and developing basic rural infrastructure such as water supply, electric facilities, telecommunications, etc.
 - by rehabilitating and developing market facilities and logistics, etc.
- To attract private investors and to create rural entrepreneurship like ESOP (Enterprise Service and Producers Organization: *Entreprises de Services et Organisations de Producteurs*)
 - by solving land expropriation issues and arranging farmland for newcomers,
 - by establishing and/or arranging a legal system related to investment of the private sector and to create entrepreneurs in rural areas
 - by rehabilitating and developing access roads to the production place and markets etc.

28.1.5 Programmes and Projects for Agriculture Sector of Togo for the Long-Term

In order to achieve the objectives defined for the agriculture sector of Togo, it is desirable to implement projects that realise integrated agricultural development which can improve the fundamental issues based on the strategies.

Table 28.1.1 Integrated Projects for the Long Term in the Agricultural Sector in Togo

Projects	Main Activities	Status
PDRI-MÔ (Rural Development Project in the MÔ plain) :on-going project 2014-2020	Rural development project with multi sectorial activities; organization of village people and cooperatives, construction of class rooms to teach literacy, input and material supply, research on agricultural techniques , construction of warehouses, rural tracks and water supply systems. Irrigation and land development done by the ZAAP.	On going
ZAAP (Planned Agricultural Zones Development): on-going project 2011-	1)Land security (coordination among land owners and farmers), 2)Development of irrigation facilities with management techniques, 3)Establishment of producers' cooperatives, 4)Development of warehouses and drying machinery, 6)Introduction of financial institutions and 7)Protection of the environment	On going
PRODAT(Agropole Development Project in Togo) in Kara	Involving private sectors to establish Sesame value chine; reinforcement of the production through enlargement of production area, construction of processing factory and introduction or processing, and basic infrastructure; electricity, water supply, ITC and rural tracks. PDPR-K can be included in the project.	Planned
PRODAT(Agropole Development Project in Togo) in Oti	Involving private sectors, to develop Rice, production; reinforcement of the production through enlargement of the production area by the ZAAP, and development of electricity and ITC along with livestock and fishery development. PDR-Oti and PATA-Oti can be included in the project.	Planned
PRODAT(Agropole Development Project in Togo) in (Haut) Mono	Extension of good practice in the ESOP and private investors which have already operated in the area, to develop Cashew value chine, production; reinforcement of the production through development of rural tracks, electricity and ITC	Planned
PRODAT (Agropole Development Project in Togo) in Amou, Agou, Yoto, ,Bas-mono, Kovié, Djangblé et Agoméglouzou	The details are to be determined. As all locations are famous for rice and vegetable production, it is expected that the strengthening of a value chain of those crops through the rehabilitation and reconstruction of production base and facilities including logistic infrastructures will be effective	Planned
Market oriented peri-urban agricultural development with private sector	Introducing market oriented products, esp. vegetables and fruits in enclosed areas relatively close to Lomé and Kara through rehabilitation of the watering points and rural tracks. Marketing facilities, information and distribution systems are also introduced.	Proposed by JICA study team based on the strategy of MAEP

Source: MAEH and JICA Study Team

Table 28.1.2 Specific Projects for the Long Term on the Agricultural Sector in Togo

Projects	Contents	Status
Project on professionalization of rural people (PNPER):on-going project 2015-2020)	Training on professionalization for agricultural producers for stable production and development of related industry such as processing. There are 3 components ; Component 1: Facilitating access to non-financial services Component 2: Facilitating access to financial services Component3: Coordination, monitoring and evaluation of the project and knowledge management	On -going
Extension of ESOP organization for value chain development	Development of the food value chain through organization ESOP across the whole country. In addition develop other profitable crops as yam, tomatoes and animal feed to sell in the domestic markets and to export to sub-regional countries.	On going
ProDRA (Programme of Rural Development and Agriculture) : phase-2	Following the experience of the Organization of producers, introduction of materials and providing training on entrepreneurship etc. for Coffee, Cacao, Pineapple and Cashew, to implement the same activities for pulse crops envisaging export to sub-regional countries.	On going
Project on feed production development	For all animals, researching the appropriate feed crop production according to the climactic conditions and animal type in Togo.	Proposed by JICA study team based on the strategy of MAEP
Land use innovation	To utilize unused land properly for agricultural and feed production by introducing new technologies ; stone line, half-moon structure, trench, rotation, intercropping, agroforestry in Centre, Kara and Savannes	Proposed by JICA study team based on the strategy of MAEP
Community development for rural track maintenance	To improve distribution of agricultural material and information, and trading agricultural production over rural tracks by construction of rural tracks as a high priority and Introduction of maintenances schemes for the rural community, etc.	Proposed by JICA study team based on the strategy of MAEP
Niche production for export with PPP	Reinforcement of niche production and standardize and export organic agricultural products by training and supporting of inspectors and producers	Planned

Source: MAEH and JICA Study Team

28.1.6 Profiles of Priority Projects for Agriculture Sector of Togo

The agricultural sector in Togo can contribute to regional integration and corridor development in terms of food production and distribution through the sub-regional countries. In particular, it is important to rehabilitate or construct regional and rural roads in east-west direction to the existing National Road No.1 through which most of the agricultural information on production and markets, as well as inputs and materials flow. If farmers can access such information and inputs, agricultural production and productivity would easily be increased because they most of the producers use few inputs at the present.

Roads in north-south direction also facilitate to improve accessibility to sub-regional markets. In fact, there are several markets connecting to the surrounding countries in Togo and many food crops are collected there and distributed from Liberia even to Nigeria. If many farmers can access such markets, they may be able to sell their products and reflect market needs to their production even small portion. In this manner they can generate income from agricultural production and contribute to the food security and economic revitalisation in the sub-regional countries.

Among the programmes and projects listed in 28.1.5, the ones which are prioritised by the MAEH are selected and described in this section.

(1) Project for Reactivation of Planned Agricultural Zone Development (ZAAP)

1) Rationale

Of the 3.4 million hectares of arable land in good condition in Togo, only 45% are cultivated in due to lack of adequate meccanization and water management facilities. As a consequence, the agricultural producers grow crops in a small scale, approximately 0.3-0.6ha within which they work using their own manual labour and traditional agricultural tools.

In the light of the situation, the Togolese government started a project called ZAAP in 2011 to promote small holder producers to access certain areas of land (1ha) and their modern and sustainable land use. The project was planned to develop farmlands of more than 50 ha per canton, which should have totalled about 5,000ha by 2016. However, only 15 cantons have benefited up to now.

2) Objective

In order to develop the agricultural sector by small holder producers in the rural areas, the project aims to raise agricultural production and producers' income through improvement of the production base and management system. In particular, market access should be developed systematically to obtain an appropriate agricultural income. It is desirable to start with sites near National Road No.1, where relatively large markets are available and connections to other countries.

3) Project Description

The project is composed of the following seven activities: i) Securing of Land, ii) Mechanization of Agricultural Practice (machinery introduction), iii) Water Management, iv) Evolution of Cooperatives, v) Development of an Economic Pole, vi) Involvement of Financial Institutions and vii) Protection of the Environment.

All of these activities should be implemented by the Government in the extension phase, but the activities of iv) Evolution of Cooperatives and v) Development of an Economic Pole should be strengthened to improve marketing access by implementing the following activities:

- Construction of rural tracks and warehouses: the location and scale of those infrastructures should be decided after studying the volume of harvests, traffic and market demand around the ZAAP.
- Professionalization of cooperatives: Following the good practice of the ESOP, producers' organizations should be professionalised for having accurate, timely market information and bargaining power. A mobile Market Information System can be a solution.

To set up one ZAAP for one district is a principle of the project, but it is recommendable to revise the criteria of site selection for the purpose of creating synergy with other significant projects, such as PRODAT.

Once one ZAAP is established and well operated, it is possible to attract private investor which may charge of mechanization and financial support to the farmers.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Food security and income generation by expanding farmland for individual producers
- Increasing agricultural production in certain quality and quantity by utilising land and water resources even during climate change
- Attracting private sectors to collect the products or to invest in further activities for value addition
- Growing the rural economy which contributes to the national and sub-regional development by activating distribution of products

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below:

- DAEMA (Direction de l'Aménagement de l'Équipement et de la Mécanisation Agricole), ICAT (Institut de Conseil d'Appui Technique) and other directorates in the MAEH
- DRAER (Direction Régionale de l'Agriculture, l'Élevage et l'Hydraulique) in the target area
- MIT (Ministère de l'Infrastructure et du Transport) for rural tracks
- MPEN (Ministère de la Post et de l'Économie Numérique) for the market information system

6) Implementation Schedule

The implementation schedule for this project is shown in the table below:

Table 28.1.3 Implementation Schedule of the Project for Expansion of ZAAP

Item/Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Note
Review of the 1st phase	■					By inter-sectoral committee and former beneficiaries
Modification and identification of modality of the extension phase	■					By intermenstrual comity
Explanation of formalities in rural areas		■				By DRAER, ICAT
Support for identification site by community		■	■	■	■	By DRAER, ICAT
Selection of site to be developed			■	■	■	Done by inter-sectoral committee
Conducting main activities			■	■	■	By DRAER ICAT
Linkage to other projects	■	■	■	■	■	By DAEMA, DRAER

Source: Note d'Orientation Stratégique pour la Mise en place et de la Gestion des Zone d'Aménagement Agricole Planifié (ZAAP) au Togo, version Mai 2014, Ministère de l'Équipement Rural

7) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Study on the water resource capacity and establish management measures
- Negotiations with landowners for lending the land to rural producers (beneficiaries)
- Awareness creation for the beneficiaries in terms of water management and payback the land fee
- Environmental and social considerations (see below)

8) Related Projects

Related projects are listed as follows:

- PNIASA (Programme National d'Investissement Agricole et de Sécurité Alimentaire)
- PASA (Projet d'Appui Sector Agricole)
- PRODAT including PDPR-K (Projet de développement de la production rizicole dans la Kara), PATA-Oti (Projet d'Aménagement des Terres Agricoles de la Plaine de l'Oti)etc.
- PDRI-Mô (Projet de développement rural intégré de la plaine de Mô)
- PARTAM (Projet d'Aménagement des Terres Agricoles de la Zone de Mission-Tové), etc.

9) Social and Environmental Impacts

The following social and environmental impacts should be taken into account:

- Impact on wildlife reserves and national parks
- Existence of producers who are not targeted

(2) Project for Rehabilitation of Agricultural Markets Phase 1 (including Kétao and Guérin-Kouka)

1) Rationale

Due to the location and form of the country, certain local markets are used not only for local trade but also for sub-regional and international commerce as a 'Market Hub' for transit and re-export to neighbouring countries. In particular, agricultural products are dealt among domestic traders and ones that come from Ghana, Burkina Faso, Benin and even Nigeria. Such markets can be bases of value chain development and economic integration connecting sub-regional countries.

However, most of these markets are still informal suffering from dilapidation and ruined market structures and related infrastructures, thus they are not functioning effectively. Thus the trade is limited and unbalanced at the present, even if the agricultural production has increased in the country.

2) Objective

This project aims to boost agricultural trade in Togo with neighbouring countries by rehabilitating and /or developing market facilities and logistic infrastructure of local and sub-regional/international markets. In this manner, it is also expected to contribute to establish food value chains that include sub-regional countries.

3) Project description

Target Markets

This project is targeting local markets which are categorized as assembly/wholesale ones mainly for agricultural commodity trade with neighbouring countries such as Ghana, Burkina Faso, Benin and Nigeria. In addition, the local markets which contribute to development inland and near production areas are prioritized. Under these conditions, 6 markets from 4 regions are selected in this project. Moreover it is necessary to develop logistic systems and infrastructures of other markets related to the target ones to collect and distribute products efficiently. The following table describes information of the target markets.

Table 28.1.4 Target Market Information

Region	Target markets	Main commodity	Related markets in Togo	Concerned sub-regional country
Kara	Kétao,	Cereal, Vegetables, Tubers	Kara/Niamtougou	Benin-Nigeria
	Guérin-Kouka	Yam, Maize, Cotton, Sesame	Bassar,Kabou	Ghana
Savenes	Cincassé	Cereal, Vegetables, Cattel	Dapaong	Burkina Faso, Ghana
	Gando-Namoni	Guinea fowl, Cattle, Cereal, Rice	Sansané-Mango	Benin- Nigeria
Central	Tchamba	Pulse crops, Cassava, Cashew nuts,	Sokodé, Morétan,Kamboé	Benin
Plateau	Anié	Maize, Cotton, Fruits, Catfish	Aktapame	Ghana, Benin, Nigeria

Source: JICA Study Team based on PROJET DE DEVELOPPEMENT DES AGROPOLES AU TOGO, ETAT DES LIEUX DES ZONES POTENTIELLES, and surveying the regional directorates of MAEH in Savane and Kara and the MAEH

Feasibility Study

Although target markets can be identified by the location and current situation of trade and production, a feasibility study should be done thoroughly to identify the range of the rehabilitation and development for each target market. The government has been implementing many programs/projects and aims to raise agricultural production and trade by leading the private sector such as investors or professional farmers groups such as ESOP at the present. Therefore the development plan for each market should be well exanimated and designed according to the actions of the private sector and the government to create a synergy effect. In particular, it is necessary to arrange and segment the activities of the PRODAT, which has several development activities including basic infrastructures such as electricity, ICT, water supply and road rehabilitation and construction in order not to overlap.

Necessary Rehabilitation and Development (tentative)

As above-mentioned, all details are to be determined after a feasibility study. But the following table describes market facilities and logistic infrastructures to be rehabilitated based on the current information obtained from the MAEH and a diagnostic report for national trade strategy in Togo issued by the MCIPST in 2012. According to the new governmental policy, the government should be a responsible party for public infrastructure development such as market and road implementation and the private sector may take charge of the ones related to business such as warehouses or logistic stations.

Table 28.1.5 Market Infrastructures to be Rehabilitated or Developed

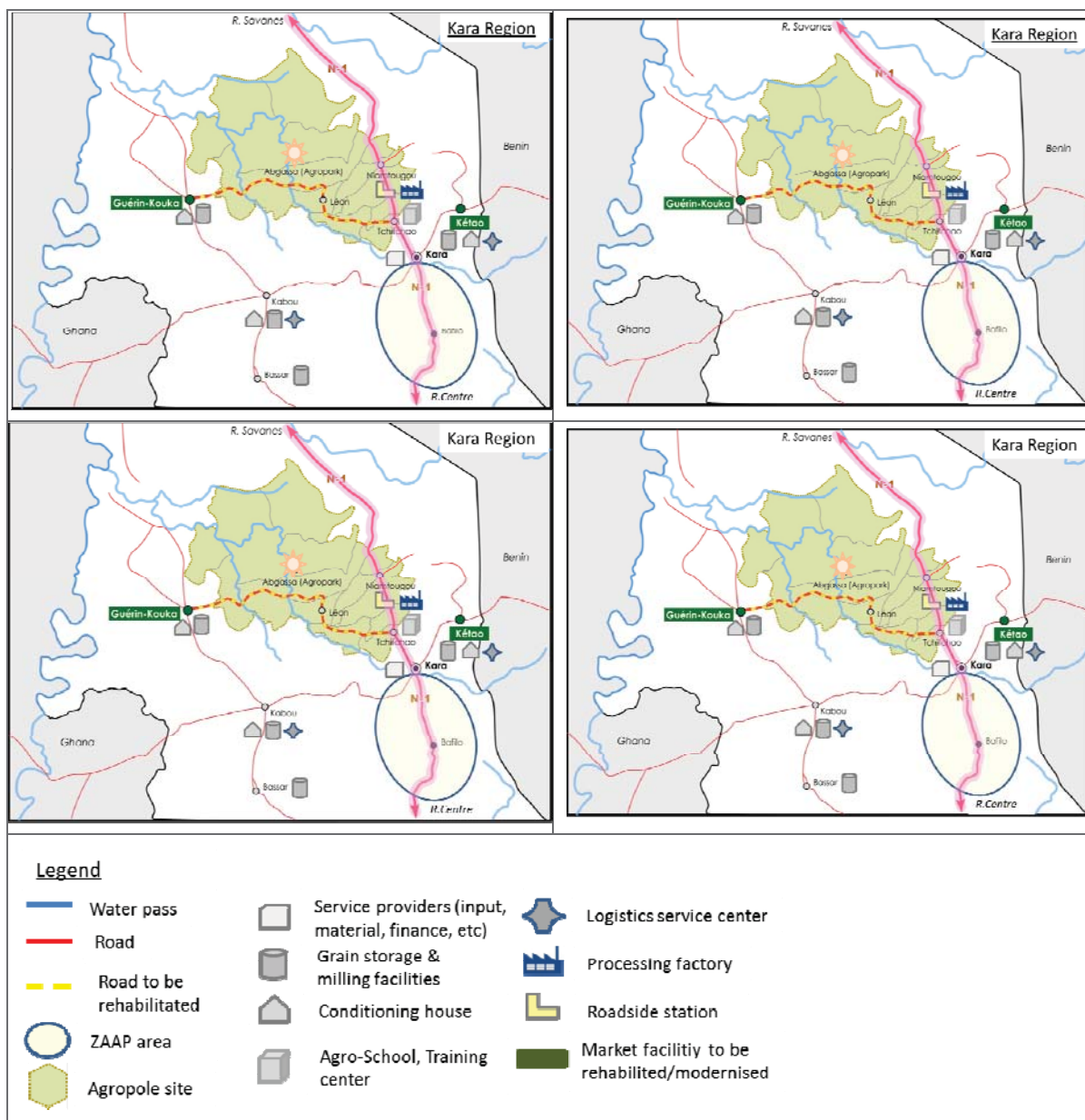
Region	Markets		Public infrastructures to be rehabilitated (Responsibility of Government)	Logistic infrastructures to be developed (Responsibility of Private Sector)
	Target	related		
SAVANES	Cincassé		- Market: Rehabilitation	- Grain/Tuber storage and milling facility
		Dapaong	- Market: Rehabilitation(Modernisation) - Road: Madouri-Dapaong	- Grain/Tuber storage and milling facility - Conditioning house (for vegetables) - Service provider (input, material finance)
	Gando-Namoni		- Market: Modernisation - Raod:Bauré-Mogou-Gand o- Namoni	- Grain/Tuber storage and milling facility
		Sansané-Mango	- Market:Complex Roadside Station - Road: Borgou- Sansané-Mango	- Conditioning house (for vegetables)
KARA	Kétao,		- Market:Rehabilitation	- Grain/Tuber storage and milling facility - Conditioning house - Logistic station
		Kara	- PARMCO*	Service provider (input, material finance)
		Niamtougou	- Market:Complex Roadside Station**	- Processing Factory
	Guérin-Kouka		- Market: Modernisation	- Grain/Tuber storage and milling facility - Conditioning house
		Kabou	- Raod:Agbassa-Guérin-Kouka	- Grain/Tuber storage and milling facility - Conditioning house - Logistic station
		Bassar		- Grain/Tuber storage and milling facility
CENTRAL	Tchamba		- Market :Rehabilitation	- Grain/Tuber storage and milling facility - Processing factory
		Sokodé	- Market:Complex Roadside Station	- Grain/Tuber storage and milling facility - Conditioning house
		Moretan, Kambolé	Road :Moretan~ Issati-Kambolé	- Grain/Tuber storage and milling facility
PLATEAUX	Anié		-Market: Rehabilitation& Formalization -Road: to be determined	- Grain/Tuber storage and milling facility - Conditioning house
		Aktapame	-Market: Modernisation -Road: to be determined	- Conditioning house

*With the Grand Market of Lomé, the Central Market of Kara is reconstructed by an on-going project called PARMCO (*Projet d'Appui à la Reconstruction des Marchés et aux Commerçants*)

** Complex Roadside Station: complex facilities including all logistic infrastructures such as grain storage, conditioning warehouse, processing house, logistic station and tourist attractions (restaurant and parking lot and others)

Source: JICA Study Team based on PROJET DE DEVELOPPEMENT DES AGROPOLES AU TOGO,détaillé toutes zones and reports from the MAEH

The following figures show examples of the infrastructures development.



Source: JICA Study Team based on PROJET DE DEVELOPPEMENT DES AGROPOLES AU TOGO, and reports from the MAEH

Figure 28.1.1 Example of Logistic Infrastructure Development for Togo

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Optimization of agricultural product flow and trading flexibility both for producers and buyers involving neighbouring countries
- Reduction of waste and lack of agricultural products in certain areas because of the optimization with neighbouring countries
- Reduction of the import goods because of the optimization among the neighbouring countries
- Generation of income by transit and re-export goods through other countries
- Generation of rural employment due to food value chain development
- Reduction of poverty in individual producers' households and in rural areas

5) Executing Agency and Related Institutions

- Concerned Directorates in the MAEH, especially regional directorates
- Ministries involved such as Commerce, Industry and Tourism, Energy, Telecommunication and Digital Economy, and Infrastructure and Transport etc.
- Organizations of the private sector such as, Chamber of commerce, Exporters unions etc.
- Agribusiness private/ semi-private companies
- ESOP
- Other donors; World bank, IFAD, BOAD, BIDC etc.

6) Implementations Schedule

The implementation is divided into 3 phrases until 2040.

- 1st phrase (2017-2025): Market in region of Kara (with an expectation to create immediate synergy with the construction of national road No.7 to be done by the Japanese government and the PRODAT which will start by Kara)
- 2nd phrase(2025-2033): Market in region of Savanes and Pleateax
- 3rd phrase(2033-2040): Market in region of Centre

The implementation schedule by phrase for this project is shown in the table below.

Table 28.1.6 Implementation Schedule of the Project

Item/Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year7	Year8	Note
Feasibility study and formulation of the project	■								
Rehabilitation & Modernization of Market facilities		■	■	■	■				
Rehabilitation of access roads to markets			■	■	■	■			
Development of storage, conditioning warehouse and logistic station			■	■	■	■			
Formalization of market: Market system improvement (regulation, management, etc.)				■	■	■	■		
Development and function of processing factory					■	■	■	■	
Development and function of Roadside station						■	■	■	

Source: JICA Study Team

7) Necessary Action for Implementation/ Critical Factor

- Necessary actions for implementing this priority project are as follows:
- Actualization of regulations on land ownership and registration
- Reform of the agricultural orientation law
- Promotion for the private sector to invest in a part of the projects
- Improvement of the access to financial institutions and other private sector entities for rural producers

8) Related Project

- ZAAP
- PRODAT

- PNPER
- ESOP
- Pro-DRA
- PARMCO : Project on Reconstruction of Markets and Traders Support: Projet d'Appui à la Reconstruction des Marchés et aux Commerçants

9) Social and Environmental Impacts

The following social and environmental impacts should be taken into account:

- Consideration of gender and more vulnerable people
- Environmental and social strategies evaluation in accordance with the Togolese regulations and the procedures of the African Development Bank especially for road rehabilitation and logistic infrastructure development.

(3) Agropole Development Project in Togo (PRODAT : Projet de Développement des Agropôles au Togo)

1) Rationale

Although the national economy has grown firmly as targeted in the SCAPE, it has not grown enough to reduce the poverty in the country, especially in the rural areas. Since the agriculture, including livestock husbandry and fishery, is the main livelihood there, it is desirable to develop value addition activities like food processing and planned shipment, which can be a good solution to generate income and employment in rural areas.

In the light of the situation, the MAEH has worked out an integrated regional economic development project with a focus on agriculture and infrastructure development for growth poles called 'Agropole'. The concept is proposed for realization of the overall objective in the new Agricultural Policy 2016-2030; to contribute to acceleration of economic growth, poverty reduction and improving living conditions, while ensuring social inclusion and respect for the environment.

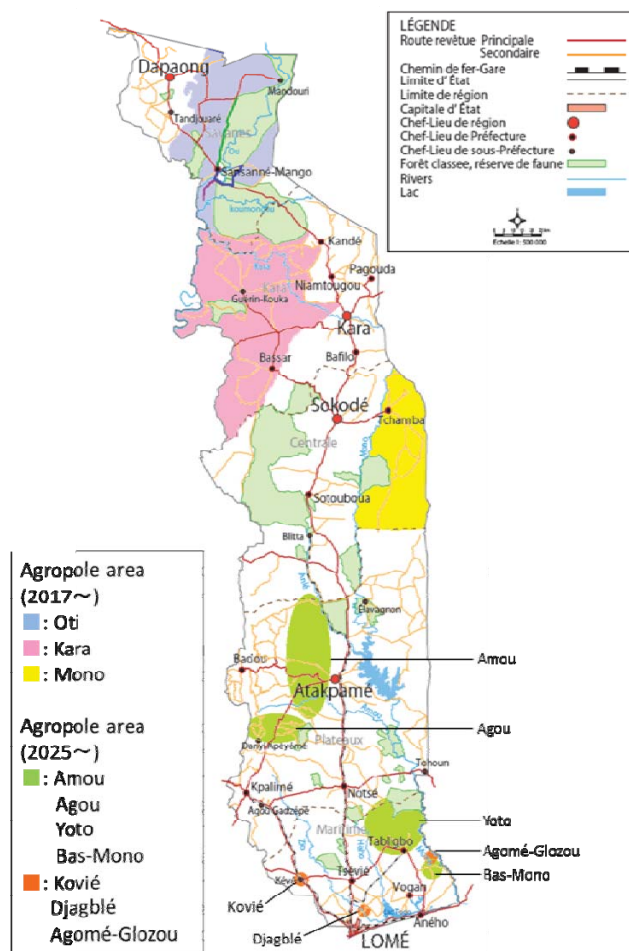
2) Objective

Aiming at the above mentioned objective of the new Agricultural Policy 2016-2030, the project of Agropole development (PRODAT) is to promote sustainable and harmonised rural development by taking advantage of the country's strengths, such as the human, natural, geographical, and socio-cultural resources. In particular, it should be implemented through coherent and complementary interventions both private and public to effectively address the need for development of targeted areas and the concerns of producers and other players in the agricultural sector.

3) Project Description

The project will be implemented initially in three target sites as a pilot in the following order:

- Kara basin in Kara Region;
- Oti basin in the Savannah Region; and
- Headwaters of the Mono basin, located in the Central and Plateaux Regions.



Source: JICA Study Team based on PROJET DE DEVELOPPEMENT DES AGROPOLES AU TOGO, ETAT DES LIEUX DES ZONES POTENTIELLES, and reports from the regional directorates of Savanne and Kara

Figure 28.1.2 Project Location for PRODAT

The projects consist of four components: i) Infrastructure Development, ii) Support for Private Initiative Development, iii) Reinforcement of Capacities and iv) Project Management.

Detailed activities by target site will be identified based on the results of technical studies, three Agropole which are to start at the first step are planned tentatively as shown below.

Table 28.1.7 Tentative Targets and Activities in Agriculture Sector by Site for PRODAT

	Kara	Oti	Mono
Targeted Crops	Sesame, Ground nuts (for export), Rice (for domestic supply)	Rice, Sugar cane, (mostly for domestic supply)	Soy bean, Cashew nuts, Sesame (for export)
Target Livestock	Poultry (for domestic supply), Guinea fowl, Pigs	Guinea fowl (pintade), Cattle (for domestic supply)	To be identified
Target fish	Catfish (for export)	To be identified	To be identified
Tentative planned activities	<ul style="list-style-type: none"> - Traffic network (rural tracks) of isolated areas - Electrification - Establishment of Information Communication Technology (ICT) - Rehabilitation/development of the Agbassa and Pagouda dams - Rehabilitation of the market Natitiki (Kara) - Rehabilitation of the school complex Tchichao - Extension of PDPR Kara - Value addition of the rice mill in Kara - Construction of infrastructure for abandoned crops - 3 ESOP and ZAAP 	<ul style="list-style-type: none"> - Traffic network (rural tracks) in isolated areas - Electrification - Establishment of Information Communication Technology (ICT) - Rehabilitation of key hydraulic structures - Financing for micro power plants - Revitalization of the Namiélé ranch - Creation of Basic quality standards and food safety - Rehabilitation of hydraulic structures (dams) - ZAAP 	<ul style="list-style-type: none"> - Traffic network (rural tracks) in isolated areas - Rehabilitation and construction of water reservoirs - Development of lowlands, central mini construction - Electrification - Establishment of Information Communication Technology (ICT) - ZAAP

Source: JICA Study Team based on PROJET DE DEVELOPPEMENT DES AGROPOLES AU TOGO, ETAT DES LIEUX DES ZONES POTENTIELLES, and reports from the regional directorates of Savanne and Kara

From among them, the rehabilitation or development of regional and rural roads, ICT and structures for water supply are indispensable for the PRODAT. In particular, as for the regional and rural roads, the following table shows roads to be rehabilitated to produce a great impact, which have been prioritised in several documents and concerned regional directorate offices in the case of Kara and Oti. Out of basic infrastructure development and improvement of extension service, post-harvest, processing and trading till exporting are expected to be implemented by private sector.

Table 28.1.8 Roads to be Rehabilitated for Agriculture Sector by Site for PRODAT

	Kara	Oti	Mono
Road to be rehabilitated	- Léon-kouka - Agbassa-Dankpen - Guérin Kouka- Brouka	- Bangou-Sansanne Mango - Sadari-Faré - Sansanné Mango-Sadori-Bauré-Mogou	- Kambolé-Morétan

Source: JICA Study Team based on PROJET DE DEVELOPPEMENT DES AGROPOLES AU TOGO, ETAT DES LIEUX DES ZONES POTENTIELLES, and reports from the regional directorates of Savanne and Kara

Other transversal activities such as training and research, mobilization and awareness making of producers and establishment of service centres are also planned.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Achievement of food security by increase of agricultural production and distribution
- Poverty reduction by generating income from agro-industrial development and creation of employment
- Creation and development of agro-industries in rural areas
- Economic growth in the rural areas and across the country by increasing national production, consumption and investment

5) Executing Agency and Related Institutions

Expected executing agencies and related institutions for this project are listed below.

- Concerning Directorates in the MAEH, especially regional directorates
- Ministries involved such as Commerce, Industry and Tourism, Energy, Telecommunication and Digital Economy, and Infrastructure and Transport etc.
- Organizations of private sectors such as, Chamber of commerce, Exporters unions etc.
- Union and federation of producers organizations
- Other donors; World bank, IFAD, BOAD, BIDC etc.

6) Estimated Project Cost

The estimated cost for Agropole in Kara is 31.095 billion FCFA among which 3 billion FCFA was earmarked for implementation of PDRP-K to be integrated with the Agropole –Kara.

7) Implementation Schedule

Including a technical study and formulation project conducted in 2016, the implementation schedule for this project is shown in the table below.

people make a living with crop production together with traditional raising of 1-2 head of small ruminants and a few hens per household.

However, demand for animal products has been increasing gradually in recent years due to the economic development of the country. Domestic livestock husbandry is becoming more important in the urban areas. In terms of rural development, this sector should be improved in order to generate extra income. For that reason, poultry, pig and small ruminants, which quickly reach breeding age, have increased in productivity, largely through extension of semi-intensive methods and the professionalization of producers organizations' with help from the private sectors as part of the National Programme for Agricultural Investment and Food Security (PNIASA: *Programme National d'Investissement Agricole et de Sécurité Alimentaire*).

Based on such experience, a new agricultural policy for the period 2016-2030 (PA-PSTAT2030) also supports a development project, Agropole Development Project in Togo (PRODAT: *Projet de développement des Agropôles au Togo*) in which the livestock sector should be one component to increase the animal productivity in the country and contribute to rural development. Value chain development for poultry and cattle is programmed to contribute to poverty reduction in the first five-years (2016-2020).

28.2.2 Issues regarding the Livestock Sector of Togo

Shortage of animal production is the main problem to be tackled in the livestock sector of Togo. Thus, the sector does not contribute to generate income for rural producers as much as it could. The main causes of the problem are the four issues as follows.

(1) Inaccessibility to Reasonable Feed and Veterinary Service

Although a lot of crop residues and unused water resources exist, lack of feed and pastureland restrains livestock husbandry development in Togo. As for poultry, the necessary feed needed to support semi-intensive livestock raising is imported from Ghana and even American countries at high prices, which limits the poultry industry development.

The veterinary service, technical advice and necessary inputs also are hard to access for the producers in the rural areas. In consequence, the producer cannot raise their productivity and they lose their animals through some diseases which can be prevented easily by a vaccine or raising method; e.g. a chicken disease called 'new castle' or pork cholera etc.

(2) Extensive Familial Livestock Raising

As above-mentioned, the livestock sector in Togo is not well developed as an economic sector and falls behind crop production. In general, cattle husbandry is mostly practiced in a traditional transhumance way to look for animal feed. This way cannot only limit the productivity and production but also causes a conflict with crop producers when the cattle raisers go south with their troupes to look for grassland and watering points. As for the small ruminants, most of them are kept in a back yard garden and fed house scraps or weeds from natural grassland.

(3) Lack of Competitive Production Methods for Imports

Lack of competitiveness with imported livestock products reduces Togolese producers' incentives to expand livestock raising. Since the animal production requires intensive care and a great deal of feed which is expensive, the livestock production using feed is very costly in the country. Additionally, meat consumers who are mostly living in urban areas tend to buy imported products even if they are more expensive than the domestic ones because of their suspicion regarding quality and sanitation. Thus the livestock cannot generate income as the producers spend time and money, which discourages livestock producers from producing more.

(4) Conflict with Transhumance

Animals raised through transhumance from Niger, Burkina Faso and Mali are important supplies of animal products in Togo, however the opportunity is not well utilised. One of the main reasons is the conflict between the transhumant pastoralists and indigenous crop producers. The animals conducted by the pastoralists sometimes happen onto an entire cropping field and destroy the crops. The crop producers, which are most of the rural people, do not welcome them to come into their area to trade animal products, even certain markets that are located suitably for domestic and sub-regional consumers. Thus, the animal trading markets generally are located in marginalised areas.

28.2.3 Objectives for Livestock Sector of Togo

Since there is a lack of experience in livestock husbandry and the demand for animal products is increasing in the domestic markets, the overall objective of the sector is simply to increase animal production and to become competitive to be a supplemental economic activity. The detailed objectives of the sector are set as follows:

- To realise stable and competitive animal production by improvement of the access to reasonable domestic feeds and veterinary service
- To increase productivity and production by changing livestock raising style but not to disturb the tradition
- To boost local animal trade by utilising the maximum opportunity of transhumance and the advantage of market location.

28.2.4 Strategies for Livestock Sector of Togo

The basic strategy for the livestock sector in Togo is to efficiently utilise existing animal resources and avoid concurrence with neighbouring countries.

In the light of the above, the strategies and measures are set as follows:

- To continue to allow transhumant animals to be brought into Togo from northern countries
 - by designating movement routes and developing watering points and pasture lands for transhumant cattle in accordance with the existing Management Plan of Transhumance
 - by buying cattle from pastoralists, and raising them to increase the number of head in Togo
 - by organizing livestock producers to exchange information and techniques

To utilise existing animal products (guinea fowls, pigs, sheep and goats) which quickly reach maturity and Togo has advantages over other countries

- by introducing in house- feed making by using residues of crops
- by improving animal varieties
- by expanding the extension service and inputs by increasing the workforce and extension centres

28.2.5 Programmes and Projects for Livestock Sector of Togo for the Long-Term

In order to achieve the objectives, it is desirable to implement projects which contain several possible measures based on the strategies. Regarding the integrated projects, contents related to the livestock are selected as shown in the following tables.

Table 28.2.1 Integrated Projects for the Long Term in the Livestock Sector

Projects	Main activities	Status
PDRI-MÔ (Rural Deve. Project in the MÔ plain) : <u>on-going project 2014-2020</u>	Poultry, small ruminants and pork production through extension of improved henhouses, technical training regarding improved raising systems. Rural track rehabilitation and producers organization activities are included.	On going
PRODAT(Agropole Development Project in Togo) in Kara	Poultry farming development with construction/rehabilitation of rural tracks, energy and ITC and Training centre for producers (for production and processing)	Planned
PRODAT(Agropole Development Project in Togo) in Oti	-Poultry farming development with construction/rehabilitation of rural tracks, energy and ITC and Training centre for producers (for production and processing) -Cattle raising development by utilising ranch Namiérié in Mango prefecture	Planned
PRODAT(Agropole Development Project in Togo) in Amou, Agou, Yoto, Bas-mono, Kovié, Djagblé et Agoméglouzou	The details are to be determined later. As all locations are famous for rice and vegetable production, it is expected that the strengthening of the value chains of those crops through the rehabilitation and reconstruction of their production bases and facilities, including logistic infrastructures	Planned
PASA (Agriculture Sector Support Project) :phase-2	As the next phase of implementation 2011-2016, for stable production of small ruminants and chickens through introducing feed production and semi-intensive raising and intensive hog raising in the next phase.	On going
Project on extension system development (as extension project of PPAO)	Based on the experience and knowledge of PPAO, introduce the new improved breed and raising techniques for chickens and small ruminants. Pork raising and feed production also should be included for the extension phase.	Proposed by JICA study team based on the policy of MAEP
Project on 1000ha Development for Agro-sylvo-pastoral and Fishery	Livestock development through construction of watering points and management systems. The pasture land establishment can be included in accordance with the transhumance management plan.	Planned
Market oriented peri-urban agricultural development with the private sector	Introducing profitable animal raising (such as chickens, pigs) in enclosed areas relatively close to Lomé and Kara through rehabilitation of the points and rural tracks together with horticultural production. Marketing information and distribution systems are also introduced.	Proposed by JICA study team based on the policy of MAEP

Source: JICA Study Team based on information from MAEH

Table 28.2.2 Specific Projects in the Long Term for the Livestock Sector in Togo

Projects	Contents	Status
Project on professionalization of rural people (PNPER): <u>on-going project 201-2020</u>	Training on professionalization for animal producers for stable production and development of related industries such as processing.	On going
Extension of ESOP organization for value chain development	Development of the meat value chain for small ruminants through organization ESOP in Kara and Savanne. Slaughterhouse construction and equipment is included for their products and transhumant animals.	On going
Project for feed production development	For all animals, researching the appropriate feed crop production according to the climate condition and animal type in Togo.	Proposed by JICA study team based on the policy of MAEP
Project for Coexistence of Transhumant and Pastoralists	To utilise transhumant animals as a product, establishing pasture land and watering points according to the transhumance path plan drafted in 2014.	Planned
Animal Processing Development in Rural Areas	Traditional cheese processing development through organization and capacity building of women's groups and construction of a processing factory and equipment.	Proposed by JICA study team based on the policy of MAEP
Development of Intensive Beef Meat Production with PPP	Beef meat production development through introduction of varieties that are productive and resistant to the environment and Production of feed crops and silage	Proposed by JICA study team based on the policy of MAEP

Source: JICA Study Team based on the information from MAEH

28.2.6 Profiles of Priority Projects for Livestock Sector of Togo

The livestock sector in Togo, even the small scale producers, contributes to the sub-regional economic integration corridor development, especially for balancing supply and demand of meat in West Africa. The meat demand has surged in recent years and there are plenty of crop residues in Togo. Moreover, there are local markets related to the sub-regional counties, even to Nigeria, the biggest consumer country in West Africa. Therefore, Togo can consume or distribute the animals that come from Burkina Faso and Niger every dry season. As for the short cycle animals which the Togolese farmers are used to raising, they are highly demanded within and outside of the country; for instance, Guinea fowl and Goats for Ghana, Pigs for Benin, Sheep for Nigeria, etc.

In that manner, if the livestock sector is developed and recognized as an income generation activity in the county, it is conceivable that related industries such as input trading or processing of animal products can emerge or be developed. This can push the urban rural economic growth along the main corridor and feeder roads in the future.

(1) Cross-border Transhumance Management for Togo

1) Rationale

The same as the other coastal countries in West Africa, Togo has been receiving a large number of cross bordered transhumance from northern Sahelian counties as a source of animal products. However, at the same time, it causes a conflict between the nomadic herders (transhumant pastoralists) and other natural resources users, indigenous farmers in particular, because the frequency and duration of the pasturage have become longer due to frequent occurrence of drought.

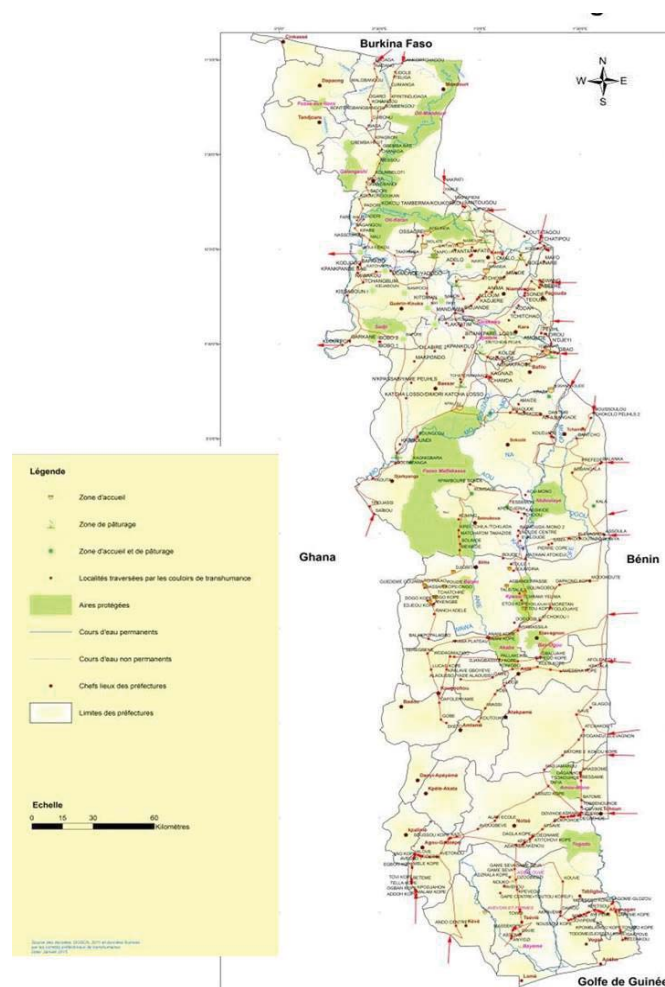
In order to cope with the influx of a large number of livestock, the Government set up a National Committee of transhumance (CNT) for each prefecture and canton. After a series of reflections in the CNT, the Togolese government established a national plan on Cross-border Transhumance Management. The overall objective is to ensure that the transhumance that is secure and has a positive economic impact and that animal sanitation is monitored in an environment of peaceful social cohesion. The strategy consists of 9 principals and was set up for 7 years 2014-2020 and several urgent activities have partially started.

2) Objective

In order to efficiently use cross-bordered transhumance, and to solve its problems as an urgent transnational issue, it is worth the implementing actions and activities mentioned in the plan as a project or programme. At the present, there are seven expected outputs, 40 actions and 60 activities that are raised in the plan, some of which have already started implementation.

3) Project Description

The project covers all regions because the transhumant arrives in the Maritime Region through all those regions. However, the areas where the traffic of transhumant animals is most frequent should be focused on, such as the borders of Burkina Faso (2 points), Benin (14 points) and Ghana (3 points).



Source: Direction de l'Elevage of MAEH, September 2014, National Plan on Cross-border Transhumance Management

Figure 28.2.1 Transhumance Map of Togo

Under the two following specific objectives; i) Significant reduction of conflicts caused by transhumance and ii) Better integration of the transhumance into the national economy, there are seven expected outputs and 40 actions as shown in the following table.

Table 28.2.3 Actions in the Transhumance Management Plan

Expected Output	Main Actions
Transhumance is better managed	- Distribution of the transhumance support and communication through ITC - Awareness improvement of all actors on the regulation and text concerning transhumance - Identification of parties for collaboration, etc.
Sociocultural relations between farmers and transhumants are improved significantly	- Identification of focal points in different communities - Organization of regular consultation meetings between the various stakeholders
People and property are secured	- Increase of control for entry and actions within the territory - Establishment of security mechanism for nomadic herds etc
Disturbance risk of animals and negative impacts on human health are reduced	- Checking transhumant animals at entry points - Treatment of sick animals - Identification of sedentary cattle, etc.
Natural resources management is improved	- Development of animal receiving zone and pasturage - Determination of place for charge and pasturage , etc.
The transhumance contributes to national economic growth	- Installation of infrastructures and measures for the transhumant animal management - Production of fodder crops (green feed, silage, hay etc.), etc.
Communication(among actors is activated)	- Organization and holding training workshops - Installation of announcement spot of the transhumant period, etc.

Source: Direction de l'Elevage of MAEH, September 2014, National Plan on Cross-border Transhumance Management

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Reduction of conflicts caused by cross border transhumance
- Contribution of animal production in the country by increasing secure and appropriate transhumance
- Contribution to the national economic growth by increasing the animal products and related economic activities

5) Executing Agency and Related Institutions

Expected executing agency and related institutions for this project are listed below.

- MAEH, especially the Directorate of Livestock and regional directorates
- Ministries in charge of transhumance such as Ministries of Territory Administration, Forest resources, Economy and Finance, Territory Development etc. and those regional directorates
- FENAPFIBVITO (Union Fédération Nationale des Professionnels de la Filière Bétail Viande du Togo ; national federation of meat supply chain professionals in Togo)
- Other NGOs and donors concerning the transhumant issues

6) Estimated Project Cost

The estimated total cost is counted 6,867,912,000FCFA (approx. 10,470, 064euro) for 7 years from 2014 to 2020.

7) Implementation Schedule

Activities are roughly classified into five categories and the implementation schedule can be assumed by cost allocation for seven years. The estimated schedule is shown below.

Table 28.2.4 Implementation Schedule by Output for Cross-Border Transhumance Management

Output	Year 1 2014	Year 2 2015	Year 3 2016	Year 4 2017	Year 5 2018	Year 6 2019	Year 7 2020	Note
Definition of the actors, Commencement of comity and	■		■ ■					
Purchase of necessary materials and installation	■							
Construction of urgent infrastructures (main animal park, veterinary station etc.)	■			■ ■	■	■		
Construction of necessary infrastructures (animal park, pastureland, etc.)			■					
Awareness raising, Training, Workshops Meeting	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	Anytime necessary

Source: JICA Study Team based on reports from the Direction de l'Élevage at MAEH and Direction de l'Élevage at MAEH, September 2014, National Plan on Cross-border Transhumance Management

8) Necessary Actions for Implementation / Critical Factor

(a) Crosscutting Actions for the Corridor Development

- Development of water resource
- Improvement of telecommunication
- Improvement of the access to financial institutions and other private sector entities for rural producers
- Development/ rehabilitation rural tracks

(b) Actions for the Priority Project

- Actualization or reform of regulations regarding land ownership and transhumance
- Preparation for mitigation of risks of natural disasters (drought), outbreaks of infectious diseases in animal and humans like Ebola, haemorrhagic fever, etc.

9) Related Projects

Related projects are listed as follows:

- PNIASA (Programme National d'Investissement Agricole et de Sécurité Alimentaire)
- PASA
- PPAAO (Programme de Productivité Agricole en Afrique de l'Ouest)

10) Social and Environmental Impacts

The following social and environmental impacts should be taken into account:

- Consideration of transnational transhumant and indigenous residents
- Environmental and social strategies evaluation in accordance with the Togolese regulations and procedures of the African Development Bank.

(2) Agropole Development Project in Togo (PRODAT :Projet de Développement des Agropôles au Togo)

1) Rationale

The livestock husbandry is the second most common livelihood but it is not very prosperous in Togo, but the demand for animal products such as meat, eggs and dairy products have surged in the country. In fact more than 50% of the meat is imported, and enhancement of animal production is an urgent issue at the present.

In accordance with the new Agricultural Policy 2016-2030, the MAEH has worked out an integrated regional economic development project with a focus on agriculture including livestock husbandry and fishery and infrastructure development as a growth pole called 'Agropole'. The livestock sector is considered as an important economic activity next to agriculture in the project, PRODAT

2) Objective

In order to contribute to increase domestic animal production and decrease imports, the project is to promote animal production by reviving existing projects and by introducing new animal raising systems.

3) Project Description

The project, the PRODAT will be implemented initially in three target sites, the basins of Kara and Oti and headwater of Haut Mono as a pilot as mentioned in 28.1.6 (2). Activities of the livestock sector were planned in the Kara and Oti heretofore. Those of Mono will be decided after a preparative study.



Source: JICA Study Team based on PROJET DE DEVELOPPEMENT DES AGROPOLES AU TOGO, ETAT DES LIEUX DES ZONES POTENTIELLES, and reports from the regional directorates of Savanne and Kara

Figure 28.2.2 Project Location for PRODAT

The same as mentioned in 28.1.6 (2), the project consists of four components; i) Infrastructure Development, ii) Support for Private Initiative Development, iii) Reinforcement of Capacities and iv) Project Management.

Detailed activities by target site will be identified based on the results after technical studies. Those of the livestock sector are planned tentatively as below.

Table 28.2.5 Tentative Activities in Livestock Sector by Site for PRODAT

	Kara	Oti
Target	Poultry (for domestic supply) Guinea fowl, Pig	Guinea fowl (pintade), Cattle (for domestic supply)
Existing projects	Semi-intensive raising of poultry by PASA	Revitalization of the ranch Namiélé*
Tentative activities related to the sector	<ul style="list-style-type: none"> - Traffic network (rural tracks) of isolated areas - Improvement of telecommunication system - Rehabilitation/development of the dam Agbassa and Pagouda - Rehabilitation of the market Natitikipi 	<ul style="list-style-type: none"> - Traffic network (rural tracks) of isolated areas - Financing for micro power plants - Improvement of telecommunication system - Creation of basic quality standards and food safety regulations - Rehabilitation of hydraulic structures (dams)

Note*: Ranch de Namiélé: 1300 head of cattle were raised in some 7,000ha established by a Suisse company, UNEFICO (Universal Engineering and Finance Corporation) in a project for 'Modernising agro-pastoral techniques in the Namiélé' 1978-83. The Togolese government took over the operation in 1999, but the ranch has been managed with only 60 cattle on a shoestring due to lack of budget.

Source: JICA Study Team based on PROJET DE DEVELOPPEMENT DES AGROPOLES AU TOGO, ETAT DES LIEUX DES ZONES POTENTIELLES, and reports from the regional directorates of Savanne and Kara

(b) Actions for the project

- Promotion for the private sector to invest in a part of the projects
- Actualization of regulations on land ownership and registration
- Transhumance management and extension of cohabitation system between transnational transhumant and indigenous residents

9) Related Projects

Related projects are listed as follows:

- PNIASA with projects which are principle;
- PASA
- PPAAO (Programme de Productivité Agricole en Afrique de l'Ouest)
- PNPER (Projet National de Promotion de l'Entrepreneuriat Rural)
- Project ESOP (Entreprises de Services et Organisations de Producteurs), etc.

10) Social and Environmental Impacts

The following social and environmental impacts should be taken into account:

- Consideration of transnational transhumant and indigenous residents
- Consideration of gender and more vulnerable people
- Environmental and social strategies evaluation in accordance with the Togolese regulations and procedures of the African Development Bank.

28.3 Fisheries Sector of Togo

28.3.1 Present Situation of Fisheries Sector in Togo

Fishing in Togo is essentially artisanal and practiced both at sea and on inland water courses. Mainly women living in fishing villages smoke these fish and sell them at the market. Besides artisanal fishery, there is also a marine industrial fishery subsector, but the amount of capture is at a very low scale.

The demand for fish follows the population growth in Togo, and in year 2010, the fish demand was estimated at 47,672 ton. To meet this growing demand, Togo has been importing fish mainly from the African countries such as Senegal and Mauritania. Since 2008, Togo has also been importing tilapia from China.

Fish production amount has increased considerably over the period between 2012-2015. Artisanal fishing is the most important fishery and its production (80% of the national production). On Lake Nangbeto, production increased from 500 to 2029 tonnes. Similarly, fish production is increased to 58 tons in 2015 against 20 tons in 2012. Despite these performances, fish production is still structurally deficient. It is about 25,000 tons / year covering only 35% of national requirements. Fish production, on the other hand, remains derisory.

The main problems are the low level of technical knowledge of the actors, the use of inadequate fishing gear, the difficulty of access to aquaculture inputs, the adverse effects of climate change on water resources and the difficulty of Access to sector funding.

Despite this situation, the fishing port at Lomé has been forced to the fringe due to the strategic development of Lomé Port, and environmental and safety issues have arisen. In April 2016, the Governments of Togo and Japan signed a grant agreement for the Project for Construction of Lomé Fishing Port which can help improve the condition of marine fisheries in Togo.

The national aquaculture production was only 20 ton per year in 2010. However, aquaculture is gradually developing in Togo. In recent years, aquaculture using 1m³ plastic tanks to farm catfish

started in Lomé importing necessary equipment from Ghana. Such method of aquaculture has been popular in Nigeria in the past decade. These catfish grown in plastic tanks are sold in Lomé frozen or smoked for exporting to Lagos. In one 1m³ tank it is possible to grow 200 catfish per year which is equivalent to 0.2 ton. On the other hand, tilapia farming is taking place mainly in the backwaters of Nangbeto Dam in the east of Togo. In addition to Nangbeto Dam, construction of Adjarala Dam is planned for hydropower close to the border of Benin. This dam will also become a great potential area for future aquaculture development.

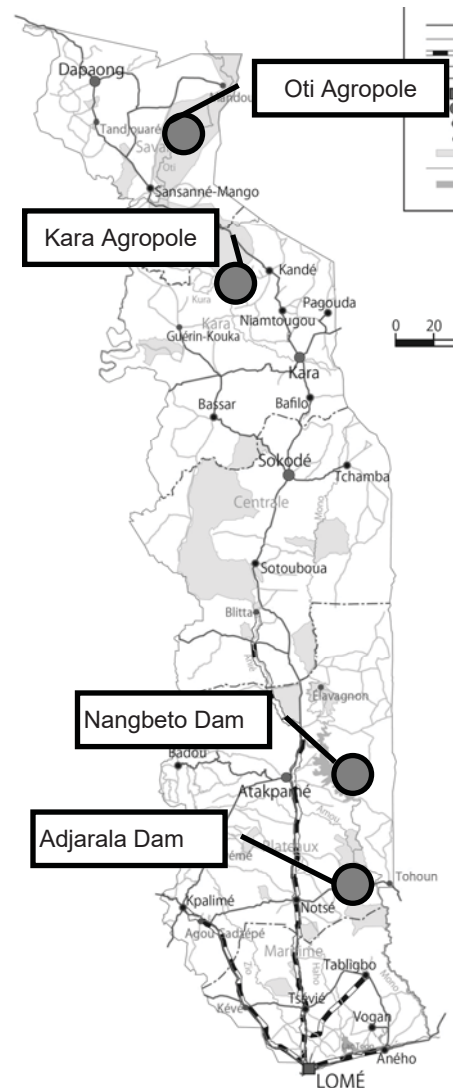
Togo is also promoting agropole development at Kara and Oti which includes the fisheries sector.

Besides the above, in the Maritime Region, coastal areas with aquaculture potential exist including rivers, lagoons, water reservoirs and coastal waters. This area covers an area of about 380,000 ha.

28.3.2 Issues regarding Fisheries Sector of Togo

The following issues exist regarding the fisheries sector in Togo:

- Increasing demand for fish products in pace with the growth of the population
- Fish stock in the Gulf of Guinea can decline due to heavy industry development and lack of information on stock assessment
- Relocation of the fishing commune of Katanga for the construction of new Lomé Fishing Port which can affect the people making their living from smoking fish
- Lack of road connection between potential fishing areas and the main corridor



Source: JICA Study Team

Figure 28.3.1 Potential Area for Fisheries in Togo

28.3.3 Objectives for Fisheries Sector of Togo

The objectives of the fisheries sector development in Togo are determined as follows:

- To develop maritime fishing in a sustainable manner to enhance the fishery resources in the Gulf of Guinea for the future
- To develop aquaculture to fulfil the county's demand and also to supply fish products to Nigeria
- To improve the living standard of people engaged in the fisheries industry

28.3.4 Strategies for Fisheries Sector of Togo

The strategies for the fisheries sector development in Togo are the following:

- To promote fishery related industry in Lomé taking advantage of the corridor development and construction of new Lomé Fishing Port
- To enforce measures against illegal, unreported and unregulated (IUU) fishing
- To improve sustainable management of the fishery resource through the development of fisheries management plans on water bodies

- To increase the production of tilapia and catfish by promoting aquaculture at Nangbeto Dam and Adjarala Dam
- To improve the road network connecting potential aquaculture areas in Togo

28.3.5 Programmes and Projects for Fisheries Sector of Togo

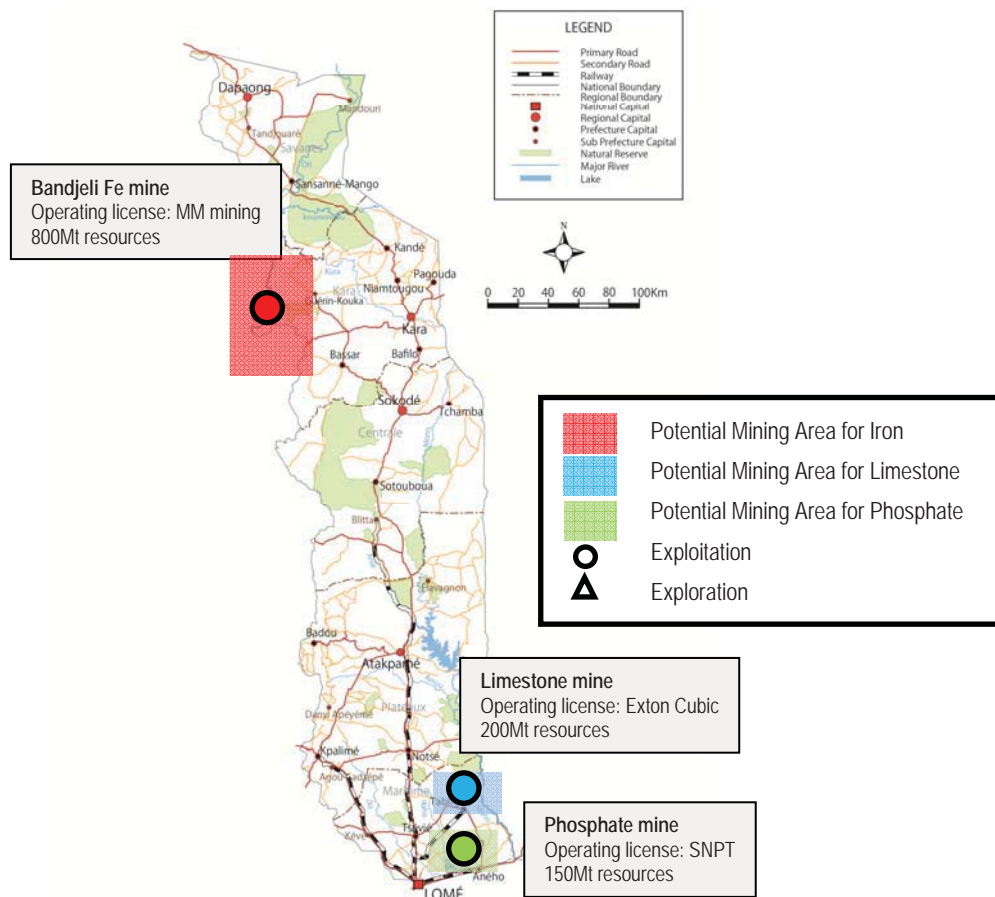
The following programmes and projects are proposed for the fisheries sector in Togo:

- Project for developing fishery related industries such as fish feed and fish processing at Lomé and Kara by preparing a light industrial area for food processing
- Programme for Aquaculture Development at Nangbeto Dam and Adjarala Dam
 - Development of Road Network between Nangbeto Dam and Adjarala Dam, and Local Urban Centres
 - Establishment of a Value Chain for Aquaculture

28.4 Mining Sector of Togo

28.4.1 Current Situation of Mining Sector in Togo

Phosphate and limestone are the two important mineral resources in Togo. In addition to that, an iron mine has been producing but it is currently suspended due to the low metal price although its exploitation potential is high.



Source: JICA Study Team

Figure 28.4.1 Existing and Potential Mining Sites in Togo

Table 28.4.1 Mineral Reserves and Resources and Production Forecast of Main Mines in Togo

Ore Deposit	Reserves and Resources	Production forecast
SNPT Phosphate mine (Operating)	150 million tons resources**	3 million tons/year*
Elenilto Phosphate mine (Not developed)		High production rate of 5 million tons /year**
Scantogo Limestone mine (Operating)	200 million tons resources***	2016: 1 million tons/year**** 2017: 2 million tons/year****
Wacem Limestone mine (Operating)		2016: 1 million tons/year**** 2017: 1 million tons/year****
Bandjeli Fe mine (Suspended)	800 million tons resources**	100,000/year

Source*: SNPT, 2016

Source**: Elenilto homepage,

<http://www.elenilto.com/press/elenilto-rejoint-le-geant-chinois-wengfu-pour-lappel-doffre-relatif-au-phosphate-du-togo/>

Source***: Ministry of Mines and Energy, 2015

Source****: CIMTOGO, 2016

(1) Phosphate Mines

1) SNPT Phosphate Mine

SNPT Phosphate mining is the most important source of revenue for the government of Togo. It is operated by the Societe Nouvelle des Phosphates de Togo (SNPT), a state-owned company that specializes in the mining, processing and marketing of phosphate in Togo. Togo's vast phosphate reserves include carbonated phosphate deposits with a life expectancy estimated to be more than 100 years, even with a significant per annum extraction rate. Phosphate is being mined in the coastal basin of Togo in the region of Hahotoé and Kpogamé through large investments in the past. However, total production per annum still remains far below expectations. One of the reasons for the low productivity of Phosphate is because the company does not have good mining management systems or good policy for mining.

2) Elenilto Phosphate deposit

Other than SNPT, Elenilto won the bid to develop a phosphate mine and fertilizer plant in Togo. Elenilto will develop the carbonated phosphate and produce both phosphate ore and fertilizer to export. The production is planned to start in 2017.

(2) Limestone Mines

Tabligbo Limestone Mine

Scantogo is a subsidiary of Heidelberg Cement own the limestone mine in Tabligbo and Wacem (West African Cement) exploits this limestone. They produce 1.8 million tons of limestone per annum. Heidelberg Cement constructed a clinker plant and commenced production at the end of 2014. The plant, with an annual capacity of 1.5 million tons is located near the town of Tabligbo. It was officially opened in the beginning of March 2015 and will supply clinker to Heidelberg Cement's cement grinding plants in Togo and the neighbouring countries such as Benin, Burkina Faso and Ghana. Moreover, they are constructing a cement grinding facility with a capacity of around 250,000 tons in the north of Togo, which is scheduled for completion in 2017. Scantogo will produce more than 2 million tons of clinker in the next few years.

(3) Iron Mine

Bandjeli Iron Mine

The MM mining, an Indian steel company, owns an exploitation permit, and produces iron ore around Bandjeli. Iron resources are estimated at 800 million tons around Bandjeli. The production is now suspended owing to the low metal price. The mining performance by MM mining has not been good from the beginning of production because MM mining does not follow its agreement with the Togolese government. Under this condition, the government wants to withdraw some portions of the exploitation licenses from MM mining.

28.4.2 Issues regarding the Mining Sector of Togo

The following issues are identified for the mining sector in Togo:

- Stagnant mining activities in mineral recession periods
- Non-compliance with agreements between the government and private mining companies concerning development of transport infrastructure for transporting extracted minerals, as well as fuel and equipment for mining activities
- Lack of foreign investments in exploration and extraction of the mining sector
- Shortage of information on mineral resources provided to the private sectors
- Underdevelopment of downstream sectors of mining including processing of mineral resources within the country
- Unsafe condition of mine workers
- Negative impacts of mining projects on surrounding natural and social environments
- Lack of utilization of local people, including women from local communities, as the labour force in mineral resource development in their country.
- Improper mining activities by artisanal small-scale mining

28.4.3 Objectives for Mining Sector of Togo

The objectives for development of the mining sector in Togo are defined as follows:

- To sustain mining activities so that the mining sector could continue to contribute to the national economy and employment
- To develop transport infrastructure for transporting extracted minerals, as well as fuel and equipment for mining activities
- To attract foreign investments in exploration and extraction of the mining sector by providing information on mineral resources
- To create an industrial structure which focuses not only on upstream industries but also downstream sectors including processing of mineral resources within the country
- To ensure the safety of mine workers, and to mitigate the impacts of mining projects on surrounding natural and social environments
- To utilize local people, including women from local communities, as the labour force in mineral resource development in their country.
- To enable artisanal small-scale mining to engage in proper mining activities in full consideration for the environment and local community.

28.4.4 Strategies for Mining Sector of Togo

The following strategies are formulated for development of the mining sector in Togo:

- To select potential target mines, formulate and implement an integrated programme for promoting sustainable mining activities by involving government organizations in charge of mining, railway and roads, as well as investment promotion
- To establish a mineral information data base and open it to the private sectors for supporting investment promotion in the mining sector
- To raise the level of mining policies and laws to the same standards as those in advanced countries and develop mining businesses.
- To distribute taxes and royalties derived from mining activities to local communities and create a funding system that can contribute to community development, in addition to Corporate Social Responsibility (CSR) activities

- To establish a proper monitoring system of artisanal small-scale mining

28.4.5 Programmes and Projects for Mining Sector of Togo

The mine to be targeted for development of the mining sector in Togo follows:

- Bandjeli Iron Mine

Necessary interventions to promote sustainable development of Baddjeli iron mine are as follows:

- Promotion of foreign private investment in order to reactivate Bandjeli iron mine
- Facilitation of PPP scheme by involving foreign private investment for rehabilitation of the railway between Lomé and Blitta and new construction of railway from Blitta and up to Bandjeli mine

28.5 Manufacturing Sector of Togo

28.5.1 Present Situation of Manufacturing Sector in Togo

The Industrial Policy of the Ministry of Commerce, Industry, Private Sector Promotion and Tourism aims to serve as a reference framework for the industrial development. This policy is based on the Strategy for Accelerated Growth and Employment Promotion (SCAPE: *Stratégie de Croissance Accélérée et de Promotion de l'Emploi*), Vision Togo 2030 and West Africa Common Industrial Policy (WACIP).

The overall objective of this policy is to improve the sector's contribution to economic growth and creation of employment. As specific objectives, the following are pursued: (i) integration of the primary sector and the secondary sector; (ii) creation of competitive industrial products, (iii) provision of an opportunity to install industrial processing units by entrepreneurs of Togo and (iv) improvement of management and control of the department.

Four axes and orientations are designated by the Industrial Policy as follows:

1) Axis 1: Integration of the Agriculture and Industrial Sector

Despite favourable ground for agricultural and mining potential, the industry faces a shortage of local raw materials. To overcome this problem, the strategies to be implemented are (i) to encourage intensification and expansion of the cultivation of agricultural commodities such as cereals (maize and paddy rice); tubers (yam and cassava); legumes (soy and beans); oilseeds (palm and coconut palm, coconut, shea butter, peanuts, cashew nuts, cotton seed); fruits (pineapple, mango, cashew nuts, bananas); flowers and aromatic and medicinal plants; vegetables (tomatoes); cash crops (coffee, cocoa, cotton), and (ii) to promote the harmonious operation throughout the country according to the comparative advantages of each region and strongly encourage the development of synergies between agriculture, livestock, handicrafts and industry. Currently, this concept is called Agropole development.

2) Axis 2: Competitive Products and Compliance with Standards

The national framework of standardization, accreditation, certification and metrology should be developed through public and private research, research and development in universities, research institutions and industrial enterprises. A free zone or science park may be developed in Kara.

3) Axis 3: Industrial Entrepreneurship

Difficulty of access to the land is largely determined by traditional practices. In Togo, the only serviced industrial zone, which is based mainly in the port area, is full. The strategies to be implemented are: (i) to acquire and develop industrial sites nationally, (ii) to develop industrial sites in each economic region and (iii) to encourage the development of private industrial parks, all within five years.

4) Axis 4: Institutional Capacity Building

The analysis of the sector and interviews with stakeholders at different levels reveal the weakness of the means of intervention. Thus, institutional capacity building and skills development is indispensable for the related agencies/organizations.

28.5.2 Issues regarding the Manufacturing Sector of Togo

Especially from the viewpoint of the corridor development, the following are recognized as issues or constraints for industrial development.

- Low investment in the industrial sector due to the lack of developed industrial sites
- Poor integration of the industrial sector into the other sectors (agriculture, livestock, fisheries, trade, etc.) and limitation of the processing of local raw materials
- Low support to industries due to: (i) the limited manpower and budget of the department, (ii) non-operationalization of the Agency for Investment Promotion and Free Zones (API-ZF) because of not enforcing the Investment Code 2012, and (iii) low synergy between support agencies for the industries.
- Except for the Maritime region, there are no significant accumulations of industries in the other regions, which is explained by (i) lack of infrastructure (lack of developed industrial zones, inadequate communication channels, low extension of ICT, etc.) and (ii) difficulty with supply of raw materials.

28.5.3 Objectives for Manufacturing Sector of Togo

Major objectives for the manufacturing sector are;

- To develop free zones and industrial zones, especially along North-South Corridor in accordance with the appropriate type of industrial subsector,
- To develop “Agropole” to integrate the industrial sector into the other sectors (agriculture, livestock, fisheries, trade, etc.) and to increase the processing of local raw materials
- To strengthen the capacity of support organizations for industries

28.5.4 Strategies for Manufacturing Sector of Togo

The strategies for the manufacturing sector of Togo are determined as follows:

- To develop free zones and industrial zones along the Coastal and North-South Corridors,
- To strengthen the capacity of the Agency for Investment Promotion and Free Zones (API-ZF),
- To introduce the following expected types of industrial sub-sectors such as food, beverages, and plastics for industrial zones along the Coastal and North-South Corridors as shown in Table 28.5.1 which can be consumed by the emerging middle income population in the sub-region.
- To develop parts and intermediate goods manufacturing for motor vehicles and electrical and electronics industries in the long-term basis along the Coastal Corridor aiming at the large market of Nigeria

Table 28.5.1 Expected Type of Industries in Togo

Classification of sub-sector/ISIC	Prioritized types of sub-sector by Ministry of Commerce and Industry in the whole country	Typical types of industries in major cities along the East-West Corridor factors	Existing types of industries in major cities along the East-West Corridor	Expected Types of Industries in major cities along the Coastal Corridor	Typical types of industries along North-South Corridor such as Kara	Existing types of industries along North-South Corridor such as Kara	Expected Types of Industries along North-South Corridor such as Kara
10 - Manufacture of food products (Based on cocoa, coffee, cereals, etc.)	V	V	V	X	V	V	X
11 - Manufacture of beverages	V	V	V	X		V	X
12 - Manufacture of tobacco products							
13 - Manufacture of textiles (cotton)		V			V		X
14 - Manufacture of wearing apparel		V	V	X	V	V	X
15 - Manufacture of leather and related products							
16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials		V	V	X			
17 - Manufacture of paper and paper products		V					
18 - Printing and reproduction of recorded media		V	V	X			
19 - Manufacture of coke and refined petroleum products		V					
20 - Manufacture of chemicals and chemical products	V	V	V	X			X*
21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	V	V	V	X			
22 - Manufacture of rubber and plastics products		V	V	X	V	V	X
23 - Manufacture of other non-metallic mineral products (clinker, cement, etc.)	V	V	V	X		V	X
24 - Manufacture of basic metals		V					
25 - Manufacture of fabricated metal products, except machinery and equipment		V	V	X		V	X
26 - Manufacture of computer, electronic and optical products		V					
27 - Manufacture of electrical equipment		V					
28 - Manufacture of machinery and equipment		V	V	X		V	X
29 - Manufacture of motor vehicles, trailers and semi-trailers		V					
30 - Manufacture of other transport equipment		V					
31 - Manufacture of furniture		V	V	X		V	X
32 - Other manufacturing (wig, etc.)			V	X			
33 - Repair and installation of machinery and equipment			V	X		V	X

Source: JICA Study Team based on the Industrial Policy of the Ministry of Commerce, Industry, Private Sector Promotion and Tourism, and various documents on industrial location factor by Industrial Location Center of Japan

Note*: Phosphate-based fertilizer industries may be promising if there is enough demand in the surrounding countries.

28.5.5 Programmes and Projects for Manufacturing Sector of Togo¹

The following programmes and projects are proposed:

- Development of Adetikopé free zone (80 ha) with introduction of expected or prioritized types of subsector
- Development of Kara free zone (35 ha) with introduction of expected or prioritized type of subsectors
- Development of Kanykpedji free zone (200 ha), which is located 55 km north of Lomé.
- Provision of support programmes for Agency for Investment Promotion and Free Zones (API-ZF: Agence de Promotion des Investissements et des Zones Franches) for smooth

¹ Development concept of agropole is discussed in the agriculture sector.

implementation of the investment promotion and industrial zone development through the managerial and technical training based on lessons learnt in other countries.

- Development of Tsévié Free Zone (100 ha)

28.5.6 Profiles of Priority Projects for Manufacturing Sector of Togo

(1) Project for Construction of Industrial Park including Free Zone in Kara

1) Project Outline

The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply, industrial parks and ICT.

The population of Kara City was 117,000 in 2015. It is forecast that Kara's population is to be 334,000 by 2040. Kara is located on the Lomé-Ouagadougou Corridor. By upgrading of the road of the Lomé-Ouagadougou Corridor, and by providing economic infrastructures, Kara will be able to play a role of one of the major regional centres and agricultural, industrial, logistical, and commercial centres in the northern areas of Togo.

The project aims to construct and manage an industrial park in Kara for the purpose of attracting investment for manufacturing sectors including agro-processing industries utilizing local products. The project will provide divided lots with adequate infrastructure including electricity, water drainage and telecommunications. The project will also provide management services for factories in the industrial park.

The Agency for Investment Promotion and Free Zones (API-ZF) will be in charge of developing the industrial park (35 ha) in Kara by promoting a PPP scheme.

2) Funding Scheme

ODA Loan

3) Estimated Project Cost

US\$ 25 million

(2) Project for Construction of Industrial Park including Free Zone in Sokodé

1) Project Outline

The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply, industrial parks and ICT.

The population of Sokodé City was 119,000 in 2015. It is forecast that Sokodé's population is to be 343,000 by 2040. Sokodé is located on the Lomé-Ouagadougou Corridor. By upgrading of the road of the Lomé-Ouagadougou Corridor, and by providing economic infrastructures, Sokodé will be able to play a role of one of the major regional centres and agricultural, industrial, logistical, and commercial centres in the northern areas of Togo.

The project aims to construct and manage an industrial park in Sokodé for the purpose of attracting investment for manufacturing sectors including agro-processing industries utilizing local products.

The project will provide divided lots with adequate infrastructure including electricity, water drainage and telecommunications. The project will also provide management services for factories in the industrial park.

The Agency for Investment Promotion and Free Zones (API-ZF) will be in charge of developing the industrial park (35 ha) in Sokodé by promoting a PPP scheme.

2) Funding Scheme

ODA Loan

3) Estimated Project Cost

US\$ 25 million

(3) Project for Construction of Industrial Park along the Motorway in Greater Lomé

1) Project Outline

The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply, industrial parks and ICT.

Considering the current economic and infrastructure situation, the government policies are based on the understanding that Togo should seek strengthening of service industries, including logistics. However, in accordance with the SCAPE (Togo's national development plan), development of the manufacturing sector is one of the pillars for national development.

The Ministry of Commerce, Industry Private Sector Promotion and Tourism has a plan for developing industrial parks with export processing zones in the following locations:

- Adetikopé free zone (80 ha) : 18 km from Lomé
- Tsévié Free Zone (100 ha): 32 km from Lomé
- Kanykpedji free zone (200 ha): 55 km north of Lomé

The Agency for Investment Promotion and Free Zones (Agence de Promotion des Investissements et des Zones Franches: API-ZF) is in charge of implementation of the projects for construction and management of industrial parks, by utilizing a PPP scheme.

Greater Lomé is one of the important industrial centres in the country. The population of Greater Lomé was 2.0 million in 2015. It is forecast that Greater Lomé's population is to be 5.0 million by 2040.

The project aims to construct and manage an industrial and logistics park, which is to be located along the prospective sections of the Abidjan-Lagos Motorway. This project is based on the strategic location of Greater Lomé that is not only close to Greater Accra (197 km from Lomé), but also to Greater Lagos (273 km from Lomé).

The project will start with land of 100 ha at the initial phase. Then this project will continue to expand its size of industrial park up to 500 ha or more, for the purpose of attracting manufacturing and logistics industries. The project will provide divided lots with adequate infrastructure including electricity, water drainage and telecommunications. The project will also provide management services for factories in the industrial park.

2) Funding Scheme

ODA Loan or PPP

3) Estimated Project Cost

US\$ 70 million

(4) Adetikopé Free Zone Project

1) Rationale

Adetikopé is located in the Maritime Region 20 km north of Lomé along the Lomé - Ouagadougou Corridor.

To cope with industrial saturation in the existing free zone and congestion of economic activities (including transport) of the Lomé port area and Grand Lomé, this project is proposed by SAZOF/API-ZF and the Ministry of Commerce, Industry, Private Sector Promotion and Tourism through a PPP scheme. Also, Adetikopé is a possible location of a new truck terminal.

2) Objective

- To provide industrial enterprises with industrial space in which qualified infrastructure and management services are available
- To attract foreign investors in a free zone in Adetikopé along the North-South Corridor

3) Project Description

The project descriptions are as below.

- To conduct land development of 80 ha for an Industrial Free Zone for exporting industries
- To provide divided lots with adequate infrastructures including electricity, water drainage and telecommunications

Also, the Project is to provide management services for enterprises located in the free zone. Based on a study by SAZOF, total development cost for Adetikopé Free Zone amounts approximately to CFA 30.6 billion.

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Effective and efficient development of industrial sector with an expected truck terminal function along the North-South Corridor.
- Decentralization of the industrial accumulation from Lomé

5) Executing Agency and Related Institutions

SAZOF (or API-ZF) and the Ministry of Commerce, Industry, Private Sector Promotion and Tourism would be the executing agency for the Project with private developers through PPP schemes. SAZOF (or API-ZF) and a private developer will be responsible for basic design and detailed design of the industrial zone, preparation of management plans for the industrial free zone and implementation of EIA in cooperation with the local administration.

6) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 28.5.2 Implementation Schedule for Adetikopé Free Zone Project

Item/Activity	Year 1	Year 2	Year 3	Year 4	Note
1. Component 1 Planning & Promotion					Technical & Financial Support will be necessary.
2. Component 2 Design Works					
Preparatory Works					
Construction					

Source: JICA Study Team

7) Necessary Actions for Implementation / Critical Factor

Land acquisition for the project site and selection of a private developer is necessary for implementing this project.

8) Related Projects

Development plans for the new truck terminal should be taken into consideration.

28.6 Information and Communication Technology (ICT) Industry of Togo

28.6.1 Present Situation and Future Prospects of ICT Industry in Togo

Togo, despite its small size, is a central country in the West African sub-region because of its geographical location. It is surrounded by Côte d'Ivoire, Ghana, Burkina Faso, Benin and Nigeria and now houses a new international airport as well as the safest port in the sub-region. It is thus at the heart of the growth ring. Faced with this position of choice of central platform of international exchanges in the sub-region, the accelerated development of ICT in Togo is a real necessity that the country intends to implement well. Strengthening ICT infrastructure and improving the quality of telecommunication services will improve the business climate, ensure certain attractiveness for foreign investors and foreign companies, facilitate and strengthen the socio-economic development of the country.

(1) ICT Policy

The Strategy for Accelerated Growth and Employment Promotion 2013-2017 (SCAPE) states that "Togo aims to enter the information society by becoming a showcase in the sub-region for ICT".

Togo aims to become a genuine hub in the sub-region for ICT in the sub-region by strengthening its infrastructure and the quality of its telecommunication services. Togo will thus contribute directly to the development of the sub-region, not only to that of its own country by offering transnational services (purchasing international bandwidth, storing data, etc.).

This will contribute both to national development and sub-regional development through the strengthening of ICT becoming firmly established by the Togolese State.

(2) Telecommunication Network

The backbone network of fibre optic cables is currently being operated by the Togo Telecom State Company with its subsidiary Togocel, which have almost a monopoly. However, their quality is unreliable. Other telecommunications operators have set up network lines based on the wireless network.

The mobile phone service is also a monopoly and the 3G zone is very limited. Regarding mobile telephony, however, the monopoly is held by two Togocel and Moov operators not only by Togocel. Land lines are not well integrated. Therefore, broadband connection is very difficult in this country



Source: JICA Study Team by report from MPNE
Figure 28.6.1 Telecommunication Network in Togo

(3) ICT Park/Data Centre

There is a plan for a Data Centre.

(4) Human Resources Development

At present there are only a few public and private schools training in ICT. Apart from these, no notable training institution is involved in the development of human resources in the field of ICT. But the construction of an establishment for this purpose is being planned. The Centre of Innovation is not, however, intended to replace schools or universities or to provide full training of several years. Training will be of two types:

- Incubation and acceleration programs lasting from 3 months to 1 year for young entrepreneurs and start-uppers throughout the sub-region:
- Workshops, seminars and conferences organized occasionally to initiate studies in: business management, computer programming, accounting, law, etc.

Finally, another project, which is also underway (the setting up of Digital Work Environments) in schools, is partly aimed at modernizing and updating the training provided in these establishments to, among other things, fulfil the needs of the labour market.

(5) ICT Services

The size of the local market is still very limited. Suppliers therefore depend on public projects while some companies target foreign markets. Concerning ICT services, it should be pointed out here that two of the problems encountered concerning the services offered by operators to the population are:

The relatively high cost;

The lack of competence or willingness of the personnel employed for customer service and maintenance to be carried out.

(6) Future Prospect

The current situation and future prospects of ICT sector in Togo can be proposed as below.

Table 28.6.1 Current Situation and Future Prospects of ICT Sector in Togo

	Present	2025	2040
Individuals using Internet	4.50% (2013)	40.0% (World Ave. 2014)	60%
Broadband subscription	0.10% (2013 only fixed line)	5%	10%
ICT HRs		5,000	20,000

Source: JICA Study Team based on ITU statistics and estimation

Improved ICT will support the development of other infrastructure such as corridors and industries along the corridors. Necessary measures must be taken and adopted prior to the implementation of the new corridor infrastructure. In this sense, the development of ICT infrastructure should be a priority with a major focus on delivering quality ICT services

28.6.2 Issues on ICT Infrastructure of Togo

In the ICT infrastructure sector of Togo, the following issues are identified.

(1) ICT Infrastructure

- There are no reliable trunk lines without redundant configuration
- There are very unstable telecommunication services, especially for data communications
- There are few facilities that can reach users except wireless connection (2G level)
- There are no facilities to run IT systems stably and safely
- There are few opportunities for citizens to be served by optic fibre connections or broadband wireless for more utilization of IT applications with internet connection and facilities to access them
- There are no well facilitated data centres where valuable data are stored in a secure way and many types of ICT services can be provided to various types of users

(2) Human Resources Development

Although there is a plan to create an organized HR development system, none currently exists in Togo.

- Graduates from computer science schools have few opportunities to get good jobs in the country. Therefore many graduates leave the country.
- Implementing more public projects is expected to create more opportunities to participate in actual projects.

(3) ICT Services

The ICT sector in Togo is almost non-existent. It is characterized only by the activities of telecommunication operators. The services offered are insufficient and the infrastructures obsolete, but since the improvement of the quality of the 3G in Lomé, there is an increase in the number of subscribers and subscription requests.

28.6.3 Objectives for Development of ICT Industry of Togo

The objectives for development of the ICT industry of Togo are as follows:

- To upgrade the telecommunication infrastructure:
- To provide more opportunities to use ICT so that ICT will be reachable by all the citizens of

Togo

28.6.4 Strategies for ICT Industry of Togo

The strategies for the development of the ICT industry of Togo are determined as follows:

- To upgrade telecommunication infrastructure to achieve higher reliability;
- To provide more opportunities to use ICT for all the citizens in Togo not only telecommunication by providing equipment to access ICT and also user-friendly applications;
- To facilitate and develop the human resources necessary to expand the ICT infrastructure and ICT accessibility to avoid procurement by foreign companies;
- To create a domestic ICT industry with the assistance of foreign investment.

28.6.5 Programmes and Projects for ICT Industry of Togo

The following projects are proposed for ICT industry:

- Rehabilitation and construction of the backbone
- Construction of a New Data Centre and an IXP in Lomé
- Construction of an Innovation Cluster
- Construction of a Network Access Centre in rural areas
- Establishment of connection in the Universities Network. The network connection is also implemented within the framework of the ENT project in technical high schools.

28.6.6 Profiles of Priority Projects for ICT Infrastructure of Togo

Togo intends to contribute actively to the socio-economic development not only of the Togolese population but also of those of the sub-region. The two projects presented for the ICT sector will enhance the exchange of skills.

There are two priority projects in Togo

- Project for Construction and Operation of Data Centre in Greater Lomé
- Project for Human Resourced Development for ICT Specialists
- Project for Improvement of ICT Connection (including Construction of Fibre Optic Cable from Lomé to Cinkassé)

(1) Project for Construction and Operation of Data Centre in Greater Lomé

1) Rationale

The candidate location is in the city of Lomé which is along both Abidjan-Lagos and Lomé-Ouagadougou Corridors as well as Lomé Port which are the strategic logistic hubs where the data centre can easily provide ICT services to any entity on the corridor.

The project is in relation with the following national plan:

- Strategy for Accelerated Growth and Promotion of Employment 2010-2015 (SCAPE 2010-2015)

2) Objective

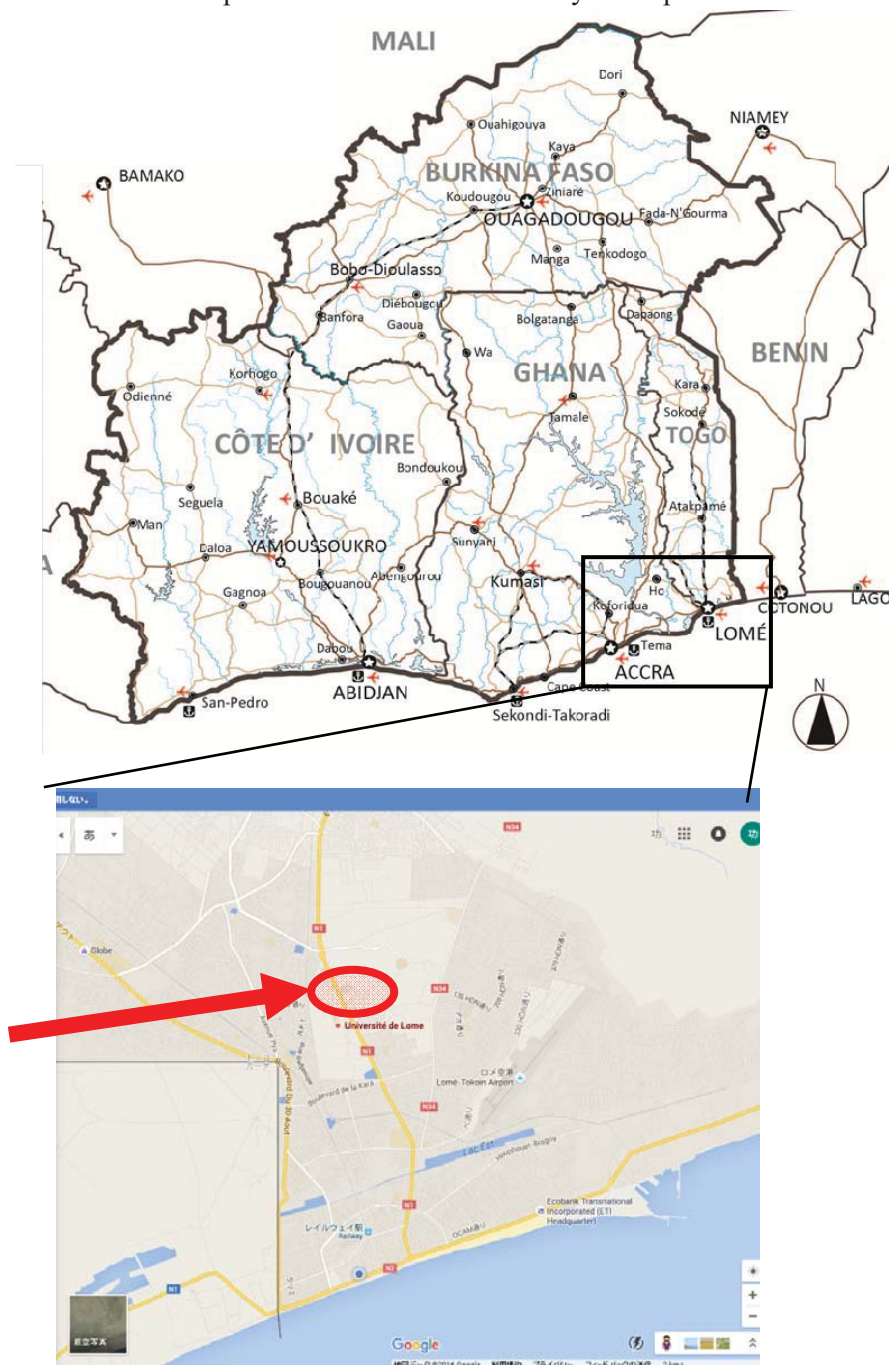
The objectives of this project are as follows:

- Construct the country's first well-dressed data centre to provide ICT services to government offices, existing and future enterprises, and the citizens;
- Many ICT resources will gather in the place to serve all of the public and private entities;
- Create a trigger to launch the ICT industry;

3) Project Description

The project descriptions are as below:

- New Tier 3 data centre construction, which has 500m² spaces in the north inside the city of Lomé;
- Necessary facilities such as redundant electricity, telecommunication lines, generators, air-conditioners, UPSs, etc.;
- A network operation centre will be built in a place remote from the centre (inside the Ministry of Posts and Digital Economy);
- Prepare office spaces where ICT human resources can be accommodated;
- Technical assistance to implement efficient and secure system operation.



Source: JICA Study Team based on report from MPEN

Figure 28.6.2 Project Location for Data Centre Construction Project

4) Expected Benefits

The following benefits are expected in this project:

- Strengthen other sectors by offering easier utilization of ICT;
- More services and contents to the citizens;
- Usage of domestic services rather than foreign services. This contributes to the improvement of the national economy;
- Supports the concept of a hub port and hub airport;

5) Executing Agency and Related Institution

Expected executing agency for this project is as below.

- Ministry of Posts and Digital Economy

6) Estimated Project Cost

Estimated project cost for this project is US\$ 8 – 10 mil.

7) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 28.6.2 Implementation Schedule for Data Centre Construction Project in Togo

Item/Activity	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Note
Design	■						
Construction		■	■				
HR development for System Operation	■	■	■				

Source: JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Waiting for study report which will be issued in the middle of May/2016

9) Estimated Project Cost

US\$ 15 million

(2) Project for Improvement of ICT Connection (including Construction of Fibre Optic Cable from Lomé to Cinkassé)

1) Rationale

The city of Lomé is located along the Abidjan-Lagos and Lomé-Ouagadougou corridors as well as the Port of Lomé, which are the strategic logistics poles where the data center can easily be established and provide ICT services to any entity of the Corridor.

The project is in relation with the following national plan:

- Strategy for Accelerated Growth and Promotion of Employment 2010-2015 (SCAPE 2010-2015)

2) Objectives of the Project

The objectives of this Project are as follows:

- Strengthen ICT infrastructure;
- Bring broadband Internet to the entire population throughout the country so that no Togolese is

- more than 5km from a high-speed Internet access point;
- Combat the digital exclusion of a large part of the territory; and
- Ensure lower prices charged by operators.

3) Project Description

The project descriptions are as shown below:

- The refurbishment of the South North backbone of Aného - Lomé - Cinkassé;
- Securing the main backbone;
- The connection of all mobile sites to this backbone by the progressive construction of ramps to link the main sites (major cities, national roads, medium-sized towns, economic interest zones, etc.) and secondary sites (small towns, Localities according to the number of inhabitants, etc.).

4) Expected Benefits

The following benefits are expected in this project:

- Stronger telecom infrastructures;
- Better penetration;
- Better connectivity throughout the country; and
- Reduced costs; and
- The democratization of Internet tools.
- Use of internal services rather than foreign services. This contributes to the improvement of the national economy

5) Executing Agencies and Related Institution

Expected executing agencies for this project are shown below:

- Ministry of Posts and Digital Economy
- Togo Telecom

6) Estimated Project Cost

Expected project cost is US\$40 mil.

7) Implementation Schedule

The implementation schedule for this project is shown in the table below:

Table 28.6.3 Implementation Schedule for Backbone Network Project in Togo

Item/Activity	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)
Design				
Construction				

Source: JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

The key factor in implementing this priority project is:

- The choice of the most interesting scenario

(3) Innovation Hub Construction Project

1) Rationale

The candidate location is located in the city of Lomé which is along both the Abidjan-Lagos and Lomé-Ouagadougou Corridors as well as Lomé Port which are the strategic logistic hubs where the data centre can easily provide ICT services to any of the entities on the corridor.

The project is in relation with the following national plan:

- Strategy for Accelerated Growth and Promotion of Employment 2010-2015 (SCAPE 2010-2015)

2) Objectives of the Project

It is necessary to tackle unemployment and underemployment, increase the support and opportunities offered to young Togolese to work in the professional world, and support and strengthen initiatives and entrepreneurship.

In pursuit of this objective and the economic and social development of Africa inevitably involving digital, technology, innovation and research, Togo aims to build an innovation center in Lomé, the capital of Togo.

The objectives of this project are as follows:

- Promote and support ICT entrepreneurship in Togo
- Reduce the unemployment rate and underemployment by encouraging entrepreneurship
- Democratize information technology, and more widely, the use of ICT tools (numerical control machines, programming, etc.)
- Provide ICT resources and low-cost workspaces for Togolese youth
- Ensure that Togolese youth take part in the digital revolution in progress and boost the sector;
- Provide a pool of computer skills to respond to ad hoc government requests
- Build facilities for ICT human resources including entrepreneurs
- Strengthen the capacity of ICT human resources and their effective use
- Create new job opportunities and solve the lack of available ICT resources for the public and private sectors.

3) Project Description

The project descriptions are as shown below:

- Construction on 3,000m² of a building comprising
- Two support structures for business start-ups (incubators), including work and training spaces;
- Fablab prototyping workshops
- A media library
- A cyber-snack and accommodation space to accommodate Togolese from within the country on a trip to the capital during a conference or an acceleration program
- A well-established offer for start-ups, including low-cost offices for start-ups to establish their headquarters, a mailbox and a switchboard operator. Development of programs, such as training and incubation programs, organization of workshops, seminars and conferences
- Installation of necessary facilities such as redundant electricity, high-speed Internet connection, telecommunication lines, generators, air conditioners, inverters, 3D printer, computer-controlled machine tools, etc.

The innovation centre will be built in the centre of Lomé, in the Quartier des Etoiles.

The study report should have been issued in middle of May 2016.

4) Expected Benefits

The following benefits are expected in this project:

- Increase employment opportunities
- Develop more ICT human resources
- Usage of domestic services rather than foreign services. This contributes to the improvement of

the national economy

5) Executing Agency and Related Institution

Expected executing agency for this project is shown below:

- Ministry of Posts and Digital Economy

6) Estimated Project Cost

Expected project cost is US\$2 mil.

7) Implementation Schedule

The implementation schedule for this project is shown in the table below.

Table 28.6.4 Implementation Schedule for Innovation Hub Construction Project in Togo

Item/Activity	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Note
Design	■			
Construction		■		
Programme Development		■		

Source: JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Waiting for study report which will be issued in the middle of May/2016

28.7 Investment Promotion of Togo

28.7.1 Present Situation of Investment Promotion of Togo

The Togolese National Assembly adopted the 2012 Investment Code, which prescribes equal treatment for Togolese and foreign businesses and investors; free management and circulation of capital for foreign investors; respect for private property; protection of private investment against expropriation; and investment dispute resolution regulation.

Currently, no organization for investment promotion exists. In the near future, however, the Free Zone Authority (SAZOF: *Société d'Administration des Zones Franches*), which has been responsible for administering free zones since 1990, is expected to be replaced by the Agency for Investment Promotion and Free Zones (API-ZF: *Agence de Promotion des Investissements et des Zones Franches*).

The latest value for FDI into Togo was US\$84.2 million as of 2013. The percentage of FDI to GDP was 1.9 percent in 2013 and that to GFCF was 10.4 percent in 2012. The sectors that attract most of the foreign investment are phosphates, cotton, coffee and cocoa.

28.7.2 Issues on Investment Promotion of Togo

The following points are determined as issues for investment promotion in Togo:

- Limited information about not only the investment environment but also general information such as life styles in the country
- No enforcement of the 2012 Investment Code
- Absence of an investment promotion agency
- Difficulty of attracting FDI because of limited market size in Togo

28.7.3 Objectives for Investment Promotion of Togo

The objectives of the investment promotion for Togo are as follows:

- To create more favourable investment environment for Togo and WAGRIC Sub-Region
- To take advantage of the integrated and expanded sub-regional markets, especially coastal markets for attracting investment to economic sectors of Togo targeting the growing coastal markets
- To attract investment to the mining sector

28.7.4 Strategies for Investment Promotion of Togo

The basic strategies for the investment promotion are the following:

- To remove restrictions on investment for improving the business climate
- To offer more appropriate services to potential investors by capacity building of API-ZF
- To promote private investment with strategic focuses on specific economic sectors, which are agriculture, livestock and agro-processing sectors targeting growing sub-regional markets
- To attract FDI to economic sectors oriented to sub-regional markets by utilizing the merit of customs union under UEMOA and ECOWAS, which is establishment of integrated and expanded sub-regional markets
- To attract investment to the mining sector, at the same time attracting investment to necessary transport development for mining development

28.7.5 Possible Measures for the Investment Promotion

The following measures are proposed:

- Policy arrangement for a stable business climate
- Strengthening of the institutional capacity of the API-ZF and other public agencies in charge of investment promotion and business climate policy
- Promotion of investment to priority projects for Togo, utilizing the enlarged market due to economic and physical integration.

28.7.6 Programmes and Projects for Investment Promotion of Togo

(1) Projects for Investment Promotion for Growth Economic Sectors

Investment promotion projects in the table below should be implemented in Togo to take advantage of integration and expansion of sub-regional markets as well as to increase the number of middle income population.

Table 28.7.1 Priority Projects for Investment Promotion for Growth Economic Sectors in Togo

Sector	Project	Short Term (2018-25)	Mid Term (2026-33)	Long Term (2034-40)
Agriculture	Investment Promotion for Development of Three Agropoles (Oti, Kara and Mono) in Inland Areas	•		
	Investment Promotion for Development of Agropoles and Mini-Agropoles in Inland Areas		•	•
Manufacturing	Investment Promotion of Manufacturing and Logistics Industries in Greater Lomé	•	•	•
	Investment Promotion of Manufacturing in Kara and Sokodé	•	•	•
Mining	Investment Promotion for Reactivating Bandjeli Iron Ore Mining and Railway Construction between Lomé and Kabou	•		
	Investment Promotion for Reactivating Bandjeli Iron Mine		•	
Aquaculture	Investment Promotion for Aquaculture at Nangbéto Dam	•		
	Investment Promotion for Aquaculture at Adjarala Dam		•	

Source: JICA Study Team

(2) Capacity development programmes for API-ZF

1) Programme for Strengthening Information Services of SAZOF/API-ZF for the Private Sector

- Provision of information and services regarding the investment climate (e.g. Cooperation with Japan External Trade Organization (JETRO))
- Promotion of mutual exchanges of information regarding investment (e.g. organizing investment seminars, dispatching investment missions, creating local company database)

2) Programme for Formulating Investment Policy and Implementation in Law Enforcement by Expanding Capacity of Investment Promotion Institutions in Togo

- Clarification of investment promotion policy (e.g. Promotion of public-private dialogue to fully understand investor's needs, Technical training program for assisting in the formulation of investment promotion policies on the basis of the country's strengths and weaknesses)
- Establishment of the API-ZF in charge of investment promotion and business climate policy
- Development of human resources for the newly established API-ZF (e.g. learning good practices in developing countries which are successful for attracting foreign direct investment, dispatching experts who are working as advisors on investment promotion to organize investment seminars and plan and manage investment missions)
- Strengthening of cooperation among related organizations to correspond to investors' needs (e.g. establishing a coordinating committee to support a policy dialogue with related organizations for provision of necessary infrastructure)

28.7.7 Profiles of Priority Projects for Investment Promotion of Togo

(1) Investment Promotion for Economic Sectors targeting Sub-Regional Markets

1) Project Outline

Private investment has been attracted mostly to the mining sector in Togo. However, not much attention has been paid to the growth potential of Togo's economic sectors targeting coastal markets in the sub-region.

By taking advantage of the possibility to integrate and expand the size of sub-regional consumers' markets, it is possible for the Agency for Investment Promotion and Free Zones (Agence de

Promotion des Investissements et des Zones Franches, API-ZF) to attract investment to economic sectors targeting sub-regional consumers' markets. Such target economic sectors include those of agriculture, fisheries and agro-processing.

The project aims to making a clear shift of investment promotion toward economic sectors orientated to sub-regional markets. For this purpose, the project will prepare new promotion materials, provide training to related agencies and personnel and implement actual activities for investment promotion.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

US\$ 4 million

(2) Investment Promotion for Reactivating Bandjeli Iron Ore Mining and Railway Construction between Lomé and Kabou (410 km)

1) Project Outline

The WAGRIC Master Plan points out the importance of economic sectors targeting sub-regional markets for seeking balanced development between inland areas and coastal areas. However, at the same time, it is important for individual countries of the WAGRIC Sub-Region to expand the production of primary commodities, such as minerals and agricultural products.

Bandjeli has 800 million tons of iron ore deposits. Annual production of iron ore from Bandjeli Mine might be 100,000 tons per year. Currently the exploitation of iron ore has been stopped due to low metal prices. The government has considered removing some portion of the exploitation license from the current concessioner.

The project aims to attract private investment to revitalize the operation of Bandjeli Iron Mine and to facilitate a PPP scheme for constructing a railway between Lomé and Kabou and a railway between Kabou and Bandjeli Mine

2) Funding Scheme

PPP

3) Estimated Project Cost

US\$ 1,214 million

Chapitre 29 Development Strategies for Infrastructure Sectors of Togo

29.1 Roads and Highways in Togo

29.1.1 Present Situation of Roads and Highways in Togo

(1) Institutional Framework of the Road Sector in Togo

The Ministry of Infrastructure and Transport (MIT) and Executing Agency of Urban Work (AGETUR) are responsible for road construction and maintenance in Togo. The Autonomous Financing Company for Road Maintenance (SAFER) is in charge of collection of toll fees and maintenance of roads. The Road Management Agency (AGEROUTE) is supposed to play a role as an executing agency for road management. However, it does not yet seem to be functional.

Togo Invest Corporation is a State Owned Company. Its mandate is to implement schemes of public-private partnerships for large-scale infrastructure projects, such as expansion of Lomé Port, construction of international airports and rehabilitation of railways. They are conducting feasibility studies and seeking finance for realization of the railway project between Lomé Port and the border of Burkina Faso.

(2) Framework of Road Planning and Road Development in Togo

The Road Sector Policy Statement of the Government of the Togo for the period 2011-2016 (October 2010) and the Priority Investment Programme for the Road Infrastructure Sector¹ (February 2011) provide the basis for the road sector projects in Togo.

In January 2015, the National Transportation Policy for the period 2014-2030 was formulated based on the Accelerated Growth Strategy and Promotion of Employment (SCAPE). In the Policy, the importance of the improvement and maintenance of the National Road No.1 between Lomé and Cinkassé as a national north-south corridor is emphasized. At the same time, the rehabilitation of east-west crossing roads including access bridges to neighbouring countries is emphasized to improve the access to major agricultural production areas.

(3) Existing Condition of the Road and Highway Network in Togo

The total length of roads was 11,900 km in Togo in 2014. The road network in Togo consists of national routes, urban roads and rural roads (See Table 29.1.1). Table 29.1.2 shows the improvement of road condition of the national routes between 2009 and 2014.

Road tolls and gasoline taxes of 35 FCFA per litre are collected to finance road management. However, the budget of 40% against the budget plan is still insufficient.

¹ This programme was prepared on the basis of the Road Sector Policy Statement by the Government of the Togolese Republic for the period 2011-2016.

Table 29.1.1 Road Length by Road Type in Togo, 2014

Road Type	Length	Proportion
National Route (Paved)	1,900 km	16%
National Route (Non-Paved)	1,700 km	14%
Urban Road	1,800 km	15%
Rural Road (Classified)	900 km	8%
Rural Road (Non-Classified)	5,600 km	47%
Total	11,900 km	100%

Source: MIT Togolese, 2015

Table 29.1.2 Proportion of Road Conditions, 2009 and 2014

	Good	Fair	Bad
2009	20%	30%	50%
2014	27%	33%	40%

Source: MIT Togolese, 2015



Source: MIT Togolese

Figure 29.1.1 National Road Network in Togo

(4) Corridor Development in Togo

The development and upgrading of the national routes No.1 and No.2 are promoted as main components of corridor development. At the same time, the government has the policy of development of four or five arterial crossroads that connect to Ghana and Benin.

Togo North-South Corridor: National Route No.1

The development of the South-North Corridor is the most important policy for the Togolese Government to provide a port and to improve the logistics for the nation. The feasibility study for the section between Lomé and Cinkassé was conducted by UEMOA in 2012, and the rehabilitation and construction of the road has progressed with the financial assistance from development partners including BAD.

The construction of new bypass road at Bafilo, which was the largest rough spot for large size trucks, was completed two year ago. However, road damage and potholes have already occurred due to construction defects.

The road widening from 2 lanes to 4 lanes (2 lanes each way) is ongoing on the section between Lomé-Tsévie. Regarding the section after Tsévie, MIT has an intention to widen the road to 4-lanes sequentially.

The bypass roads to control the through-traffic in urban areas are planned for the cities of Tsévie, Notsé, Atakpamé, Sokodé and Kara on the national route No.1. Some flyovers are also planned to improve the traffic flow on the roundabout interchanges in Lomé.



RN1 in Lomé



RN1 in Lomé

Source: JICA Study Team

Figure 29.1.2 Road Conditions of National Route No.1 in Lomé



RN1 in Lomé



Lomé-Tsévie



Tsévie-Atakpamé



Bafilo Bypass



Kara



Dapong

Source: JICA Study Team

Figure 29.1.3 Road Conditions of National Route No.1 in Togo

The National Shipper's Council of Togo (CNCT) has constructed truck parking lots on the national route No.1 for promoting the functional enhancement of the north-south corridor.

The CNCT installed three truck stations, one each at Atakpamé, Blitta and Bafilo and provide the parking spaces, lavatories, weigh-bridges, cafeterias or shops, repair shops and mosques.



Atakpamé Truck Station



Atakpamé Truck Station



Blitta Truck Station



Blitta Truck Station

Source: JICA Study Team

Figure 29.1.4 Truck Parking and Parking Lots on National Route No.1

Coastal East-West Corridor (National Route No.2)

The development of the East-West Corridor that runs through the coastal zone has been promoted as an essential part of the road network for the nation's logistics. Although the rehabilitation of the existing 2-lane roads, including the overpass road crossing the port area and the Outer Ring Road from Lomé Port to the National Route No.1 was already completed, the extension of the Outer Ring Road that connects to Noépé, which is on the border with Ghana, is planned. At the border at Noépé, a One Stop Border Post has been built with finance from the EU.

(5) Existing and Planned Projects

1) Togo North-South Corridor: National route No.1

Project for Road Widening

- Lomé-Tsévie-Atakpamé: Road widening to 4 lanes

Projects for Rehabilitation and Strengthening

- Atakpamé-Blitta : BAD
- Blitta-Auda : BEOAD
- Auda-Kande : BID and ECOWAS Bank
- Kande-Cinkassé: Government of Togo and BCEAO

2) Coastal East-West Corridor: National route No.2

Lomé Outer Ring Road Project

- The Outer Ring Road Project from National Route No.1 to Noépé OSBP (Border of Ghana)

East-West Crossing Road, which includes the following sections:

- Lomé-Vogan-Anfoin (61 km)
- Lomé-Kpalimé (61 km)
- Tsévié-Kévé-Zolo (44 km)
- Notsè-Agou-Kpalimé (54 km)
- Nyamassila-Bagou-Goubi, CU19 (180 km)
- Sokodé-Bassar (57 km)
- Katchamba-Sadori. (50 km)

3) Bypass Road and Improvement of Intersections in Major Cities

- Bypass road : Tsévie, Atakpamé, Sokodé, Kara (F/S of road widening)
- Improvement of intersections in Lomé: GTA, Bé, SIMTOGO

29.1.2 Issues on Roads and Highways in Togo

Issues on development and management for roads and highways in Togo are summarised as follows:

- Traffic around the Lomé Port and in the urban areas of Greater Lomé is increasing. The road network in Greater Lomé should be upgraded to meet the traffic demand.
- Through traffic in cities along the Togo's north-south corridor will disturb urban traffic and socio-economic activities in the cities.
- Conditions of the national road network are not so good in consequence of poor performance of road management organizations and insufficient funding, as well as weak enforcement of regulations against overloaded large-sized trucks.
- Resources allocated to road maintenance are insufficient. In fact, the budget executed by the MIT is around 60 % of the necessary quantity.
- A road management system based on a road data bank with updated and reliable data for

efficient and transparent planning of road management is lacking.

- A cement stabilized method has often been observed in Togo. In Bafilo Bypass, the subbase course and base course were constructed using the cement stabilized method, which was specified in the original design. This may have shortened the service life of this road. The cement stabilized base course cannot have sufficient friction with the Asphalt Concrete Pavement. And once the cement stabilized base course has cracks, the strength will be reduced to the strength of only the base material such as sand or soil.
- The pavement type for the shoulders of the existing major corridors is Surface Treatment (DBST or SBST: Double or Single Bitumen Surface Treatment). Most of the shoulders have deteriorated and partly disappeared and are obstructing passengers and bicycles to pass safely. Further, this deterioration sometimes causes edge damage to the carriage way.

29.1.3 Objectives for Development of Roads and Highways in Togo

The road network development in Togo should aim at building the basic road and highway framework for the country and improve the accessibility to the neighbouring countries. The Togo's north-south corridor consists of the national road No.1, No.2 and No.17 and it is the first priority policy for the development of Togo.

The road should also support activation not only of socio-economic exchanges within the country, but also of socio-economic exchanges within the sub-region by improving road condition and reducing the travel time and costs. For Togo, it is an important policy to collect a great deal of transit cargo from/to inland countries like Burkina Faso, Mali and Niger.

The overall goal of road development is to promote socio-economic exchanges and socio-economic development, to improve global competitiveness and to expand demand (both freight and passengers) for transportation using the Togo's north-south corridor.

The following objectives for road development are identified:

- Objective 1: To contribute to economic sector development and enhance socio-economic exchanges within the country and between countries by establishing networks of roads centring on the Greater Lomé and Togo logistics Corridor (Lomé- Cinkassé-Ouagadougou Corridor) , which is mainly national road No.1,
- Objective 2: To establish a road and motorway network for sub-regional and national integration by linking Abidjan - Accra - Lomé -- Cotonou - Lagos in the coastal belt zone and for enhancing the global gateway function of major cities and major ports in the coastal belt zone, thereby contributing to the acceleration of economic growth and improvement of the global competitiveness of Togo and Togo's north-south corridor,
- Objective 3: To realize the road network that facilitates personnel and economic exchanges between the regions in the east-west direction centred on the Togo's north-south corridor,
- Objective 4: To promote development of inland areas which are relatively underdevelopment by strengthening north-south connectivity and providing better accessibility to agricultural potential areas in inland areas
- Objective 5: To develop the road environment for realization of smooth and safe road transportation.

29.1.4 Development Strategies and Possible Measures for Development of Roads and Highways in Togo

Five strategies are identified for road development in Togo as shown below. Possible measures to implement each strategy are also described in this section.

- Strategy 1: Upgrading of the road capacity and the service level of road on Togo's north-south corridor by phased upgrading of the national road,
- Strategy 2: Enhancement of the hub function of Greater Lomé and Togo's north-south corridor,
- Strategy 3: Strengthening of east-west Roads by extending them from major urban centres on the Togo logistics corridor to potential developments,
- Strategy 4: Development of Coastal East-West Motorway for supporting the development of the Coastal Economic Corridor (part of Abidjan-Lomé-Cotonou-Lagos Corridor),
- Strategy 5: Organization of a sustainable road use environment.

(1) Strategy 1: Upgrading of the Road Capacity and the Service level of the Roads on Togo North-South Corridors by Phased Upgrading of the National Road

Considering Togo's north-south corridor, which is the national road No.1 and No.17, that is expected to serve as the development axis of Togo, the development of high-standard roads to upgrade the road capacity and the service level of the roads should be sought so that the transport corridor could realize high-speed transportation service.

The target corridors for Strategy 1 are as follows:

- Lomé - Sokodé - Kara - Border of Burkina Faso

Possible measures for Strategy 1 include the following:

- Road rehabilitation with asphalt concrete pavement that can sufficiently withstand the traffic of heavy vehicles,
- Road widening between Lomé and Sokodé depending on the traffic demand increase,
- Construction of bypass roads or ring roads in cities on the corridor: Tsevie, Sokodé, Kara and other cities on the corridor where the through traffic should be avoided,
- Reinforcement or replacement of aged bridges,
- Installation of truck stations, bus bays and truck bays along the road.

(2) Strategy 2: Enhancement of the Hub Function of Greater Lomé and Togo's North-South Corridor

In order to respond to increasing traffic demand and in order to provide smooth access to Lomé port and to the existing international airport, a network of arterial roads and ring roads should be developed in the Greater Lomé that will serve as the strategic node of the national road network in Togo to promote smooth traffic in the city and the expansion of urban areas. For the arterial road network formation, the connection to Lagos-Abidjan motorway should be considered. And the planning for an access road to the new airport in North-East area of Lomé should be started, which should be a motorway that connects to the city centre and to Lagos-Abidjan motorway.

The target corridors for Strategy 2 are as follows:

- Lomé metropolitan

Possible measures for Strategy 2 include the following:

- Development of radial arterial roads and ring roads in Greater Lomé,
- Improvement of bottleneck intersections,
- Development of access roads for linking major transport nodes: Lomé Port and the new airport and the Abidjan-Lagos corridor.

(3) Strategy 3: Strengthening of East-West Roads by Extending them from Major Urban Centres on Togo North-South Corridor to potential developments

Upgrading or improvement of roads to connect regional core cities, such as Tsevié, Atapamé, Sokodé, Kara and other cities on Togo's north-south corridor with surrounding areas, for providing basic urban services, should be done.

Connectivity from agricultural development areas to city areas as consumption markets and Lomé port for exportation should be upgraded. Pavement of roads and construction of bridges for connecting roads to villages and farms should be promoted to facilitate the access to major corridors.

The target corridors for Strategy 3 are as follows:

- The connecting road in the east-west direction from regional core cities; Tsevié, Notse, Atapamé, Sokodé, Kara, Dapaong,
- Agricultural potential development areas: Agropole in Oti, Kara and Mono,
- Mineral development areas, such as iron ore mines in the western part, and limestone and phosphate mines in the south part of the country,
- Tourism development areas

Possible measures for Strategy 3 include the following:

- Pavement of roads with asphalt concrete,
- Rehabilitation of roads,
- Reinforcement or replacement of aged bridges,
- Development of feeder roads (simple pavement, construction of bridges, application of Labour-Based Technology).

(4) Strategy 4: Development of Coastal East-West Motorway for Supporting the Development of Coastal Economic Corridor (part of Abidjan-Lomé-Cotonou-Lagos Corridor)

Development of Abidjan - Lagos motorway forming the coastal economic growth belt should be initiated. This motorway development will be a key driver to create a logistics and economic hub in the Sub-region. Alignment of Abidjan - Lagos motorway where it passes through the Lomé metropolitan area must match the preceding development plan. Especially, the alignment and interchange should be selected at a location that promotes the manufacturing development.

The target corridors for Strategy 4 are as follows:

- Togo section of Abidjan - Lagos motorway

Possible measures for Strategy 4 include the following:

- Development of 6-lane motorway (Abidjan - Lagos motorway),
- Access road from motorway to city centre, to new airport and National Road No.2..

(5) Strategy 5: Organization of Sustainable Road Use Environment

Introduction of incidental road institutions to ensure efficient use and road traffic safety should be promoted. Especially, measures to implement smart traffic systems that contribute to the improvement of the functionality of road infrastructure should be promoted in the Metropolitan area.

Strengthening of the road administration function should be promoted.

Establishment or strengthening of organizations in charge of road traffic safety is important to ensure efficient and safe use of the roads. And also it is necessary to strengthen the road administration function for this aspect.

Target roads and areas, as well as administrative organizations for Strategy 5 are as follows:

- All roads, cities, and road administrative organizations

- Possible measures for Strategy 5 include the following:
- Implementation of road safety measures including enforcement of road safety rules
- Implementation of Traffic control systems, advanced traffic signal systems, and traffic information providing systems
- Strengthening of administrative functions concerning road planning, design, construction and maintenance
- Strengthening of maintenance capabilities (maintenance planning capabilities, equipment, budgeting)
- Establishment of overload monitoring systems for heavy vehicles and strengthening of enforcement of axle load control
- Training of trucking companies to improve safe transport capabilities and to ensure compliance with regulations
- Designation of road routes and time in which large trucks are allowed to use them
- Application of engineering design of road structures responding to the increase of truck weight
- Establishment of road management systems including a road inventory database

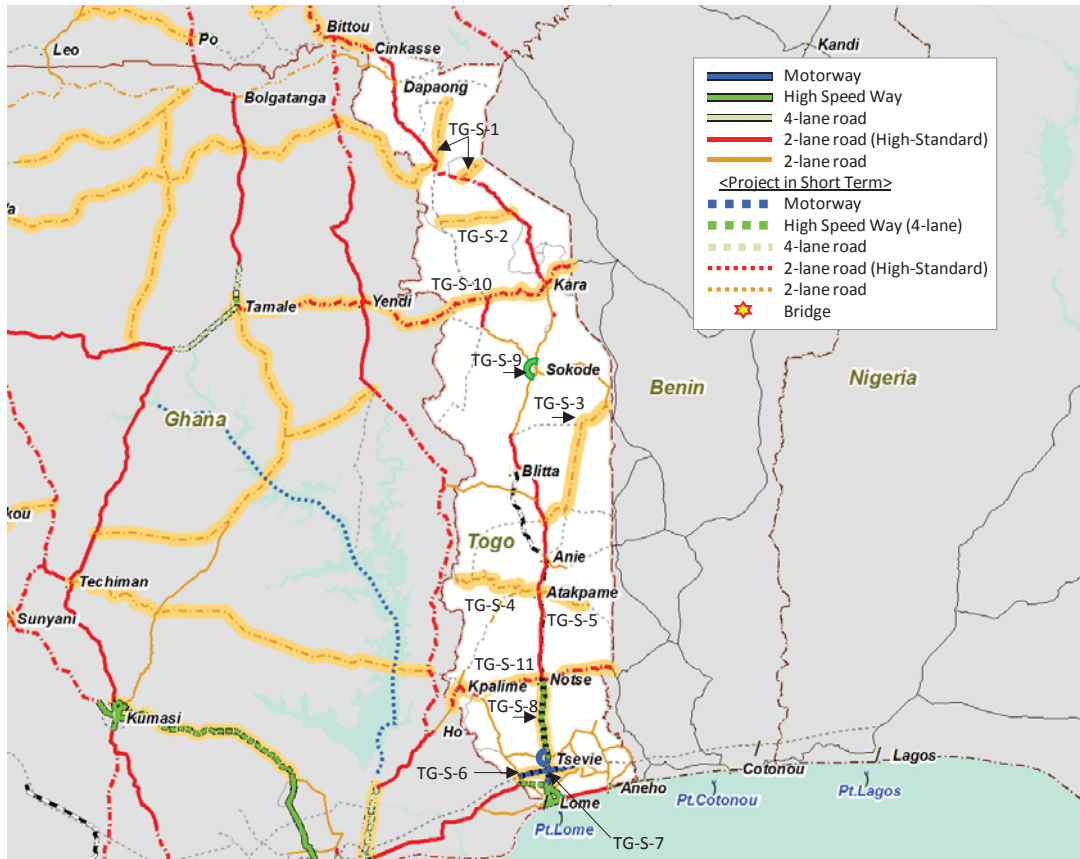
29.1.5 Programmes and Projects for Development for Roads and Highways

The road projects selected based on road development strategies are shown in Table 29.1.3, Figure 29.1.5, Figure 29.1.6 and Figure 29.1.7. These projects shown are essential road projects which should be tackled strategically for corridor development of WAGRIC-CACAO. However, there are also other road projects which should be promoted by the government of Togo for development of the country.

Table 29.1.3 Priority Project of Road Sector in Togo

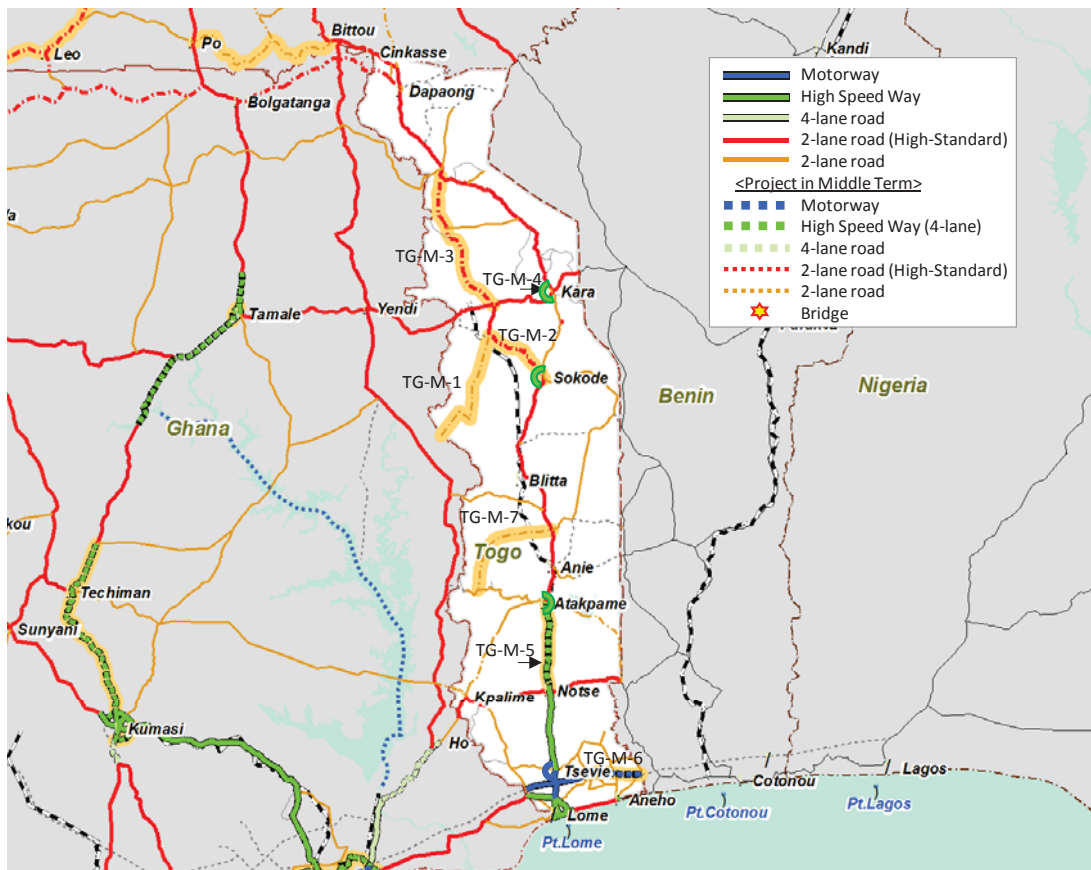
	Name of Priority Project	No. Lane	Length	Project Schedule		
				Short	Middle	Long
Togo						
TG-S-1	Improvement of Road of Borgou and Mango and Road of Baouré and Road of Mogou and Gando-Namoni for Oti Agropole	2	50 km			
TG-S-2	Improvement of Road of Tchitcho – Leon – Guérin-Kouka for Kara Agropole	2	50 km			
TG-S-3	Improvement of Road between Kambole – Bila - Goubi - Bagou - Issati –Moretan - Nyamassila for Mono Agropole	2	50 km			
TG-S-4	Improvement of Road between Kougnonhou and Atakpamé for Agricultural Potential Areas for Mini-Agropoles of Amou and Agou in Plateau Region	2	95 km			
TG-S-5	Improvement of Road between Atakpamé and Nangbéto Dam	2	40 km			
TG-S-6	Project for Construction of Greater Lomé Sections of Abidjan-Lagos Motorway	6	30 km			
TG-S-7	Project for Construction of Motorway between Lomé Bypass and New International Airport: (including Tsévié Bypass)	4	25 km			
TG-S-8	Construction of 4-Lane High-Speed Way between Tsévié and Notsé	4	60 km			
TG-S-9	Construction of Sokodé Bypass Road as part of 4-Lane High-Speed Way	4	10 km			
TG-S-10	Project for Upgrading of East-West Road Connecting Kara with Kétao at East Side National Border (toward to Parakou of Benin) and with West Side National Border (toward to Yendi and Tamale of Ghana)	2	80 km			
TG-S-11	Project for Upgrading of East-West Road Connecting Notsé with East Side National Border (toward Bohicon of Benin) and with West Side National Border (toward to Ho of Ghana)	2	140 km			
TG-S-12	Project for Reconstruction of Three Bridges of National Road No.1 for Strengthening of Lomé-Ouagadougou Corridor	2	- km			
TG-M-1	Improvement of Road of Bassar – Mô – Tindjasse – the Western National Border with Ghana for Agricultural Potential Areas in Mô Valley of Central Region	2	110 km			
TG-M-2	Improvement of North-South Road between Sokodé and Bassar	2	60 km			
TG-M-3	Improvement of North-South Road between Kabou and Sansanné Mango	2	105 km			
TG-M-4	Construction of Kara Bypass Road as part of 4-Lane High-Speed Way	4	10 km			
TG-M-5	Construction of 4-Lane High-Speed Way from Notsé to Atakpamé including Atakpamé Bypass	4	65 km			
TG-M-6	Project for Construction of Togo's Central and Eastern Sections of Abidjan-Lagos Motorway	4	80 km			
TG-M-7	Improvement of Road between Kougnonhou and Nyamassila for Agricultural Potential Areas in Plateau Region	2	80 km			
TG-L-1	Project for Construction of 4-Lane High-Speed Way from Atakpamé to Kara	4	180 km			

Source: JICA Study Team



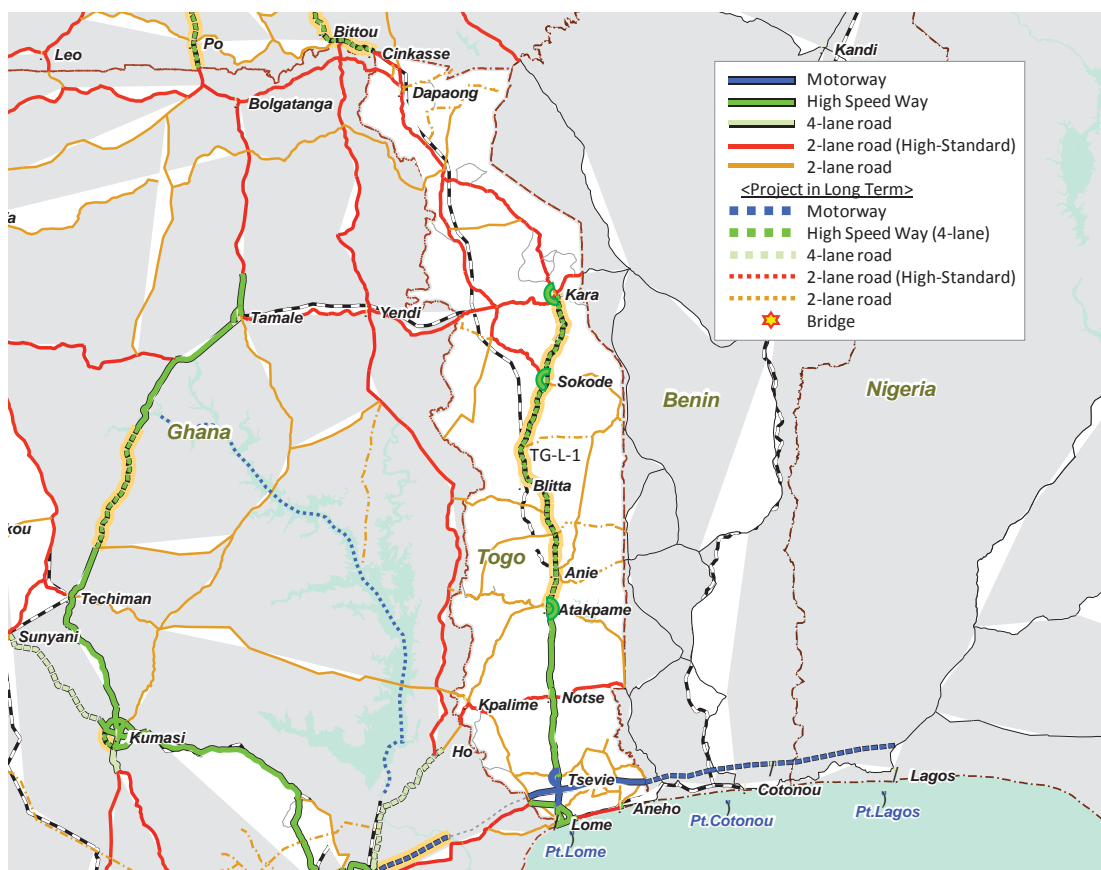
Source: JICA Study Team

Figure 29.1.5 Locations of Priority Road Project in Short Term in Togo



Source: JICA Study Team

Figure 29.1.6 Locations of Priority Road Project in Middle Term in Togo



Source: JICA Study Team

Figure 29.1.7 Locations of Priority Road Project in Long Term in Togo

29.1.6 Profiles of Priority Projects for Road and Highway Sector of Togo

(1) Projects for Improvement of Roads for Providing Better Access to Potential Agricultural Areas in Inland Areas (for Kara, Oti and Mono Agropoles)

1) Project Outline

The size of the coastal consumers' markets is increasing within Togo, and neighbouring coastal markets are expected to become integrated with Togo within the sub-region through the customs union. Because of this situation, Togo, as well as other WAGRIC countries, has the potential to develop economic sectors, both in coastal areas and inland areas, targeting these integrated and expanded coastal markets of the sub-region. Moreover, the roads of Lomé-Ouagadougou Corridor are relatively good and usable for promoting inland development, while the WAGRIC Master Plan strongly recommends the upgrading of the existing roads of Lomé-Ouagadougou Corridor to high-standard four-lane roads.

The WAGRIC Master Plan points out the possibility to attract investment to agriculture by providing improved access roads to potential agricultural areas, as well as by providing other infrastructure, such as irrigation schemes.

The projects aim to improve the following access roads to three agropoles (Oti, Kara and Mono agropoles), which are prioritized potential agricultural areas:

- Improvement of Road of Borgou and Mango and Road of Baouré and Road of Mogou and Gando-Namoni for Oti Agropole
- Improvement of Road of Tchitcho – Leon – Guérin-Kouka for Kara Agropole
- Improvement of Road between Kambole – Bila - Goubi - Bagou - Issati –Moretan - Nyamassila for Mono Agropole
- Improvement of Road between Kougnonhou and Atakpamé for Agricultural Potential Areas for

Mini-Agropoles of Amou and Agou in Plateau Region

- Improvement of Road between Atakpamé and Nangbéto Dam
- Improvement of Road of Bassar – Mô – Tindjasse – the Western National Border with Ghana for Agricultural Potential Areas in Mô Valley of Central Region

These projects are in line with the national policy on agropole development of Togolese government.

2) Funding Scheme

ODA Grant

3) Estimated Project Cost

US\$ 475 million

(2) Project for Construction of Greater Lomé Sections of Abidjan-Lagos Motorway

1) Project Outline

Togo's potential to develop economic sectors is limited in the case of targeting its own domestic consumers' markets. However, such potential would be enhanced greatly by targeting the sub-regional markets through integration with neighbouring countries' markets. This market integration will become possible by upgrading transportation along the coastal east-west corridor (Abidjan-Lagos Corridor), as well as strengthening of implementation of the customs union.

The upgrading of transportation along Abidjan-Lagos Corridor would become possible by construction of strategically selected sections of the Abidjan-Lagos Motorway. The WAGRIC Master Plan strongly recommends locating the route of the Abidjan-Lagos Motorway Sections of Togo closer to the urbanization areas of Greater Lomé as much as possible.

The most important section of the Abidjan-Lagos Motorway for Togo is the motorway sections between the national border of Noepe and northern part of Greater Lomé.

The project aims to construct the sections (30km) of Greater Lomé of the Abidjan-Lagos Motorway for the following purposes:

- To connect the central area of Greater Lomé with Noepe, (national border with Ghana) on the Abidjan-Lagos Corridor
- To connect the central area of Greater Lomé with Togo's eastern part of the coastal area on the Abidjan-Lagos Corridor

2) Funding Scheme

ODA Loan

3) Estimated Project Cost

US\$ 294 million

(3) Project for Construction of Motorway between Lomé Bypass and New International Airport (including Tsévié Bypass)

1) Project Outline

The WAGRIC Master Plan recommends establishing high-speed transportation in the north-south corridor for strengthening the connectivity between inland areas and coastal areas. The north-south high-speed transportation is important for attracting investment to economic sectors targeting sub-regional markets, while the establishment of efficient and low-cost cargo transportation in the north-south corridor is required for establishing an enabling environment for competitive business operation.

The government of Togo started upgrading the national road to a high-standard four-lane road from Lomé toward Atakpamé, including providing by-pass roads. In response to the prospective increase of road traffic on the Lomé-Ouagadougou Corridor, as well as within the Greater Lomé, it will be necessary to construct a motorway from Lomé to Tsévié for the following two purposes:

- To create another exit road from Greater Lomé to the north
- To provide high-speed transportation from the central area of Lomé to the new International Airport, which is planned near Tsévié for the future

This kind of high-speed transportation is necessary to attract investment for the economic sectors in inland areas, especially those targeting coastal markets. In addition to reduction of travel time, the extension of a high-standard road could reduce vehicle costs.

2) Funding Scheme

ODA Loan or PPP

3) Estimated Project Cost

US\$ 153 million

(4) Construction of Sokodé Bypass Road as part of 4-Lane High-Standard Road (10km)

1) Project Outline

The WAGRIC Master Plan recommends establishing high-speed transportation in the north-south corridor for strengthening the connectivity between inland areas and coastal areas. The north-south high-speed transportation is important for attracting investment to economic sectors targeting sub-regional markets, while the establishment of efficient and low-cost cargo transportation in the north-south corridor is required for establishing an enabling environment for competitive business operation.

The government of Togo started upgrading the national road to a high-standard four-lane road from Lomé toward Atakpamé, including providing by-pass roads.

In response to the prospective increase of road traffic on the Lomé-Ouagadougou Corridor, as well as within Sokodé, it will be necessary to extend the four-lane high-standard road on the Lomé-Ouagadougou Corridor for shortening the travel time between inland areas and coastal areas. This kind of high-speed transportation is necessary to attract investment in the agriculture and agro-processing sectors in inland areas, especially those targeting coastal markets.

The population of Sokodé was 119,000 in 2015. It is forecast to be 343,000 by 2040. Together with Kara, Sokodé is expected to play an important role as a major regional city and economic centre accommodating agro-processing industries and commercial/service functions.

The project aims to construct a 4-lane high-standard bypass road (about 10km) for Sokodé. Along the Sokodé Bypass Road to be constructed by this project, land development is possible for industrial and logistics land use.

2) Funding Scheme

ODA Grant

3) Estimated Project Cost

US\$ 53 million

29.2 Railways of Togo

29.2.1 Present Situation of Railways in Togo

(1) General Situation of Railway in Togo

The total route length of all the railway lines in Togo is 559km. However, out of the total 559km, 442km (=the total of the three closed lines) is not operating. The railway has a single track and is not electrified. Its gauge is 1,000mm.

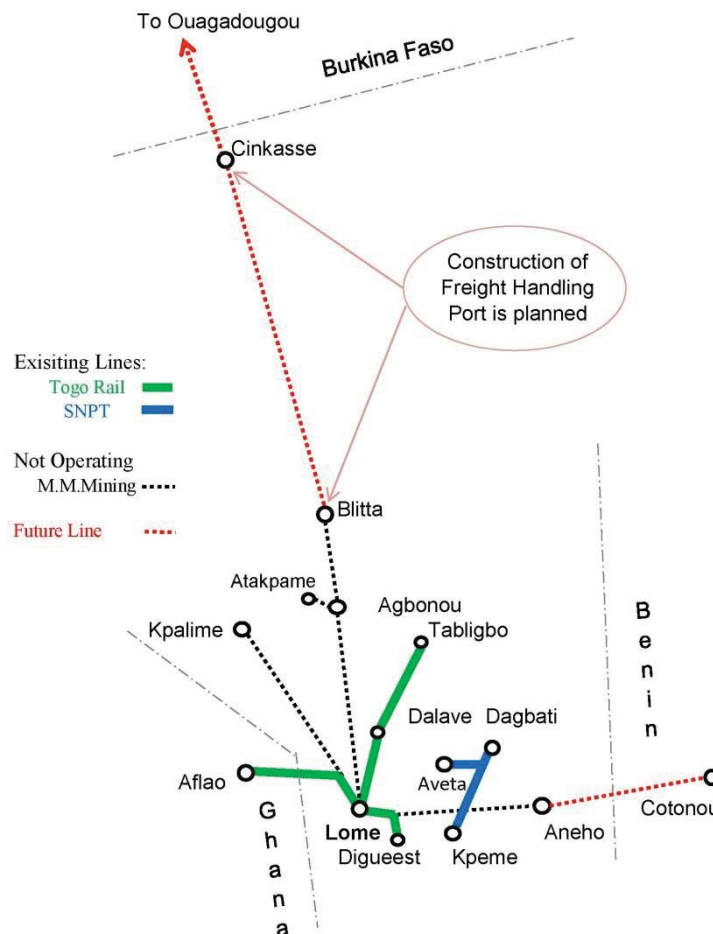
The history of the railway in Togo began when Togo Railway (CFT: *Chemins de Fer du Togo*) was started by Germany in 1905. Currently, there are two companies operating railway transport in Togo, which are Togo Rail S.A. and Société National Phosphate Togo (SNPT).

Table 29.2.1 Togo Railway Network (2015)

Existing Line	Length	Built	Rail (kg/m)	Operates by	Closed
Lome~Blitta	276 km	1911~1933	20 + 26	M.M.Mining	2012
Lome~Kpalime	119 km	1907	20	M.M.Mining	1996
Lome~Aneho	47 km	1905	20	M.M.Mining	1986
Lome~Tabligbo	77 km	1978	36	Togo Rail	
Lome~(Tokoin)~Aflao	4 km	2014	36	Togo Rail	Rehabili+New line
Kpeme~Dagbati	30 km	2007	23 ~ 26	SNPT	
Kpeme~Aveta (Branch line)	6 km	2007	23 ~ 26	SNPT	
Total =	559 km				

* All lines are non-electrification single track, gauge 1,000mm

Source: JICA Study Team



Source: JICA Study Team

Figure 29.2.1 Railway Routes and Terminal Stations in Togo

Togo Rail S.A. operates the railway cargo transport since 2002.

On the other hand, SNPT was created in 2007 as a state company after the dissolution of the Togo Phosphates Office (OTP: *Office Togolais des Phosphates*) and International Fertilizers Group-Togo (IFG-TG). The mission of SNPT is extraction, processing and marketing of phosphate in Togo.

At present, Togo Rail S.A is operating under the supervision of the Ministry of Infrastructure and Transportation, and SNPC is operating under the supervision of the Ministry of Mining and Energy.

The volume of transport by Togo Rail is shown in Table 29.2.2.

Table 29.2.2 Volume of Transport of Togo Rail (ton)

	2011	2012	2013	2014
Clinker	111,562	263,676	319,914	359,983
Coal	0	0	0	30500
Limestone	0	719	14,091	131,556
Total	111,562	264,395	334,005	522,039

Source: Togo Rail

(2) Connection between Port and Railways

Current situations of the connection between Lomé Port and the railways is only the Lomé Port - Aflao Line (23km), operated by Togo Rail S.A for transportation of clinker from Digueest (Lomé Port) to Aflao (in Ghana). Figure 29.2.2 shows Lomé Port Railway Plan which was prepared by the Port Authority in 2011.

According to Lomé Port Master Plan, the railway track in Lomé Port will be rehabilitated including the construction of a container yard for transportation of containers to Blitta Dry Port.

As the Ministry of Infrastructure and Transport has decided to change the gauge of the railway from meter gauge to standard gauge, all tracks inside the port will have to be renewed as well.



Source: Lomé port Master Plan Final Report 2011

Figure 29.2.2 Railway Plan for Lomé Port

29.2.2 Issues on Railways of Togo

The following issues are identified on railways in Togo:

- The existing railway line between Lomé - Blitta and Lomé - Aneho are not operational due to insufficient track maintenance.
- There is no railway system for long distance transport in the north-south direction and the long distance transport is fully relying on truck transport
- Although Lomé Port has the potential to expand its catchment area to the major cities in the neighbouring countries such as Accra and Cotonou, there is no railway system between Aneho - Cotonou (104km) to connect the port to the borders of these countries.

29.2.3 Objectives for Railways in Togo

The objectives for development of railways in Togo are set as follows:

- To upgrade the north-south corridor into an economic corridor with integrated infrastructure network by establishing a railway to Cinkassé to promote economic development along the corridor
- To expand the catchment area of Lomé Port by connecting Aneho and Cotonou by railway

29.2.4 Strategies for Railways of Togo

The following are the strategies for railway development in Togo:

- To implement phased development of the railway lines to connect Lomé and Cinkassé by utilizing the existing alignment and mining potential
 - 1st Phase: Lomé-Blitta
 - 2nd Phase: Blitta- Kabou
 - 3rd Phase: Kabou - Cinkassé
- To promote multi-modal transport by developing multi-modal dry ports at the following stations:
 - Blitta
 - Kabou
 - Cinkassé
- To establish railway transportation along the coastal corridor by connecting with the railways of Benin and Ghana considering both passenger transport and freight transport for the east-west coastal railway development

29.2.5 Programmes and Projects for Railways Development in Togo

The following projects for railway development are formulated for Togo:

(1) Short-Term Projects

- Project for Construction of Railway from Lomé to Blitta

(2) Mid-Term Projects

- Project for Construction and Operation of Railway from Blitta to Kabou

(3) Long-Term Projects

- Project for Construction and Operation of Railway from Kabou to Cinkasé of Burkina Faso
- Project for Construction of Railway from Lomé to boarder of Benin

29.2.6 Priority Projects for Railway Development in Togo

The projects below were selected as priority projects for railways development in Togo.

- Project for Construction of Railway from Lomé to Blitta
- Project for Construction and Operation of Railway from Blitta to Kabou
- Project for Construction and Operation of Railway from Kabou to Cinkasé of Burkina Faso

29.3 Sea Ports of Togo

29.3.1 Present Situation of Lomé Port

Lomé Port has a large surface area of 900 ha and functions not only as an international trade hub but also as a base for trade and manufacturing, thanks to the large industrial free zone where dozens of businesses have set up operations. Therefore the importance of Lomé Port is very high not only from the point of view for efficient logistics on the corridors, but also from the point of view of industrial development in Togo.

The container terminal at Lomé Port is 16.6m deep, making it the only deep-water port on the West African coast where ships with considerable draught can call.

The port is run by Lomé Port Authority (PAL: *Port Autonome de Lomé*) established on 26 April 1968 which is a state-owned company that oversees activities at the port and performs loading and offloading of wheat, hydrocarbons and minerals.

The total container handling capacity has increased to 2.2 million TEU per annum making Lomé Port into an incomparable hub port in the West Africa region.

The handling volume in 2016 including transshipment cargo was 14 million ton which increased by 50% since 2014 when the new container terminal started its operation. While around 70% of the total cargo was import cargo and only 18% transshipment cargo in 2014, the share of transshipment cargo increased to almost 56% in 2016. In TEU units, in total, 822 thousand TEU of containers were handled in 2016.

When comparing the import cargo volume amongst different commodities, the largest volume commodity is clinker which accounts for 28% of the total volume. The following commodity is food products which accounts for 17%. On the other hand, in export cargo, 27% of the total export volume is agricultural products.

Table 29.3.1 Total Container Throughput of Lomé Port (2011 – 2016)

Unit: TEU (ton)

Category	2011	2012	2013	2014	2015	2016
Import			119,015 (1,903,473)	128,417 (2,104,233)		
<i>Import Togo</i>	175,109	143,489	66,754	67,682	123,880	118,756
<i>Transit Import</i>	(2,089,406)	(2,265,532)	(2,700,748)	(2,299,204)	52,261	60,735
Export			115,844 (746,791)	119,435 (853,426)		
<i>Export Togo</i>	177,586	144,992	105,475	109,954	128,835	119,4317
<i>Transit Export</i>	(1,393,258)	(1,504,376)	(1,617,229)	(972,867)	10,369	9,481
Transshipment			76,611 (1,157,145)	132,946 (1,699,777)		
<i>Import TEU</i>			37,606	69,510	652,985	583,466
<i>Export TEU</i>			39,005	63,436	39,005	63,436
Total	352,695 (3,482,664)	288,481 (4,125,043)	311,470 (4,317,977)	380,798 (3,272,071)	905,700 (3,807,409)	821,639 (4,657,436)

Source: Port Autonome de Lomé

The access road to the port area was drastically improved during the last few years. The frontage road of the port area in the east-west direction was elevated, and the outer ring road was upgraded to a four-lane road which can directly access N1 as the international corridor to Burkina Faso.

Regarding the railway, Togo Rail has an extension of its network into the port. Quays and sheds are connected.

Recently, two container terminals were opened. These modernized facilities contribute to the increase of throughput cargos. Lomé Port should take full advantage of these modernized port facilities to attract more transit cargos and transshipment cargos. Moreover, it is considered that the land that is currently being used inefficiently should be used for industrial development. Repurposing of land use is one of the urgent challenges for further development of Lomé Port and its surrounding areas.

29.3.2 Issues on Lomé Port

The following issues in Lomé Port are observed:

- Poor and inefficient land use within the port area and its surrounding area (PAL's domain) for industrial development
- Insufficient capacity of the existing container terminal, grain terminal and mineral terminal for the increasing demand and facilities such as car park for trucks and container depot for more efficient services as the regional hub port
- Traffic congestion within the port area and its surrounding area, mainly on the roads in front of the port entrance

29.3.3 Objectives for Development of Lomé Port

The following objectives are set for the development of Lomé Port:

- To develop Lomé Port not only for the contribution to the development of Greater Lomé as an international gateway to the international corridors but also for the development of inland areas of Togo and inland countries
- import and export a reasonable amount of goods at more competitive charges for cargo handling by reducing transportation cost and time
- To increase the catchment area of Lomé Port by increasing the competitiveness of Lomé Port
- To increase revenues not only from handling domestic cargo, but also from collecting more cargos in transit from / to Burkina Faso, Mali and Niger countries and coastal neighbouring countries, and transshipment cargo by expanding service areas
- To upgrade port performance by making maximum use of existing facilities and equipment

29.3.4 Strategies for Development of Lomé Port

The following strategies are formulated for development of Lomé Port:

- To promote the expansion of the container terminal by ICT and creation of an additional ore terminal in the PAL area, as well as improving interfaces between berths and railway lines for smooth access to the North-South Corridor and Coastal Corridor.
- To promote the development of logistics parks by using the SAZOF system (Free zone system) to attract related industries and to promote better integration of port areas with the strategic industrial areas. Land for this purpose could be created by relocating existing functions of PAL's land to other areas.

Regarding the value-added services, the following services should be considered for increasing the customer service and for increasing the port competitiveness.

Table 29.3.2 Value-added Services for Increasing Customer Service and Port Competitiveness

Value-added Logistics Services	Loading/unloading, Stripping/stuffing, Bulk storage, Tank storage, General warehousing, Air conditioned warehousing, Distribution centres
Logistics chain Integration Services	Quality control, Repacking, Customizing, Assembly, Testing, Repair, Re-use
Value-added Facilities	Parking facilities, weighbridges, customs facilities, truck maintenance and repair facilities, container repair and maintenance, cleaning facilities, tanking facilities, trailer renting and leasing, Information and communication, safety and security services, offices, hotels, restaurants, shops

Source: JICA Study Team

29.3.5 Programmes and Projects for Development of Lomé Port

The projects for port development are listed below:

(1) Short-Term Projects

- Promotion of Land Use Restructuring of Terminal and Waterfront Areas surrounding Lomé Port for Effective Port Operation and for Attracting Enterprises of the Logistics Industry and Processing Industry
- Mainly the creation of new access roads to the new container terminal to expand the service area of Lomé Promotion of Reduction of Port Charge at Lomé Port
- Extension of the ore terminal

(2) Mid-Term and Long-Term Projects

- Construction of dry port and rail connection from/to Sahel countries
- Extension of mineral berth

29.3.6 Priority Projects for Development of Lomé Port

The following projects are selected as priority projects for the development of Lomé Port:

- Promotion of Land Use Restructuring of Terminal and Waterfront Areas surrounding Lomé Port for Effective Port Operation and for Attracting Enterprises of the Logistics Industry and Processing Industry
- Promotion of Reduction of Port Charge at Lomé Port

29.4 Logistics Infrastructure of Togo

29.4.1 Present Situation of Logistics Infrastructure in Togo

(1) Present Situation

The country is the leader in transit cargoes to the land-locked countries (LLC) in terms of volume of freight handled. In 2014, of the 4.3 Million Ton freight to LLC, 44.0% passed through the Lomé Port. This is closely followed by the Abidjan Port which captured 42.6% and the remaining share is taken by the Tema Port. The above figures highlighted the fierce competition among the countries in attracting transit cargoes and the notable small difference that separate Lomé Port and Abidjan Port. For Lomé to maintain the lead and even pull away from its rivals, it has to continue its innovation both in infrastructure supply and operation as well addressing the remaining issues that hold back the country's potential to become a true logistics hub in the sub-region.

A good start to understanding the condition of Logistics Infrastructure in the country is by revisiting the 2013 JICA-assisted study entitled "Study on Togo Logistics Corridor Development" (TLC). The TLC succinctly explained the challenges that confront the industry:

“The major issues of transit transport on the TLC are: 1) the low level of maintenance at Lomé Port and deteriorated condition of N1, 2) aged freight vehicles, many broken-down, overloaded and oversized vehicles, and 3) complicated and inefficient customs clearance processes, inappropriate and inexperienced customs brokerages, customs clearance document forms and data that are not interchangeable between Togo and Burkina Faso, and requests to pay bribes at the port, border and checkpoints. Therefore, the transit cargo transport systems in Togo and Burkina Faso are still not efficient and must be improved to the standard of international logistics.”

Although some of the issues above have been addressed or partly addressed such as upgrading of Lomé Port, notable improvement of road surface condition of N1 and reduction of the number of checkpoints, there are still some works left to further elevate the position of the country in relation with transit cargoes. These undertakings should include efforts to professionalize the industry (including fleet renewal scheme), further simplification of customs inspection inside Lomé Port as noted by the 2014 JICA-assisted study (Study on Customs Procedures and Operations of the Lomé-Ouagadougou Corridor), traffic congestion inside Lomé city and other major cities along the North-South corridor, resolve the issues of a transit guarantee fund with Burkina Faso (single payment on departure instead of the current twice which cause substantial delay to the freight traffic), formal operation of Cinkanse OSBP among others. All of the above cited inefficiencies in the logistics chain contribute in a very high transportation cost that characterizes the corridor.

(2) Legal Framework

There have been several legal instruments enacted to govern trade between and among the ECOWAS and UEMOA countries. The major legal instruments are as follows:

1) Transit Traffic and Interstate Transport

- 1982 ECOWAS Convention A/P.4/5/82 (Inter-State Road Transit of Goods - ISRT): This protocol calls for a single carnet (guarantee) system involving payment (single payment on departure) and sharing of guarantee fees among the sureties (guarantor) of the countries of transit. This means that a guarantee fee of 0.5% will be paid at the port (assuming imported goods) and a mechanism to split the fee between the coastal country (entry point) and the land-locked country (final destination point) will be established. Currently, only Côte d’Ivoire and Mali have made such agreement to implement a single guarantee system in the sub-region.
- Axle Load Control: UEMOA Règlement N°14/2005/CM/UEMOA Relatif à l’Harmonisation des Normes et des Procédures du Contrôle du Gabarit, du Poids, et de La Charge A l’Essieu Des Véhicules Lourds de Transport de Marchandises dans les États Membres de l’UEMOA. This regulation basically confirms the original axle load limit established by the 1982 ECOWAS IST Convention on Inter-State Road Transport which sets a limit of 11.5 tons per axle. For instance, maximum weight of cargoes to be loaded on a 6-axle truck is only 51 ton. Of the four governments, only the Togolese government is currently compelling truckers to observe the regulation.
- Cargo Quota System or Freight Sharing: The ECOWAS Inter-State Road Transportation Convention (No. A/P2/82) allows pairs of member states to conclude bilateral treaties that set quotas in terms of specific percentages of the freight passing through a coastal country’s port en route to a landlocked country to the truckers of each of the two countries. Several such bilateral treaties exist, usually dividing imported goods into “strategic” goods and nonstrategic goods. Strategic goods are 100 percent allocated to the landlocked country and nonstrategic goods are allocated 2/3 to the landlocked country and 1/3 to the coastal country. (Impact of Road Transport Industry Liberalization in West Africa, USAID, 2012)

2) Trade Facilitation

- ECOWAS Decision A/DEC/13/01/03. This relates to establishing a Sub-regional Road

Transport and Transit Facilitation Programme in Support of Intra-Community Trade and Cross-Border Movements.

- Joint Border Posts: Supplementary Act /Sa.1/07/13. This relates to the Establishment and Implementation of the Joint Border Posts Concept within Member States of ECOWAS, it establishes, among other things, the legal framework of Joint Border Posts.
- Décision N°15/2005/CM/UEMOA Portant Modalités Pratiques d'Application du Plan Régional de Contrôle sur les Axes Routiers Inter-Etats de l'UEMOA. This decision spells out clearly that there should be no controls at all of transit traffic along inter-state roads and that all controls must be limited to the point of departure, border crossings and the point of arrival.
- Décision N° 39/2009/CM/UEMOA Portant Création et Gestion des Corridors de l'Union – creation of Corridor Management Committees.

3) Trade Policy

- ECOWAS Trade Liberalization Scheme (ETLS) and its various instruments - ECOWAS operational tool for promoting the West Africa sub-region as a Free Trade Area.
- ECOWAS Common External Tariff - this is one of the instruments for harmonizing ECOWAS Member States and strengthening its Common Market.

(3) Existing Development Plan for Logistics Infrastructure

The 2013-2017 national development plan of the country entitled “Strategy on Accelerated Growth and Employment Promotion (SCAPE)” gave prominence to the importance of logistics infrastructure in the total development of the country. The Plan intends to utilize the country’s strategic advantage vis-à-vis land-locked countries (shortest corridor) as well as its infrastructure advantage being the only country in the sub-region with a deep-sea port (draft of 16.6 meter). Ingrained in this plan is the initiative to build the North-South corridor as a dynamic economic corridor which would play a key role in bridging the wealth gaps among the sub-regions. This initiative would accelerate growth, create jobs, increase people’s income, and promote rural development. The SCAPE objectives for this initiative are as follows:

- Rehabilitation, in partnership with the private sector, the main corridor including road and rail which link Togo to its neighbouring countries;
- Optimize investment in the corridor by taking advantage of new opportunities created by the rehabilitation of infrastructure;
- Optimize social development opportunities while encouraging the participation of traditionally disadvantaged communities;
- Reduce sub-regional disparities and promote rural development.

The above initiatives require massive investment, thus, aside from tapping the public and private fund, the plan recognized the importance of attracting foreign direct investment.

29.4.2 Issues on Logistics Infrastructure in Togo

The critical issues that need to be addressed by the Togo side to push forward the industry are presented in the table below.

Table 29.4.1 Major Issues affecting the Logistics Infrastructure in Togo

Grouped Issues	Details
a. Weak (or lack) compliance on the laws and regulations enacted by regional bodies	<p>Level of compliance on the different enacted major laws by the regional bodies (ECOWAS and UEMOA) is as follows:</p> <ul style="list-style-type: none"> • 2005 Number of control points along the corridor by UEMOA—all controls must be limited to the point of departure, border crossings and the point of arrival. Compliance on this directive is very weak as evident by the multiple check points on all the three (3) corridors. • 2005 Axle load control by UEMOA – for compliance on this important measures to protect the road asset, the Togolese government had shown a strong resolved. Of the four governments, only the Togolese government is currently compelling truckers to observe the regulation. • ECOWAS protocol on Inter-State Road Transit of Goods (ISTG) – the envisioned single guarantee fee of 0.5% to be paid at the port (assuming imported goods) and a mechanism to split the fee between the coastal country (entry point) and the land-locked country (final destination point) will be established is still not completely realized. Currently, only Côte d'Ivoire and Burkina Faso have agreed to implement a single guarantee system. At Lomé Port, the two (2) chambers of commerce (guarantors) of Togo and Burkina Faso have signed an MOU in late 2015 to allow the two (2) customs bounds fees to be charged once at Lomé port however this has not been implemented yet. No progress is reported at the Tema/Accra-Ouagadougou corridor.
b. Operational-related issues	<ul style="list-style-type: none"> • Traffic circulation inside the port is poor which affects the flow of cargoes. This is due to several factors such as poor pavement condition of the road, presence of activities not related to port functions (e.g. market and church inside Lomé Port) • Lengthy cargo processing time which contributes to port congestion. The reasons include preference of carriers for bulk cargo (devanning) over containerized cargo thus increasing the dwell time, customs conducts its inspection / intervention twice (by the compliance officer and by the brigade) inside the port which create unnecessary delay. These two activities should be unified to reduce cargo dwell time. • Strong presence of road blocks (road harassment) for bribery. It was reduced to 13 in the past but it now stands at 29 according to verification mission done by Borderless in November 2015. • Prevalence of overloaded trucks • Inefficient transit system which results in the immobilization of trucks. At Cinkasse OSBP, it can be very congested and the long delay may result in a waiting time at the border of 1 or 2 days while the usual time is estimated to be an average of 6 hours • Likewise, the amount of fee charged by clearing agents to process documents at Cinkasse JBP (USD 164 Togo side + USD 25 informal fee; USD 68 Burkina Faso side) represent about 7% of the total cost. This is the highest border crossing cost among the three corridors. • At Lomé Port, the two chambers of commerce (guarantors) of Togo and Burkina Faso signed an MOU in late 2015 to allow the two customs bound fees to be charged once a Lomé port however this has not been implemented yet.
c. Infrastructure-related issues	<ul style="list-style-type: none"> • Lack of dry port as support-extension of Lomé Port • Almost complete shutdown of railway operation which could be useful even for just domestic freight particularly mining • Some rest areas are not patronized by truck drivers due to the issue of suitability of locations. • Poor road condition of some sections of the corridors • Old vehicles are used to transport cargoes and are thus susceptible to frequent breakdowns and accidents • Lack of OSBP resulting in complicated and inefficient transit procedures (between Togo and Benin)
d. Institutional-related issues	<ul style="list-style-type: none"> • Cargo sharing agreement between land-locked countries and coastal countries (Freight Sharing) • First-come, first-served system practiced by the truck unions (Queuing System) • Inadequate enforcement of axle load control resulting in road damage and accidents • Lack of single guarantee fund (Regional Guarantee system). MOU between Togo and Burkina Faso was signed in late 2015 but is still not in operation. • Lack of regional insurance/guarantee scheme for containers • Insufficient effort by concerned authorities to end road harassment

Source: JICA Study Team

29.4.3 Objectives for Development of Logistics Infrastructure in Togo

(1) Overall Objective

The overall goal for the logistics sector in this study is the reduction of transport and transaction cost through establishment of an efficient multi-modal logistics system in the region. This bold target

naturally calls for upgrading the logistics infrastructure (terminals and links), modernization of logistics operation (mechanization of the remaining activities that are now being done manually), promotion of logistics human resources (that would contribute to professionalization of the industry) and gradual abolition of the outdated systems governing the industry.

(2) Specific Objectives

The specific objectives for Logistics Infrastructure in Togo are as follows:

- To provide high quality logistics infrastructure to contribute in addressing regional disparity within the country and strengthen economic relation with neighbouring countries;
- To establish a multi-modal logistics system to capitalize on the strength of each mode (all modes work together to satisfy customers demand) thereby contributing in the reduction of transport cost;
- To modernize logistics operation through increasing use of ICT to take advantage of the available modern technologies
- To promote professionalization of Logistics Infrastructure in the country.

29.4.4 Strategies for Logistics Infrastructure of Togo

The strategies are designed to achieve the four objectives enumerated above. The strategies are divided into five categories which touch infrastructure, logistics operation, and human resources development.

- Strengthening of logistics links (road and rail) and nodes (logistics platform) to facilitate smooth flow of domestic and transit cargoes
- Integration of logistics infrastructure for seamless transfer of cargoes from one mode to another
- Provision of cross-border facilities, utilization of modern ITS and data standardization for seamless flow of trade data
- Promotion of containerization to support intermodal logistics operation
- Promotion of human resources development for Logistics Infrastructure (to contribute to professionalization of the industry)

29.4.5 Infrastructure Programmes and Projects for Logistics Infrastructure in Togo

The list of projects is presented the table below.

Table 29.4.2 Proposed Projects on Logistics Infrastructure in Togo

Project Name	Project Type	Expected Responsible Organization	Term	
			Short-Mid 2025	Long 2040
Modernization of Sahel Truck Terminal (conversion into Urban Distribution Centre)	Logistics terminal	Ministry of Infrastructure and Transport	x	
Adetikopé Truck Terminal	Logistics terminal	Ministry of Infrastructure and Transport	x	
*Lomé-Blitta Railway Line	Railway	Togo Rail		x
Blitta Dry Port	Logistics terminal	Ministry of Infrastructure and Transport	x	
*Blitta-Cinkasse Railway Line	Railway	Togo Rail		x
Cinkasse Dry Port	Logistics terminal	Ministry of Infrastructure and Transport		x

Note: *Discussed in Railway section (Chapter 30)

Source: JICA Study Team

29.4.6 Programmes and Projects for Professionalizing Logistics Services and Trade Facilitation in Togo

Equally important are the non-infrastructure projects that would complement the infrastructure-based projects. These measures would address concerns on existing outdated systems that currently govern how cargoes are transported.

Table 29.4.3 Programmes and Projects for Professionalizing Logistics Services and Trade Facilitation in Togo

Project Name	Explanation
a. Institutional Strengthening and Capacity Building Support for Freight Transport Stakeholders in both the Public and Private Sectors	<p>This project aims to strengthen the capacity of the Government and of professional associations in the transport, transit and trade sectors to effectively provide efficient support and services to private operators operating primarily on the three corridors. This will also support activities that promote the professionalization of the road transport industry, as well as accompanying measures for the transport and logistics operators. It should be noted that the same project is about to commence in Côte d'Ivoire with the support of the World Bank. The project may include the following:</p> <ul style="list-style-type: none"> a. Strengthening the institutional capacity of the ministries involved in logistics operation and other related agencies. b. Support to transport operators by (i) building capacity for professional transport sector associations through the development of public and private training capacity for the transport and logistics profession, (ii) supporting informal transport operators which cannot comply with possible new regulatory requirements to convert them to other transport related activities or retrain them. c. Support to joint initiatives and formalization of public-private dialogue to facilitate trade on the corridor by (i) supporting communication campaigns on transport and trade reforms to build broad ownership and support, (ii) supporting regional dialogue among the countries on transport and transit facilitation issues on the corridors and (iii) supporting monitoring of transport conditions on the three corridors through a road users' survey, logistics costs measurements, and studies of pricing in the trucking industry.
b. Development of Fleet (Truck) Renewal Scheme	<p>This project aims to support the development of a fleet renewal scheme that will allow truck companies to access credit lines to renew their old trucks. It will also support the institutional strengthening of the authority that will be tasked by the government to handle the scheme to ensure that it would have adequate capacity in managing the activities of the project including the relationships between the commercial banks and the trucking companies. The project may include the following:</p> <ul style="list-style-type: none"> a. Support to the development of a self-sustaining Fleet Renewal Scheme and institutional strengthening the agency assigned by the government to ensure it has adequate institutional and management capacity to administer and manage the truck renewal scheme on behalf of the Government. These supports may include (i) designing of institutional and implementation arrangements for the involved stakeholders (commercial banks, truck operators and other stakeholders) to qualify them for the credit line, (ii) selection of commercial banks to host the line of credit and the selection of operators qualified for truck renewal, including clear flow of funds, and (iii) support in competitive selection of a contractor to manage the truck scrapping system. b. Capacity building and technical assistance for the agency designated by the government to more effectively manage truck renewal scheme.
c. Support to Customs Modernization and Trade Facilitation along the Corridors	<p>This project aims to improve efficiency of trade and transit procedures between Burkina Faso and Togo, Burkina Faso and Cote d'Ivoire, and Burkina Faso and Ghana. The primary activities are (i) ensuring efficient connection of customs information systems within the country (i.e. dry ports to the border for the case of land-locked countries; and ports to borders for coastal countries) and (ii) between the countries (i.e. inter-connection of two customs systems at the border). The proposed project may include the following components:</p> <ul style="list-style-type: none"> a. Supporting the interconnection of the existing customs' management systems on the four corridors (Ouagadougou-Abidjan, Ouagadougou-Tema/Accra, Ouagadougou –Lomé, Abidjan-Lagos) and implementation of new ICT systems to facilitate regional trade by unifying customs procedures. b. Modernization of customs' clearance procedures and promotion of coordination between customs departments to reduce congestion at gateway ports (Abidjan Port, Tema Port, Lomé Port) and border posts on the corridors and capacity building for customs officials. c. Training of customs officials and external users of customs systems, including support to professionalization of the clearing and forwarding industry through capacity building. d. Anti-harassment campaign including an information drive to different freight transport operators from both the public and private sectors.
d. Enhancement of Government's Road Safety Programme	<p>This project aims to focus on activities to improve the safety of road users including truck transport operators along the three corridors. It will also support the institutional strengthening and capacity building of the primary agency which has the overall mandate for road safety oversight. The following activities may compose the project:</p> <ul style="list-style-type: none"> a. Capacity building for the primary agency tasked for road safety and monitoring of road safety on the three corridors including effective enforcement of axle load control b. Launching of traffic safety campaigns on the three corridors via television, radio, social activities and other means. c. Identifying accident black spots along the three corridors. d. Provision of training equipment and other materials needed by the primary agency for road safety.
e. Driving Enhancement Training for Truck Drivers Plying the International Corridors	<p>This type of project was started in December 2015 in Côte d'Ivoire through the support of the European Union (EU). The plan for this project is to expand its coverage to the other countries, i.e. Burkina Faso, Ghana and Togo. The objective is to enhance truck driver's skills in driving and understanding of traffic laws, rules and regulations to facilitate the orderly and timely flow of traffic. The training would have two components: (i) theoretical and (ii) practical driving. The former would involve study of traffic rules and regulations while the latter would deal with actual driving of trucks and trailers.</p>
f. Management Enhancement Training for the Managers of Trucking Companies	<p>This type of project has been introduced as well in Côte d'Ivoire through support from the EU. The target for this proposed project is to expand it to the other three countries: Burkina Faso, Ghana, and Togo. The project includes training of managers (the person running the day-to-day activity of the truck company) in legislation covering domestic laws, and regional trade regulations as well company management which cover book keeping, cost calculations, insurance, human resource development among others.</p>

Source: JICA Study Team

29.4.7 Profiles of Priority Projects for Logistics Infrastructure of Togo

Although all the projects are selected from the view point of regional development and corridor development, there are some projects which have greater impact in terms of accelerating regional development hence given a priority. Likewise, project readiness (e.g. FS has been conducted), urgency from the government side to pursue the project, and significant impact into the international logistics chain were also given weight in coming up with the priority list..

(1) Project for Strengthening of Implementation of Customs Union for Sub-Regional Products at National Borders

1) Project Outline

In addition to logistics industry and export of primary commodities (minerals and agricultural products), it is necessary for Togo to diversify economic sectors. The WAGRIC Master Plan recommends paying attention to the potential of economic sectors both in coastal areas and inland areas, by targeting growing sub-regional markets and taking advantage of the customs union which has been institutionalized by UEMOA and ECOWAS.

For this purpose, it is necessary to strengthen the implementation of the customs union by taking advantage of the customs union, which has been institutionalized by the member countries of UEMOA and ECOWAS.

The project aims at enforcement of implementation of the customs union and trade facilitating for sub-regional products with neighbouring countries of the sub-region, especially with Ghana and Benin, along Abidjan-Lagos Corridor. The project will be applied to the national border with Burkina Faso along Lomé-Ouagadougou Corridor.

The project will establish new materials for training and train related agencies and personnel. Campaigns for customs union trade facilitation of sub-regional products will also be implemented together with WAGRIC countries and its surrounding countries under this project.

2) Funding Scheme

ODA Technical Assistance

3) Estimated Project Cost

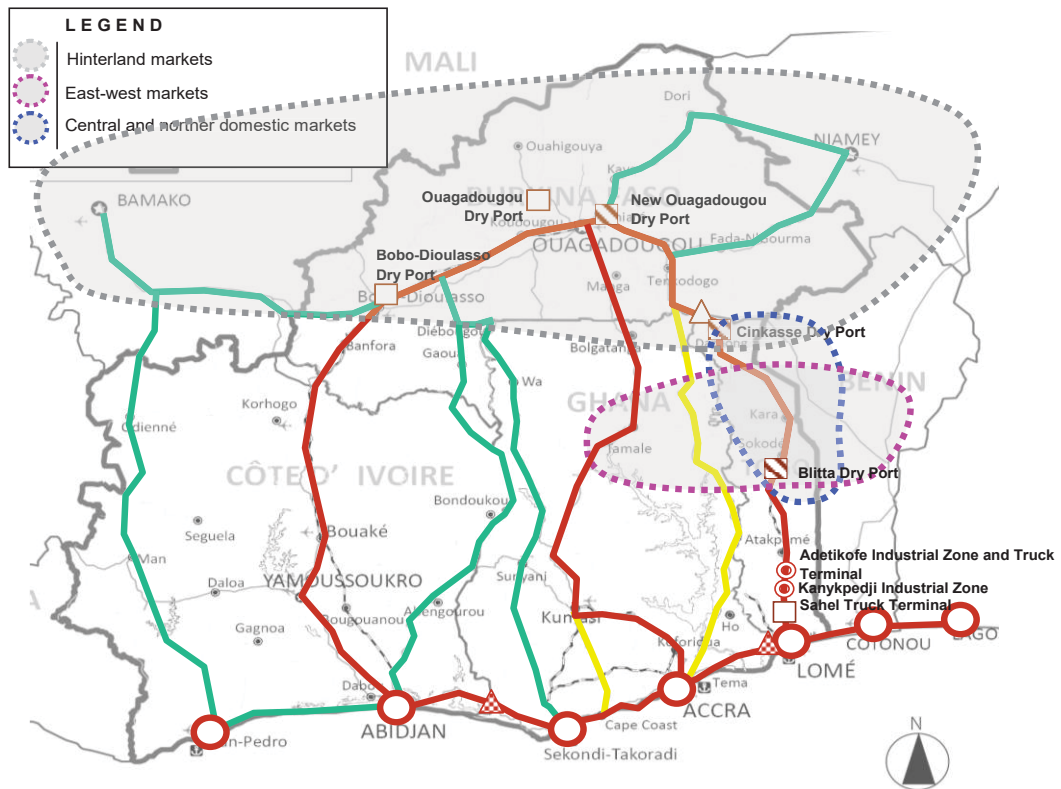
US\$ 4 million

(2) Project for Construction and Operation of Multi-Modal Dry Port in Blitta

1) Rationale

This project has been recommended by the 2013-JICA assisted study entitled (The Study on Togo Logistics Corridor Development) as an important facility to realize the concept of Corridor Towns and Logistics Facilities. The idea is to develop a logistic facility which would serve as the hub of the sub-regional economy. The facility will handle both domestic freight and transit freight to Sahel countries (see Figure 29.4.1).

The idea is that freight from Lomé Port to Blitta Dry Port is serviced by railway on both ways. Truck's role would be limited on the final leg, i.e. between the dry port and the final destination. The same arrangement is envisioned on freight for export where truck would unload freight at the dry port and the final leg to Lomé Port would be served by the railway.



Source: JICA Study Team

Figure 29.4.1 Target Markets for Blitta Dry Port

2) Objective

The objective of the dry port is to induce regional development in the heart of the country. This action would have multiple effects such as it would generate jobs, attract new investment, and create new services that would contribute to dispersing development among the regions of the country.

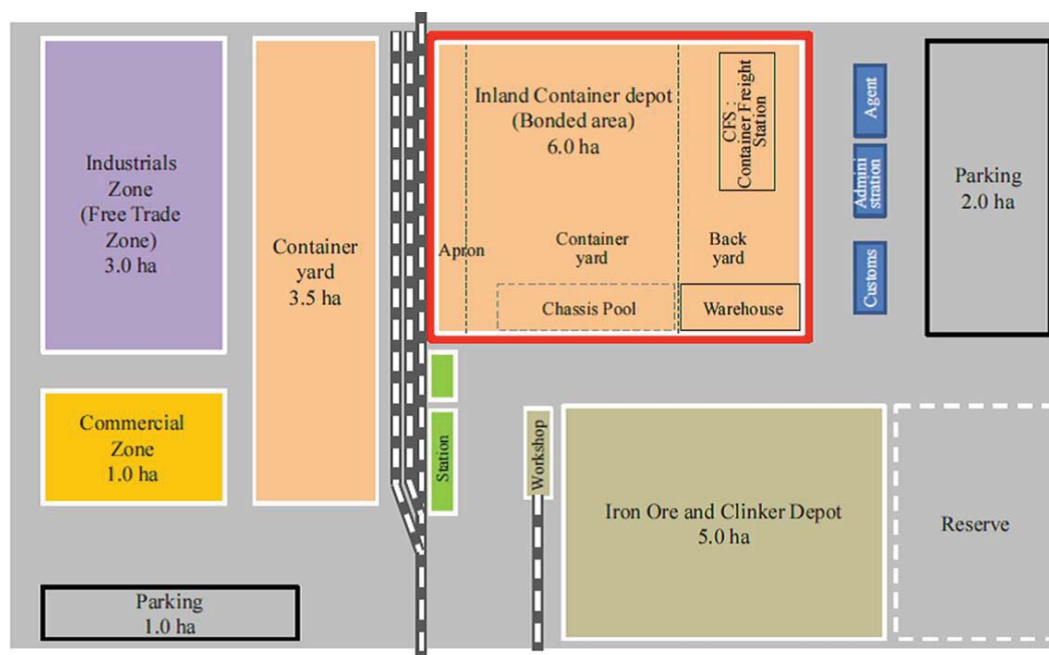
3) Project Description

The project involves construction and operation of a dry port supported by an economic zone (see Figure 29.4.2). The core components of the project are as follows:

- Industrial zone
- Commercial zone
- Container yard
- Truck parking area
- Inland container depot
- Iron ore and clinker depot

For the dry port facility, it is envisioned to offer the following core logistics functions:

- Transit point for freight to Sahel countries
- Transit point, storage, and inventory adjustment to inland areas of Togo
- Inland container depots (ICD)



Source: The Study on Togo Logistics Corridor Development, JICA, 2013

Figure 29.4.2 Layout Plan of Blitta Dry Port

4) Expected Benefits

The expected benefits in this project are as follows:

- Reduction of congestion at Lomé Port
- Improvement of container logistics
- Enhancement of competitive position of Togo for transit trade to the Sahel countries.
- Reduction of transportation costs
- Increase in transportation reliability
- Greater security and safety of transportation
- Upgrading of competitive position

5) Executing Agency

- Ministry of Infrastructure and Transport

6) Estimated Project Cost

EURO 14.616 Million (2013 JICA-assisted study's estimate)

7) Implementation Schedule

To be determined

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Review of the 2013 Financial and Economic evaluation undertaken by the JICA Study Team

9) Related Projects

Related projects are listed as follows:

- The project is envisioned in tandem with the rehabilitation of Lomé-Blitta railway line

10) Social and Environmental Impacts

The 2013 JIA-assisted TLC assessed the possible social and environmental impact of constructing the dry port. The results are as follows:

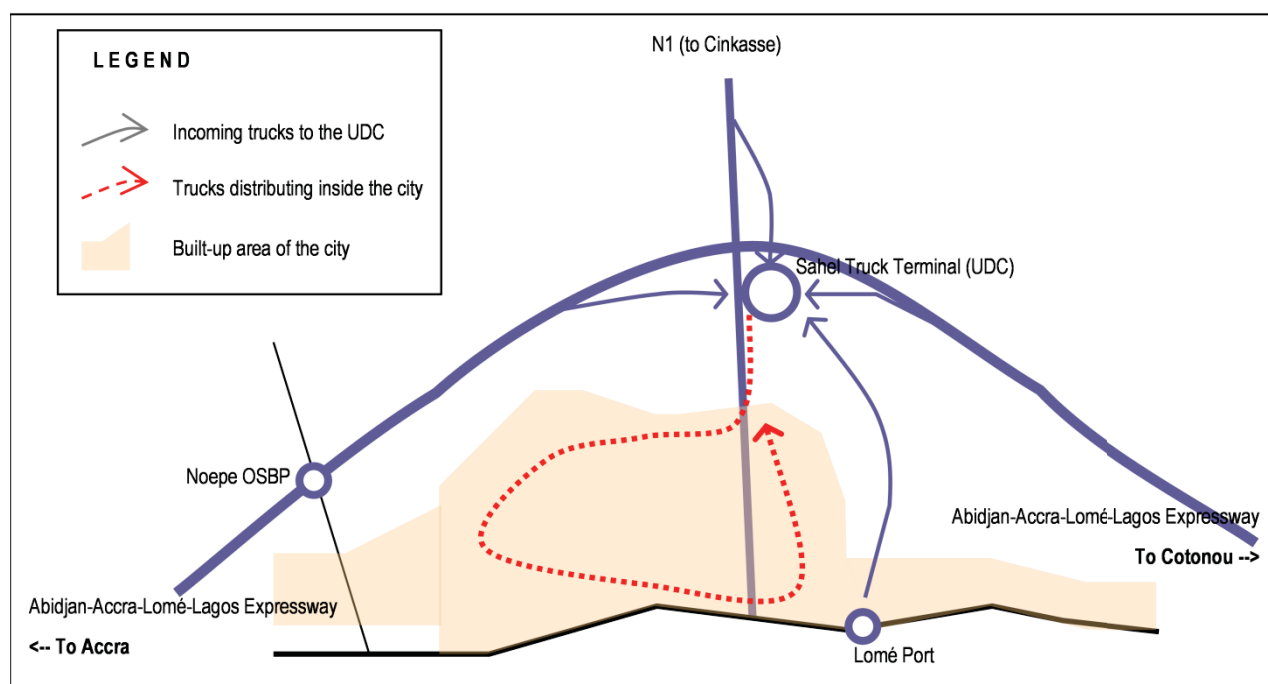
- Environmental impact is B- (some negative impact is expected)
- Social impact is B- (some negative impact is expected)

(3) Modernization of Sahel Truck Terminal (conversion into Urban Distribution Centre)

1) Rationale

With the impending plan to transfer the current functions of Sahel Truck Terminal to the new envisioned Adétikopé Truck Terminal, there's a need to rethink how to best utilize the existing facility. One idea is to convert the facility into a logistics centre (urban distribution centre - UDC) where all cargoes intended for Lomé city (for local consumption) have to be delivered initially in the facility. Cargoes to be diverted into the Urban Distribution Centre (UDC) include (i) those coming from Lomé Port and their destination is Lomé City as well as (ii) those cargoes coming from ECOWAS countries and their destination is Lomé City. In essence, UDC is a place for trans-shipment from long distance traffic to short distance (urban) traffic where the consignments can be sorted and bundled (break-bulk point).

The concept is illustrated in Figure 29.4.3. One of the requirements of the UDC is that it should have good access to the trunk road to ensure smooth movement of trucks. The UDC has good access with the N1 however since the final alignment of Abidjan-Accra-Lomé-Cotonou-Lagos Expressway at the section of Togo has not been determined, it was assumed that it is close to Adétikopé based on the discussion with the government. The on-ramp and off-ramp of the expressway should be designed in a way that it could support exit/entry of trucks from/to the facility. Once this is secured, the next challenge is how to secure the truck route between the UDC and Lomé Port without passing through the city's built-up area.



Source: JICA Study Team

Figure 29.4.3 Concept of Urban Distribution Centre after Conversion of Sahel Truck Terminal

2) Objectives

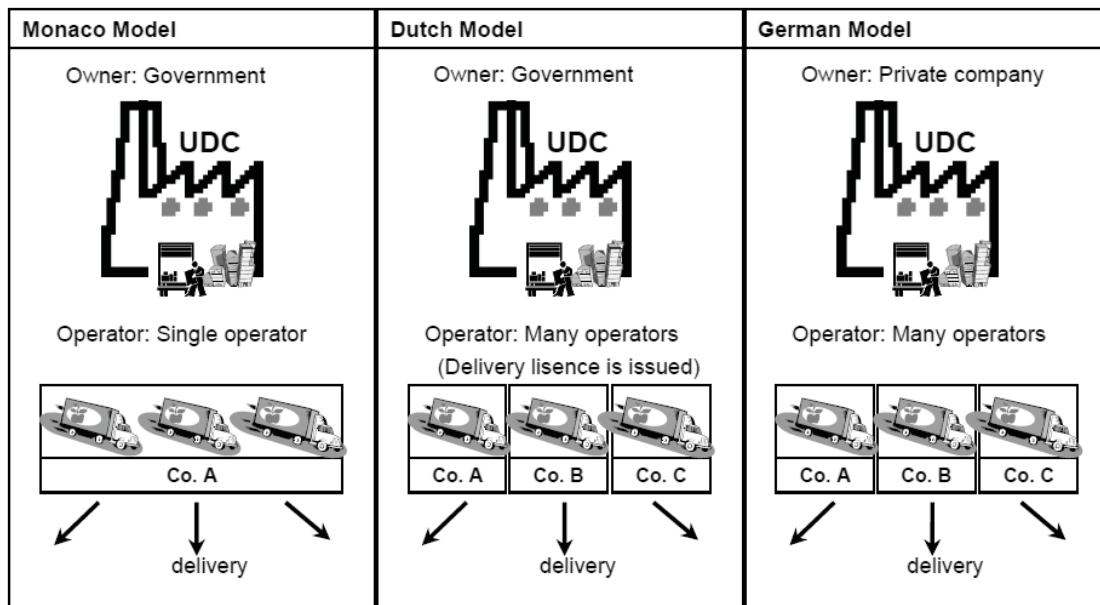
The objectives are as follows:

- To facilitate in the merging of the operations of small companies which lack funds to upgrade their logistics facilities and relocate them outside the city
- Reduction of the number of heavy trucks inside the city thus contributing in reduction of traffic

congestion and improvement of the urban environment

3) Project Description

The project involves conversion of Sahel Truck Terminal into UDC. One of the major tasks in this project is construction of huge warehouses that would be rented out to different logistics operators. As far as financing of facilities is concerned, there are three possible models which are: (i) the Monaco model wherein the government owns the facility and contracts the operation of freight distribution to a single transport company, (ii) Dutch model wherein licenses are given by authorities to operators who meet certain criteria to deliver goods in the city, and (iii) German model which is a private carrier initiative to consolidate freight and distribute it cooperatively. Selection of which model is most suitable should be carefully studied taking into account government resources, private sector's experience to operate such facility, and logistics operators' views (i.e. whether they are willing to utilize the facility in their operation and if they are not willing, what are the incentives to induce them to cooperate by utilizing the facility).



Source: Sinarimbo, N., 2005, Freight Transport Management in the Central Business District: An Empirical Analysis of the Traffic and Environmental Impacts of the Cooperative Delivery System. Unpublished Doctoral Dissertation. Tokyo University of Marine Science and Technology, Tokyo, Japan

Figure 29.4.4 Different Types of Financing and Management of UDC

4) Expected Benefits

The following benefits are expected:

- Improved traffic circulation in the city due to reduced number of trucks (reduction of traffic congestion)
- Improved urban environment (reduction of air pollution, noise pollution, and vibration caused by heavy trucks)
- Improved efficiency in logistics operation due to opportunity of consolidating cargoes for delivery (cost reduction)

5) Executing Agency

- Ministry of Infrastructure and Transport

6) Estimated Project Cost

To be determined

7) Implementation Schedule

To be determined

8) Necessary Actions for Implementation / Critical Factor

The government should be the prime mover to realize the project by organizing a forum with different logistics actors. The purpose is to explain the concept and gauge the level of interest of the private sector in the proposal.

9) Related Projects

None

10) Social and Environmental Impacts

Possible Social and Environmental Impacts are as follows:

- Social impact is minimal since the area is not inhabited. Noise and other types of disturbances caused by construction works are expected.
- Environmental impacts are expected to be minimal and limited to those which might be caused by filling and other construction works.

(4) Construction of Adétikopé Truck Terminal

1) Rationale

This plan by the government is in line with its effort to develop the North-South corridor to better serve transit cargoes as well as inducing development along the corridor. The idea is to transfer the current function of Sahel Truck Terminal into this planned new truck terminal. Along with this facility, the government is also planning to develop Adétikopé Industrial Zone with an area of about 80 hectares.

2) Objective

To supply a modern facility where all the needs of trucking and transport operators are provided to improve efficiency of logistics operation in the country.

3) Project Description

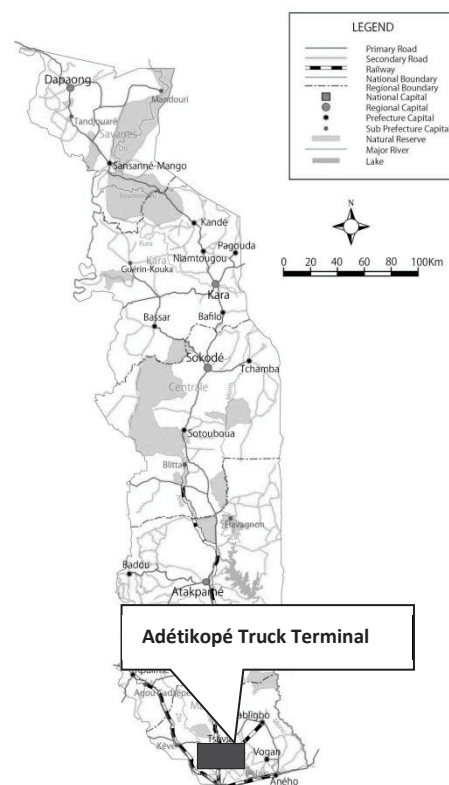
The project involves constructing a new truck terminal that could serve as an extension of Lomé Port. This means that the facility is customs controlled and the following activities might be undertaken:

- Transit Documentation
- Installation of Tracking devices on the Transit trucks
- Issuance of insurance
- Provision of Waybill
- Other formalities

The area of the facility is about 60 hectares which could serve more than a thousand vehicles. Empty trucks waiting for their turn in the first-come first-serve system might be accommodated as well in the facility depending on the final design and plan after careful study. Another idea is for the Sahel Truck Terminal to serve as a holding area for trucks waiting for their cargoes. The decision on how to allocate the function for each facility should be carefully studied.

4) Expected Benefits

The following benefits are expected in this project:



Source: JICA Study Team

Figure 29.4.5 Project Location of Adétikopé Truck Terminal

- Contribute to decongesting Lomé Port by allowing containers to automatically depart the port and formalities will be carried out at the dry port
- Enhancement of Togo's competitiveness position for transit cargo to land-locked countries
- Promotes greater security and safety of cargoes
- Improved efficiency in logistics operation due to concentration of logistics services

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- Port Autonome de Lomé
- Ministry of Infrastructure and Transport

6) Estimated Project Cost

To be determined

7) Implementation Schedule

To be determined

8) Necessary Actions for Implementation / Critical Factor

Feasibility study should be carried out.

9) Related Projects

The proposed Truck Terminal is a complementary project for the proposed Adétikopé Industrial Zone by the government.

(5) Construction of Cinkasse Dry Port

1) Rationale

Ultimately the Cinkasse Dry Port has to be built in accordance with the phasing development of the railway. This proposed project is in line with the 2013 JICA-assisted project (The Study on Togo Logistics Corridor Development). The project is envisioned as the gateway of Togo in freight facilitation with the land-locked countries. There are compelling reasons for the construction of the facility and one of these is to take advantage of the planned construction of the railway line from Lomé to Cinkasse. In order to fully utilize the railway line, a freight terminal at the end of the line is necessary which would permit intermodal operation (transfer of freight from rail to truck or the other way around). Another reason is the anticipated heavy investment into infrastructure development of the rival corridors to strengthen their position in relation with transit freight. Togo could not afford to take the position of do-nothing while the rest is filling in their infrastructure gap. By constructing the dry port, in essence the country is bringing closer to the clients (land-locked countries) services at their primary port, Lomé Port.

2) Objective

The overall goal of the project is to strengthen the position of the country as far as transit freight is concerned. Likewise, this facility would trigger regional development driven by the new services created at the dry port. And these services would attract new investment which would in turn generate jobs.

3) Project Description

Construction of the dry port at Cinkassé has been long envisioned by the government as part of their broader strategy of making the country the primary logistics hub of the sub-region. This is in tandem with the plan to further strengthen NI and to construct a railway line from Lomé to the country's border with Burkina Faso.

In this Study, the railway development programme was set as follows:

- 1st stage: Construction of Lomé-Blitta (Target year is 2030)

- 2nd stage: Construction of Blitta- Kabou (Target year is 2030)
- 3rd stage: Construction of Kabou-Cinkassé (Target year is 2040)

Like the planned dry port in Blitta, the core components of the project are as follows:

- Industrial zone
- Commercial zone
- Container yard
- Truck parking area
- Inland container depot

The dry port facility should offer the following core logistics functions:

- Transit point for freight to Sahel countries
- Transit point, storage, and inventory adjustment to inland areas of Togo
- Inland container depots (ICD)

As seen in Figure 29.4.6, freight from Lomé Port is envisioned to be transported through the railway (or at least majority of the freight). Truck will pick up freight destined to land-locked countries at the dry port. The same pattern is expected for freight for export that would go through the Port of Lomé. Trucks from land-locked countries unload their freight at the dry port where customs clearance and other formalities are undertaken and from thereon freight is serviced by the Cinkasse-Lomé railway line.

4) Expected Benefits

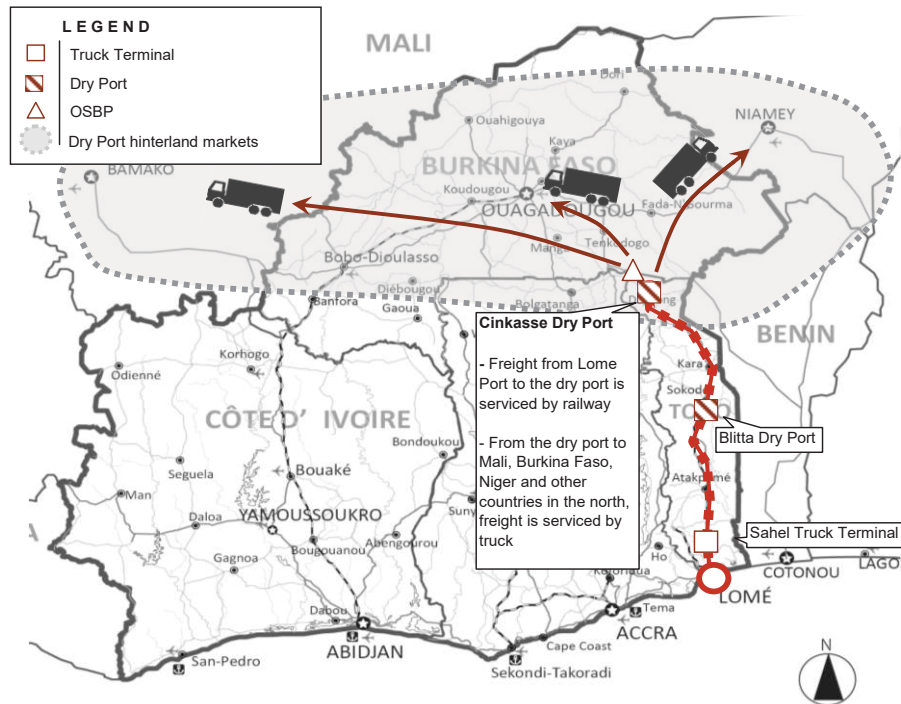
The expected benefits in this project are as follows:

- Reduction of congestion at Lomé Port
- Improvement of container logistics
- Enhancement of competitive position of Togo for transit trade to the Sahel countries.
- Reduction of transportation costs
- Increase in transportation reliability
- Greater security and safety of transportation
- Upgrading of competitive position

5) Executing Agency

Expected executing agency for this project is listed below.

- Ministry of Infrastructure and Transport



Source: JICA Study Team

Figure 29.4.6 Concept of Cinkassé Dry Port vis-à-vis Mode of Freight Transport

6) Estimated Project Cost

To be determined

7) Implementation Schedule

To be determined

8) Necessary Actions for Implementation / Critical Factor

Feasibility study should be undertaken in tandem with the Lomé-Blitta-Cinkassé Railway line

9) Related Projects

Related projects are listed as follows:

- Lomé-Blitta-Cinkassé railway line

10) Social and Environmental Impacts

Extent of social and environmental impact will be known during the feasibility study stage

29.5 Air Transport Sector in Togo

29.5.1 Present Physical Situation of Air Transport and Airports in Togo

(1) Present Operating Civil Airports in Togo

In Togo, there is one operational international airport, which is Lomé International Airport. There are six regional airports, namely Anie, Atakpame, Dapaong, Niamtougou (Kara), Sansanne-Mango and Sokode. Niamtougou (Kara) Airport used to have regular flights but currently none of the regional airports have regular flights.



Source: JICA Study Team

Figure 29.5.1 Location of Operational Airports in Togo

(2) Present Air Transport in Togo

The 18 destinations of international passenger flights from and to Lomé International Airport are currently as follows:

- Abidjan, Abuja, Accra, Addis Ababa, Bamako, Bissau, Brussels, Casablanca, Conakry, Cotonou, Dakar, Douala, Lagos, Libreville, Malabo, Ouagadougou, Paris and Yaoundé. (Source: OAG July 2015, Time Table).

(3) Present Situation of Lomé International Airport

Lomé International Airport is the gateway airport and the only operational airport in Togo.

The number of passengers at Lomé International Airport grew rapidly from 2010 to 2014 at an annual growth rate of 9%, and recorded 620,000 passengers in 2014. The 620,000 passengers in 2014 are expected to increase to 1,200,000 by 2020.

The volume of transit passengers was 170,000 passengers in 2014, which is comparable to the volume of transit passengers at Accra Airport in 2014. This large number was due to the active operation of ASKY airline, which is operated in a coordinated manner with Ethiopian Airline.

In the WAGRC Sub-Region, at present, Accra International Airport and Lomé International Airport have been competing with each other to attract more international transit passengers. Compared with Accra, Lomé has a large advantage for attracting more international transit passengers because it does not have a large amount of its own international passengers or domestic air passengers nor will it have even in the future.

The air traffic volume of international cargos at Lomé International Airport increased at an annual growth rate of 1.5% from 2010 to 2014.

Togo has a future plan to develop a new airport in Davie Area, which is located near Tsévié to the north of Lomé.

(4) Present Situation of Niamtougou (Kara) Airport

The existing Niamtougou Airport has a 2,500m runway and operation of B737 class aircraft is available, but no regular flights are operated due to lack of traffic demand.

29.5.2 Issues regarding Air Transport in Togo

The following issues confront the air transport in Togo:

- Although there are full airport facilities at Niamtougou Airport in Kara, no operating domestic flights which hinders the development of inland areas of Togo
- The rapid increase of passengers using Lomé International Airport which can soon exceed the capacity of the current airport

29.5.3 Objectives for the Aviation Sector of Togo

The objectives for the development of the aviation sector in Togo are defined as:

- To maintain the status of Lomé International Airport as one of the major hub airports in West Africa
- To provide facilities to improve access to remote regions, enhance mobility and develop opportunities for travel within the country as well as to increase the frequency of domestic flights

29.5.4 Strategies for the Aviation Sector of Togo

The strategies for the development of aviation sector in Togo are the following:

- To increase the capacity of Lomé International Airport for the future increase in both cargo and passenger flights including the development of a new international airport in Davie near Tsévié
- To encourage private sector participation in the aviation industry

29.5.5 Programmes and Projects for the Aviation Sector of Togo

- Construction of a New Lomé International Airport in Davie near Tsévié
- Project for Functionalization of Kara Regional Airport by Operationalizing Lomé- Kara Line)

29.6 Electricity Supply of Togo

29.6.1 Present Situation of Electricity Supply in Togo

The power demand in Togo has steadily increased due to Togo's economic growth as neighbouring countries have done. The maximum power demand has also been updated year by year, and it was recorded to be 203MW in 2014. The annual growth rate of the peak demand for 2014 in Togo was approximately 12%. This was the highest level of annual growth rate among the four countries. In fact, the annual growth rates of the other three countries of WAGRIC, namely, Ghana, Burkina Faso, and Côte d'Ivoire, in 2014, were 10%, 9%, and 7% respectively.

In terms of the power system capacity of Togo, the Togolese grid is not so large-scale comparing to the adjacent countries. For the domestic power demand, the existing power plants, NANGBETO hydro power plant, CONTOUR GLOBAL thermal power plant, and TAG LOME thermal power plant are supplying the power, of which the total installed capacity is 185MW and this volume accounts for approximately 70% of the total demand. In addition to the power supply by the existing power plants, the power is imported mainly from Côte d'Ivoire through Ghana and Nigeria, and Togo depends on imported power. However, due to the unstable power supply, especially from Nigeria, it is required for Togo to improve the quality of the power supply. Policies for development of Togolese power systems place great importance on attracting both foreign and domestic investors who can establish power plants.

29.6.2 Issues on Electricity Supply of Togo

The present main issues related to the power sector are as follows:

- Most of the domestic power demand is supplied by adjacent countries, such as Ghana and Nigeria. This means high dependency on the outer environment in terms of power supply. In 2014, the power supply from Ghana was interrupted only twice, while the power supply from Nigeria was interrupted thirty six times according to the transmission company, CEB.
- CEB and Togolese distribution company, CEET, are faced with a difficulty in expanding and rehabilitating the power facilities required for satisfying the growing demand. Due to the shortage of financial resources, they cannot rehabilitate and replace power facilities or even afford to conduct the studies necessary for creating development plans.
- Aged power facilities are still used, and they cause faults in the lines, cables and transformers. This is also because the power company does not have sufficient funds to properly maintain their own power facilities.
- As shown in Figure 29.6.1, power is supplied to Dapaong, capital of Savanes Region, from Ghana through the 161kV transmission lines connected to the main grid of Ghana. Also, through this transmission line the power is supplied to Cinkansé in Burkina Faso, too. However, Dapaong is not connected to the main grid of Togo which covers the middle and southern parts including Lomé.



Figure 29.6.1 Two Main Grids in Togo

29.6.3 Objectives for Development of Electricity Supply of Togo

In the light of the issues on the power sector, the following objectives need to be set for development of electricity supply:

- To develop the domestic power resources so as to reduce the dependency on external power supply
- To realize reliable and high quality power supply
- To enable the bulk power to transfer to potential areas for economic sector development

29.6.4 Strategies for Development of Electricity Supply of Togo

Since it takes time to establish the power facilities required to achieve the objective, it is significant to prepare strategic plans based on the priority of the development as follows:

- The development strategy in the power sector of Togo is focusing on the development of the network and the hydroelectric potential in the Mono river basin. Togo has a strong hydroelectric potential distributed all over the country and the evaluation study on the potential of the hydroelectric is ongoing with the assistance of the European Union (EU).
- The feasibility study for construction of a coal power plant is ongoing controlled by the Presidency of the Republic of Togo.
- It is important to connect the northern network with the main grid established for the middle and southern region of Togo by new 161kV transmission lines.
- The water resources are found in the mountainous areas located in the eastern part of Togo that could be utilized. Power should be generated using domestic natural resources for economic growth, as well as for reducing the burden on the power consumers.
- In order to supply the power at a competitive price, it is required to establish a power market where the reserve margin can be sufficiently ensured. In a market where the power demand exceeds the available power supply, the electricity tariff has a tendency to rise. Also, there is a possibility that the dependency on the development of the power resources by investors and private companies would cause a delay in the power development plans and lead to the chronic lack of power resources. Accordingly, it is recommended that the power plants, which can produce the power at a lower cost, are developed led by the Government for the time being, in parallel with attracting investors to the power sector.

29.6.5 Programmes and Projects for Electricity Supply of Togo

The following projects are formulated and included in the development plans that have been created by power companies for power generation, power transmission and power distribution:

(1) Projects for Development of Power Generation in Togo

These development plans are designed for the purpose of the first bullet point in the objectives described above.

- Development Plans of Several Hydropower Plants Implemented by EU
- Coal Thermal Power Development Plan Studied by TOGO INVEST
- Tetetou Hydropower Development Plan
- Upgrading of Tago Lomé Thermal Power Plant
- Development of Adjarala Hydropower Plant
- Expansion of Kozah Hydroelectric Power Plant

(2) Projects for Development of Power Transmission Lines for Togo

The power system development plans in Togo are classified into two categories, namely, “regional transmission lines” and “international transmission lines”.

1) International Transmission Lines

- 330kV Transmission Line: Accra (Ghana) - Lomé C - Sakete (Bening) [350km] for the second and third bullet points in the objectives described above.
- 330kV/161kV Transmission Line: Khara - Yendi (Ghana) [135km] for the second and third bullet points in the objectives described above
- 161kV Transmission Line: Porga (Benin) - Kompienga (Burukina Faso) [35km] for the second

bullet point in the objectives described above

2) Regional Transmission Lines

- 161kV Transmission Line: Natitingou-Porga (Benin)-Dapang[210km]
- 161kV Transmission Line: Atakpamé-Kara [246km]
- 161kV Transmission Line: Davie-Notsé-Atakpamé [125km]

29.6.6 Profiles of Priority Projects for Electricity Supply of Togo

In consideration of corridor development in Togo, priority should be given to the following projects, and profiles of these projects are prepared as follows:

(1) Project for Construction of 161kV Interconnection Line (Porga-Kompienga) with Burkina Faso

1) Rationale

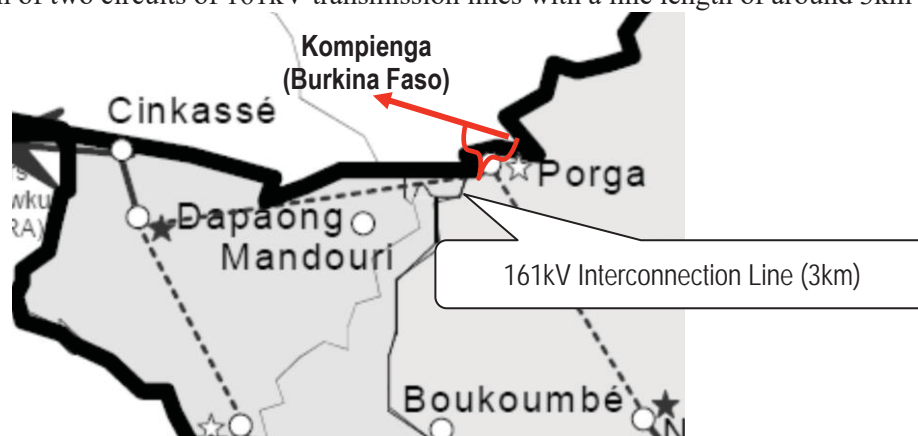
In order to realize the first interconnection with Burkina Faso, it is necessary to construct 161kV transmission lines from Porga (Benin) to Kompienga (Burkina Faso). This project could also contribute to the improvement of the reliability of the power supply.

2) Objective

The objective of this project is to realize direct power trade between CEB and SONABEL and to improve the system reliability of the power grid in Togo.

3) Project Description

- Construction of two circuits of 161kV transmission lines with a line length of around 3km



Source: CEB

Figure 29.6.2 Location of 161kV Interconnection Line with Burkina Faso

4) Expected Benefits

The following impacts and benefits are expected in this project:

- To contribute to the improvement of the system reliability and reduction of power failure
- To enable selling the surplus power to Burkina Faso

5) Executing Agency and Related Institution

Expected executing agency and related institution for this project are listed below.

- Ministry of Mines and Energy of Togo (MMET)
- Communauté Électrique du Bénin (CEB)
- Société Nationale d'électricité du Burkina (SONABEL)

6) Estimated Project Cost

The project cost would be estimated in Table 29.6.1. For estimation, it was calculated using standard unit price applicable to the construction work for power facilities in Japan and a ratio of construction cost between Japan and Ghana, “0.4”(Source: Website, “https://archi-book.com.”).

Table 29.6.1 Estimated Project Cost

Project Components	Estimated Cost [Million JPY]	Remarks
Transmission Facilities	14.4 ~ 44.4	2cct, 161kV, 3km

Source: “Standard Unit Price for Construction Work of Power Facilities”, issued by Organization Cross-regional Coordination of Transmission Operators, JAPAN (OCCTO)

7) Implementation Schedule

The project implementation schedule is estimated to be around four and half (4.5) years.

Table 29.6.2 Implementation Schedule

	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasible Study																				
<i>Route Survey</i>																				
<i>System Analysis</i>																				
<i>Social and Environmental Impact Assessment</i>																				
Preliminary Studies																				
<i>Final Line Routing</i>																				
<i>Permitting</i>																				
Engineering and Procurement																				
<i>Engineering</i>																				
<i>Procurement of Equipment</i>																				
<i>Financing</i>																				
Construction and Commissioning																				
<i>Construction</i>																				
<i>Commissioning</i>																				

Construction Period for the Part of Burkina Faso

Source: Created by JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

- Feasibility Study
- Social and Environmental Impact Study

9) Related Projects

Project for construction of new 161kV inter-connection lines with Benin in Burkina Faso

(2) Project for Construction of Adjarala Dam and Hydropower Plant

1) Project Outline

The WAGRIC Master Plan recommends the diversification of economic sectors both in inland areas and coastal areas. The WAGRIC Master Plan pays attention to both urban development and rural development in its recommended growth scenario. Urban centres along the economic corridors (both north-south corridors and the coastal east-west corridor) are strategic locations to attract manufacturing industries. In order to support such development of manufacturing sectors in urban centres, it is important to provide economic infrastructures, such as water supply, electricity supply and industrial parks.

The power demand in Togo has steadily increased due to Togo’s economic growth. In fact, the annual growth rate of the peak demand for 2014 in Togo was approximately 12%. This was the highest level of annual growth rate among the WAGRIC countries.

About 70% of power demand was satisfied by the Togolese power plants. Approximately 30% of the power demand is met by importing from Côte d’Ivoire through Ghana and Nigeria. However, due to the unstable power supply, especially from Nigeria, it is required for Togo to improve the quality of its power supply.

Policies for development of Togolese power systems place great importance on attracting both foreign and domestic investors for establishing power plants. While an electricity company (CEB) supplies electricity to Togo and Benin, the national economies of the two countries are not large enough to build a large thermal power generation using imported fuels. Therefore, it is necessary for Togo to utilize its natural sources of energy for power generation and to reduce the financial burden on power consumers. The water resources that could be utilized are found in the mountainous areas located in the eastern part of Togo. Currently Togolese government's power development strategy focuses on the hydroelectric potential in the Mono river basin.

The project aims to construct Adjarala Dam (40-meter-tall rock and earth dam) on the Mono River, a hydropower plant (147 MW) and a transmission line for increasing Togo's own power generation.

2) Funding Scheme

ODA Loan

3) Estimated Project Cost

US\$ 400 million

(3) Adjarala Hydro Power Development Project

1) Rationale

It is important to develop the hydro power plant utilizing domestic natural resources, such as water resources for national energy security in order to reduce the dependency on external power supply.

2) Objective

The objective of this project is to increase the capability of power supply in Togo by utilizing natural resources.

3) Project Description

The development of Adjarala hydro power plant is considered one of the potential hydro power plants that will highly contribute to the power supply in Togo. In its development plan, it is planned as a storage type with an output of 34MW according to MME. However it takes long time to develop it along with the construction of dam and might require long patience to realize it. Instead, the low-head type of hydro power plant, which has less environmental impact and whose construction does not require long period compared to the storage type, is recommendable here. The potential location for the Adjarala hydro power plant in the Mono river basin is shown in Figure 29.6.3.



Source: CEB & Google Earth

Figure 29.6.3 Location of Adjarala Hydro Power Plant

For identification of its desirable location, it is crucial to evaluate an effective head for computation of expected output because the low-head hydro is adequate for the location where the effective head is from 15m to 7m. Figure 29.6.4 represents the altitude profile for potential location for low-head type of hydro power plant and “Point A”, the effective head of which is 8m and the largest in this basin, is recommended as its potential location.



Source: CEB & Google Earth

Figure 29.6.4 Altitude Profile for Potential Location for Hydro Power Plant

The turbine applied to the low-head type of hydro is shown in Figure 29.6.5.

Kaplan Turbine (conventional type)

Bulb-type Tubular Turbine (up-to-date type)

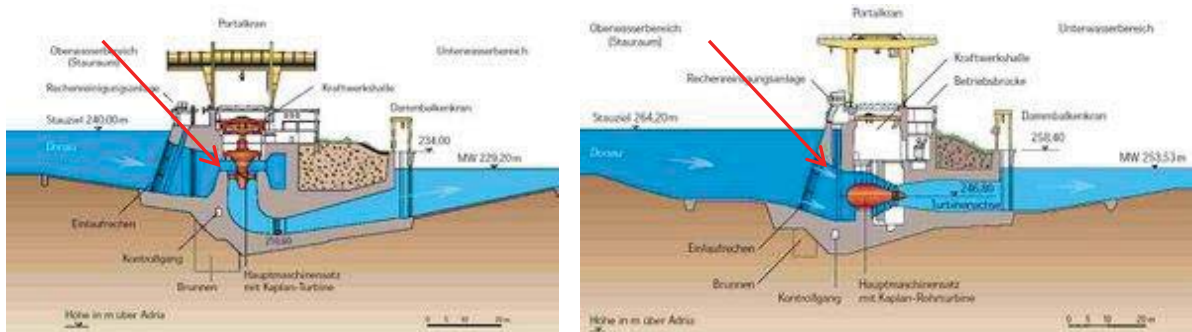


Figure 29.6.5 Image of Low-head Type of Hydro Power Plant (Run-of-River Type)

The ideal power output of hydro can be calculated based on the following formula.

$$Q = 9.8QH$$

Q: Flow Rate [m³/s]

H: Effective Head [m]

The flow rate of the targeted area provided by MMT is 107m³/s. Accordingly, the ideal power output is as follows:

$$Q = 9.8 \times 107 \times 9 \cong 8.38[\text{MW}]$$

4) Expected Benefits

The following impacts and benefits are expected in this project:

To contribute to the improvement of the domestic power supply capacity

To contribute to the reduction of greenhouse gas emitted from power plants

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- Ministry of Mines and Energy of Togo (MMET)
- Communauté Électrique du Bénin (CEB)

6) Estimated Project Cost

Generally, the unit cost [USD/kW] for the middle-scale of hydro power plant is estimated to be from 2.3 to 3.0 [Million USD/MW]. Considering the computed output, 8.38MW, the project cost would be roughly estimated to be from 19.2 to 25.1 Million USD.

7) Implementation Schedule

The implementation schedule would be estimated as follows:

Table 29.6.3 Implementation Schedule

	2017				2018				2019				2020				2021				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasibility Study																								
Water Flow & Geographic Survey																								
Surveys on Fishery & Water Rights																								
System Impact Study																								
Economic Analysis																								
Social and Environmental Impact Assessment																								
Financing																								
Financing																								
Permitting																								
Engineering and Procurement																								
Engineering (Basic Design)																								
Bidding Preparation & Bidding																								
Construction and Commissioning																								
Detailed Design																								
Construction																								
Commissioning																								

Source: Created by JICA Study Team

8) Necessary Actions for Implementation / Critical Factor

Necessary actions for implementing this priority project are as follows:

Social and Environmental Impact Study

- Social and Environmental Impact Study
- System Impact Study
- Surveys on Fishery & Water Rights
- Water Flow & Geographic Survey
- Economic Analysis

29.7 Water Resources in Togo

29.7.1 Current Situation of Water Resources in Togo

(1) Water Resources Potential and Water Use

According to FAO-Aquastat, the total renewable water resources in Togo is estimated at 14.7BCM/yr, of which 11.5BCM/yr are generated internally. The total reservoir capacity is 1.7BCM in 2010.

The estimated total volume of water use in 2007 was 129MCM/yr, which is about 0.9% of the total renewable water resources. The highest consumable water use is domestic use (72MCM/yr), followed by agricultural use (42MCM/yr) and industrial use (15MCM/yr).

(2) Legal Framework regarding Water

The existing water resources management and development is anchored on the following documents:

- The Strategy for Accelerated Growth and Employment Promotion (SCAPE 2013-2017)
- National Strategy for Sustainable Development (NSSD)
- National Water Policy 2010 focused on IWRM and based on recognition of the broad impact of water on the country (social, economic and environmental)
- Sub-sector policy of drinking water and sanitation in rural and semi urban areas (2006) with the aim to sustainably improve equitable access of rural and semi-urban populations to safe drinking

water and to modern sanitation

- Policies and National Strategies for the Integrated Management of Water Resources in Togo (2006)
- National Water and Sanitation Action Plan
- Water Code of 2010
- The National Action Plan for Integrated Water Resources Management
- Law on the organization of public drinking water and community sanitation for domestic wastewater

(3) Existing Plans and Programmes regarding Water

1) Water Sector in National Development Plan for Togo

The Strategy on Accelerated Growth and Employment Promotion (SCAPE) (2013-2017) is the latest national development plan in Togo. Among the five strategies shown in the SCAPE, the water sector is mainly related to the following strategy.

- Strategy-3: Development of the human capital, the social protection and the use of water

Within the above strategy, the following actions are proposed for the access to drinking water and sanitation.

- Implement the National Action Plan for IWRM
- Improving equitable and sustainable access to safe drinking water
- Improving people's access to adequate sanitation, and promoting good hygiene and sanitation
- Improve sector performance

2) National Action Plan for Water and Sanitation (PANSEA) for Togo

The Sector National Action Plan for Water and Sanitation (PANSEA) 2015 essentially aims at achieving the Millennium Development Goals (MDGs) related to water sector and sanitation.

After five years of implementation, the results remain mixed globally in terms of results and is difficult in terms of reference, indicators and precision in the forecasts. Indeed, the exercise of the review, conducted in 2014, helped to highlight the intrinsic and extrinsic features of PANSEA that have plagued the expected growth over the period. This does not exclude the positive aspects that remain an asset to the area.

Despite major gains, it should take account of new mutations that influence the development of the water sector and sanitation include: (i) changes in the national context characterized by rapid population growth, increasing rapid urbanization, the level of poverty of the population, the effects of climate change and the various reforms carried out in the field or in connection with the sector; (ii) the changes at the regional level such as new concepts contained in the provisions of Directive UEMOA and internationally mutations such as sustainable development goals (SDGs) in 2030, the various commitments and global declarations which Togo has subscribed.

These considerations militated for a formulation of a new policy on water and sanitation (NAEP) with a variation of a new version of a national action plan for the water sector and sanitation by 2020 (in actualization).

3) National Action Plan for IWRM (PANGIRE) for Togo

The National Action Plan for IWRM (PANGIRE) was prepared in 2010 to promote IWRM in Togo.

The specific objectives of the action plan are as follows:

- Define and plan the implementation of the future framework for integrated water resources management;
- Identify the main specific actions to be taken and propose the means necessary for their implementation

The PANGIRE was developed toward 2025. Forty-one actions structured in eight domains have been proposed to achieve the objectives. They are:

- Action Area 1: Creating good governance for water
- Action Area 2: Institutional setting
- Action Area 3: Management instrument
- Action Area 4: Economic and financial setting
- Action Area 5: Capacity development
- Action Area 6: Planning and management of water resources
- Action Area 7: Conservation and protection of water resources
- Action Area 8: Risks to water resources

29.7.2 Issues regarding Water Resources in Togo

The major issues regarding water resources management and development, which have been identified in relation to the corridor development, are shown in Table 29.7.1.

Table 29.7.1 Major Issues regarding Water Resources Management and Development in Relation to Corridor Development in Togo

Major Issue	Description
Increasing water demand for urban water supply	It is expected that the urban centres along the growth corridor will be developed more intensively, according to the corridor development. It is necessary to address the increasing water demand for urban water supply in order to secure the appropriate urban environment for the regional growth. As shown in Table 29.7.2, the current bulk water supply capacity per capita in Greater Lome is about 20liter per capita per day (lpcd), which is very low. For all major urban centres along major corridors, the bulk water supply capacity per capita in 2025 is expected to be reduced to about 60% of that in 2015 if there will be no additional water source development.
Necessity of coordinated use of existing reservoirs	The existing reservoirs could be utilized by different water users. For example, the planned irrigation project in Oti River assumes utilizing the regulated water from Kompienga hydropower dam located in Burkina Faso. Proper coordination is required for the stable usage of water.
Uncompleted IWRM plans at basin level	There will be a high water demand due to the development of the corridor. It is necessary to coordinate the various uses of water through the development and implementation of the IWRM plan in river basins. At present, there is no development master plan and water management (SDAGE) for the three river basins of the country.

Source: JICA Study Team

Table 29.7.2 Bulk Water Supply Capacity per Capita for Major Urban Centres along Major Corridors

	Current Capacity (m ³ /day)	Current Actual Production (m ³ /day)	Population (2015)	Production per capita (lpcd) (2015)	Population (2025)	Production per capita (lpcd) (2025) without additional water source development
Greater Lome	50,000	40,000	1,932,000	20.7	2,933,000	13.6
Kara	9,000	9,000	120,000	75.0	194,000	46.4

Source: Capacity and actual production – SP-EAU, Population –JICA Study Team

29.7.3 Objectives for Water Resources in Togo

(1) Overall Objective

The overall objective of the water resources management and development in the present study is as follows:

“Sustainable and secured water source for major urban centres along major corridors and other water needs such as agriculture and power generation to support promising regional economic growth.”

(2) Specific Objectives

To fully discuss the water resources management and development for the whole of all the countries and covering all sub-sectors related to water is a big task which should be conducted by the appropriate responsible agencies as a separate study on the water sector. Instead, the present study specifically focuses on the following areas on the basis of the existing water sector policy and plans:

- Water resources management for sustainable water use in relation to corridor development
- Water source development for urban water supply including conveyance, transmission and treatment for major urban centres along major corridors
- Large scale water resources development in relation to the economic and infrastructure sector programs and projects shown in the present study

On the basis of the overall objective as well as the above-mentioned considerations, the specific objectives of the water resources management and development are set as follows.

Objective-1: Sustainable and secured water source for major urban centres along major corridors

Objective-2: Effectively utilized water resources for the economic and infrastructure sectors to support promising regional economic growth

Objective-3: Well-functioning Integrated Water Resources Management

As for the major urban centres along major corridors, the following urban centres are selected for discussion in the present study.

- Lomé
- Kara

29.7.4 Strategies for Water Resources in Togo

On the basis of the major issues as well as the current situation and future prospects described in the Progress Report, the strategies to achieve the specific objectives are proposed as shown in Table 29.7.3.

Table 29.7.3 Strategies on Water Resources Management and Development in Togo

Specific Objective		Strategy
Objective-1: Sustainable and secured water source for major urban centres along major corridors	1a: Lomé	Strategy 1a-1: Implementation of planned new water sources development from Volta River Strategy 1a-2: Study and its implementation for new water sources with long-term perspective considering multiple water sources such as Zio dam and conveyance from Mono River
	1b: Kara	Strategy 1b-1: Effective use of existing Kozah dam Strategy 1b-2: Study and its implementation for new water sources such as Bafilo with long-term perspective
Objective-2: Effectively utilized water resources for economic and infrastructure sectors to support promising regional economic growth		Strategy 2-1: Effective use of existing reservoirs Strategy 2-2: Implementation of planned hydropower and irrigation projects Strategy 2-3: Early implementation of existing sanitation projects
Objective-3: Well-functioning Integrated Water Resources Management		Strategy 3-1: Development of Schéma Directeur d'Aménagement et Gestion de l'Eau (SDAGE) for three river basins in Togo

Source: JICA Study Team

29.7.5 Programmes and Projects for Water Resources in Togo

The programs and projects based on the strategies are listed in Table 29.7.4.

Table 29.7.4 Programs and Projects regarding Water Resources Management and Development in Togo

Specific Objective	Program and Project	Related Strategy	Expected Responsible Organization	Term	
				Short-Mid. 2025	Long 2040
Objective-1: Sustainable and secured water source for major urban centres along major corridors					
1a: Lomé	Sogakope - Lomé Transboundary Drinking Water Supply Project (230,000m ³ /day) by PPP	1a-1	GWCL/ SP-EAU	x	
	Study for new water source development including Zio dam and conveyance from Mono River for Lomé water scheme	1a-2	SP-EAU	x	
	Implementation of new water source development for Lomé water scheme	1a-2	SP-EAU	x	x
1b: Kara	Expansion of WTP in Kozah dam (9,000m ³ /day)	1b-1	SP-EAU	x	
	Study for new water source development including conveyance from Bafilo for Kara water scheme	1b-2	SP-EAU	x	
	Implementation of new water source development for Kara water scheme	1b-2	SP-EAU		x
Objective-2: Effectively utilized water resources for economic and infrastructure sector to support promising regional economic growth^{*1}					
2	Adjarala Hydropower Development Plan (147MW)	2-2	CEB	x	
	Tetetou Hydropower Development Plan	2-2	CEB		x
	PRODAT(Agropole Development Project in Togo) in Kara	2-2	MAEH	x	
	PRODAT(Agropole Development Project in Togo) in Oti	2-1	MAEH	x	
	Urban sanitation project in Togo-Phase II (PAUT-II)	2-3	MEAH	x	
Objective-3: Well-functioning Integrated Water Resources Management					
3	Implementation of IWRM national action plan	3-1	DRE	x	x

Source: Arranged by JICA Study Team based on information provided by relevant agencies

*1: The projects described in the agricultural sector and electricity supply sector in the present study are listed here.

29.7.6 Profiles of Priority Projects for Water Resources of Togo

Among the programmes and projects listed in Table 29.7.4, the ones which are considered to be urgent or strategically important are preliminarily selected as priority projects as shown below.

(1) Sogakope - Lomé Transboundary Drinking Water Supply Project

1) Rationale

This project is in line with the Strategy 1a-1: Implementation of planned new water source provided from Volta River (Ghana).

There is a fruitful and stable volume of water in Volta River for further usage. This project is to utilize the water in Volta River to provide the municipal water for the towns in Ghana along the conveyance pipeline as well as for Lomé in Togo.

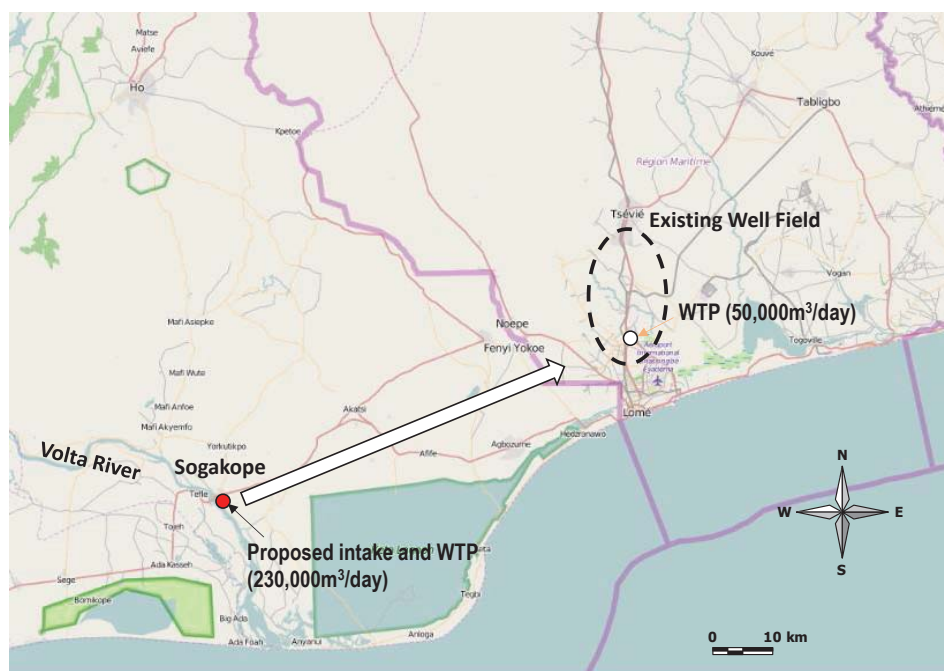
2) Objective

- To secure an adequate water source in the mid-term (targeting at around 2025) for municipal water supply for Lomé

3) Project Description

The project descriptions are as below.

- Construction of intake, Water Treatment Plant (WTP) (230,000m³/day) at Sogakope in Volta River and conveyance pipeline.
- The project is considered to be implemented by a PPP scheme.



Source: Prepared by JICA Study Team based on information provided by SP-EAU

Figure 29.7.1 Project Location for Sogakope - Lomé Transboundary Drinking Water Supply Project

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in Lomé

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- GWCL/ SP-EAU

6) Estimated Project Cost

US\$ 110million

7) Remarks

The feasibility study is on-going under the support of AfDB.

(2) Study for New Water Source Development including Zio Dam and Conveyance from Mono River for Lomé Water Scheme

1) Rationale

This project is in line with the Strategy 1a-2: Study and its implementation for new water source with long-term perspective considering multiple water sources such as Zio dam and conveyance from Mono River.

It is expected that the municipal water for Lomé will be supplied from Volta River through the Sogakope - Lomé Transboundary Drinking Water Supply Project. However, its source depends on trans-boundary conveyance. In the long-term point of view, it could be advisable to maintain multiple water sources for Lomé provided from within the internal territory of Togo. This project is to study possible future options for water sources within the territory of Togo.

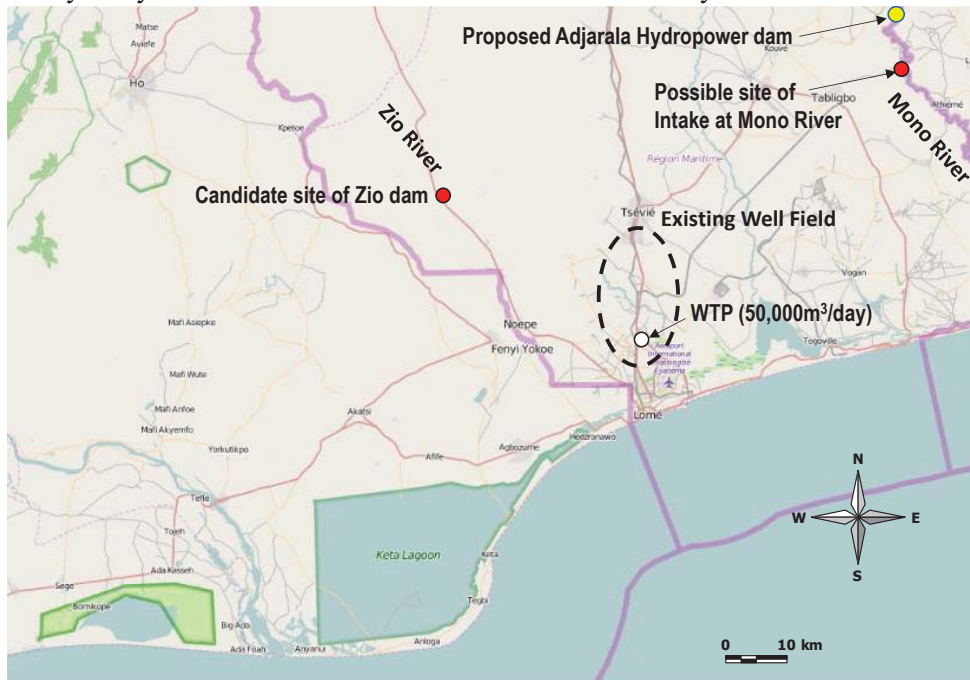
2) Objective

- To secure an adequate water source in the long-term (targeting at around 2040) for municipal water supply for Lomé

3) Project Description

The project descriptions are as below.

- Feasibility study on candidate dam sites in Zio River and conveyance from Mono River



Source: Prepared by JICA Study Team based on information provided by SP-EAU

Figure 29.7.2 Project Location for Study for New Water Source Development including Zio Dam and Conveyance from Mono River for Lomé Water Scheme

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in Lomé

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- SP-EAU

6) Estimated Project Cost

Not available

7) Remarks

There is a study that was conducted in 1991 which could need an update considering the current situation.

(3) Project for Expansion of Water Treatment Plant at Kozah Dam for Kara

1) Rationale

This project is in line with the Strategy 1b-1: Effective use of existing Kozah dam

The current total capacity of WTP at the Kozah dam is about 9,000m³/day. It is said that the possible volume of abstraction for domestic water supply from the Kozah dam would be 18,000 m³/day in total if its reservoir is properly managed.

2) Objective

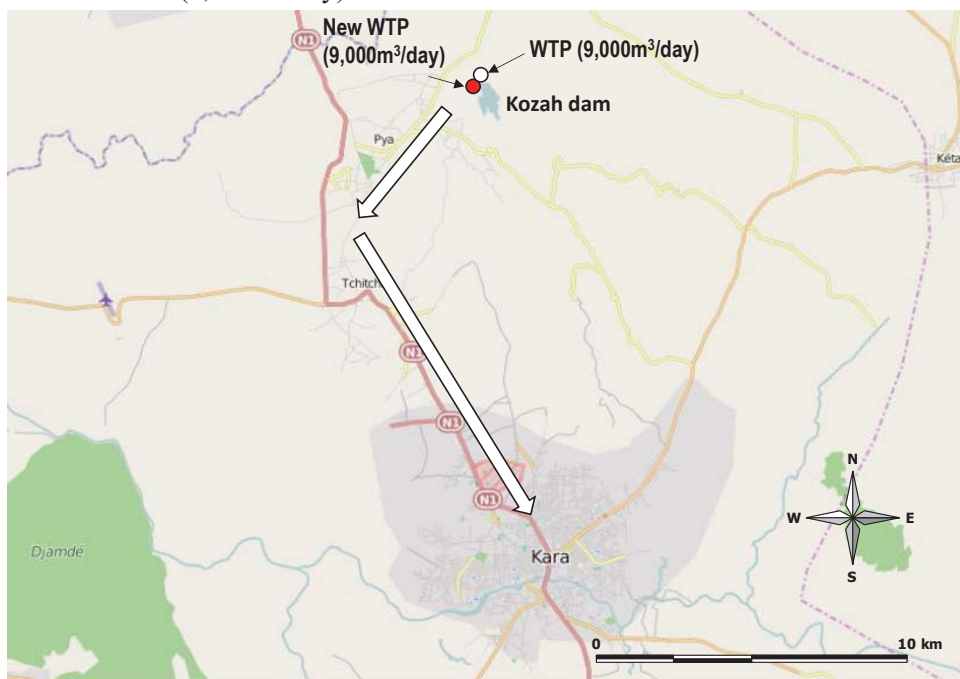
- To secure an adequate water source in the mid-term (targeting at around 2025) for municipal

water supply for Kara and surrounding area

3) Project Description

The project descriptions are as below.

- Expansion of WTP (9,000m³/day) in Kozah Dam



Source: Prepared by JICA Study Team based on information provided by SP-EAU

Figure 29.7.3 Project Location for Expansion of WTP in Kozah Dam

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Secured necessary water volume for urban water use in Kara and surrounding area

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- SP-EAU

6) Estimated Project Cost

Not available

7) Remarks

The study at F/S level was completed in 2000.

(4) Preparation of IWRM Plans for All River Basins in Togo

1) Rationale

This project is in line with the Strategy 3-1: Preparation of IWRM plans for all river basins in Togo.

It is necessary to properly coordinate several kinds of water use by preparing and implementing IWRM plans at the basin level. In Togo, no IWRM plans for the three river basins in the country have been prepared yet. All river basins should have an IWRM plan.

2) Objective

- Proper management of water resources at basin level

3) Project Description

The project descriptions are as below.

- Preparation of the IWRM plan for Lake Togo, Mono and Oti river basins

4) Expected Benefits

The following impacts and benefits are expected in this project:

- Proper management of water resources at basin level in Togo

5) Executing Agency and Related Institution

Expected executing agencies and related institutions for this project are listed below.

- DRE

6) Estimated Project Cost

Not available

7) Remarks

This is one of the activities in the IWRM action plan.

Chapter 30 Urban Development Strategies for Togo

30.1 Urban Development in Togo

30.1.1 Present Situation on Urban Development in Togo

In 2010, approximately 38% of the national population in Togo lived in urban areas.

Table 30.1.1 Urban Population in Togo

Year	Total Population	Urban Population	Share of Urban Population
2010	6,191,155	2,334,495	37.7%

Source: Bureau Central du Recensement, 2011, Recensement General de la Population et de l'Habitat

30.1.2 Hierarchy of Urban Centres in Togo

The territorial division in Togo consists of municipalities, prefectures and regions. Article 2 of Law No. 2007-011 of 13 March 2007 provides that: “The national territory is divided into local authorities, each of which possesses legal status and financial autonomy. The local authorities are at the following three levels:

- Municipalities
- Prefectures
- Regions

In Togo, there are 21 urban municipalities, 333 rural municipalities, 30 prefectural councils, and 5 regional councils. The municipality of Lomé has a particular status with urban subdivisions (arrondissements) that enjoy autonomy of management and are administered by urban subdivision mayors, who are also deputies to the Mayor of the city of Lomé.

All of these constituencies are local authorities and administrative constituencies of state authorities. The municipality is only the headquarters of a local authority. For the municipalities there is a distinction between rural and urban municipalities. Urban municipalities are made up of urban subdivisions and are home to the prefectures. The 1998 Law bringing decentralization to Togo used this division to decide on the number of local authorities.

The seven largest urban centres of Togo each with a population of over 50,000 inhabitants as of 2010 are Greater Lomé, Sokodé, Kara, Kpalimé, Atakpamé, Tsévié and Dapaong.

In the absence of a national territorial development plan, regional capitals are broadly expected to play a major role in promoting regional economic development, in addition to their administrative functions.

30.1.3 Review of Urban Development Plans for Togo

At the city level, most regional capitals have already prepared their master plans to guide both their physical and economic expansions. However, many of the existing plans are already outdated (i.e. Lomé 1981, Sokodé 2001) and need to be revised. Accordingly, several cities have started or just finished the revision process of their master plans, such as the city of Blitta (2014), the city of Sotouboua (2011), and the city of Tsevié in Zio prefecture (2011). Similarly, the Greater Lomé area,

which includes the capital and its surrounding cantons, is currently preparing its urban master plan (SDAU: *Schéma Directeur d'Aménagement et d'Urbanisme*).

Urban centres selected for special attention in corridor development due to their current urban size are the six urban centres, which are along the primary international corridors, namely Greater Lomé, Kara, Sokodé, Atakpamé, Dapaong and Tsevié. In consideration of the corridor development strategies, the following functions for major urban centres in Togo are designated for the future:

- Greater Lomé : First-class international city for business and administration centre
- Kara: National centre for business, industry including agro processing and commerce
- Sokodé: Regional growth pole with agro processing industry base and service centre for central Togo
- Atakpamé: Regional growth pole with agro processing industry base and service centre for southern Togo
- Dapaong: Regional growth pole with agro processing industry base and service centre for northern Togo
- Tsevié: New gate way city to Togo with airport city and logistics centre

30.1.4 Future Urban Population Framework for Togo

Once the physical integration starts the urbanization will occur rapidly in Lomé. It is projected that the population of Greater Lomé will reach almost 5 million by 2040.

Sokodé, Kara and Atakpamé are expected to grow to reach a population of approximately 300 thousand by 2040, which is approximately four times larger than the current population.

Table 30.1.2 Future Populations of Major Urban Centres in Togo

Region		2010	2015	2025	2033	2040	Increase 2015-2040
Greater Lomé	Population	1,571,508	1,949,591	2,915,686	3,908,998	4,970,417	3,020,826
	Annual Growth Rate		4.41%	4.11%	3.73%	3.49%	3.81%
Sokodé	Population	95,070	118,840	184,205	258,436	343,427	224,587
	Annual Growth Rate		4.56%	4.48%	4.32%	4.15%	4.34%
Kara	Population	94,878	116,562	177,834	249,618	333,840	217,278
	Annual Growth Rate		4.20%	4.31%	4.33%	4.24%	4.30%
Atakpamé	Population	69,261	87,926	141,609	206,039	283,554	195,628
	Annual Growth Rate		4.89%	4.88%	4.80%	4.67%	4.80%
Dapaong	Population	58,071	71,717	107,871	147,291	191,064	119,347
	Annual Growth Rate		4.31%	4.17%	3.97%	3.79%	4.00%
Tsévié	Population	54,474	61,786	80,407	96,699	111,715	49,929
	Annual Growth Rate		2.75%	2.68%	2.33%	2.08%	2.40%

Source: JICA Study Team based on computations of data provided by the Directorate General of Statistics and National Accounting

30.1.5 Issues on Urban Development in Togo

With relation to the corridor development the following are recognized as issues or constraints for urban development in Togo.

- Marked imbalances between the urban and rural situation
- Overconcentration on Lomé the capital at the expenses of second and third tier cities along the North-South Corridor highlighted in poor urban settings, insufficient economic activities and job opportunities
- Insufficient services and institutions provision (hospitals, universities, etc.) at the level of second tier cities
- Inadequate infrastructure
- Declining and poorly structured urban centres
- Problems related to land tenure and the right to land property and housing

30.1.6 Overall Objectives for Urban Development for Togo

The overall objectives for urban development of Togo are presented as follows:

- To prepare urban centres for leading roles in terms of economic development
- To upgrade the functions of major urban centres so that they can plan their expected roles
- To build on the advantages of prospective transport corridor development in order to weave better connections between urban centres and rural areas
- To mitigate negative impacts to be caused by transport corridor development

30.1.7 Strategies for Urban Development for Togo

In order to accomplish the overall objectives for urban development, and in anticipation of the impacts and opportunities generated by the prospective transport corridor project, it is important to review the SDAU of each urban centre taking into consideration the following:

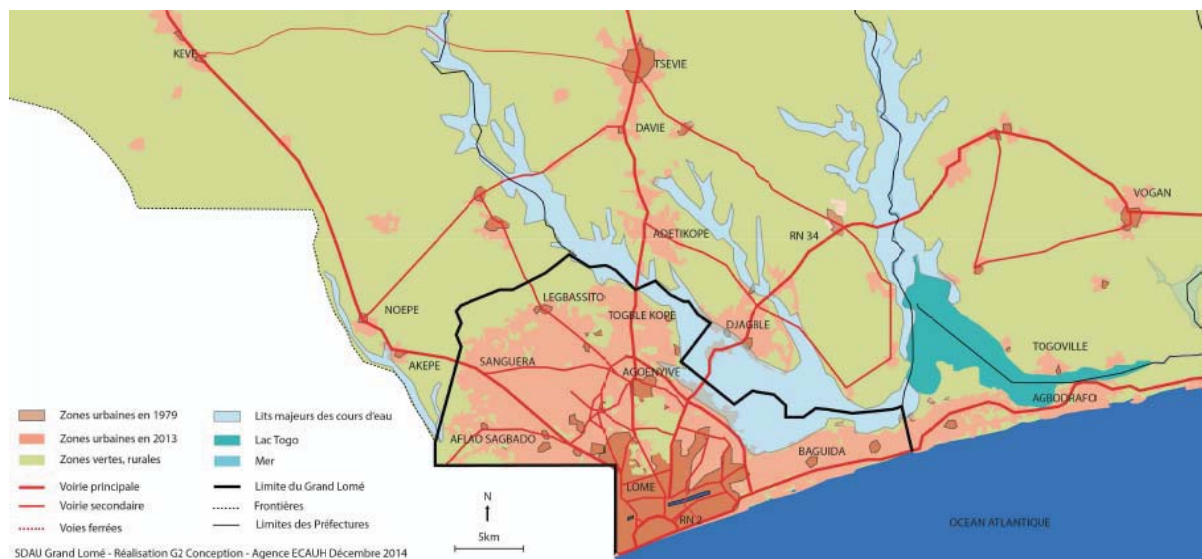
- Transformation of urban structure for accommodating further development in relation to corridor development
- Infrastructure development and urban upgrading by taking into consideration development of potential economic sectors in major urban centres
- Construction of ring roads or bypass roads not only to avoid congestion in respective city centres, but also to open up land for economic sector development.

30.2 Urban Development Strategies for Greater Lomé

30.2.1 Present Situation of Greater Lomé

(1) Urban Expansion of Greater Lomé

Since 1979 the Greater Lomé urban area has witnessed a continued sprawl as shown in Figure 30.2.1. These were mainly along the coastal corridor along National Road No.2 and towards the north along National Road No.1. The expansion was also prominent along National Road No.5 and Noépé and equally along National Road No. 34 till Djagblé where even the existing water bodies could not limit this pronounced urban sprawl.

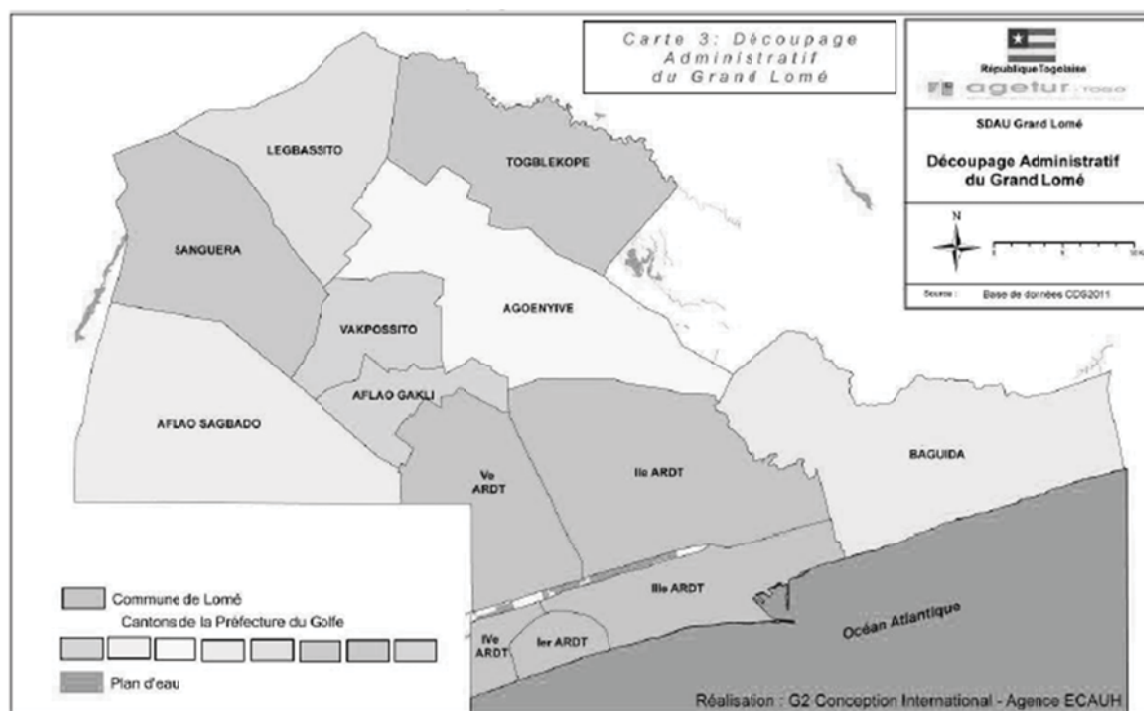


Source: Agence ECAUH, Schéma Directeur d'Aménagement et d'Urbanisme du Grand Lomé. Phase II "Analyze Prospective", G2 Conception International

Figure 30.2.1 Urban Growth of Greater Lomé between the Years 1979 and 2013

(2) Demography of Greater Lomé

The Greater Lomé consists of the Lomé Commune with its 5 districts that represent the capital area of Togo in addition to the eight surrounding cantons of Aflao Gakli, Aflao Sagbado, Agoenyive, Baguida, Legbassito, Sanguera, Togblekopé and Vakpossito in Golfe Prefecture.



Source: Schéma Directeur d'Aménagement et d'Urbanisme du Grand Lomé Phase II "Analyze Prospective", G2 Conception International / Agence ECAUH

Figure 30.2.2 Administrative Boundaries of Greater Lomé

Lomé the capital and its metropolitan area have experienced a large population growth between 1981 and 2010 increasing with annual growth rate of over 4% for almost three decades.

Table 30.2.1 Population of Greater Lomé (1981 and 2010)

	Entities	Population		Annual Growth Rate (%)	Area (km ²)	Population Density 2010 (persons/km ²)
		1981	2010			
Lomé Commune	1 st District	375,499	25,876	2.81%	90	9,329
	2 nd District		348,876			
	3 rd District		187,573			
	4 th District		60,031			
	5 th District		217,210			
Golfe Prefecture	Aflao Gakli	72,307	81,711	8.31%	255	2,870
	Aflao Sagbado		108,857			
	Agoenyive		258,389			
	Amoutive		24,613			
	Baguida		117,350			
	Legbassito		29,348			
	Sanguera		38,349			
	Togblekopé		46,310			
	Vakpossito		27,015			
Greater Lomé	447,806	1,571,508	4.42%	345	4,555	

Source: Direction Générale de la Statistique et de la Compatibilité Nationale RGPH 1981, 2010

(3) Existing Urban Master Plan

The City Development Strategy (CDS) was made ready by 2012. It aims to provide the capital, Lomé with a long-term development vision for the horizon 2030 based on a coordination process that includes a larger geographic space shared by the Lomé Commune, and its surrounding cantons. Moreover, the Greater Lomé CDS is coupled with a priority to reduce urban poverty.

The shared vision for Greater Lomé which has been adopted by the CDS is set as follows: "By 2030, the Greater Lomé will be a modern urban community, healthy, attractive, underpinned with a strong local government, a transit centre, a competitive pole of development in West Africa and with a better structured agglomeration where the citizen is well satisfied"

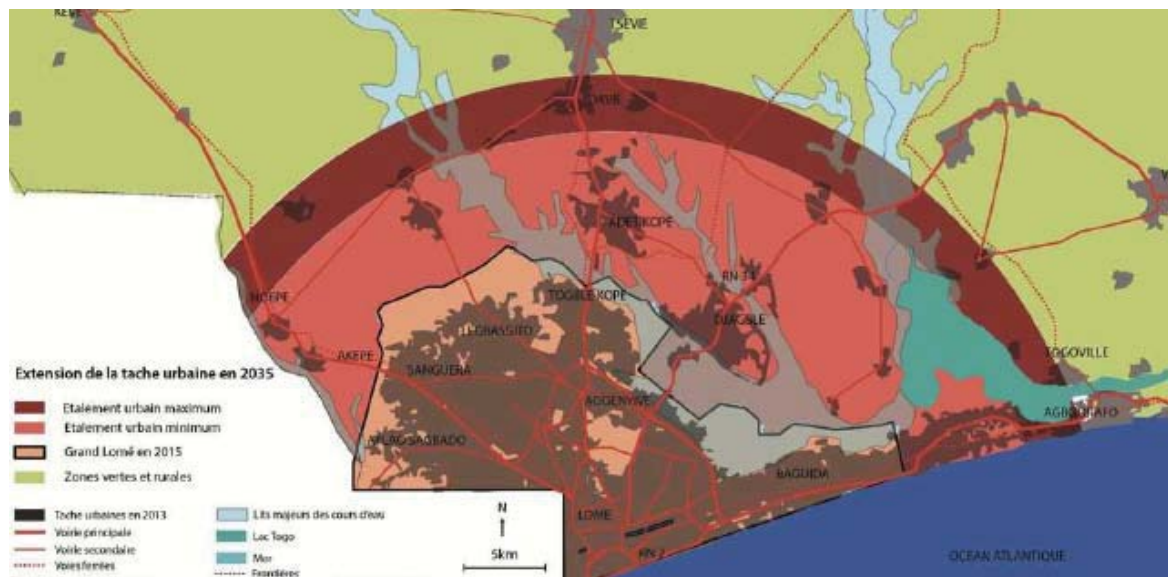
Accordingly, the CDS has prepared an emergency programme prioritizing fifteen major projects and actions to be implemented urgently including "Developing of the Master Plan of Greater Lomé."

During the formulation of the Master Plan of Greater Lomé, several development scenarios were discussed and evaluated concerning the future spatial structure of Greater Lomé.

The first scenario proposes a maximum growth boundary covering 993.3 km² which can absorb the urban extension based on a constant density similar to the one already witnessed in 2010 (4,248 inhabitants/km²). (See Figure 30.2.3)

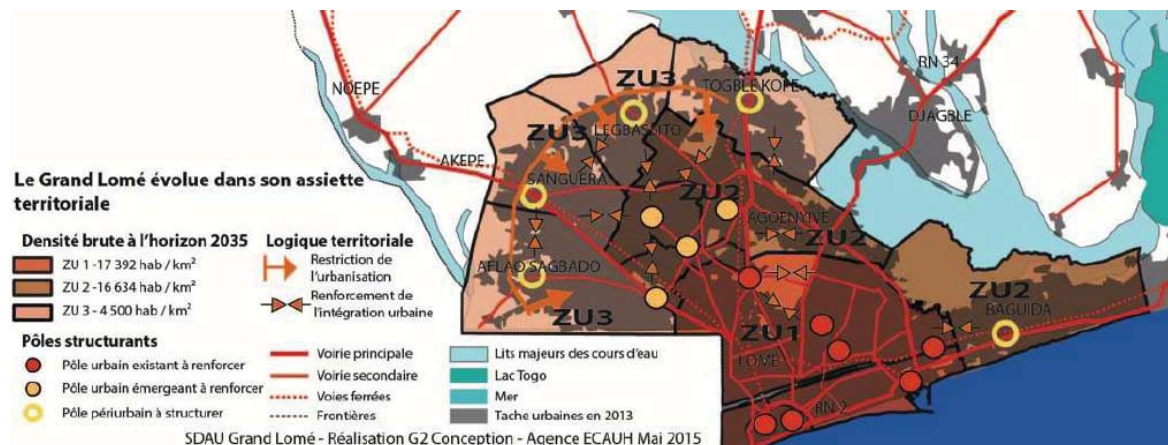
The second scenario proposes to contain the urban growth within the boundaries of Greater Lomé. Accordingly, different urban densities are assigned to different zones in order to achieve such scenario. (See Figure 30.2.4)

The third scenario proposes to densify the Greater Lomé while at the same time it suggests to include the larger metropolitan area based on a polycentric development which leaves space for an important green belt in addition to certain agriculture areas. (See Figure 30.2.5)



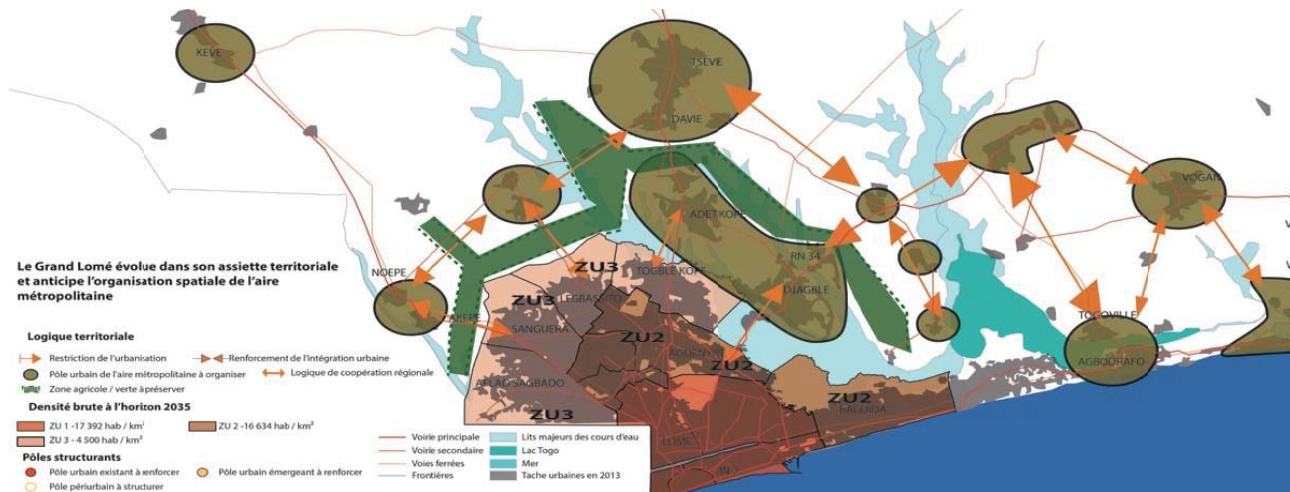
Source: Schéma Directeur d'Aménagement et d'Urbanisme du Grand Lomé Phase II "Analyze Prospective", G2 Conception International / Agence ECAUH

Figure 30.2.3 Proposed Spatial Development Scenario-1 for the Greater Lomé Area



Source: Schéma Directeur d'Aménagement et d'Urbanisme du Grand Lomé Phase II "Analyze Prospective", G2 Conception International / Agence ECAUH

Figure 30.2.4 Proposed Spatial Development Scenario-2 for the Greater Lomé Area



Source: Schéma Directeur d'Aménagement et d'Urbanisme du Grand Lomé Phase II "Analyze Prospective", G2 Conception International / Agence ECAUH

Figure 30.2.5 Proposed Spatial Development Scenario-3 for the Greater Lomé Area

30.2.2 Future Prospects for Greater Lomé

Greater Lomé area is geared to play a major role at both the sub-regional and national levels in spearheading economic growth and urban development. Indeed, due to its strategic location along the Abidjan-Lagos coastal corridor, in addition to its growing role as a major gateway to the landlocked countries to the north, the greater Lomé area can rely on an already performing port and its regional airport hub to sustain its position as a major player in the West African region thus attracting further foreign direct investments.

In such circumstances, the prospective Greater Lomé urban development plan should incorporate these recent structural changes, and furthermore, take into account the possible economic and physical impacts of regional integration, especially those related to the recent developments in the adjacent Ghanaian urban areas across the border, particularly in Aflao. Accordingly, the diagnostic report related to the Greater Lomé master plan has identified a list of potential projects to be implemented on the short and medium terms and by the horizon 2030. These include the expansion of the outer ring road that connects to Noépé at the Ghanaian border, the new Lomé international airport, and the expansion of Lomé Container Terminal, in addition to several road and logistics infrastructure projects, as well as social housing projects, environment related projects and social and public services.

30.2.3 Issues on Urban Development of Greater Lomé

The following issues are defined regarding the urban development of Greater Lomé:

- Fast population growth causing leapfrogging urban sprawl
- Inadequate road infrastructure
- Commuter rush hour congestion caused by lack of good urban road network and public transport
- Environmental threats related to flooding, inadequate drainage systems and inappropriate solid waste management.
- Limited industrial parks available

30.2.4 Objectives for Urban Development of Greater Lomé

The following objectives are set for the urban development of Greater Lomé:

- To make maximum use of the potential of Greater Lomé as the national capital and

- sub-regional gateway city in relation to the corridor developments
- To promote the Greater Lomé area as a modern city not only for a business and administration centre but also for industrial production
 - To manage urban growth and address the pressure of population increase and the loss of strategic land reserves around the city
 - To organize and reorient future developments along the coastal corridor, especially that in the hinterland where towns such as Tsevié and Noépé are also at the same time experiencing substantial spatial changes which need to be accommodated within a larger metropolitan logic
 - To address economic activity concentration and transport congestion in the city centre and around the port area
 - To develop necessary high-standard economic infrastructures and facilities, as well as high-standard social services, and recreational facilities, in order to make Greater Lomé an attractive competitive city in the West African sub-region.

30.2.5 Strategies for Urban Development of Greater Lomé

The following are the strategies for urban development of Greater Lomé:

- To make full use of the existing International Airport
- To upgrade roads and railways for responding to the planned upgrading of the cargo handling capacity of Lomé Port
- To strengthen and upgrade business functions within Greater Lomé in relation to the Lomé Port
- To construct an Outer Ring Road not only for managing urban and through traffic but also future urban land expansion
- To construct an east-west motorway as part of the Abidjan-Accra-Lomé-Lagos Motorway
- To prepare necessary plans in a timely manner to secure lands for future urban expansion and the development of new industrial and activity zones
- To implement the development of necessary urban road networks to ease the traffic pressure caused by motorization, population increase and development of transport corridors
- To implement necessary improvement and upgrading of public transportation for securing high urban mobility but also inter-city mobility for the poor and middle-income groups of people
- To provide enough electricity and water for the inhabitants and industries of Greater Lomé
- To provide necessary residential areas for the future population by redeveloping areas within the city centre
- To manage existing environmental risks related to floods and inadequate drainage networks
- To provide better public services, such as advanced medical facilities and laboratories, and sophisticated recreation and cultural facilities to attract business persons and enterprises.

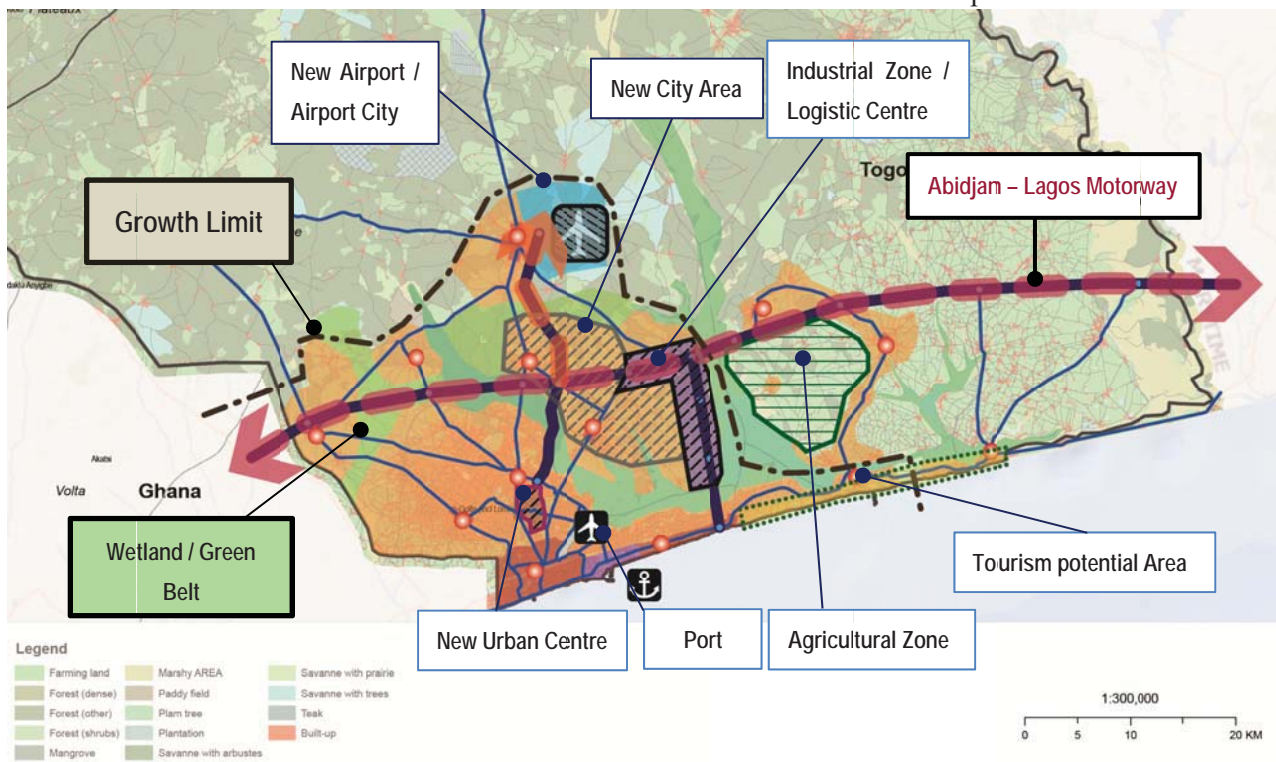
30.2.6 Conceptual Spatial Structure for Greater Lomé

JICA Study Team is proposing an additional future spatial development alternative (Figure 30.2.6) taking into account the prospective changes which will be induced by the implementation of the coastal sub-regional corridor Abidjan-Lagos.

WAGRIC Master Plan prepared spatial concepts for the coastal metropolitans by conducting preliminary analyses on the following points:

- Where to put an east-west motorway, as part of the Abidjan-Lagos Corridor Motorway, in each coastal metropolitan
- How to secure the connectivity between north-south corridors and coastal corridor within each of the coastal metropolitan

- How to secure a strong access to strategic sea ports which have plans for expansion within coastal metropolitans
- How to get access to new international airports planned within each of the coastal metropolitans
- Where to locate new industrial zones within each of the coastal metropolitans



Source: JICA Study Team Proposal Based on a Sub-Regional Corridor Development Scenario

Figure 30.2.6 Proposed Spatial Structure for the Greater Lomé in the Context of a Sub-Regional Corridor Development Scenario

30.2.7 Programmes and Projects for Greater Lomé's Urban Development related to Corridor Development

In terms of outlook, the following infrastructure projects are planned: the extension of the outer ring road which connects to Noépé on the border with Ghana; the new planned Tsévié International Airport; extending Niamtougou Airport, and the extension of Lomé Container Terminal.

The following projects must be programmed:

- Revision of the Master Plan for Greater Lomé area, to accommodate a sub-regional development scenario, taking into account the extents and impacts of the WAGRIC project on both the national and sub-regional scale. Accordingly, the potential needs in terms of industrial and economic activity zones, the logistics sector, tertiary sector development, etc. need to be taken into account.
- Construction of Outer Ring Road for Greater Lomé
- Formulation of a detailed master plan for Lomé Port area
- Formulation of a master plan for the coastal area aimed at addressing future growth scenarios, tourism activities and coastal area protection
- Upgrading the drainage network of Greater Lomé
- Construction of a waste water treatment plant for Greater Lomé
- Formulation of a master plan for solid waste collection and treatment for Greater Lomé

30.3 Urban Development Strategies for Tsévié

30.3.1 Present Situation of Tsévié

(1) Urban Expansion of Tsévié

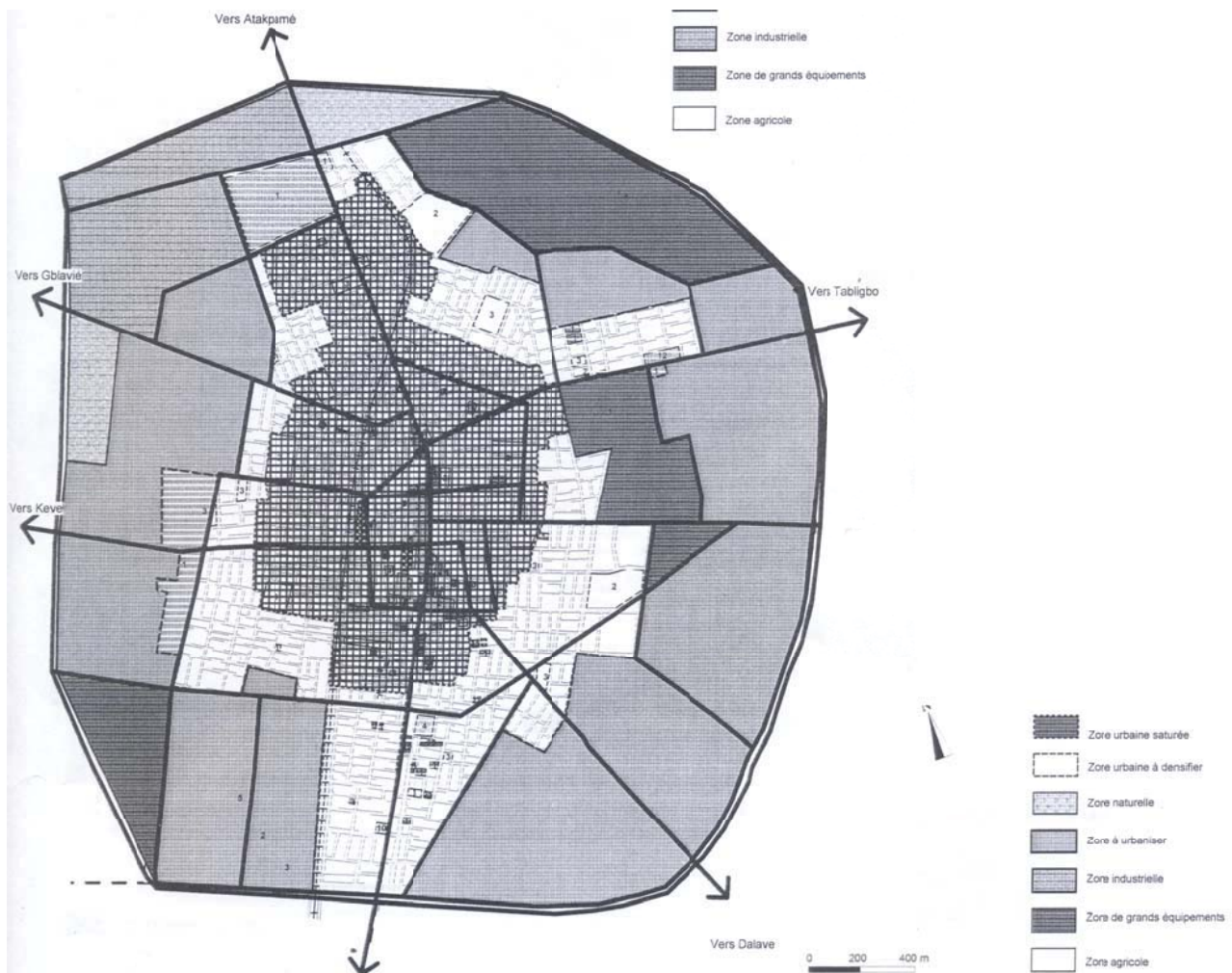
The Master Plan of Tsévié has been updated in 2011. The city which is the capital of the Maritime Region has recently experienced increasing urban pressure leading to substantial changes in its spatial structure mainly due to its proximity to the capital (35 km) and its spill over effects.

(2) Demography of Tsévié

The population of Tsévié was 54,500 inhabitants in 2010.

(3) Existing Urban Master Plan

The spatial structure and road network for Tsévié which were proposed by the newly updated master plan are shown in Figure 30.3.1.



Source: SDAU of Tsévié 2011

Figure 30.3.1 Spatial Structure of Tsévié (SDAU 2011)

30.3.2 Future Prospects for Tsévié

Tsévié is strategically located at a crossroads along the national road1 that crosses the country from South to North linking Lomé port to Ouagadougou, and is also connected to Davié to the South, Gblavié and Kévé to the East, and to Tabligbo to the west and Dalavé to the South-West. The city is preparing to host the new Lomé airport while the new highway section linking Lomé to Cinkasé has already been built until the city's southern entrance. Another structural feature of Tsévié is the outer

ring road that is planned to divert through-traffic to the peripheries of the city and constitutes its urban growth limit. Accordingly, it is important to take into account the prospective spatial and demographic transformations related mainly to the development of the new airport city in Tsévié and to review the master plan of the city to anticipate such changes.

30.3.3 Issues on Urban Development of Tsévié

The following issues are defined regarding the urban development of Tsévié:

- Steady population growth causing low density urban sprawl
- Environmental threats related to inadequate drainage systems and inappropriate solid waste management.
- Ill defined vision and role in relation to future development prospects.

30.3.4 Objectives for Urban Development of Tsévié

The following objectives need to be considered for the urban development of Tsévié:

- To envision a new role for Tsévié based on the future development of the new airport and the airport city.
- To make maximum use of the potential development of the new airport and the airport city of Tsévié.
- To manage urban growth and address the pressure of population increase and the loss of strategic land reserves around the city.

30.3.5 Strategies for Urban Development of Tsévié

The following are the strategies for urban development of Tsévié:

- To develop an International Airport City for accommodating increasing population and economic activities by formulating a master plan for the Airport City and by providing necessary infrastructures.
- To upgrade the existing railway connecting Lomé to Tsévié and to upgrade the existing railway station.
- To plan a future rail link to the new airport area
- To strengthen and upgrade business functions within the City in relation to the new airport
- To construct an Outer Ring Road for managing urban and through traffic
- To implement necessary improvement and upgrading of public transportation for securing high urban mobility but also inter-city mobility for the poor and middle-income groups of people
- To provide necessary residential areas for the future population
- To prepare facilities, such as advanced medical facilities and laboratories, and sophisticated recreation and cultural facilities to attract business person and enterprise
- To prepare a master plan for drainage and solid waste treatment

30.3.6 Programmes and Projects for Tsévié's Urban Development related to Corridor Development

The following is an additional list of priority projects that should be developed within Tsévié in an effort to complement the development of the WAGRIC project. Other priority projects have been highlighted and detailed at the beginning of this chapter and in different sections of this manuscript relating to specific sectors. In that sense, only the first project of the list will be treated in detail as it has not been specifically touched upon in terms of prioritizing the construction of specific sections at an earlier stage.

- Construction of Outer Ring Road for Tsévié and Davié
- Updating of the Spatial Development Framework and Structure Plan for Tsévié, taking into account the potential needs in terms of industrial and economic activity zones, logistics sector, tertiary sector development, etc.
- Formulation of Master Plan for the Airport City of Tsévié and its Surrounding Areas
- Rehabilitation of the railway station of Tsévié
- Upgrading the drainage network of Tsévié
- Formulation of a master plan for solid waste collection and treatment for Tsévié.

(1) Construction of the Outer Ring Road for Tsévié and Davié

1) Rationale

Tsévié and its neighboring town Davié, have become a gateway to Greater Lomé area, and play a major role in terms of attracting major economic infrastructures such as the new Tsévié airport in addition to becoming a prime settlement choice for young families. The conurbation is therefore expected to draw a substantial volume of traffic demand. In anticipation it is important to construct an outer ring road that defines the conurbation growth limits, and most importantly helps deviating through traffic while serving strategically positioned economic infrastructures such as the new Airport. City of Tsévié

2) Objective

- To avoid unnecessary through traffic leading to aggravated congestion
- To facilitate access to major sectors of the city and avoid traffic congestion
- To serve existing economic infrastructures such as the new Tsévié airport.
- To define and expand the urban growth limits of Tsévié and Davié
- To enable high-speed travelling of motor cars and trucks on the international transport corridor.

3) Project Description and Phasing

The project description and phasing are provided below.

- To review existing right-of-ways of bypass roads and outer ring roads proposed in the master plan of Tsévié and propose the best connections to the Lomé-Ouagadougou corridor
- To secure necessary land for the future implementation of such infrastructure projects
- To reshape the spatial structure along the outer ring road.

In an effort to reduce cost and at the same time achieve quick wins by serving the Lomé-Ouagadougou International Corridor passing through Tsévié and Davié, a specific part of the outer ring road has been designated as a priority to be constructed at the earliest stage of the project Implementation Figure 30.3.2. This specific section situated at the southwestern part of the city should therefore be given priority since it is relatively easier to implement as it passes at the outskirts of the conurbation far from urban areas. This part of the outer ring road helps achieving the different strategic objectives stated above.

4) Expected Benefits

The following impacts and benefits are expected in this project:

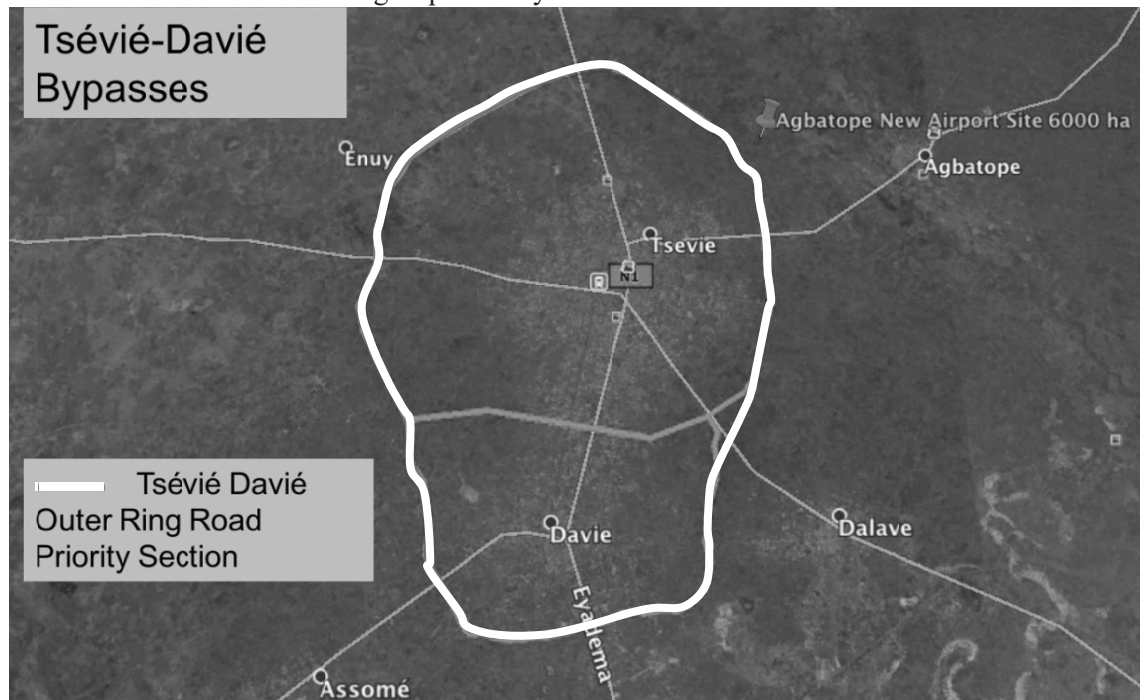
- Effective and efficient spatial development and deployment of economic sector activities along the bypass and outer ring road.
- Effective management of traffic flows along the Lomé-Ouagadougou transport corridor and within the targeted cities
- Facilitation of people and goods transportation
- Expansion of the urban areas of the targeted cities

5) Executing Agency and Related Institutions

- The Ministry of Public Works and Transports
- The Ministry of planning, housing and Quality of Life represented by AGETUR in cooperation with the regional and local administrations.

6) Related Projects

- Updating of the existing Master Plan of Davié and Tsévié
- Construction of Motorway between Lomé Bypass and New International Airport
- Construction of 4-Lane High-Speed Way between Tsévié and Notsé



Source: JICA Study Team Proposal, based on existing conditions on the ground, and the review of the proposed Tsévié outer ring road trace in SDAU of 2011

Figure 30.3.2 Proposed Location of Davié-Tsévié Outer Ring Road

30.4 Urban Development Strategies for Atakpamé

30.4.1 Present Situation of Atakpamé

(1) Urban Expansion of Atakpamé

The city is the capital of the Plateaux region, situated 160 km to the North of Lomé and is squeezed between hilly mountains with slopes reaching 20 to 40%. Due to the rugged terrain, urban expansion has followed a patchy track producing an irregular spatial structure with two different urban centres.

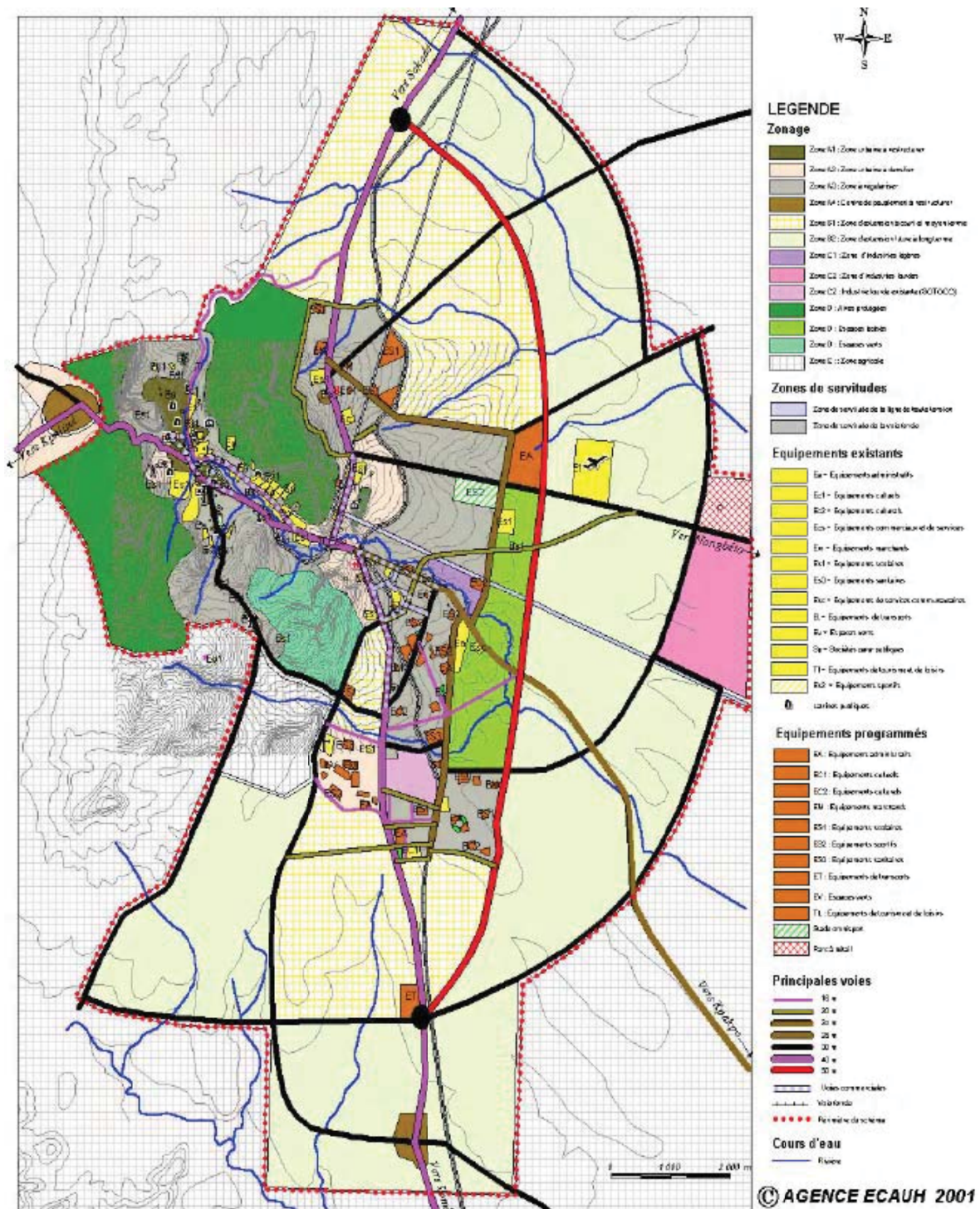
(2) Demography of Atakpamé

The population was estimated at 69,300 inhabitants in 2010.

(3) Existing Urban Master Plan

The Master Plan of Atakpamé has been prepared as early as 2001. Due to the rugged topography, the Master Plan has directed future urban extensions away from the mountainous areas towards the north-east, east, south and south-west of the city. The proposed urban extension is structured by a major 50 meters wide road that crosses the city from south to north avoiding at the same time the traditional centres. The road network is completed by a series of secondary service roads of 30 meters wide connecting major parts of the city to the main road structure. Moreover, the Master Plan has accommodated for different land uses including industrial, commercial, housing and public

services, not to forget the green and protected areas along the river banks and also covering some of the mountain areas.



Source: SDAU 2001

Figure 30.4.1 Proposed Master Plan of Atakpamé (SDAU 2001)

30.4.2 Future Prospects for Atakpamé

Due to its relatively close distance from the capital, and to its unique geographic and natural features, Atakpamé could be developed as a major touristic destination. Indeed, the Lomé-Ouagadougou Corridor could facilitate access to the city and activate its untapped potentials.

30.4.3 Issues on Urban Development of Atakpamé

- Rugged topography and sloppy terrain 20%-40% constraining urban expansion
- Ill defined urban centrality with two different centres competing for space
- Underdeveloped non-diversified economy relying on tourism and a mono-sector industry (cotton production)

30.4.4 Objectives for Urban Development of Atakpamé

The major objectives of the Master Plan of Atakpamé are stated as follows:

- To redefine urban centrality within the city
- To manage urban growth taking into account the difficult geographic conditions

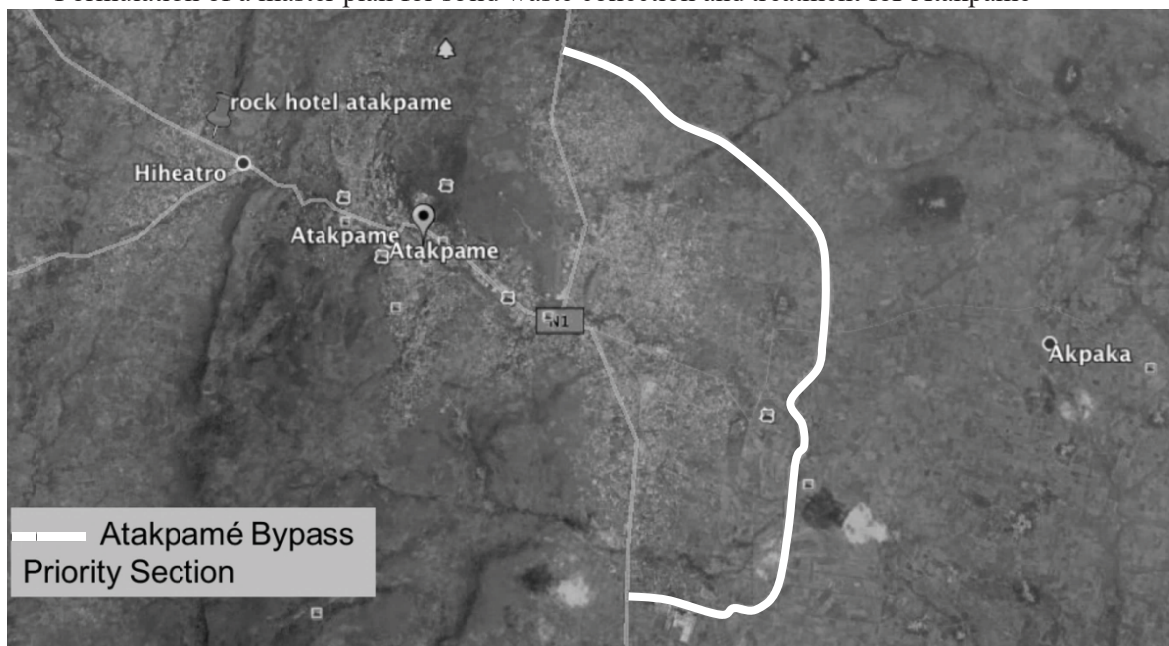
30.4.5 Strategies for Urban Development of Atakpamé

- To reorient the city's urban expansion towards flat terrains to the East and South –East
- To weave the peripheral neighbourhoods into the main urban structure of the city
- To take into consideration the emerging centre to the south of the city at the crossroads of RN1, RN5 and the railway
- To restructure the city centre

30.4.6 Programmes and Projects for Atakpamé's Urban Development related to Corridor Development

The following is an additional list of priority projects that should be developed within Atakpamé.

- Construction of a bypass road for Atakpamé
- Updating of the Spatial Development Framework and Structure Plan for Atakpamé, to help develop its inherent potentials in terms of ecotourism and agrotourism
- Upgrading the drainage network of Atakpamé
- Formulation of a master plan for solid waste collection and treatment for Atakpamé



Source: JICA Study Team based on existing conditions on the ground and the proposed Atakpamé bypass road in SDAU of 2001

Figure 30.4.2 Proposed Location of Atakpamé Bypass Road

30.5 Urban Development Strategies for Sokodé

30.5.1 Present Situation of Sokodé

(1) Urban Expansion of Sokodé

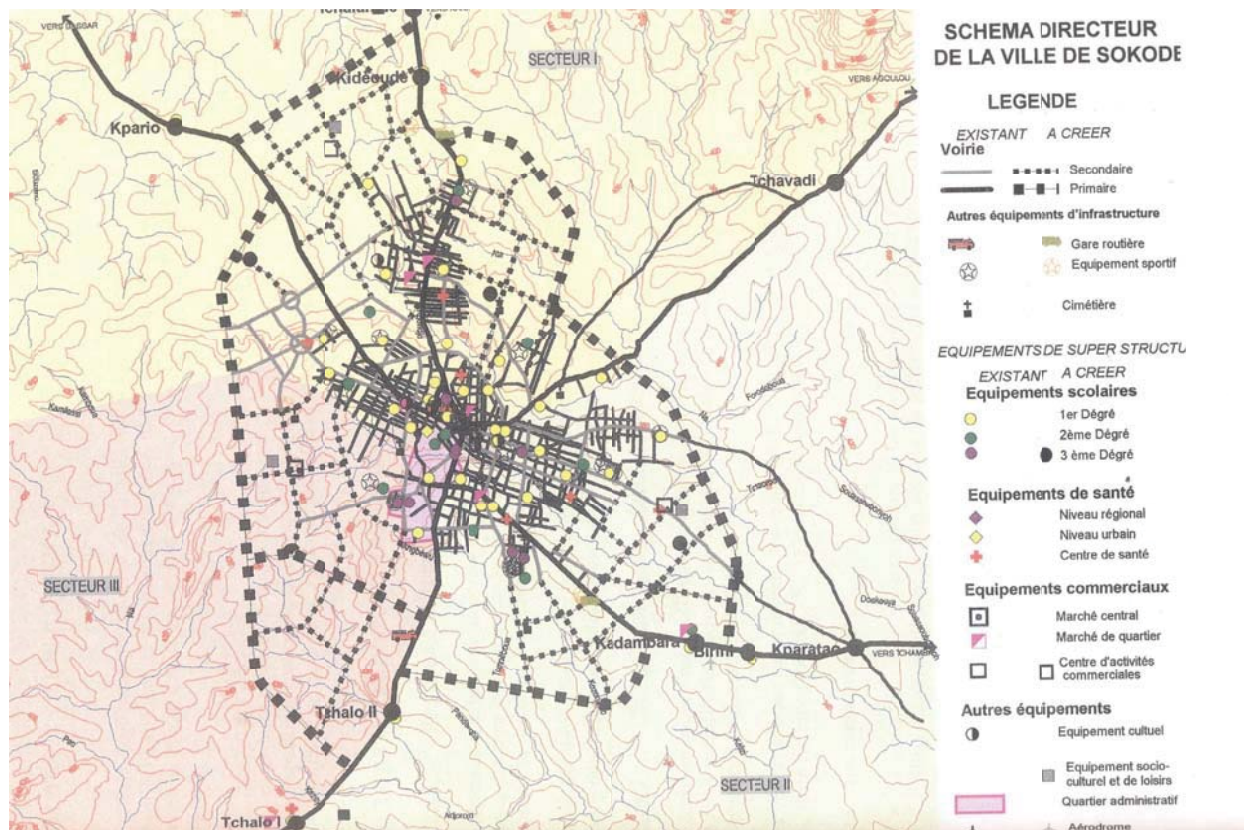
Sokodé is the third largest city in Togo and seat of the Tchaoudjo and Centrale Region in the centre of the country, 339 kilometres north of Lomé. Recently, the city has been experiencing an accelerated urban expansion with a marked urban sprawl sustained by a steady demographic growth.

(2) Demography of Sokodé

In 2015, the city's population was estimated at 101,900 inhabitants.

(3) Existing Urban Master Plan

The master plan of Sokodé proposes to develop the city in a concentric way around the main city centre by designating three major development sectors in which a network of outer ring roads is laid out defining the future growth limits. This network is further densified by a grid of secondary roads servicing the inner extension areas and equally providing the backbone for future development. In addition, the Master Plan identifies the necessity to build different public buildings and services including a bus station, sports facilities, a cemetery, schools, high schools in addition to a college, health facilities for the local and regional levels, public markets and commercial centres, and an administrative centre.



Source: SDAU of Sokodé

Figure 30.5.1 Proposed Master Plan of Sokodé (SDAU 2015)

30.5.2 Future Prospects for Sokodé

The city developed in precolonial times as a commercial crossroads on the Kola nut route between Ghana and Benin. Today Sokodé plays a major role as an administrative and commercial centre for the central region and specifically for the surrounding areas. Accordingly, and due to its strategic central location along the Lomé-Ouagadougou Corridor, and also due to its already established road and relational networks with the neighbouring countries of Benin and Ghana, Sokodé can be

prepared to play a major role at both the sub-regional and national levels as a major commercial and industrial hub.

30.5.3 Issues on Urban Development of Sokodé

- Accelerated low density urban sprawl
- Undersized urban centre
- Underdeveloped non-diversified economy relying mainly on trade of agriculture products

30.5.4 Objectives for Urban Development of Sokodé

The major objectives for urban development of Sokodé are listed below:

- To better connect the city to the neighbouring countries of Benin and Ghana
- To manage urban growth

30.5.5 Strategies for Urban Development of Sokodé

- To diversify the economic activities of Sokodé
- To restructure and uplift the city centre
- To weave the peripheral neighbourhoods into the main urban structure of the city

30.5.6 Programmes and Projects for Sokodé's Urban Development related to Corridor Development

The following is a list of priority projects that should be developed within Sokodé:

- Construction of outer ring road for Sokodé
- Updating of the SDAU for Sokodé, to help develop its inherent potentials as a major crossroad city
- Upgrading the drainage network of Sokodé
- Formulation of a master plan for solid waste collection and treatment for Sokodé

(1) Construction of the Outer Ring Road for Sokodé

1) Rationale

Sokodé is already congested with sprawling urban settlements towards the southeast where the geographical conditions are suitable for construction. The city is therefore expected to draw additional economic activities and a substantial volume of traffic demand. In anticipation it is important to construct an outer ring road that defines the city growth limits, and most importantly helps deviating through traffic along the Lomé-Ouagadougou International Corridor.

2) Objectives

- To avoid unnecessary through traffic leading to aggravated congestion
- To facilitate access to major sectors of the city and avoid traffic congestion
- To serve existing economic infrastructures.
- To define and expand the urban growth limits of the city
- To enable high-speed travelling of motor cars and trucks on the international corridor

3) Project Description and Phasing

The project description and phasing are provided below.

- To review existing right-of-ways of bypass roads and outer ring roads proposed in the outdated master plan of Sokodé, and propose the best connections to the Lomé-Ouagadougou Corridor
- To secure necessary land for the future implementation

- To reshape the spatial structure along the outer ring road

In an effort to reduce cost and at the same time achieve quick wins by serving the Lomé-Ouagadougou International Corridor passing through Sokodé, a specific part of the outer ring road should be designated as a priority. The eastern part of the city is easier to implement due to the existing geographic conditions. However, the national road which separates from RN 1 at the centre of Sokodé to the northwest can access to agriculture and mining potential areas of Togo. Therefore, the phasing of the outer ring road should be determined based on a more detail study. In both cases, the selected bypass road will help achieving the different strategic objectives stated above and should be scheduled for completion by the year 2025.

4) Expected Benefits

The following impacts and benefits are expected in this project:

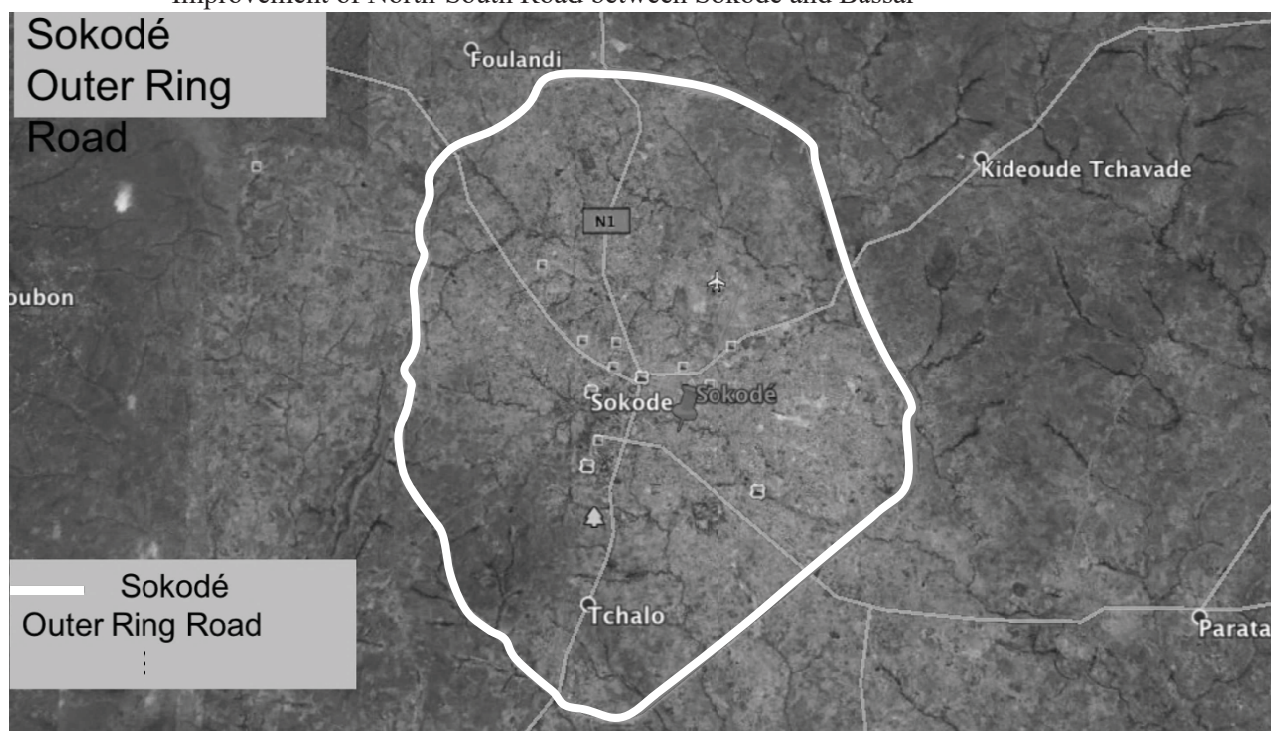
- Effective and efficient spatial development and deployment of economic sector activities along the bypass / outer ring road.
- Effective management of traffic flows along the Lomé-Ouagadougou Corridor and within Sokodé
- Facilitation of people and goods transportation
- Limiting urban sprawl by defining urban growth limits

5) Executing Agency and Related Institutions

- Ministry of Public Works and Transports
- Ministry of planning, housing and Quality of Life represented by AGETUR in cooperation with the regional and local administrations

6) Related Projects

- Project for Construction of 4-Lane High-Speed Way from Atakpamé to Kara
- Improvement of North-South Road between Sokodé and Bassar



Source: JICA Study Team based on existing conditions on the ground, and the proposed bypasses in SDAU of Sokodé

Figure 30.5.2 Proposed Location of Sokodé Outer Rings Road

30.6 Urban Development Strategies for Kara

30.6.1 Present Situation of Kara

(1) Urban Expansion of Kara

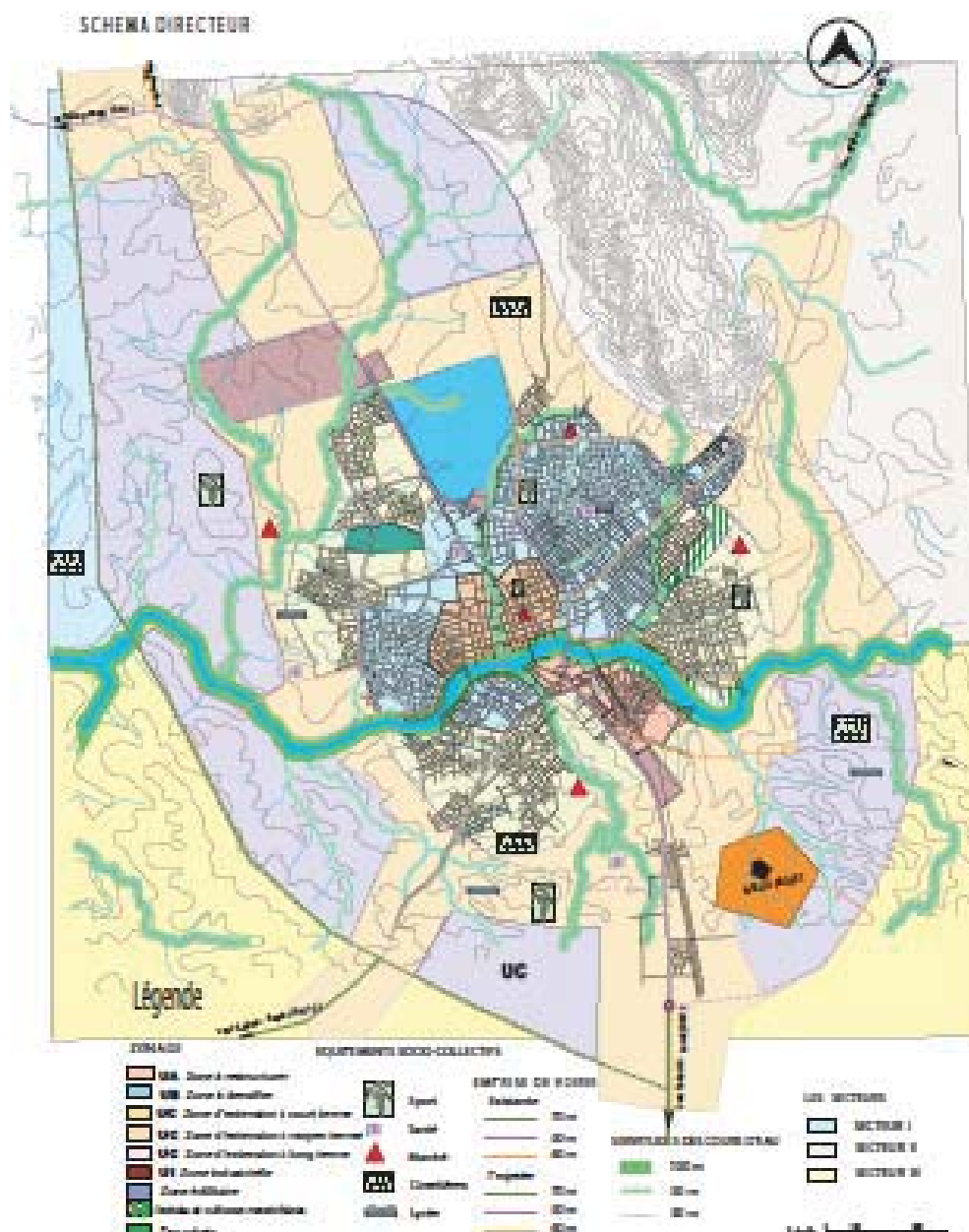
Kara is the capital of the Kara Region and the second administrative city of Togo situated 413 km north of the capital Lomé. Like most second tier cities in Togo, Kara has been experiencing and accelerated urban growth characterized by a low density sprawling development along major and secondary roads.

(2) Demography of Kara

In 2010, Kara had a population of 94,900 and has grown since to reach 104,400 inhabitants in 2015.

(3) Existing Urban Master Plan

The Master Plan of Kara has taken into account the geographical and physical features of the city and equally tried to compose with such natural elements proposing linear parks within the easements of the river and water streams.



Source: SDAU of Kara

Figure 30.6.1 Proposed Master Plan of Kara

Similarly, the master plan oriented the development of the city away from the mountain range. The urban extension is structured by an outer ring road of 70 meters wide bypassing the city from the West, mirrored by a 50-meter-wide eastern ring road which constitutes the urban growth limit of the city towards this direction. The road network is structured along the national road RN1, and completed by a series of semi-elliptic secondary roads passing along the edges of the current urban expansion and connected transversally in the East-West direction to the outer ring roads forming as such a large irregular grid that is supposed to guide the future urban extension of the city.

In terms of land use, the master plan has provided for urban extension zones for the short, medium and long terms. It has also suggested the urban restructuring and the densification of the central core area, equally designating a large industrial area to the north of the city in addition to two smaller industrial areas along RN1 from both sides of the river. In addition, the master plan has reserved a large zone for functional activities, and has also proposed sites for building public markets, sports terrains and facilities, an urban park, and a regional hospital.

30.6.2 Future Prospects for Kara

Kara is strategically located along the National Road RN1 connecting Lomé to Ouagadougou. Similarly, and in addition to its administrative role, the city has developed as a major commercial centre and has equally developed close ties with neighbouring Benin and Ghana weaving a dense trading network with the two countries. Moreover, the city is home to the second university of the country. All these factors have contributed to the development of the city and constitute today the stepping stone for projecting the future role of Kara at both the sub-regional and national levels. In that sense, it is imaginable that Kara could be developed on the medium and long terms as a second national capital and major regional metropolitan centre, and commercial hub in an effort to balance the national spatial structure and curb the overconcentration of activities and extreme polarization currently being witnessed in the Greater Lomé area.

30.6.3 Issues on Urban Development of Kara

The following issues are defined regarding the urban development of Kara:

- Kara has a series of water streams running from the north to the south within the city, and is geographically bounded to the North and to the Northeast by a chain of mountains, constraining somehow the urban extension towards these directions.
- Steady population growth causing low density urban sprawl
- Ill defined vision and role in relation to future development prospects.

30.6.4 Objectives for Urban Development of Kara

The following objectives need to be considered for the urban development of Kara:

- To envision a new role for Kara as second national capital and regional growth pole
- To make maximum use of the potential development of the Lomé –Ouagadougou transport corridor
- To build on the already established networks between Kara and the neighbouring countries of Benin and Ghana
- To manage urban growth and address the pressure of population increase and the loss of strategic land reserves around the city.

30.6.5 Strategies for Urban Development of Kara

The following are the strategies for urban development of Kara:

- To develop a regional growth pole for balancing spatial distribution and for accommodating

- increasing population and economic activities by formulating a master plan for Kara
- To build an efficient freight and passengers railway line connecting Lomé to Kara.
 - To upgrade the existing connections between Kara and Benin and Kara and Ghana.
 - To construct an Outer Ring Road for managing urban and through traffic
 - To implement necessary improvement and upgrading of public transportation for securing high urban mobility but also inter-city mobility for the poor and middle-income groups of people
 - To provide necessary residential areas for the future population
 - To prepare facilities, such as advanced medical facilities and laboratories, and sophisticated recreation and cultural facilities to attract business person and enterprise
 - To prepare a master plan for drainage and solid waste treatment

30.6.6 Programmes and Projects for Kara's Urban Development related to Corridor Development

The following is an additional list of priority projects that should be developed within Kara in an effort to complement the development of the WAGRIC-CACAO project. Other priority projects have been highlighted and detailed at the beginning of this chapter and in different sections of this manuscript relating to specific sectors. In that sense, only the first project of the list will be treated in detail as it has not been specifically touched upon in terms of prioritizing the construction of specific sections at an earlier stage.

- Construction of Kara Bypass Road
- Updating of SDAU for Kara, to help develop its inherent potentials as a major growth pole.
- Construction and management of industrial zones along the planned ring road or bypass road
- Upgrading the drainage network of Kara
- Formulation of a master plan for solid waste collection and treatment for Kara

(1) Construction of the Bypass Road for Kara

1) Rationale

As the second administrative capital of Togo with the second largest population, Kara has been prepared to play a major role in balancing the spatial structure at the national level. The city is therefore expected to draw additional economic activities and a substantial volume of traffic demand. In anticipation it is important to construct a bypass road that helps deviating through traffic along the Lomé-Ouagadougou international transport corridor which will reduce congestion within the city and at the same time facilitate high-speed travel of motor cars and trucks.

2) Objectives

- To avoid unnecessary through traffic leading to aggravated congestion
- To facilitate access to major sectors of the city and avoid traffic congestion
- To define and expand the urban growth limits of the city
- To enable high-speed travelling of motor cars and trucks on the international transport corridor

3) Project Description and Phasing

The project description and phasing are provided below.

- To review existing right-of-ways of bypass roads and outer ring roads proposed in the master plan of Kara, and propose the best connections to the Lomé-Ouagadougou Corridor
- To secure necessary land for the future implementation of such infrastructure projects
- To reshape the spatial structure along the outer ring road

In an effort to reduce cost and at the same time achieve quick wins by serving the Lomé-Ouagadougou International Corridor passing through Kara, bypass road has been designated as a priority to be constructed at the earliest stages. This specific section situated to the western part

of the city should therefore be given priority since it is easier to implement due its shorter length and most importantly to the relatively smoother geographic conditions.

4) Expected Benefits

The following impacts and benefits are expected in this project:

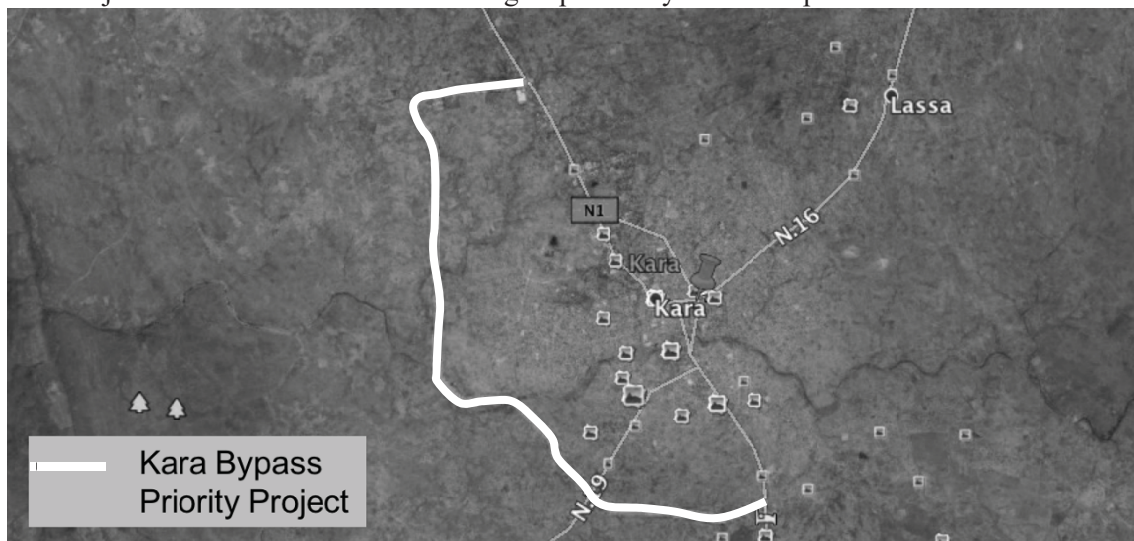
- Effective and efficient spatial development and deployment of economic sector activities along the bypass road.
- Effective management of traffic flows along the Lomé-Ouagadougou transport corridor and within Kara
- Facilitation of people and goods transportation
- Limiting urban sprawl by defining urban growth limits

5) Executing Agency and Related Institutions

- The Ministry of Public Works and Transports
- The Ministry of planning, housing and Quality of Life represented by Agetur in cooperation with the regional and local administrations.

6) Related Projects

- Updating of the existing Master Plan of Kara
- Project for Upgrading of East-West Road Connecting Kara with Kétao at East Side National Border and with West Side National Border
- Project for Construction of 4-Lane High-Speed Way from Atakpamé to Kara



Source: JICA Study Team based on existing conditions on the ground, and the proposed bypasses in SDAU of Kara

Figure 30.6.2 Proposed Location for Kara Bypass Road

30.7 Urban Development Strategies for Dapaong

30.7.1 Present Situation of Dapaong

(1) Urban Expansion of Dapaong

Dapaong is the regional capital of Savanes which includes four prefectures (Tone, Oti, Tandjoaré, and Kpendjal) in addition to the sub-prefecture of Cinkassé. The city is situated in the utmost north of the country close to the border with Burkina Faso, 638 km far from Lomé the capital and has an area of 91.59 km².

The city develops along the major roads that pass through it, and stretches 12 km long from south to north following the national road RN1, and 7,6 km from east to west. The morphological expansion

urban expansion, industrial activities, in addition to green agricultural and protected areas, as well as mountains and water bodies protection areas. The master plan also provides for public and social facilities, commercial areas and public markets, administrative buildings, regional education and health facilities, sports and leisure, and municipal and transport facilities including a regional bus station.

30.7.2 Future Prospects for Dapaong

As a northern gateway city to Togo, the city's future needs to be carefully envisioned in an attempt to balance the spatial imbalance at the national level and at the same time to take full advantage of the strategic location of Dapaong along the prospective Lomé–Ouagadougou Corridor.

30.7.3 Issues on Urban Development of Dapaong

The following issues are defined regarding the urban development of Dapaong:

- Marshy terrain
- Steady population growth causing low density urban sprawl
- Ill defined vision and role in relation to future development prospects.

30.7.4 Objectives for Urban Development of Dapaong

The following objectives need to be considered for the urban development of Dapaong:

- To envision a new role for Dapaong as a gateway city to Togo
- To make maximum use of the potential development of the Lomé –Ouagadougou Corridor
- To build on the already established networks between Dapaong and neighbouring Burkina Faso
- To manage urban growth and address the pressure of population increase and the loss of strategic land reserves around the city.

30.7.5 Strategies for Urban Development of Dapaong

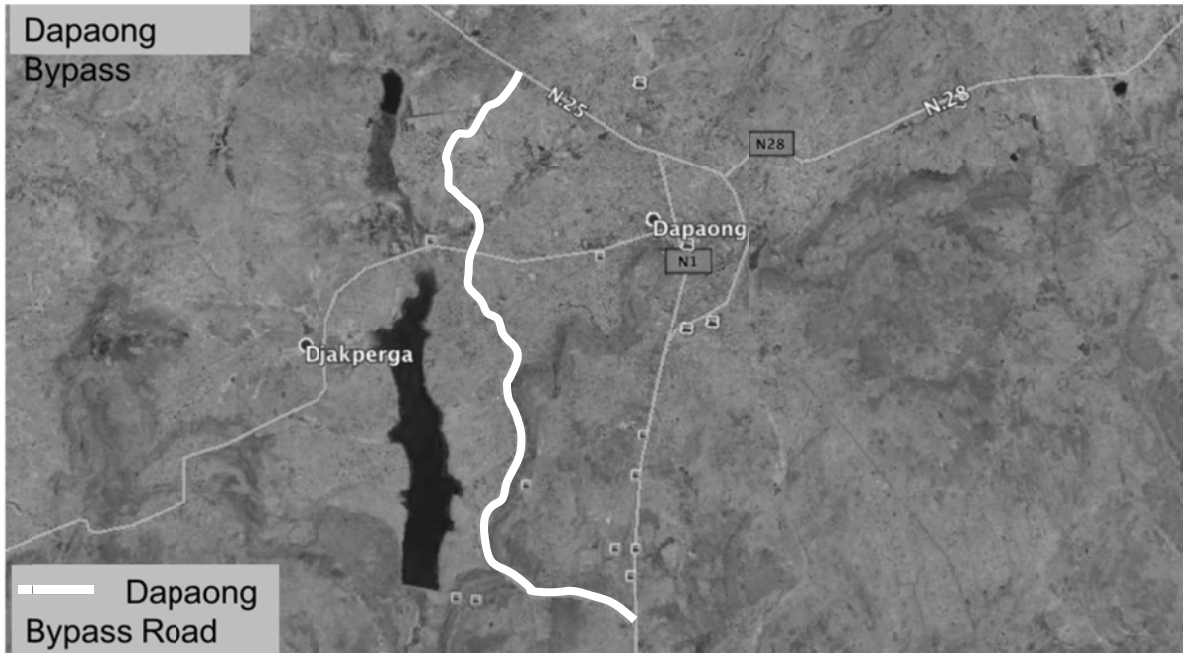
The following are the strategies for urban development of Dapaong:

- To develop the city as a northern gateway of Togo in an effort to balance spatial distribution by formulating a master plan for Dapaong
- To build an efficient dry port and industrial zone in Dapaong.
- To upgrade the existing connections between Dapaong and the international border with Burkina Faso and between Dapaong and Kara.
- To construct an Outer Ring Road for managing urban and through traffic
- To provide necessary residential areas for the future population
- To upgrade the provision of public services and infrastructures in Dapaong
- To prepare a master plan for drainage and solid waste treatment for Dapaong

30.7.6 Programmes and Projects for Dapaong's Urban Development related to Corridor Development

The following is an additional list of priority projects that should be developed within Dapaong:

- Construction of a Bypass Road for Dapaong
- Updating of the Spatial Development Framework and Structure Plan for Dapaong, to help develop its inherent potentials as a major growth pole
- Construction of a dry port and industrial zone
- Upgrading the drainage network of Daopong
- Formulation of a master plan for solid waste collection and treatment



Source: JICA Study Team based on existing conditions on the ground, and the proposed bypasses in SDAU of Dapaong

Figure 30.7.2 Proposed Location for Dapaong Bypass Road

Chapter 31 Social Development Strategies for Togo

31.1 Present Social Situation in Togo

31.1.1 Present Situation of Social Structure in Togo

(1) Ethnicity

There are more than 30 ethnic groups in Togo. The largest groups are the Adja-Ewe/Mina, the Kabiye/Tem, and the Gourma. The Ewe and the Mina people make up over 40% of the total population. They are based in the southern part of the country. Their primary occupation is farming for export. They are predominantly Christian. Ewe women are active in local commerce across the region.

The Kabiye-Tem make up approximately 25% of the population and are based in the northern part of the country. They are mostly subsistence farmers, predominantly Christian.

The Gourma make up approximately 15 % of the population and are based in the high north.

(2) Religion

According to the sample survey conducted for the Third Demographic and Health Survey (EDST-III: *Troisième Enquête Démographique et de Santé*) in 2013-14, Catholic has the greatest share regardless of sex (26% women against 27% for men) in Togo. Islam comes second (17% and 19%) followed by animists with 14% of women and 18% of men. Pentecostals also represent a large group with 17% of women against 15% of men.

Most Muslims live in the central and northern areas. Christians live mainly in the southern part of the country. The Muslim Union of Togo reports a large surge in immigrants from Muslim countries every year, but the government does not collect the statistics that would verify such reports.

(3) Rural Settlement

In 2010, approximately 50% of the population were living in urban areas, whereas the rest were in rural areas. Most of these rural populations are scattered in the small villages across the country.

(4) Social Structure and Traditional Communities / Leaders

The Ewe people are predominantly farmers and sea-fishing people who live along the coastal areas. They are living in under patrilineal lineage and hierarchy. The male elders are the chiefs and the leadership of the community.

The Kabye people are also predominantly farmers. There is a labour division based on gender. Men perform farming activities while women process the agro products and sell them at the market. The Kabye also live in a hierarchical society.

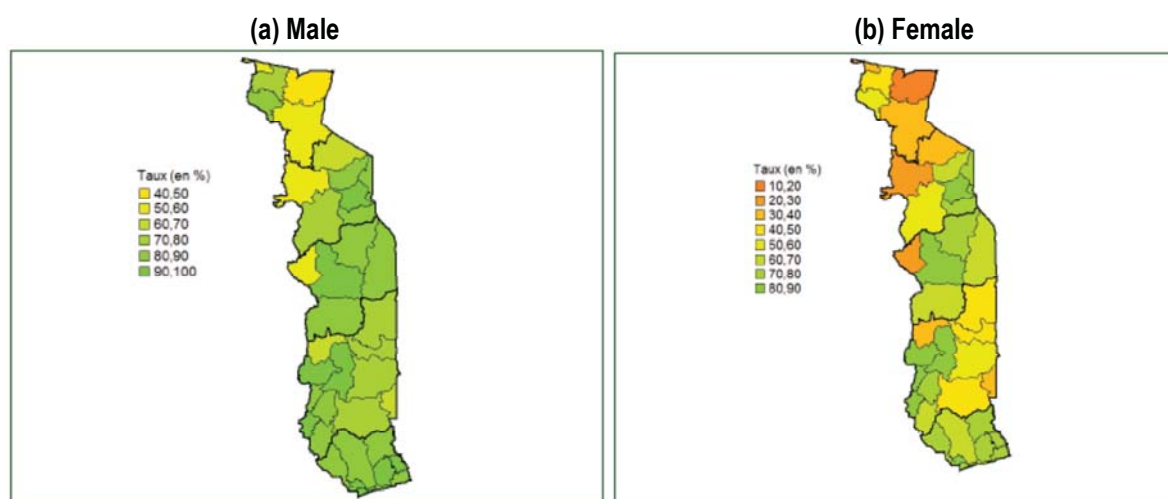
The Gourma people are also predominantly farmers. Weaving, dyeing, pottery, and basketry are also important crafts. The Gourma are patrilineal and have chieftaincy tradition. Most Gourma men, and many women, migrate to seek work in coastal areas.

31.1.2 Present Situation of Social System in Togo

(1) Education and Gender

According to Article 15 of the Togolese Constitution, education is compulsory for all children up to the age of 15. However, in 2010, 96.1 % of boys had completed primary school whereas only 71.6% of girls were able to complete it. The main factor of the low literacy rate for females in Togo is due to the time girls spend bringing water to their households.

The following figure also shows that the literacy rates are low in the Savanes Region for both males and females, and they are low for females west of Kara Region and east of the Plateau Region.



Source: Togo Cartographie de la Pauvreté 2011, UNDP

Figure 31.1.1 Literacy Rate by Gender and Prefecture (15-24 years old)

In addition to the above situation, according to the Strategy on Accelerated Growth and Employment Promotion (SCAPE: *Stratégie de Croissance Accélérée et de Promotion de l'Emploi*), there were on average only 33.1% of students with a usable manual for reading and 46.5% of students with a useable handbook.

(2) Health

The distribution of health workers in Togo is uneven with 82% of doctors working in the Maritime Region (77% are in Lomé) compared to 18% for the rest of the country. On the other hand, 48% of nurses are found in the Maritime Region (31% in Lomé) compared to 52% for the other regions. The share of the rural population with access to improved sanitation facilities has declined from 7.9% to 2.5% between 1990 and 2012, compared to 26.3% to 25.5% over the same period for the urban population, according to the World Bank.

31.1.3 Present Situation of Economic Activities and Land Use

(1) Economic Activities

Over 40% of the economically active population in Togo were engaged in primary and tertiary sectors each. While there are more males engaged in the primary sector, more females are engaged in the tertiary sector.

Table 31.1.1 Economically Active Population by Sector and Sex in Togo (2010)

		Primary Sector	Secondary Sector	Tertiary Sector	Total
Male	Number	520,470	215,005	405,282	1,140,757
	Share	45.6%	18.8%	35.5%	100.0%
Female	Number	487,868	170,143	573,021	1,231,032
	Share	39.6%	13.8%	46.5%	100.0%
Total	Number	1,008,338	385,148	978,303	2,371,789
	Share	42.5%	16.2%	41.2%	100.0%

Source: Bureau Central du Recensement, 2010, Quatrième Recensement Général de la Population et de l'Habitat, Publication des Résultats Définitifs Volume I: Résultats Prioritaires

The share of economically active population engaged in the tertiary sector in Lomé Commune is extremely high with over 75%, while that of Savanes Region, located next to Burkina Faso, is as low as only 19%. On the other hand, the share of economically active population engaged in the primary sector in Savanes Region is over 70%.

Table 31.1.2 Economically Active Population by Sector and Region in Togo (2010)

Region		Primary Sector	Secondary Sector	Tertiary Sector	Total
Lomé Commune	Number	4,223	86,188	275,803	366,214
	Share	1.2%	23.5%	75.3%	100.0%
Maritime	Number	218,877	148,421	339,917	707,215
	Share	30.9%	21.0%	48.1%	100.0%
Plateaux	Number	323,966	66,119	137,922	528,007
	Share	61.4%	12.5%	26.1%	100.0%
Centrale	Number	101,131	28,106	79,824	209,061
	Share	48.4%	13.4%	38.2%	100.0%
Kara	Number	147,515	29,145	88,650	265,310
	Share	55.6%	11.0%	33.4%	100.0%
Savanes	Number	212,626	27,169	56,187	295,982
	Share	71.8%	9.2%	19.0%	100.0%

Source: Bureau Central du Recensement, 2010, Quatrième Recensement Général de la Population et de l'Habitat, Publication des Résultats Définitifs Volume I: Résultats Prioritaires

The poverty ratio of Togo in 2011 was 58.7% which decreased by 3% compared to 61.7% in 2006. However, while Lomé Commune, and Maritime and Kara Regions decreased their poverty rates Plateaux, Centrale and Savanes Regions increased their poverty rates.

Inequality at the national level, as well as in all regions, increased between 2006 and 2011. Accordingly, Plateau and Kara have the highest inequality coefficients (0.354), followed by Savanes (0.342), Lomé (0.337), Maritime (0.33) and Centrale (0.31). In terms of the rate of increase between 2006 and 2011, the ratio in the Maritime Region increased greatly by 0.041 points. Considering both the poverty ratio and Gini coefficient, the Savanes Region, which is located in the northernmost part of Togo is in a severe condition of poverty and has a large income gap with the national level.

(2) Land Use

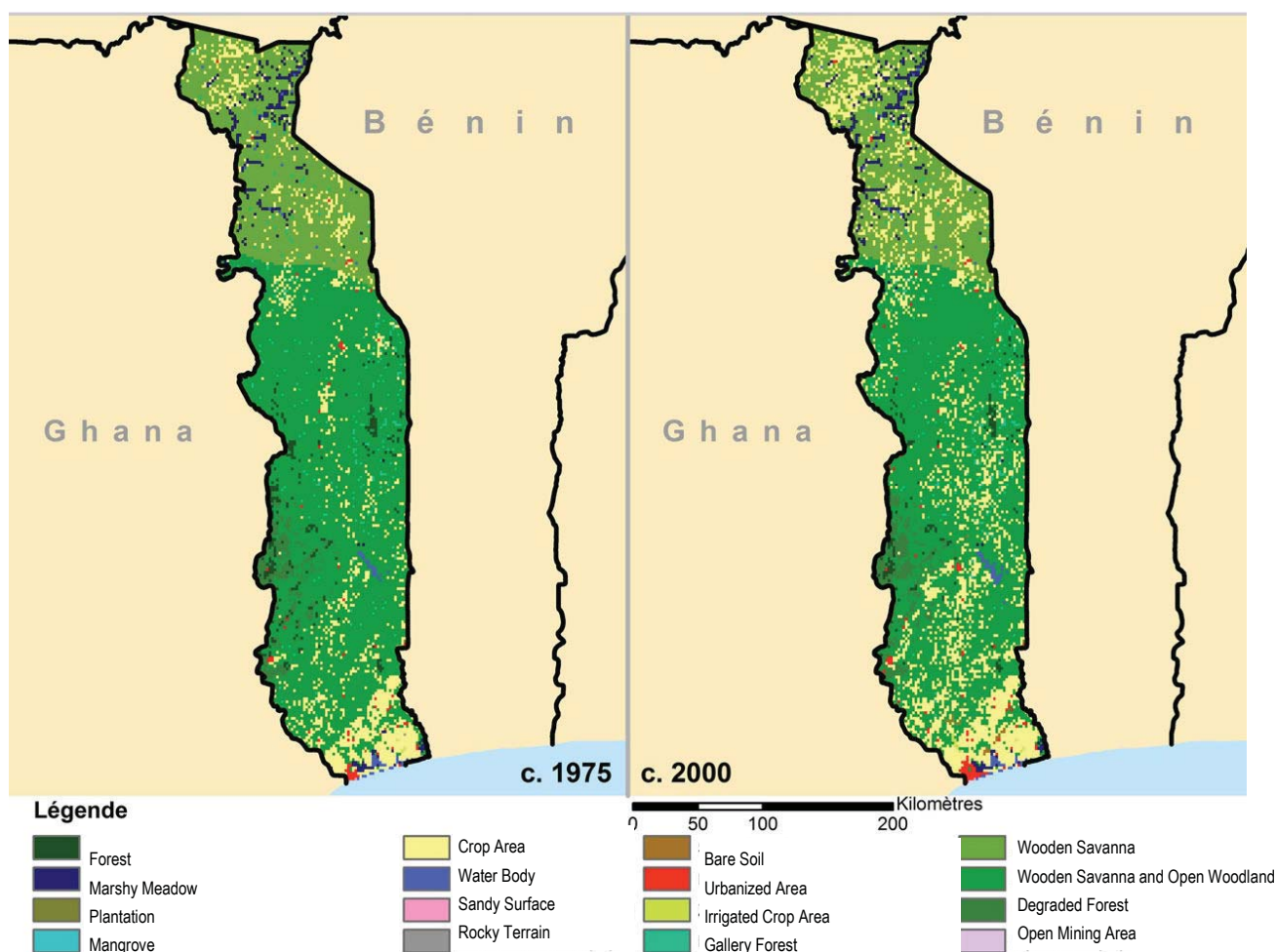
According to FAOSTAT 68% of the land area of the country is agricultural area, of which 67% was arable land in 2011. Permanent meadows and pastures were 27% of the agricultural area in Togo in 2011.

Figure 31.1.2 shows the change of land use in Togo between 1975 and 2000. The increase in agricultural land in all regions can be seen.

(3) Land Disputes

Land disputes in Togo are mainly caused by misunderstandings regarding verbal contracts over agricultural land. Bureaucratic procedures and expensive cost for land transaction are two of the reasons that local people do not follow the procedure for land registration. On the other hand, only Togolese and French citizens can directly own real estate in Togo without first requesting the permission of the Prime Minister.

Coastal erosion is also a significant concern related to land in Togo along the coast. Some fishing villages are losing their land for fishing activities due to the coastal erosion in the eastern part of Togo.



Source: USGS, West Africa Land Use and Land Cover Trends Project

Figure 31.1.2 Change of Land Use in Togo

31.2 Social Development Strategies for Togo

31.2.1 Issues on the Social Development in Togo

(1) Conflict over Land

As a result of an increase in the amount of farmed land, vacant lands continue to decrease. Since most rural lands are unregistered, conflicts over land might increase.

(2) Basic Education Inequity

There is gender inequality in the education sector because the value of education for girls is not well recognized, for they are often expected by their family members to stay home to assist in house work. In Togo, the literacy rate, especially for females in Savanes Region, is extremely low.

(3) Lack of Employability among the Youth

With the increase in foreign investments, job opportunities would increase. However, it is reported that the graduates from universities in Togo are not able to find employment in their chosen fields because they are not qualified for their operation.

Vocational schools which provide necessary skills to meet the requirements of the labour market such as construction or manufacturing are also necessary.

(4) Coastal Erosion and its Influence on Fishing Villages

People who earn their livelihoods by doing activities related to fishery are losing their jobs.

(5) Insufficient Health Facilities and Human Resources

In Togo, the number of doctors is more concentrated in Lomé and Maritime Region, where as the number of nurses is distributed more evenly. However, due to the increasing population, the number of health facilities in Lomé is insufficient.

In the rural areas, it is also important to improve the road access from rural villages to the health facilities.

31.2.2 Objectives for the Social Development in Togo

To tackle existing problems on social development in Togo, the following objectives are defined:

- To promote registration of rural lands for their agriculture and livestock by utilizing the land tenure law and monitoring the land ownership system
- To increase employability and create employment opportunities, as well as promote local industries
- To improve basic education and promote sufficient health care service

31.2.3 Strategies for the Social Development in Togo

The following strategies are formulated for social development in Togo:

- To raise the awareness and understanding of the communities and local people regarding their land rights and land values
- To develop the capacity of the institutions related to land possession
- To empower urban communities by supporting local people, especially the youth, in starting their own businesses, as well as getting jobs
- To create economic activities for fishermen along the coastal area who will be affected by coastal erosion and relocation
- To raise the awareness of parents and teachers for the importance of education, especially for girls, by promoting participatory community-based school management
- To improve employability of school graduates by promoting children's enrolment in secondary school education and vocational training

31.2.4 Programmes and Projects for the Social Development in Togo

The following projects and measures are proposed for social development in Togo.

- Project for Strengthening the Mechanism on Land Tenure Law Enforcement
- Project for Strengthening Capacity for Land Ownership Database
- Project for Health Infrastructure Development Planning
- Community-based School Management Projects
- Project for Strengthening Secondary Education and Vocational Education
- Project for livelihood creation for fishermen and women who are engage in fishing industry

PART VIII

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

Chapter 32 Strategic Environmental Assessment (SEA) for Burkina Faso

32.1 Legal Basis of SEA in Burkina Faso

In Burkina Faso, a Strategic Environmental Assessment (SEA) is carried out following the requirements described by the Environmental Code in Burkina Faso (Law No. 006-2013).

In this law, SEA is defined as the process of assessment and examination of impacts to be made by using policies, plans and programmes or any other initiatives (Article 4). All activities that might have considerable impacts on the environment are subject to prior opinion of the ministry in charge of the environment. The opinion should be drawn up on the basis of the Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA) or Environmental Impact Statement (EIS) (Article 25). Therefore, projects, plans, programs and policies likely to have significant effects on the environment are subjected to a strategic environmental assessment (Article 28).

In accordance with this law, guidelines for SEA are currently being developed.

32.2 Methodology for SEA for the WAGRIC Project

32.2.1 Objectives of the SEA Study for the WAGRIC Project

The objectives of the SEA Study for the WAGRIC Project are as follows:

- To incorporate environmental/sustainability issues in decision-making for formulating strategies and priority projects of the WAGRIC Master Plan
- To improve the WAGRIC Master Plan by making it clearer and more internally consistent;
- To involve stakeholders including representatives of private sectors and civil society organizations in the decision-making process;
- To educate decision-makers about the environmental impacts of their decisions;
- To predict environmental impacts of the WAGRIC Master Plan; and
- To use those predictions in decision-making for formulating strategies and priority projects of the WAGRIC Master Plan.

32.2.2 SEA Process

SEA is not simply a study, but also a process in parallel with plan formulation. For the project for formulating the WAGRIC Master Plan, the following steps were done for SEA:

- 1) Design of an overall process for SEA applied to the WAGRIC Project
- 2) Collection and analysis of baseline information and data on present social and environmental situations (land use, natural environment, social and economic situations)
- 3) Scoping (identification of possible impacts caused by the implementation of the WAGRIC Master Plan and identification of assessment tools) based on the understanding of concepts and approaches for formulating the Strategic Master Plan
- 4) Comparative Evaluation of alternative corridor development scenarios at the level of policies, plans, and programmes (PPPs)

- 5) Impact assessment of corridor development plans in accordance with a selected scenario at the level of PPP
- 6) Preparation of advisory notes for the WAGRIC Master Plan

This series of steps were conducted for the four countries. The JICA Study Team conducted SEA Studies in the four countries by subcontracting SEA steps (steps 2 through 6 mentioned above) to national consulting companies in each country of the Study Areas. Therefore, there are four SEA Studies and four SEA teams.

Stakeholder consultations were conducted for SEA's important steps including scoping, comparative assessment of scenario alternatives and the assessment of impact of corridor development plans. Stakeholders were selected including not only government officers of relevant fields, but also representatives of environmental non-governmental organisations and private business organisations.

The actual steps taken and stakeholder meetings held for Burkina Faso in the WAGRIC Project are described in Appendix F.

32.3 Social Considerations for Burkina Faso

Corridor development and regional integration might bring both benefits and negative impacts to Burkina Faso. Table 32.3.1 shows social effects by corridor development in Burkina Faso.

Table 32.3.1 Expected Social Effects of Corridor Development in Burkina Faso

	Social Benefits	Social Impacts
1) Establishment of OSBPs	<ul style="list-style-type: none"> • Faster process of customs and immigration at national borders shortening the time of travel and delivering of goods which would contribute to economic development 	<ul style="list-style-type: none"> • Informal vendors and service providers might lose their jobs at the border since there might be less time to wait at the border posts • Service industry at the existing borders might decline since the existing borders might not be the main border once OSBPs are established
2) Increase of people and goods crossing the borders	<ul style="list-style-type: none"> • If the demand for travelling within the sub-region increases, better flight connections might be established between the major urban centres as well as with the countries in the sub-region, which is a more favourable environment for business 	<ul style="list-style-type: none"> • The risks of crime and prevalence of infectious diseases may increase in wide areas due to a large volume of migration.
3) Increase in competition among international transport corridors	<ul style="list-style-type: none"> • Cost of transport would decrease • Better services would be provided for the customers 	<ul style="list-style-type: none"> • Increased competition might worsen working conditions for long-distance truck drivers in terms of wages and working hours
4) Rapid development of Abidjan-Lagos Corridor	<ul style="list-style-type: none"> • Demand for agro-products would increase due to larger middle class urban population, which farmers can benefit from 	<ul style="list-style-type: none"> • Loss of specialist personnel wishing to work in the coastal urban centres
5) Upgraded transport corridor network	<ul style="list-style-type: none"> • Small-scale farmers would have opportunities to expand their markets due to better access. • Business opportunities would expand due to the geographical expansion of development areas. • Not only large enterprises but also small & medium enterprises (SMEs) would be able to participate in development opportunities that would arise due to upgrading of transport corridors. 	<ul style="list-style-type: none"> • Increase in the amount of traffic can increase the number of car accidents • Upgraded road will shorten the time of travel. Therefore, it will be possible to travel further with fewer rest stops to the destination. Under such situation, some urban centres along the corridor would be passed through in the future, which could cause decline in the economy • Construction of bypass road will shift the location of rest stops for the drivers which could be an impact for the traders
6) Large-scale infrastructure development and projects	<ul style="list-style-type: none"> • Job opportunities in the construction sector would increase 	<ul style="list-style-type: none"> • Relocation of communities and compensation for farmers would occur • Non-permanent residents engaged in construction would increase, which might cause conflicts with existing residents

Source: JICA Study Team

32.4 Suggestions from the SEA Study for Burkina Faso for the WAGRIC Master Plan

(1) Suggestions from SEA Study in Burkina Faso: Northern Parts of Burkina Faso

The WAGRIC Master Plan emphasized the development potential of economic sectors, especially that of the agricultural sector in the southern part of Burkina Faso by improving road corridors towards Cote d'Ivoire, Ghana and Togo and irrigation facilities for agriculture. As a result, development efforts in the northern part of the country tend to be ignored or less emphasized.

Therefore, it was suggested by the SEA Study that attention should be paid to northern parts of Burkina Faso in corridor development. In response to this suggestion, the WAGRIC Master Plan included the following strategies and priority projects:

- To increasing the production and supply of live cattle and small ruminants to coastal markets
 - Project for basic service improvement for cattle and small ruminants and
 - Project for technical development for fodder crop production and feeding method
- To facilitate the transporting of live cattle and small ruminants to coastal areas
 - Projects for development of cattle loading and off-loading facilities and cattle waiting pens at railway stations (Suburban Ouagadougou, Kaya and Bobo-Dioulasso)

(2) Suggestions from SEA Study for Burkina Faso: Water Resources

In Burkina Faso, the promotion of economic sectors development through corridor development always requires development of reservoirs (water resources development). As a result, such corridor development would increase water consumption, which might make an impact on downstream (coastal countries) rivers or water resources.

Therefore, it was suggested by the SEA Study that integrated water resources management should be promoted covering Burkina Faso and its neighbouring coastal countries. In response to this suggestion, the WAGRIC Master Plan recommends a study on integrated water management covering the WAGRIC countries.

Chapter 33 Strategic Environmental Assessment (SEA) for Côte d'Ivoire

33.1 Legal Basis of SEA in Côte d'Ivoire

Considering the environmental legal frameworks for Côte d'Ivoire, the Environmental Code (Law No.96-766, 1996) is considered as the principal law next to the constitution. The Environmental Code comprises six parts: I) definitions of terms, purpose and scope, II) definitions of the environment, III) general principles, IV) the obligation of the state and local authorities, V) prohibited and criminal provisions and VI) final provisions/enforcement of the environmental code. Particularly, Part III states the equal right to secure a safe environment for all persons and gives the principal philosophy of the environmental protection. Then, the following Part IV gives the state and local authorities' obligations regarding the environmental protection and general guidelines, which defines the power of designated authorities to evaluate and control negative impact activities and minimum requirements of the environmental impact assessment. Under Article 74, the national environmental agency, l'Agence Nationale de l'Environnement (ANDE) was established and given power to enforce the Environmental Code.

Under the Environmental Code, the presidential decree No. 2013-41 of 30 January 2013 on "Strategic environmental assessment (SEA) for policies, plans, and programmes" was enforced in Côte d'Ivoire. Although the detailed requirements and guidelines for such activities shall be set in the future, the decree No.2013-41 principally sets the requirement of SEA for any policy, plan, or programme development by authorities except for some exceptions such as national security matters after the date of enforcement.

In this decree, SEA is defined as the analytical and participatory approach that aims to take environmental considerations into account in the development of policies, plans and programmes and to assess their interactions with economic and social considerations prior to their implementation (Article 1). The developer of policies, plans and programmes likely to have an impact on hazardous areas or ecologically sensitive areas should prepare and submit a SEA Report for examination to a National Commission and receive a signature of approval order by the Minister for the Environment (Article 3, 7, 8 and 10).

ANNEX of the Decree 2013-41 gives general guidelines for the SEA report.

- Presentation of the policy, plan or programme, its objectives and its links with other policies, plans and programmes as well as the National Development Programme
- Description of the owner or petitioner and SEA consultancy
- Institutional and regulatory environment affected by the policy, plan or programme
- Environmental characteristics of areas likely to be significantly affected or generic environmental parameters
- Major environmental issues identified from the likely significant effects on the environment, including issues such as biodiversity, population, human activities, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage (archaeological heritage, landscape), and the interrelationship between these factors
- Summary report of the public consultation and the opinions issued by the attendees
- Recommendations and measures to prevent, reduce, or offset any negative impact of the implementation of the policy, plan or programme on the environment

- Summary statement of the reasons why other alternatives were selected, and a description of how the assessment was undertaken including any difficulties encountered, technical deficiencies or lack of know-how in collecting the required information
- Description of the environmental monitoring plan

33.2 Methodology for SEA for the WAGRIC Project

33.2.1 Objectives of the SEA Study for the WAGRIC Project

The objectives of the SEA Study for the WAGRIC Project are as follows:

- To incorporate environmental/sustainability issues in decision-making for formulating strategies and priority projects of the WAGRIC Master Plan
- To improve the WAGRIC Master Plan by making it clearer and more internally consistent;
- To involve stakeholders including representatives of private sectors and civil society organizations in the decision-making process;
- To educate decision-makers about the environmental impacts of their decisions;
- To predict environmental impacts of the WAGRIC Master Plan; and
- To use those predictions in decision-making for formulating strategies and priority projects of the WAGRIC Master Plan.

33.2.2 SEA Process

SEA is not simply a study, but also a process in parallel with plan formulation. For the project for formulating the WAGRIC Master Plan, the following steps were done for SEA:

- 1) Design of an overall process for SEA applied to the WAGRIC Project
- 2) Collection and analysis of baseline information and data on present social and environmental situations (land use, natural environment, social and economic situations)
- 3) Scoping (identification of possible impacts caused by the implementation of the WAGRIC Master Plan and identification of assessment tools) based on the understanding of concepts and approaches for formulating the Strategic Master Plan
- 4) Comparative Evaluation of alternative corridor development scenarios at the level of policies, plans, and programmes (PPPs)
- 5) Impact assessment of corridor development plans in accordance with a selected scenario at the level of PPP
- 6) Preparation of advisory notes for the WAGRIC Master Plan

This series of steps were conducted for the four countries. The JICA Study Team conducted SEA Studies in the four countries by subcontracting SEA steps (steps 2 through 6 mentioned above) to national consulting companies in each country of the Study Areas. Therefore, there are four SEA Studies and four SEA teams.

Stakeholder consultations were conducted for SEA's important steps including scoping, comparative assessment of scenario alternatives and the assessment of impact of corridor development plans. Stakeholders were selected including not only government officers of relevant fields, but also representatives of environmental non-governmental organisations and private business organisations.

The actual steps taken and stakeholder meetings held for Côte d'Ivoire in the WAGRIC Project are described in Appendix F.

33.3 Social Considerations for Côte d'Ivoire

Corridor development and sub-regional integration might bring both benefits and negative impacts to Côte d'Ivoire. Table 33.3.1 shows social effects that could be caused by corridor development in Côte d'Ivoire.

Table 33.3.1 Expected Social Effects of Corridor Development in Côte d'Ivoire

	Social Benefits	Social Impacts
1) Establishment of OSBPs	<ul style="list-style-type: none"> Faster clearing process of customs and immigration at national borders, resulting in shortening the time of travel and delivering of goods, which would contribute to economic development. 	<ul style="list-style-type: none"> Informal vendors and service providers might lose their jobs at borders since less time is required when going through one-stop border posts.
2) Increase of people and goods crossing national borders	<ul style="list-style-type: none"> Better flight connections would be established between major urban centres as well as with the countries in the sub-region, which is a more favourable environment for business. 	<ul style="list-style-type: none"> Prevalence of crime risks and infectious diseases might increase in wide areas due to increased people's mobility due to expansion of the corridor networks.
3) Increase in competition among international transport corridors	<ul style="list-style-type: none"> Cost of transport would decrease. Better services would be provided for customers. 	<ul style="list-style-type: none"> Increased competition might worsen working conditions for long-distance truck drivers in terms of wages and working hours.
4) Rapid development of Abidjan-Lagos Corridor	<ul style="list-style-type: none"> Widened national roads, multilane expressways, high-speed railways, international airports and international sea ports would be developed, which would improve the efficiency of the socio-economy. Industrial development along the corridor would also accelerate modernization of commerce and services. Heavy concentration of populations and economic activities in Abidjan can be reduced, and also in other cities, such as San-Pedro, Demand for agro-products would increase due to larger middle-class urban population, which benefits farmers more. 	<ul style="list-style-type: none"> Informal settlements might increase due to rapid increase of urban population.
5) Upgraded transport corridor network	<ul style="list-style-type: none"> Small-scale farmers would have opportunities to sell their products due to better access to market places. Business opportunities would expand due to geographical expansion of development areas. Not only large enterprises but also small & medium enterprises (SMEs) would be able to participate in development opportunities that would arise due to upgrading of the transport corridors. 	<ul style="list-style-type: none"> Increase in traffic volume might increase the number of car accidents.
6) Large-scale infrastructure development and projects	<ul style="list-style-type: none"> Job opportunities in the construction sector would increase. 	<ul style="list-style-type: none"> Relocation of communities and compensation for farmers would occur. Non-permanent residents engaged in construction would increase, which might cause conflicts with existing residents
7) Increase of private investments in urban areas	<ul style="list-style-type: none"> Number of formal jobs would increase in major urban centres, such as Abidjan, Bouake, Korhogo and San-Pédro. 	<ul style="list-style-type: none"> Disparity within urban areas as well as that between urban and rural areas might increase.

Source: JICA Study Team

33.4 Suggestions from the SEA Study for Côte d'Ivoire for the WAGRIC Master Plan

(1) Suggestions from SEA Study in Côte d'Ivoire: Much Concentrated Development on the Central Corridor

In Côte d'Ivoire, the WAGRIC Master Plan recommends upgrading transportation and promoting economic sectors in its central corridor in the north-south direction (Abidjan-Ouagadougou Corridor) so that the central corridor would become more efficient and attractive so as to encourage more cargos, people and information to use the central corridor. The Abidjan-Ouagadougou Corridor would become a strong economic corridor

attracting investment to the economic sectors. As a result, the areas along the other north-south corridors would have fewer opportunities for developing economic sectors, but they are to be improved to be transport corridors.

Therefore, it was suggested by the SEA Study that development opportunities should be created for the other north-south corridors. In response to this suggestion, this point was included as a recommendation in the WAGRIC Master Plan.

(2) Suggestions from SEA Study in Côte d'Ivoire: Water Resources

The WAGRIC Master Plan points out the importance of the major regional cities along the central corridor (Yamoussoukro, Bouaké and Korhogo), as well as Greater Abidjan, for attracting investment to economic sectors, especially agro-processing industries targeting coastal markets. Development along the central corridor of Côte d'Ivoire would heavily depend on the water resources to be developed from one large watershed of the Bandama River. As a result, the concentrated development along the central corridor might have a negative impact on the water resources of the Bandama River basin.

Therefore, it was suggested by the SEA Study that coordination of water utilization of the Bandama River is necessary for sustainable development of the central corridor in Côte d'Ivoire. In response to this suggestion, the WAGRIC Master Plan recommends implementation of integrated water resources management for the Bandama River Basin of Côte d'Ivoire.

(3) Suggestions from SEA Study in Côte d'Ivoire: Coastal Areas

In the coastal areas of Côte d'Ivoire where many lagoons are located, a 6-lane Abidjan-Lagos Corridor Motorway is planned to be constructed, and various economic sectors including manufacturing industries, would be developed. While development activities in the areas along such lagoons are restricted in accordance with government regulations, the impact of the coastal economic corridor development (industrial and urban corridor development) proposed by the WAGRIC Master Plan would be significant.

Therefore, it is suggested by the SEA Study that coastal corridor development should be monitored paying attention to the environment of the lagoons in the coastal areas. In response to this suggestion, for conducting environmental monitoring of the lagoons, it is recommended to formulate a land use plan which would guide land use.

(4) Suggestion from SEA Study in Côte d'Ivoire: Coastal Metropolitan

In Côte d'Ivoire like other coastal countries of the WAGRIC Sub-Region, out-migration from inland areas and population influx into coastal areas, especially to urban areas, will continue endlessly unless some effective measures are taken. As a result, it is predicted that the population of the urban poor would increase excessively within the coastal metropolitan areas.

It was suggested by the SEA Study that strong measures should be taken for tackling this problem. In response to this suggestion, the WAGRIC Master Plan recommends an emphasis on promoting inland areas' economic sectors targeting sub-regional consumer markets based on their development potentials.

Chapter 34 Strategic Environmental Assessment (SEA) for Ghana

34.1 Legal Basis of SEA in Ghana

In Ghana, a Strategic Environmental Assessment (SEA) is being carried out based on the requirements of three acts, namely, National Development Planning Commission Act (1994, Act 479), National Development Planning (System) Act (1994, Act 480) and Environmental Protection Agency Act (1994, Act 490).

The National Development Planning Commission NDPC Act 479 empowers the Commission to make proposals for the protection of the natural and physical environment with a view to ensuring that development strategies and programmes are in conformity with sound environmental principles (Section 2.(2) c)). The NDP (System) Act 480 ensures that the decentralized national development planning system is regulated by legislative instruments and guidelines issued by the Commission (Section 1.(3)). The Environmental Protection Agency (EPA) Act 490 gives the power to the Agency to prescribe standards and guidelines relating to the pollution of air, water, land and any other forms of environmental pollution including discharge of waste and control of toxic substances which may be the result of an existing or new development (Section 2.(h)).

Also the Ghana Shared Growth and Development Agenda (GSGDA I) (2010-2013) indicated that one of the key objectives of the Environment and Natural Resource Sector for the future is SEA applied to inform decision-makers and mainstream the environmental consideration into all sectors, especially as regards the cost of environmental degradation. Furthermore, it is recommended to ensure that sustainable development principles are institutionalised and mainstreamed by demanding the mandatory use of SEA in the public policy processes. The GSGDA II (2014-2017) also ensures that SEA is mainstreamed into public policy processes.

In Ghana, it is considered by the NDPC and EPA that the mandatory implementation of SEA for public policies and development plans is stipulated by interpreting the above law, policy document and guidelines in a combined way.

34.2 Methodology for SEA for the WAGRIC Project

34.2.1 Objectives of the SEA Study for the WAGRIC Project

The objectives of the SEA Study for the WAGRIC Project are as follows:

- To incorporate environmental/sustainability issues in decision-making for formulating strategies and priority projects of the WAGRIC Master Plan
- To improve the WAGRIC Master Plan by making it clearer and more internally consistent;
- To involve stakeholders including representatives of private sectors and civil society organizations in the decision-making process;
- To educate decision-makers about the environmental impacts of their decisions;
- To predict environmental impacts of the WAGRIC Master Plan; and
- To use those predictions in decision-making for formulating strategies and priority projects of the WAGRIC Master Plan.

34.2.2 SEA Process

SEA is not simply a study, but also a process in parallel with plan formulation. For the project for formulating the WAGRIC Master Plan, the following steps were done for SEA:

- 1) 1) Design of an overall process for SEA applied to the WAGRIC Project
- 2) 2) Collection and analysis of baseline information and data on present social and environmental situations (land use, natural environment, social and economic situations)
- 3) 3) Scoping (identification of possible impacts caused by the implementation of the WAGRIC Master Plan and identification of assessment tools) based on the understanding of concepts and approaches for formulating the Strategic Master Plan
- 4) 4) Comparative Evaluation of alternative corridor development scenarios at the level of policies, plans, and programmes (PPPs)
- 5) 5) Impact assessment of corridor development plans in accordance with a selected scenario at the level of PPP
- 6) 6) Preparation of advisory notes for the WAGRIC Master Plan

This series of steps were conducted for the four countries. The JICA Study Team conducted SEA Studies in the four countries by subcontracting SEA steps (steps 2 through 6 mentioned above) to national consulting companies in each country of the Study Areas. Therefore, there are four SEA Studies and four SEA teams.

Stakeholder consultations were conducted for SEA's important steps including scoping, comparative assessment of scenario alternatives and the assessment of impact of corridor development plans. Stakeholders were selected including not only government officers of relevant fields, but also representatives of environmental non-governmental organisations and private business organisations.

The actual steps taken and stakeholder meetings held for Ghana in the WAGRIC Project are described in Appendix F.

34.3 Social Considerations for Ghana

Corridor development and sub-regional integration might bring both benefits and negative impacts to Ghana. Table 34.3.1 shows social effects by corridor development in Ghana.

Table 34.3.1 Expected Social Effects of Corridor Development in Ghana

	Social Benefits	Social Impacts
1) Establishment of OSBPs	<ul style="list-style-type: none"> Faster process of customs and immigration at national borders shortening the time of travel and delivering of goods which would contribute to economic development 	<ul style="list-style-type: none"> Informal vendors and service providers might lose their jobs at the border since there might be less time to wait at the border posts
2) Increase of people and goods crossing the borders	<ul style="list-style-type: none"> Better flight connections would be established between the major urban centres as well as with the countries in the sub-region, which is a more favourable environment for business 	<ul style="list-style-type: none"> The risks of crime and prevalence of infectious diseases may increase in wide areas due to a large volume of migration.
3) Increase in competition among international transport corridors	<ul style="list-style-type: none"> Cost of transport would decrease Better services would be provided for the customers 	<ul style="list-style-type: none"> Increased competition might worsen working conditions for long-distance truck drivers in terms of wages and working hours
4) Rapid development of Abidjan-Lagos Corridor	<ul style="list-style-type: none"> Widened national roads, multilane expressways, high-speed railways, international airports and international sea ports would be developed which would improve the efficiency of the society Industrial development along the corridor would accelerate the modernization of commerce and services Concentration in Greater Accra can be reduced along with other cities, such as Sekondi-Takoradi and Cape Coast, which are also developing rapidly Demand for agro-products would increase due to larger middle class urban population, which farmers can benefit from 	<ul style="list-style-type: none"> Informal settlements may increase due to rapid increase of urban population Insufficient social infrastructure (electricity, water supply and drainage) in Greater Accra, Sekondi-Takoradi and Cape Coast Due to large-scale infrastructure development, the space where the street vendors can sell products would become limited along the corridor
5) Upgraded transport corridor network	<ul style="list-style-type: none"> Small-scale farmers would have opportunities to expand their markets due to better access. Business opportunities would expand due to the geographical expansion of development areas. Not only large enterprises but also small & medium enterprises (SMEs) would be able to participate in development opportunities that would arise due to upgrading of transport corridors. 	<ul style="list-style-type: none"> Increase in the amount of traffic can increase the number of car accidents
6) Large-scale infrastructure development and projects	<ul style="list-style-type: none"> Job opportunities in the construction sector would increase 	<ul style="list-style-type: none"> Relocation of communities and compensation for farmers would occur Non-permanent residents engaged in construction would increase, which might cause conflicts with existing residents
7) Increase of private investments in urban areas	<ul style="list-style-type: none"> Number of formal jobs would increase in the urban centres, such as Greater Accra, Greater Kumasi and Sekondi-Takoradi 	<ul style="list-style-type: none"> Disparity inside urban areas as well as between urban and rural areas might widen.

Source: JICA Study Team

34.4 Suggestions from the SEA Study for Ghana for the WAGRIC Master Plan

(1) Suggestions from SEA Study in Ghana: Much Concentrated Development on the Central Corridor

In Ghana, the WAGRIC Master Plan recommends upgrading transportation and promoting economic sectors in its central corridor in the north-south direction (Tema-Ouagadougou Corridor) so that the central corridor would become more efficient and attractive so as to encourage more cargos, people and information to use the central corridor. The Tema-Ouagadougou Corridor would become a strong economic corridor attracting investment to the economic sectors. As a result, the areas along the other north-south corridors would have fewer opportunities for developing economic sectors, but they are to be improved to be transport corridors.

Therefore, it was suggested by the SEA Study that development opportunities should be created for the other north-south corridors. In response to this suggestion, this point was included as a recommendation in the WAGRIC Master Plan.

(2) Suggestion from SEA Study in Ghana: Coastal Areas

In the coastal areas of Ghana where many lagoons are located, a 6-lane Abidjan-Lagos Corridor Motorway is planned to be constructed, and various economic sectors including manufacturing

industries would be developed. While development activities in the areas along such lagoons are restricted in accordance with government regulations, the impact of the coastal economic corridor development (industrial and urban corridor development) proposed by the WAGRIC Master Plan would be significant.

Therefore, it is suggested by the SEA Study that coastal corridor development should be monitored paying attention to the environment of the lagoons in the coastal areas. In response to this suggestion, for conducting environmental monitoring of the lagoons, it is recommended to formulate a land use plan which would guide land use.

(3) Suggestions from SEA Study in Ghana: Coastal Metropolitan

In Ghana like other coastal countries of WAGRIC Sub-Region, out-migration from inland areas and population influx into coastal areas, especially to urban areas, will continue endlessly, unless some effective measures are taken. As a result, it is predicted that the population of the urban poor would increase excessively within the coastal metropolitan areas.

It was suggested by the SEA Study that strong measures should be taken for tackling this problem. In response to this suggestion, the WAGRIC Master Plan recommends an emphasis on promoting inland areas' economic sectors targeting sub-regional consumer markets based on their development potentials.

Chapter 35 Strategic Environmental Assessment (SEA) for Togo

35.1 Legal Basis of SEA in Togo

Strategic Environmental Assessments (SEA) have not yet been frequently practiced in Togo. Togo's SEA is at its embryonic stage. Currently, Togo has not established any laws, regulations or guidelines for SEA. As a result, SEA in Togo should be carried out in line with Togo's Framework Law on the Environment (Law No. 2008-005) and the National Environmental Policy adopted on 23rd of December, 1998.

The Framework Law on the Environment is the basic law for environmental preservation and management in Togo. Article 1 of this law provides its objective and the following aims:

- To preserve and sustainably manage the environment;
- To guarantee an environmentally sound and balanced living environment for all citizens;
- To create conditions for the rational and sustainable management of natural resources for present and future generations;
- To establish the fundamental principles to manage and preserve the environment against all forms of degradation in order to exploit natural resources, to combat all kinds of pollution and nuisances;
- To sustainably improve the living conditions of the populations while respecting the balance with the surrounding environment.

In accordance with this law, guidelines for SEA are currently being developed by the government.

The National Environmental Policy states that the main guidelines of the government policy will focus on: i) Consideration of environmental concerns in the National Development Plan; ii) Removal and/or reduction of negative environmental impacts in public or private development projects and programs; iii) Strengthening of national capacities in environmental management and natural resources; iv) Improvement of the living conditions and the environment of the population, in order to promote good management of the environment and natural resources, stimulate the economy, and promote ecological and social sustainability of development activities.

35.2 Methodology for SEA for the WAGRIC Project

35.2.1 Objectives of the SEA Study for the WAGRIC Project

The objectives of the SEA Study for the WAGRIC Project are as follows:

- To incorporate environmental/sustainability issues in decision-making for formulating strategies and priority projects of the WAGRIC Master Plan
- To improve the WAGRIC Master Plan by making it clearer and more internally consistent;
- To involve stakeholders including representatives of private sectors and civil society organizations in the decision-making process;
- To educate decision-makers about the environmental impacts of their decisions;
- To predict environmental impacts of the WAGRIC Master Plan; and

- To use those predictions in decision-making for formulating strategies and priority projects of the WAGRIC Master Plan.

35.2.2 SEA Process

SEA is not simply a study, but also a process in parallel with plan formulation. For the project for formulating the WAGRIC Master Plan, the following steps were done for SEA:

- 1) Design of an overall process for SEA applied to the WAGRIC Project
- 2) Collection and analysis of baseline information and data on present social and environmental situations (land use, natural environment, social and economic situations)
- 3) Scoping (identification of possible impacts caused by the implementation of the WAGRIC Master Plan and identification of assessment tools) based on the understanding of concepts and approaches for formulating the Strategic Master Plan
- 4) Comparative Evaluation of alternative corridor development scenarios at the level of policies, plans, and programmes (PPPs)
- 5) Impact assessment of corridor development plans in accordance with a selected scenario at the level of PPP
- 6) Preparation of advisory notes for the WAGRIC Master Plan

This series of steps were conducted for the four countries. The JICA Study Team conducted SEA Studies in the four countries by subcontracting SEA steps (steps 2 through 6 mentioned above) to national consulting companies in each country of the Study Areas. Therefore, there are four SEA Studies and four SEA teams.

Stakeholder consultations were conducted for SEA's important steps including scoping, comparative assessment of scenario alternatives and the assessment of impact of corridor development plans. Stakeholders were selected including not only government officers of relevant fields, but also representatives of environmental non-governmental organisations and private business organisations.

The actual steps taken and stakeholder meetings held for Togo in the WAGRIC Project are described in Appendix F.

35.3 Social Considerations for Corridor Development in Togo

Corridor development and sub-regional integration might bring both benefits and negative impacts to Togo. Table 35.3.1 shows social effects by corridor development in Togo.

Table 35.3.1 Expected Social Effects of Corridor Development in Togo

	Social Benefits	Social Impacts
1) Establishment of OSBPs	<ul style="list-style-type: none"> Faster process of customs and immigration at national borders shortening the time of travel and delivering of goods could help to enlarge the catchment areas of Lomé Port which would contribute to economic development. 	<ul style="list-style-type: none"> Informal vendors and service providers might lose their jobs at the borders since less time is required when going through one-stop border posts.
2) Increase of people and goods crossing the borders	<ul style="list-style-type: none"> When land transport is developed for better mobility of people and goods, flight connections would be established between major urban centres as well as with countries in the sub-region 	<ul style="list-style-type: none"> Prevalence of crimes and infectious diseases might increase in wide areas due to increased mobility and goods, because of expansion of corridor networks.
3) Increase in competition among international transport corridors	<ul style="list-style-type: none"> Cost of transport would decrease. Better services would be provided for the customers. 	<ul style="list-style-type: none"> Increased competition might worsen working conditions for long-distance truck drivers in terms of wages and working hours.
4) Rapid development of Abidjan-Lagos Corridor	<ul style="list-style-type: none"> Widened national roads, multilane motorways, high-speed railways, international airports and international sea ports would be developed which would improve the efficiency of the society Industrial development along the corridor would accelerate the modernization of commerce and services. Demand for agro-products would increase due to the larger middle-class urban population, which farmers can benefit from. The economy of Togo will be able to grow rapidly, resulting in the increase in the number of formal jobs since Togo has the potential to become one of the attractive destinations for foreign investors who want to utilize the developed coastal corridor and it has a good location being close to both Lagos and Accra. 	<ul style="list-style-type: none"> Informal settlements may increase due to rapid increase of urban population Insufficient social infrastructure (electricity, water supply and drainage) in Greater Lomé. Concentration in Greater Lomé can be accelerated.
5) Upgraded transport corridor network	<ul style="list-style-type: none"> Small-scale farmers would have opportunities to expand their markets due to better access and lower transport costs. Business opportunities would expand due to the geographical expansion of development areas. Not only large enterprises but also small & medium enterprises (SMEs) would be able to participate in development opportunities that would arise due to upgrading of transport corridors. 	<ul style="list-style-type: none"> Increase in traffic volume might increase the number of car accidents.
6) Large-scale infrastructure development projects	<ul style="list-style-type: none"> Job opportunities in the construction sector would increase 	<ul style="list-style-type: none"> Relocation of communities and compensation for farmers would occur. Migrant workers engaged in construction would increase, which might cause conflicts with existing residents.
7) Increase of private investments in urban areas	<ul style="list-style-type: none"> Number of formal jobs would increase in Greater Lomé, Atakpamé, Sokodé and Kara. 	<ul style="list-style-type: none"> Disparity within urban areas, as well as between Greater Lomé and other areas might widen.

Source: JICA Study Team

35.4 Suggestions from the SEA Study for Togo for the WAGRIC Master Plan

(1) Suggestions from SEA Study in Togo: Coastal Areas

In the coastal areas of Togo where many lagoons are located, a 6-lane Abidjan-Lagos Corridor Motorway is planned to be constructed, and various economic sectors including manufacturing industries will be developed. While development activities in the areas along such lagoons are restricted in accordance with government regulations, the impact of the coastal economic corridor development (industrial and urban corridor development) proposed by the WAGRIC Master Plan would be significant.

Therefore, it is suggested by the SEA Study that coastal corridor development should be monitored paying attention to the environment of the lagoons in the coastal areas. In response to this suggestion,

for conducting environmental monitoring of the lagoons, it is recommended to formulate a land use plan which would guide land use.

(2) Suggestions from SEA Study in Togo: Coastal Metropolitan

In Togo like other coastal countries of the WAGRIC Sub-Region, out-migration from inland areas and population influx into coastal areas, especially to urban areas, will continue endlessly, unless some effective measures are taken. As a result, it is predicted that the population of the urban poor would increase excessively within the coastal metropolitan areas.

It was suggested by the SEA Study that strong measures should be taken for tackling this problem. In response to this suggestion, the WAGRIC Master Plan recommends an emphasis on promoting inland areas' economic sectors targeting sub-regional consumer markets based on their development potentials.