MINISTRY OF WORKS
UNITED REPUBLIC OF TANZANIA

Preparatory Survey for
Dar es Salaam Intersection Improvement Project
in the United Republic of Tanzania

DRAFT FINAL REPORT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

July 2025

JAPAN INTERNATIONAL COOPERATION AGENCY

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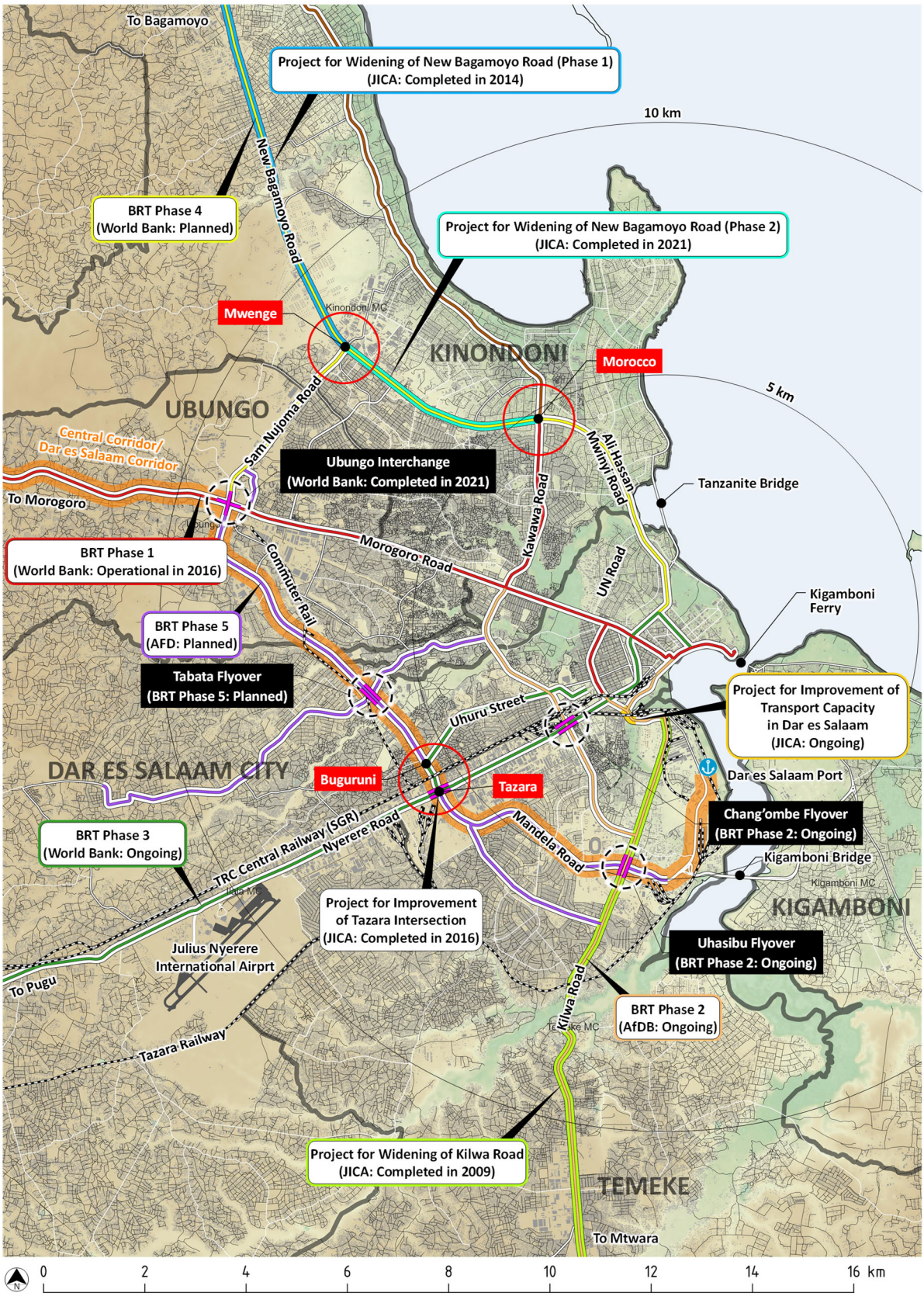

Project Location Map

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List of Abbreviations

AAS	Atomic absorption spectrometer
AIDS	Acquired Immunodeficiency Syndrome
ARAP	Abbreviated Resettlement Action Plan
BOD	Biological Oxygen Demand
BOQ	Bill Of Quantities
BRT	Dar es Salaam Bus Rapid Transit
BS	British Standards
CMM	Community meetings
COD	Chemical Oxygen Demand
DART	Dar es Salaam Rapid Transit Agency
dB	Decibel
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
ESF	Environmental and Social Frameworks
ESIA	Environmental and Social Impact Assessment
ESS	Environmental and Social Standards
HH	Household
HIV	Human Immunodeficiency Virus
ID	Identification
IFC	International Finance Corporation
ISO	International Organization for Standardization
JICA	Japan International Cooperation Agency
KMC	Kinondoni Municipal Council
MM	Minutes of Meeting
NES	National Environmental Standards
NGOs	Non-Governmental Organisation
NHC	National Housing Corporation
PAH	Project affected Household
PAHs	Polycyclic aromatic hydrocarbons
PAP	Project Affected People
PCB	Polychlorinated biphenyls
PM10	Particulate Matter with diameters that are generally 10 micrometres
PM2.5	Particulate Matter with diameters that are generally 2.5 micrometres and small
PPV	Peak Particle Velocity
RAP	Resettlement Action Plan
ROW	Right of ways
OSHA	Occupational Safety and Health authority
SHM	Stakeholder meeting
TANROADS	Tanzania National Roads Agency
TBS	Tanzania Bureau of Standards
TLVs	Threshold Limit Values
TMA	Tanzania Metrological Agency
TOR	Terms of Reference
VOCs	Volatile organic compounds
WHO	World Health Organisation

1. EXECUTIVE SUMMARY

1.1 Introduction

Dar es Salaam, the most prominent economic hub of the United Republic of Tanzania, is grappling with chronic traffic congestion driven by rapid population growth and escalating motorization. This pervasive issue has become a major social concern, strongly influencing the day-to-day lives of the city's residents and impeding economic development. To address these challenges, a multi-phase development approach for the Bus Rapid Transit (BRT) system has been initiated with substantial support from international organizations, including the World Bank (WB), African Development Bank (AfDB), and Agence française de développement (AFD). While the BRT represents a critical step toward alleviating congestion, its implementation alone is not sufficient to satisfy the continuously increasing transportation demand.

In response to these limitations, the Japan International Cooperation Agency (JICA), in partnership with Tanzanian government agencies, implemented the "Project for Revision of Dar es Salaam Urban Transport Master Plan" in 2018. This resulted in the formulation of the revised Master Plan for Urban Transport in Dar es Salaam for the period 2018-2040. The new Master Plan proposed a comprehensive set of interventions, including the deployment of an Intelligent Transport System (ITS), the improvement of key intersections, the enhancement of public transport terminals, and the development of urban railways. These measures are aimed at addressing entrenched congestion and maximizing the efficiency of existing road infrastructure.

Subsequently, a follow-up survey titled the "Data Collection Survey on Urban Transportation in Dar es Salaam" was carried out by JICA in 2020. This assessment served to evaluate the progress of priority initiatives and determine the necessity of further support via Japanese ODA loans or grants. The survey identified a crucial need for grade separations—specifically, the construction of flyovers or underpasses—at strategically important intersections, including Mwenge and Morocco on the New Bagamoyo Road and a continuous grade separation between Buguruni and Tazara on Nelson Mandela Road.

For the implementation of this project, an Environmental and Social Impact Assessment (ESIA) was initially prepared by TANROADS under the "Environmental and Social Impact Assessment for Improvement of Eight (8) Critical Intersections in Dar es Salaam City" in August 2019. This report covered eight key intersections, including the two targeted by this project. A revised version, focusing on seven intersections, was prepared in 2022 and submitted to the National Environment Management Council (NEMC) for environmental clearance.

The environmental and social studies conducted under this preparatory survey were carried out in accordance with the JICA Guidelines for Environmental and Social Considerations (Revised January 2022). These studies were undertaken to identify and supplement any gaps between the JICA requirements and the contents of the existing ESIA reports.

However, the updated and consolidated Environmental and Social Management Plan (ESMP) and Environmental Monitoring Plan (EMoP), developed through this preparatory survey, must be fully implemented to ensure compliance with JICA guidelines and to effectively manage environmental and social impacts throughout the project lifecycle.

1.2 Project Request and Scope: Government Involvement and Environmental Requirements

Following these recommendations, the Government of Tanzania, through its Tanzania National Roads Agency (TANROADS), formally requested JICA's support for the grade separation projects at the key

intersections. In response, JICA initiated the "Preparatory Survey for Dar es Salaam Intersection Improvement Project" to conduct a thorough feasibility study. In compliance with the JICA Guidelines for Environmental and Social Considerations (2022), an Environmental and Social Impact Assessment (ESIA) is mandated for ODA Loan-funded projects. The main goal of the ESIA is to identify and evaluate possible environmental and social risks and impacts, and to propose appropriate mitigation and enhancement measures. Through this process, adverse effects can be minimized, positive impacts maximized, and the project can be executed in an environmentally sustainable and socially responsible manner.

1.3 Purpose and Anticipated Outcomes of the Survey

The core purpose of the preparatory survey is to conduct the necessary groundwork required for JICA's loan appraisal process. Out of the several intersections identified for improvement, two are expected to be selected from among Mwenge, Morocco, Buguruni, and Tazara for enhancement under the Japanese ODA loan scheme. The anticipated results of the project include smoother traffic flow on primary arterial roads, improved port access for freight logistics, and a stimulus to economic activity not only within Tanzania but also for neighboring countries along the vital Central and Dar es Salaam corridors.

1.4 Baseline Environmental and Social Conditions

The proposed projects at the Mwenge and Morocco intersections are situated in Dar es Salaam's City Council and Kinondoni Municipal Councils. The Mwenge Intersection encompasses parts of Mikocheni, Makongo, and Kijitonyama Wards, while Morocco covers Msasani, Kinondoni, Mwananyamala, and Mikocheni Wards. Both sites share generally flat topography with paved roads and effective drainage systems, although some road sections display undulating terrain with elevations from 12m to 28m above sea level. The geology features multiple layers of sand and clay, resulting from episodic sea movements, with soils prone to good drainage.

The Dar es Salaam climate is tropical, consistently hot, with notable rainfall patterns featuring two distinct wet seasons. The proposed project area crosses the seasonal Mlalakuwa River and is characterized by a shallow coastal aquifer. Vegetation consists of 13 tree species (none threatened), and the area is devoid of ecologically significant wildlife. Surveys confirm minimal presence of significant wild fauna.

1.5 Policy, Legal, and Institutional Framework

The project aligns with a comprehensive assortment of national policies, including, but not limited to, environmental, road safety, transport, land use, water, and health policies. Among the legislation pertinent to the project are the Environmental Management Act, Road Act, Land Act, Land Acquisition Act, and Occupational Health and Safety Act. An institutional framework delineates the roles and responsibilities of stakeholders, ensuring management and operations adhere to national development strategies and the existing legal environment.

1.6 Project Alternatives Considered

Multiple options were evaluated, including flyovers and underpasses, each with unique technical, financial, and environmental considerations. After examining criteria such as ground conditions, flooding, cost, visual impact, and long-term community benefits, flyovers at both Mwenge and Morocco intersections were determined as the preferred solution.

1.7 Stakeholder Consultation

Stakeholder consultation is compulsory under Tanzanian law and the NEMC oversees its thorough implementation within the ESIA process. JICA's guidelines also necessitate meaningful dialogue with

local stakeholders, offering them opportunities to voice opinions on project impacts and mitigation. In June and July 2024, an array of participatory methodologies−including individual and group meetings−was utilized. Stakeholders generally viewed the project favorably, citing its potential for reducing congestion, generating employment, and fostering local economic stimulation. Nonetheless, emphasis was placed on employing the local workforce to maximize community benefits.

1.8 Land Acquisition and Resettlement

Land acquisition has already occurred for previous road-widening initiatives, with compensation paid to affected property owners. For this project, limited parcels at both Mwenge and Morocco intersections will be acquired, affecting a small number of businesses and private or institutional landowners. The ARAP, conducted in accordance with JICA guidelines, prescribes market-value compensation for private assets and outlines mechanisms for ensuring fair treatment. Street vendors operating within the project right-of-way have been surveyed−many will require relocation, though the legality of compensation is interpreted differently across policy frameworks.

1.9 Environmental and Social Impact Analysis

A robust process identified and classified all potential project impacts according to their significance, duration, and magnitude−spanning air quality, water, waste, soil, noise, hydrology, land acquisition, informal business displacement, employment, economic growth, skills enhancement, accessibility, travel time, land and resource use, disruption of public utilities, gender, children's rights, HIV/AIDS, labor environment, and accident risks. Notable findings include short-term, manageable negative impacts during construction (e.g., dust, noise, minor pollution risks, labor safety concerns), and significant long-term positive impacts during operation (e.g., improved air quality, public safety, economic vitality, and reduced congestion).

1.10 Mitigation Measures and Environmental and Social Management Plan (ESMP)

For each identified impact, tailored mitigation or enhancement measures have been designed in accordance with best management practices and local regulations. For example, dust and emissions will be managed through properly maintained machinery and dust suppression; stormwater impacts through new drainage systems; accident risks will be reduced via traffic management plans; vulnerable populations (women, children, informal vendors) will receive specific safeguards; and compliance with health, safety, and labor standards will be rigorously enforced. An ESMP integrates all these measures, identifying responsible parties, monitoring requirements, and budgeting guidelines.

1.11 Environmental Monitoring Plan

A comprehensive plan for environmental and social monitoring has been established, in alignment with both JICA policy and Tanzanian legislation. The aim is to track implementation of all mitigation measures, assess environmental performance, identify any unforeseen impacts, and facilitate adaptive management throughout the project’s lifecycle.

1.12 Conclusion

The ESIA concludes that, with the prescribed mitigation measures, no unmanageable environmental or social impacts are anticipated. All impacts can be reduced or eliminated, ensuring that the project can be advanced without significant harm to people or the environment.

1.13 Recommendations

For successful and sustainable project execution, the following recommendations are stressed: strict adherence to the ESMP; compliance with all relevant policies, laws, and standards; minimization and fair compensation for resettlement; maintenance of vehicles and road infrastructure; equal opportunity for all community members; upholding of labor rights and safety; and ongoing public communication and capacity building for local authorities.

2. ACKNOWLEDGEMENT

The ESIA team wishes to convey heartfelt thanks and appreciation to all stakeholders who in one way or other supported the completion of this work. Thanks very much all of you. Special thanks to Kinondoni Municipal Council and TANROADS Dar es Salaam Regional Office, TANROADS and DART Headquarters for their prompt assistance during the fieldwork. We also appreciate many stakeholder institutions to be affected by the Project for their attendance in the Stakeholder Meetings and interviews and providing advises and opinions about the Project. Last but not least we thank Regional Admirative Secretary Offices in Dar es Salaam and respective mutaa and mutaa leaderships for their cooperation and assistance.

3. BACKGROUND OF THE PROJECT

3.1 Background Of The Project

Dar es Salaam is the main economic center of the United Republic of Tanzania (URT) and faces severe traffic congestion due to rapid population growth and motorization. This problem has evolved into a significant social concern for the city. In order to reduce congestion and improve public transport, a phased development of the Bus Rapid Transit (BRT) system is underway with the support of international organizations such as the World Bank (WB), the African Development Bank (AfDB), and Agence française de développement (AFD). However, the implementation of BRT alone cannot be sufficient to meet the growing demand for transportation.

In 2018, the Japan International Cooperation Agency (JICA) conducted the "Project for Revision of Dar es Salaam Urban Transport Master Plan" in collaboration with the relevant organizations of the Government of Tanzania and formulated the Master Plan for Urban Transport in Dar es Salaam 2018-2040 (referred to as the "revised M/P"). The revised M/P proposed the introduction of Intelligent Transport System (ITS), improvement of intersections (specifically, eleven (11) major intersections), development of public transport terminals, and development of urban railways within the city to address chronic traffic congestion and make efficient use of existing road infrastructure.

In 2020, JICA conducted a follow-up survey called the "Data Collection Survey on Urban Transportation in Dar es Salaam" to confirm the progress of implementation of the recommended priority projects and the need for further support through Japanese Official Development Assistance (ODA) loan or grant. This data collection survey recommended the implementation of grade separations along New Bagamoyo Road at Mwenge and Morocco intersections and a continuous grade separation along Nelson Mandela Road between Buguruni and Tazara intersections. With this recommendation, the Government of Tanzania, through the Tanzania National Roads Agency (TANROADS), requested JICA to support the grade separation project at these major intersections, and JICA decided to conduct a feasibility study called the "Preparatory Survey for Dar es Salaam Intersection Improvement Project".

3.2 Objective Of The Project

The overall objective of the Project is construction of grade separations (flyovers) at Mwenge/Morocco intersections in Dar es Salaam to improve the traffic flow on the arterial roads, improve the logistical access to the port, and stimulate the economic activity in Tanzania and neighbouring countries. The flyovers and underpasses will prove beneficial to users of public transport passing through the Mwenge and Morocco Intersections. Specifically, this will help improve the life of the low-income group. The proposed project is expected to provide high economic effect and enhance the reliability and safety of physical transport using the Ali Hassani Mwinyi, Kawawa Road, Sam Nujoma, Bagamoyo Road, and Coca Cola Road.

3.3 Objectives Of The Survey

The JICA requests Project proponents etc. (Government of Tanzania through TANROADS) to conduct appropriate environmental and social considerations when implementing an ODA project, based on the JICA Guidelines for Environmental and Social Considerations January 2022 (hereinafter referred to as "JICA guidelines 2022"). The objectives of the Environmental and Social Impact Assessment (hereinafter called ESIA) for Preparatory Survey for Improvement of Intersections in Dar es Salaam Project are to implement ESIA for the Project meeting the requirements of the Terms of Reference (hereinafter called TOR) prepared by the JICA Survey Team and Oriental Consultants Global Co, Ltd. The overall objective of the ESIA process is to use the environmental information that is gathered to contribute to the evolution of the design of the project, with the objectives of reducing any adverse environmental effects that could

be caused by the project and increasing its positive effects. The assessment made use of data and information on the physical, biological, and socio-economic environment to predict both negative and positive impacts of the project, to design mitigation measures of the adverse impacts, as well as to plan the monitoring of potential changes that may arise in the course of implementing the project. Given the requirement to undertake ESIA for the Morocco and Mwenge Intersections project, the specific objectives of this report are to:

- Determine how far the projects activities, conform with environmental management practices and environmental quality standards;
- Provide regulatory bodies with a framework for checking compliance with, and the performance of an environmental and social management plan.
- Establish baseline information on both social, natural and living environment including socio-economic conditions of the project area.
- Identify, predict and evaluate foreseeable impacts, both beneficial and adverse, of the project;
- Ensure that environmental considerations are explicitly addressed and incorporated into the development decision making process
- Anticipate and avoid, minimize or offset the adverse significant biophysical, social and relevant effects of developmental proposal
- Promote development that is sustainable & optimizes resources use and management opportunities.
- Establish impacts that are likely to affect the environment before a decision is made to authorize the project;
- Enable information exchange, notification and consultations between stakeholders;
- Develop mitigation measures that aim at eliminating or minimizing the potential negative impacts and promote positive ones.
- Develop management plans and monitoring plan to be observed during project implementation.
-

3.4 Environmental Setting

3.4.1 Administrative boundary in the project site

The proposed Mwenge Intersection and Morocco Intersections project, administratively is located within the Kinondoni Municipal Council (KMC) of the Dar es Salaam Region. The KMC is among the five Municipal Councils of the Dar es Salaam Region, the other four being the Dar es Salaam City Council, Kigamboni, Ubungo and Temeke Municipal Councils. The KMC was established on 2000 under the Local Government (Urban Authorities) Act, 1982 No. 8 Sections 8 and 9 and has a total area of 321 square kilometres. Mwenge Intersection is found within the Mikocheni, Makongo and Kijitonyama Wards while Morocco intersection is within the Msasani, Kinondoni, Mwananyamala and Mikocheni Wards (Table 3.4.1 below). The provisional coordinates of the Mwenge Intersection are 06°45`52.70 south and -39°13`46.41'' east; and Morocco Intersection are 06°46`37.10 south and -39°15`50.79'' east.

Table 3.4.1 Project location area

Sn	Intersection	Region	Municipal	Wards	Mtaa
1.	Mwenge	Dar es Salaam	Kinondoni	Mikocheni	Mikocheni B
				Makongo	Mlalakuwa
				Kijitonyama	Mwenge
2.	Morocco	Dar es Salaam	Kinondoni	Msasani	Mikoroshini
				Kinondoni	Kumbukumbu
				Mwanayamala	Bwawani
				Mikocheni	Regency Estate

Source: JICA Survey Team

Source: JICA Survey Team

Figure 3.4.1 Map showing Dar es Salaam Region and Kinondoni Municipality

Source: JICA Survey Team

Figure 3.4.2 Map showing location of Intersections surveyed

3.5 Environmental And Social Consideration

The JICA's Business Protocol and Mid-term Plan clearly state that JICA has to implement cooperation projects in accordance with the JICA Guidelines, 2022. JICA encourages host country governments, including local governments, borrowers, and project proponents, to implement the appropriate measures for environmental and social considerations when engaging in the cooperation projects. At the same time, JICA provides support for and reviews of environmental and social considerations of the projects in accordance with the JICA Guidelines for Environmental and Social Considerations. Considering the urgency of solving the problem of traffic congestion, implementation of the project is highly recommended.

The Project is categorized as "B". The project is category as B if their potential adverse impacts on the environment and society are less adverse than those of Category A projects. Generally, they are site-specific; few if any are irreversible; and in most cases, normal mitigation measures can be designed more readily." The proposed project is not considered to be a large-scale road project and is not located in a sensitive area, Also the proposed project sites have none of the sensitive characteristics under the JICA guidelines 2022 and are not likely to have a significant adverse impact on the environment.

Further, the Environmental Management Act, cap 191 and the Environmental Management (EIA and Audit) (Amendment) Regulations, 2018, requires that EIA be undertaken for all new projects that may cause adverse environmental and social impacts. According to the First Schedule of the Environment Management (Environmental Impact Assessment and Audit) (Amendment) Regulations (2018), those projects with Medium to High impacts are considered to be Type B1 (borderline project), then the Screening process shall be used by NEMC to categorize them either as Type "A" or "B2" project. Further, the World Bank Environmental and Social Frameworks (ESF) and Standards (ESSs) require project developers to carry out an ESIA prior to project implementation. In view of the above, JICA Survey team commissioned TRES Consult (T) Limited of Dar es Salaam (Registered Environmental Consultancy Firm) to carry out the ESIA, for the proposed project. In fulfilment of the ESIA procedure, the ESIA Team undertook site reconnaissance and scoping study in prior to preparation of this ESIA report. The site reconnaissance identified key environmental and social issues and concerns as well as stakeholders requiring special attention during the ESIA study. These preliminary finding provided guidance under which this ESIA report was prepared.

3.6 ESIA Scope For The Mwenge And Morocco Intersections

The aim of this survey is to prepare the ESIA report with necessary information for the proposed construction of the Mwenge and Morocco intersections project. The contents of ESIA report meet the requirements of the JICA Guidelines 2022 for Category B projects; the Environmental Management Act, cap 191 and also the Environmental Management (EIA and Audit) (Amendment) Regulations, 2018. In addition, appropriate sectoral legal provisions touching on such projects such as the Road Sector Environmental Protection Regulations 2009; the Road Sector Environmental Assessment and Management Guidelines 2011 and Environmental Code of Practice for Road Works 2009 also have been referred to for the necessary considerations during the construction, commissioning and operation of the project. The ESIA Report has identified significant both positive and negative impacts of the project and formulate recommendations to minimize potential impacts on natural and social environment at maximum level.

It has been noted that a number of projects have been planned and implemented along the Morocco Intersection to Mwenge Intersection. The ESIA for the project of Widening of New Bagamoyo Road (Phase1) which entailed widening the road to four lanes over the section of approximately 17 km from Morocco Intersection through Mwenge Intersection to Tegeta was conducted and environmental approval was granted by NEMC on January 15, 2010. Also, the ESIA for the Dar es Salaam Bus Rapid Transit (BRT) System, Phase 4 was conducted in the year 2022 and the approval certificates by NEMC was issued in the 2023. The BRT Phase 4 is part of the planned BRT infrastructure system, which is comprised of about 137 km networks of bus ways, with about 220 km of feeder roads to be developed in six phases. The BRT Phase 4 corridor comprising about 30.12 Km covers: (i) A Section Bibi Titi Mohamed Road from Maktaba Street junction to Ohio Street junction (0.23km); (ii) Ali Hassan Mwinyi road (from the junction of Ohio Street to Morocco) (5.92 km); (iii) New Bagamoyo Road from Morocco junction to Tegeta (DAWASA Daladala Bus Station) (20 km); and A spur on Sam Nujoma Road from its junction with New Bagamoyo Road to Ubungo junction (4 km). These two ESIA reports were used as a reference document for this separate ESIA study for the Mwenge and Morocco Intersections project.

3.7 Approach And Methodology Of The ESIA Study

The ESIA study applied different participatory methods to involve all the concerned stakeholders. The methodology used in this study is commensurate with the JICA Guidelines for Environmental and Social Considerations (2022); the Environmental Management Act, Cap 191 and the Environment Impact Assessment and Audit (Amendment) Regulations, 2018). The study was undertaken based on checklists complimented by the Consultants' experience and through discussion with JICA Survey Team and Oriental Consultants Global Co, Ltd (Project preparatory firm), TANROADS, local government officials and communities in the vicinity of the project site.

The ESIA study was done both as a desktop study and field work. It involved the collation and review of all publicly available and relevant environmental information, including previous work done by TRES Consult (T) Limited, together with some consultation with key stakeholders and site visits. This information allowed the identification of potentially sensitive and valued environmental resources and receptors at an early stage in the design process. This information was used to identify, likely effects from the development proposals and measures that could be adopted to avoid and minimize potential effects. The study adopted the following approach:

3.7.1 Study team

A multi-disciplinary team of experienced scientists and environmental professionals was assembled to carry out the required generation of baseline data for existing environment (Social Environment, Natural Environment and Living Environment (Pollution)); resource assessment, determination of potential impacts and recommendation of mitigation measures. Table 3.7.1 below present the team member who conducted the ESIA study.

Table 3.7.1 Study team

Name of Staff	Area of Expertise	Position Assigned
Mr. Abel Sikaona (M.Sc.)	Environmental Management and Water Resources Management	Team Leader & ESIA Specialist
Mr. Ruzika Niyo Muheto (MSc)	Environmental Science and Management and Ecological Assessor	Biodiversity specialist
Mr. Bashiru Abdul Hassani (MSc)	Stakeholder Consultations and Environment Audit Expert	Sociologist, Social and RAP Specialist
Alfred Pius (LLB OHSAS)	Occupational Safety, Health and Environment management	Occupational and health experts
Dr. Julius Elias (PhD)	Environmental engineering	Environmental sampling and measurement protocol
Mr. Kaijage Erneus (MSc)	Climate Change specialist	Environmental Science, Environmental Economics
Ms. Sesilia Jeremia (M.A)	Community Economic Development	Gender/GBV Specialist/ RAP Specialist
Eng. David John Karasila (BSc.)	Civil and Transportation Engineering	Civil and Transportation Engineering
Mr. Haji Abdu Namulya	Land Management and Valuation	Land and property valuation/ RAP Specialist

Source: JICA Survey Team

An interactive approach among the environmental team members and other project professionals was adopted. The team utilized the checklist for data gathering, analysis, and presentation whereby team members conducted the reconnaissance investigations together to determine the critical elements for analysis and the issues to be highlighted for the design and planning process. Team meetings were held to

discuss the progress of investigations and analyses and facilitate integration of data toward an understanding of the systems at work in both the natural and built environment. Baseline data for the study area was collected using a combination of:

- Site Reconnaissance
- Analysis of Maps and Plans
- Review of Reports and background documents
- Checklists
- Field Studies
- Public Consultations

3.7.2 Communication with Stakeholders

3.7.2.1 Identification of stakeholders

The stakeholders were identified based on their roles, relevance, and potential to be impacted or to impact the project. Most of the stakeholders that might be impacted by the project, e.g., nearby developments, local government authorities, Government Departments, Parastatal Organisation and were pre-determined. In contrast, others were identified by different stakeholders, including the Client, i.e., TANROADS. Some of the stakeholders unfolded as consultations went along, e.g., groups and individuals on and in the vicinity of the project area.

3.7.2.2 Involvement of stakeholders

The study team, in collaboration with the project proponent representative visited the proposed project area and neighboring community. Physical observations and stakeholder interviews were conducted to collect baseline data and issues of concern. The study applied different participatory methods to involve all relevant stakeholders. The interview with individuals is based on a list of available contents or questions and discussions. Focused group discussions were also used to gather information. In establishing the public's views concerning the proposed project, the consultants were provided with an introduction letter addressed to each stakeholder, briefing the project and asking them to raise their concerns to consultant freely.

3.7.2.3 Identification of stakeholders' concerns

The stakeholders pointed out several issues and concerns. An individual or a group of people who raised an issue was cross-checked by discussing it with other groups. Key issues raised by each stakeholder group were summarized and further analyzed in this report. For details of stakeholders consulted, the record of main issues raised, names and signatures of people consulted, records of meetings, communications and comments from key stakeholders, see Chapter 5 and Appendix 3.

3.7.3 Natura Environment

Information was gathered on the existing physical environment, particularly geology, topography, soils, drainage, water quality, air quality and noise.

3.7.3.1 Geology, Topography, Soils

Information and data on the climate, geology, topography, soils were generated from published geological information as well as assessment of the site through field visits, previous site reports and intrusive site reports done and current public domain reports held within various governmental and non-governmental organizations. Aerial photos, satellite imagery and other published maps were also examined. Field work was carried out to augment and verify existing information relating to geology and soils and obtain first-hand knowledge of topography.

3.7.3.2 Hydrology and drainage

Surface and ground water characteristics were assessed using field investigation, maps and data from previous reports. Field investigation was carried out to determine and verify all the existing inflows into the general area, including both natural and man-made features, assessment of drainage issues, sediments transfer and its impact to the project, interviews with local community members and discussions with stakeholders.

3.7.3.3 Flora

The vegetative communities were identified and classified into community types. A simple 'walk through' survey of the flora within and around proposed project area was conducted. Identification was carried out on dominant vegetation species in the area. Whilst carrying out the walk through every plant species encountered was identified and included in the species inventory. Plants were identified direct in the field by experts and for those difficult to identify specimens was collected and carried to the consultant office for further verification and/or identification using various taxonomical literatures.

The principal habitats present within the site were identified, classified, and described basing on the Field Guide to Common Trees and Shrubs of East Africa (Dharani, 2002). In addition, attempts were made to include aspects of invading species, and an indication of biodiversity and species hinting important historical information among others. The identified list of plants found in the area and plant species of ecological conservation concern were investigated in the project area. Possible impact of the project activities on the flora was identified and their mitigation measures and monitoring plans suggested.

3.7.3.4 Fauna

The proposed project area was surveyed using methodology outlined in the African Forest Biodiversity (Leon et al., 2002). Interviews with the locals to get information on commonly sighted animals in the area and if there exists any migration corridor was also employed. Due to the urban nature of the project sites, no large mammals observed or identified while walking along area in representative habitats and through observation of animal signs such as droppings, burrows, footprint, or vocalization. Small mammals, amphibians and reptiles were studied through sighting, droppings whereas, birds and insects were identified through sighting, droppings, burrows, and visualization while walking along the project area. Most importantly, information about the presence of any significant species (i.e., locally observed animals) was obtained from local people in the area. List of fauna organisms found in the area were documented. Moreover, possible impact of the project activities on the organisms were identified and their mitigation measures and monitoring plans suggested. All fauna information is included in this EIS report as baseline data.

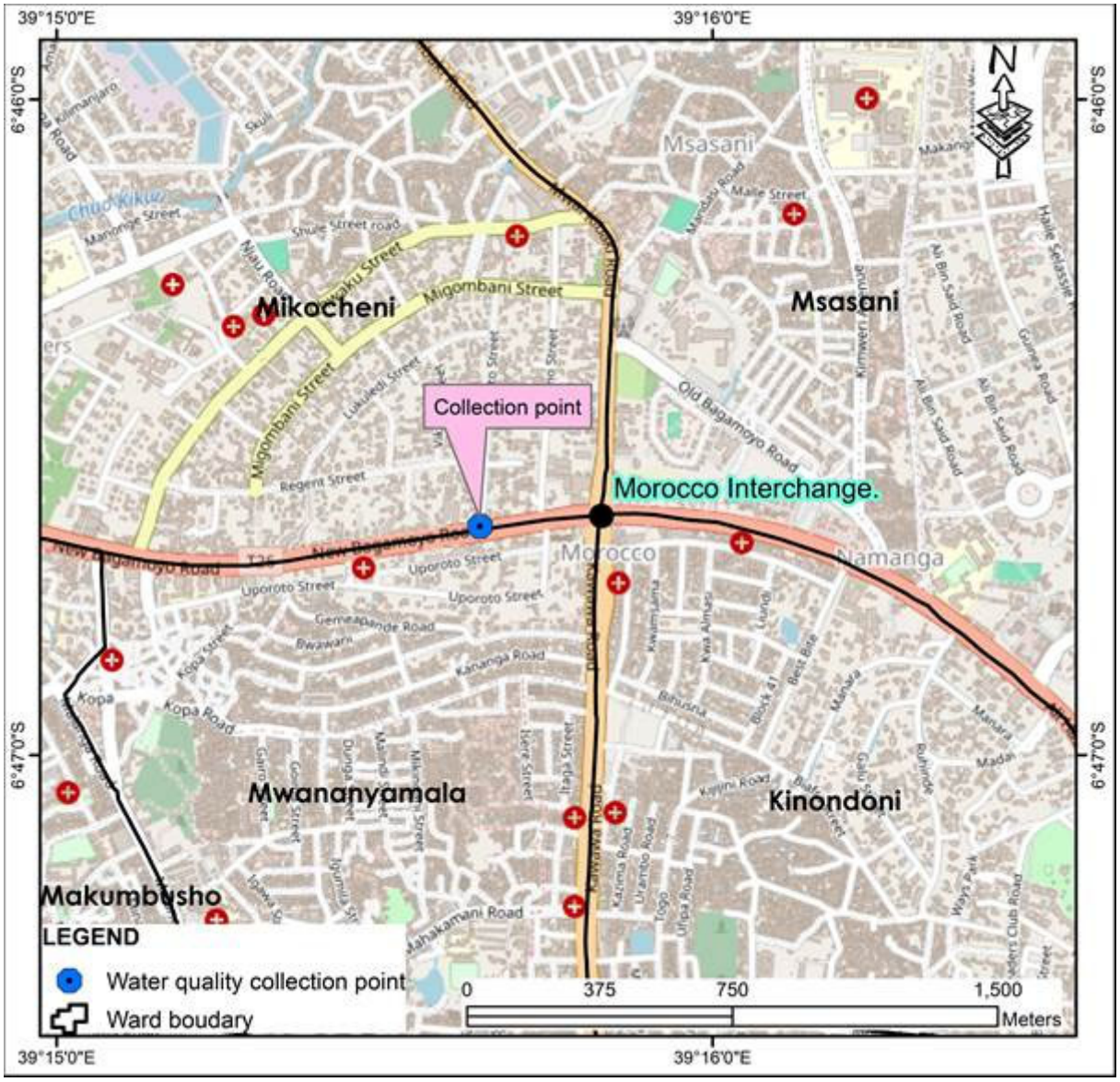
3.7.4 Living Environment (Pollution)

3.7.4.1 Measurements for water quality

Standard sampling and testing methods and procedures were also used in this study. The samples were taken on 24th June 2024. And were submitted to the Environmental Engineering Laboratory of Ardhi University for analysis on the same day. The samples were collected for physical and chemical parameters analysis. The collected water samples were done properly and appropriately following Standard Operating Procedure for water sampling. Samples were collected by a direct method using 1L glass bottles/containers from Mlalakuwa River representing Mwenge intersection and Storm water drainage along Bagamoyo Road representing Morocco intersection. All containers were appropriately pre-cleaned.

Source: JICA Survey Team

Figure 3.7.1 Water quality collection point at Mwenge Intersection (Mlalakuwa River)



Source: JICA Survey Team

Figure 3.7.2 Water quality collection point at Mwenge Intersection (Mlalakuwa River)

3.7.4.2 Ambient air quality

Measurement and analysis of ambient air quality, noise and ground vibrations within and outside the project area were carried out at two established air quality monitoring stations while targeting general environment, site workers and/or public health. The parameters were measured within the core project site and outside the project footprint (project core site) from 21/06/2024 to 27/06/2024 for Mwenge Intersection and from 28/06/2024to 4/07/2024 for Morocco Intersection. The measured parameters include: (i) Dust as ambient particulate matter in terms of PM10 and PM2.5; (ii) Ambient pollutant gases i.e., Sulphur dioxide (SO2), Oxides of Nitrogen (NO2), Carbon (CO), and Ozone (O3); (iii) ambient noise, and (iv) ground vibrations.

All measured parameters were then compared with the available air quality standards stipulated in the Tanzanian Environmental Management (Air Quality Standards) Regulations, as well as International Standards and Guidelines, specifically the WB and/or International Finance Cooperation's (IFC).

Source: JICA Survey Team

Figure 3.7.3 Air quality measurement station at Mwenge Intersection

Source: JICA Survey Team

Figure 3.7.4 Air quality measurement station at Morocco Intersection

(1) Determination of Ambient Dust as Particulate Matter in terms of PM10 and PM2.5

Dust levels were measured by using Aeroqual series 500 monitors (S-500); an instrument that complies with EMC Directive 89/336/EEC of the European Union. The device has been tested according to the standard delivery schedule and complies with the Emissions Directive Standard EN 50081-1:1992 and EN 50081-2:1993. With a resolution of 0.001 mg/m3 (1µg/m3), the device is simultaneously capable of testing dust particles of different dimensions (microns of 2.5 and 10). Both PM10 and PM2.5 were preferred due to their harmful effects on humans. These fine particles tend to reduce visibility and cause air to appear hazy when levels are elevated. When inhaled, these particles penetrate into the lungs and evade the respiratory system's natural defenses and lodge deep in the lungs.

During measurement, the testing device was fixed at a breathing height of about 1.5 meters from the ground, which is assumed to be the breathing zone of people at their respective locality or working environment. Dust levels were recorded in terms of PM10 and PM2.5 during the morning, afternoon, evening and night hours. The diurnal recordings measured at each point were used to calculate the daily average value. The

average daily data were compared with TBS-NES standards, and WHO/IFC guidelines to check for their compliance.

(2) Ambient Pollutant Gases

Ambient gas concentrations (i.e., CO, NOx, SO2, and O3) were measured using "Aeroqual series 500 monitors (S-500)" at eight stations. Different sensor heads were used depending on the type of gas that was measured at a particular time. The ambient gases were measured in accordance with the manufacturer's procedure that meets ISO 9001:2008 protocol. The device was elevated at a height of 1.5 meters above the ground; once the device is switched ON, it performs an automatic calibration for three minutes by pumping in fresh air into the sensors so as set the toxic sensors to zero. Ambient pollutant gases were measured at each air quality monitoring station during the morning, afternoon, evening and night hours. The measured gas parameters were then compared with TBS-NES limits and World Health Organization (WHO) guidelines to check their compliance.

3.7.5 Noise and Vibrations quantification

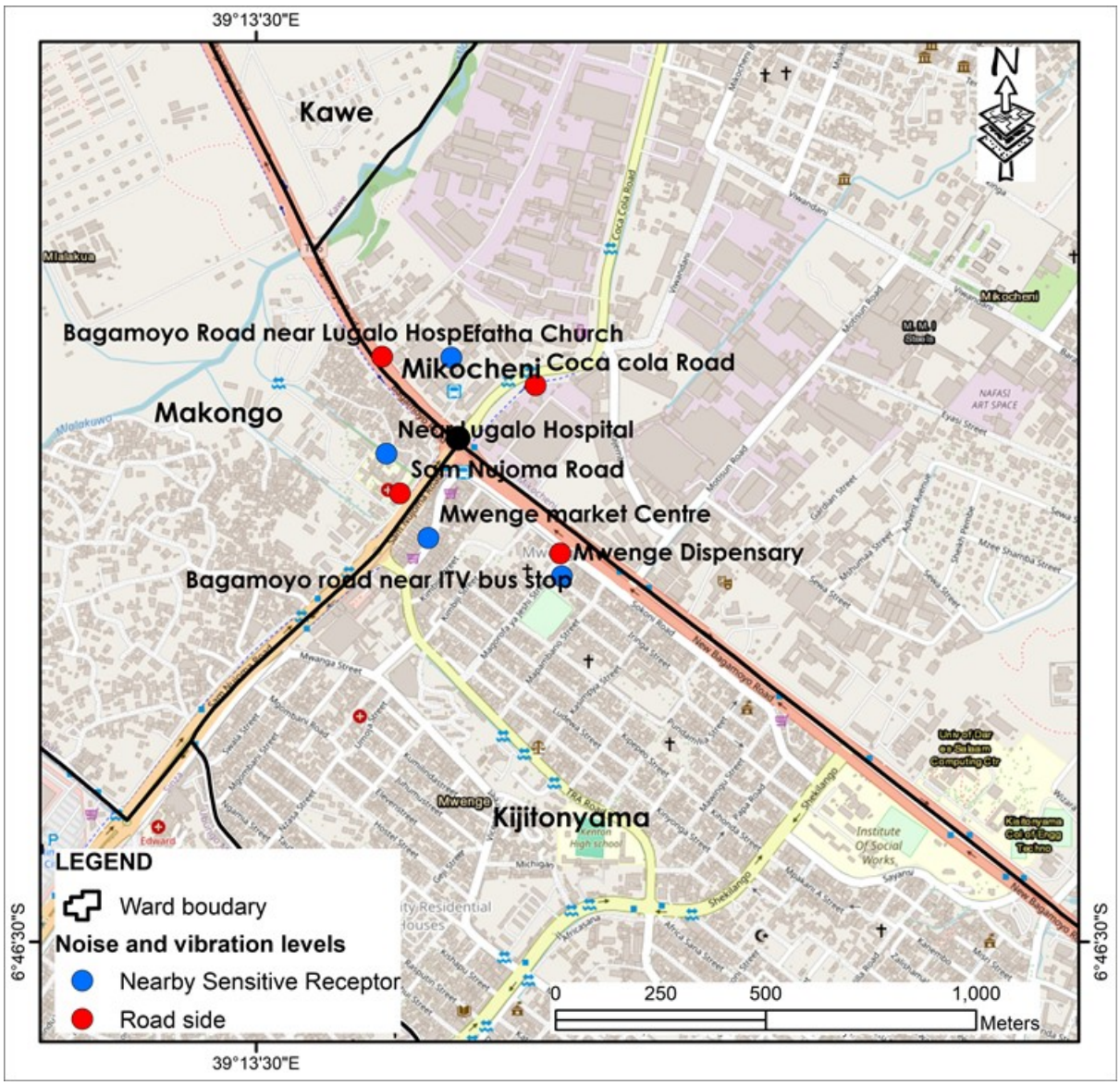
Ambient noise, vibrations and meteorological conditions (temperature, relative humidity and wind speed) were measured according to ISO Code of Practice 1996 and equipment-manufacturer's procedures. The investigation's purpose was to estimate their potential impacts on any potential sensitive onsite and offsite receptors.

3.7.5.1 Noise Levels

Noise data were recorded at all stations established near the onsite and offsite noise receptors. At each station, daytime (Lday) and night-time (Lnight) noise levels were measured in accordance with ISO 1996 -1:2003 using a digital sound level meter. On taking measurements, the meter was set to the "A" weighed measurement scale, which enables the meter to respond in the same manner as the human ear. The "A" scale is applicable for workplace compliance testing, environmental measurement, and workplace design and law enforcement. The meter was held approximately 1.5 m above the floor and at least 3 meters away from hard reflecting surfaces such as walls. Periodic measurements were taken to grasp the mean diurnal (morning, afternoon, evening and night hours) noise values for each station. The averaged Lday and Lnight values were calculated and compared with local standards and international guidelines.

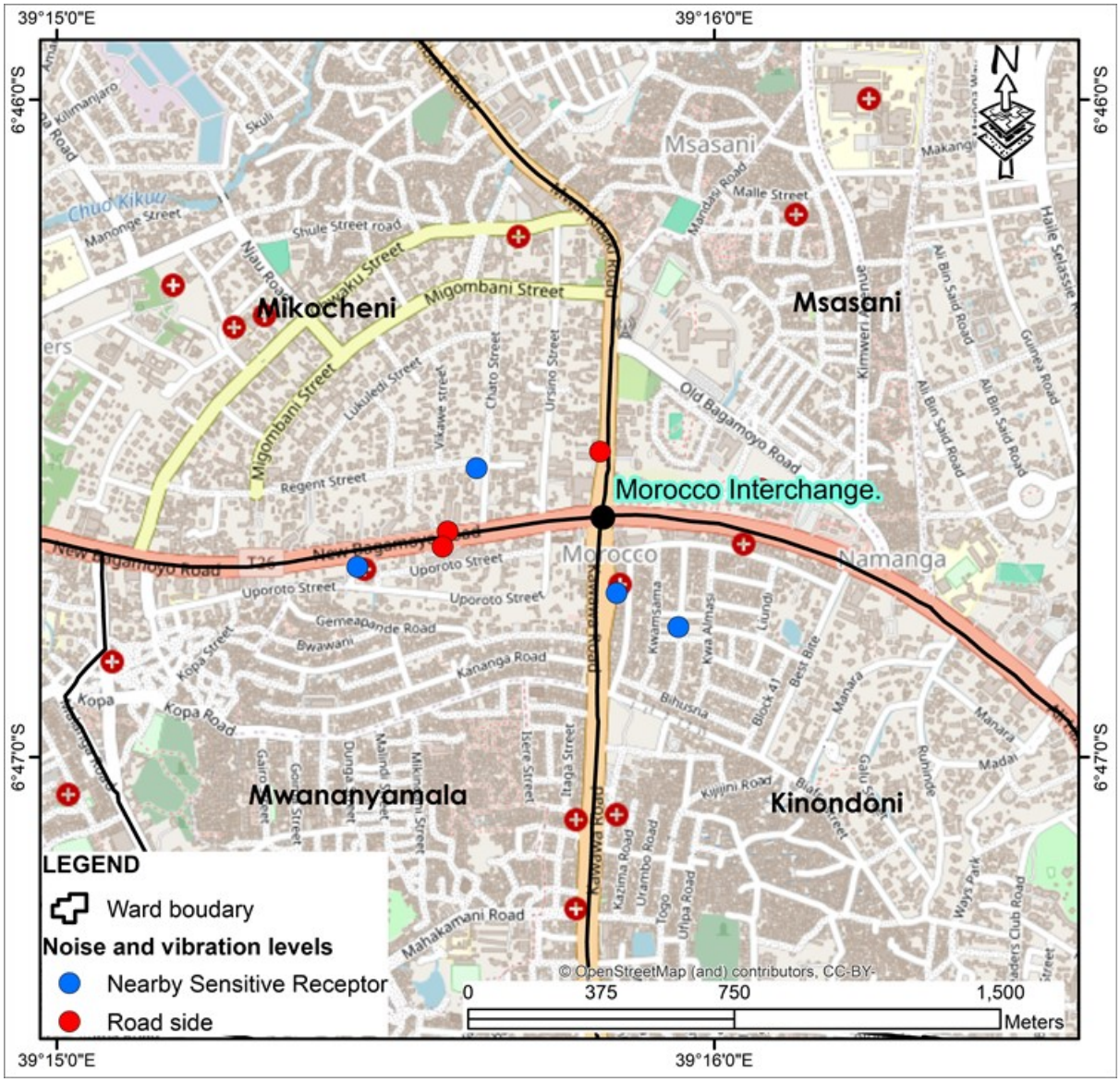
3.7.5.2 Vibrations

Ground vibrations were monitored using a vibrometer data logger, which is designed to measure ground vibrations according to European standard EN 14253:2003. The meter has an accuracy of ±5%, acceleration of 200 m/S2, a wide frequency ranges of 10 Hz to 1 kHz for capturing almost all possible ground vibrations. On taking measurements, the accelerometer transducer was mounted on the ground to record both ambient and peak vibrations. To produce accurate results, the transducer was secured in direct contact with the ground. The levels of vibrations were recorded in terms of Peak Particle Velocity (PPV) in millimetres per second in the vertical direction to secure data associated with existing operations. At each station, periodic measurements were taken during the morning, afternoon, evening and night hours. The mean value of all recorded data at each station was calculated and used to represent that particular station.



Source: JICA Survey Team

Figure 3.7.5 Average noise and vibration levels measures at Mwenge



Source: JICA Survey Team

Figure 3.7.6 Average noise and vibration levels measures at Morocco

3.7.6 Soil Quality

Soil quality baseline condition was established by identification of sampling area and soil sample collection. Soils sample were taken on road side of each road emanating from the junction point. In this case two soil samples were taken for Morocco junction and three samples were taken for Mwenge junction for laboratory analysis. One sample was undertaken at each selected site. The following procedure were involved after establishing the sampling area: (i) expose the top 1 meter of soil; (ii) describe the exposed soil profile; (iii) take samples of each soil horizon; (iv) prepare soil samples for lab analyses; and (v) analyze the soil samples in the lab. Collected samples were analyzed to establish any available contaminated soil. Lab analysis was target heavy metal to enable the interpretation of levels of contaminated soil.

The standard laboratory procedures were adopted to analyze the soil samples in order to determine its physic-chemical characteristics with respect to their proportions in terms of Cadmium [mg/kg]; Hexavalent chromium [mg/kg]; Lead [mg/kg]; Nickel [mg/kg]; Zinc [mg/kg]; Boron [mg/kg]; and Copper [mg/kg]. Equipment's used for the soil laboratory analysis are UV-visible spectrophotometer and the atomic absorption spectrometer (AAS) type Varian Spectra AA240. The Tanzania Soil Quality Standards (Regulation, 2007) has stipulated number of contaminants limits for different land used i.e., habitat and

agricultural soils. These include limits for heavy metals in the soils. Figure 3.7.7 and Figure 3.7.8 shows the location where the sample were taken at Mwenge and Morocco respectively.

Source: JICA Survey Team

Figure 3.7.7 Soil sample collection point at Mwenge Intersection

Source: JICA Survey Team

Figure 3.7.8 Soil sample collection point at Morocco Intersection

3.7.7 Social Environment

To determine the cultural and social factors associated with the construction and operation of the proposed project, members of the communities in the general vicinity of the project were interviewed and a review of economic and social literature was conducted. Further, rapid field appraisal techniques in conjunction with desk research were employed to investigations of the socio-economic considerations within the project area. These were undertaken to ascertain information to satisfy the following factors as outlined in the approved terms of reference provided:

- Numbers of affected households by the project
- Local economy such as employment and livelihood, etc.
- Land use and utilization of local resources
- Social institutions and local decision-making institutions
- Existing social infrastructures and services
- Demographic characteristics
- Culture heritage

- Present uses of surface water including water supply
- Sanitation
- Any flood problems, if any
- Hazards (Risk) and Infectious disease such as HIV/AIDs
- Others

3.7.8 Policy, Legal and Institutional Arrangement

Policy, legal and institutional arrangement were compiled from a review of documents: policies, legislation, guidelines and standards. Information and data on local by-laws, institutional structures and mandates/authority were obtained from TANROADS and local government Council (Kinondoni Municipal Council) and relevant committees.

3.8 Impact Identification And Evaluation

The methodology used considered all potential impacts using a standard Leopold matrix (Leopold et al., 1971), which is the best-known matrix methodology available for predicting the impact of a project on the environment. The matrix takes into account impacts on the physical environment (e.g., air quality, soil and ground water quality), the ecology (e.g., flora and fauna) and on human socio-economic settings.

Environmental, health, safety risk (and other risks) is a measure of the potential threats considering the likelihood that events will cause or lead to damage or degradation and the potential severity of that damage or degradation. The Consultant used the general criteria listed below to evaluate the significance of the identified impacts.

- Magnitude and likelihood of impact to occur
- Spatial and temporal extent
- Potential to implement mitigation measures and controls
- Likelihood and degree/timescale of environmental recovery
- Value of the affected environment/social component
- Level of public concerns
- Political repercussions of the project

The scale of negative and positive impacts that are likely to occur were determined using a range of low, medium and high, as follows:

A+/-: Significant positive/negative impact is expected
B+/-: Positive/negative impact is expected to some extent
C+/-: Extent of positive/negative impact is unknown.
D: No impact is expected.

3.9 Report Structure

This ESIA report has adopted a structure that covers the content requirements of Section 18 (2) in Part V of the Environmental Management (EIA and Audit) (Amendment) Regulations, 2018. The ESIA report also reflect the contents provided in the terms of refences by the client and is in accordance with relevant laws in Tanzania and JICA Guidelines as follows.

1. Executive Summary
2. Project background and objectives
3. Description of the project
4. Baseline of natural and social aspect (based on literature data)
5. Policy, Legal, and Administrative Framework

6. Alternative analysis
7. Scoping
8. Anticipated Environmental and Social Impacts and Evaluation
9. Environmental Management and Monitoring Plan (EMMP)
   9.1 Mitigation measures, budgeting and responsible agency
   9.2 Monitoring Plan (Item, frequency, budgeting and responsible agency)
10. Consultation (at least twice for a component: Scoping stage and draft ESIA stage)
11. Conclusions and Recommendations

4. DESCRIPTIONS OF THE PROJECT

4.1 Road and Intersection Design

This section includes the designed horizontal and vertical alignments for the road, the typical cross-sectional configurations at the intersections, and the transition between the flyover approach and the side roads.

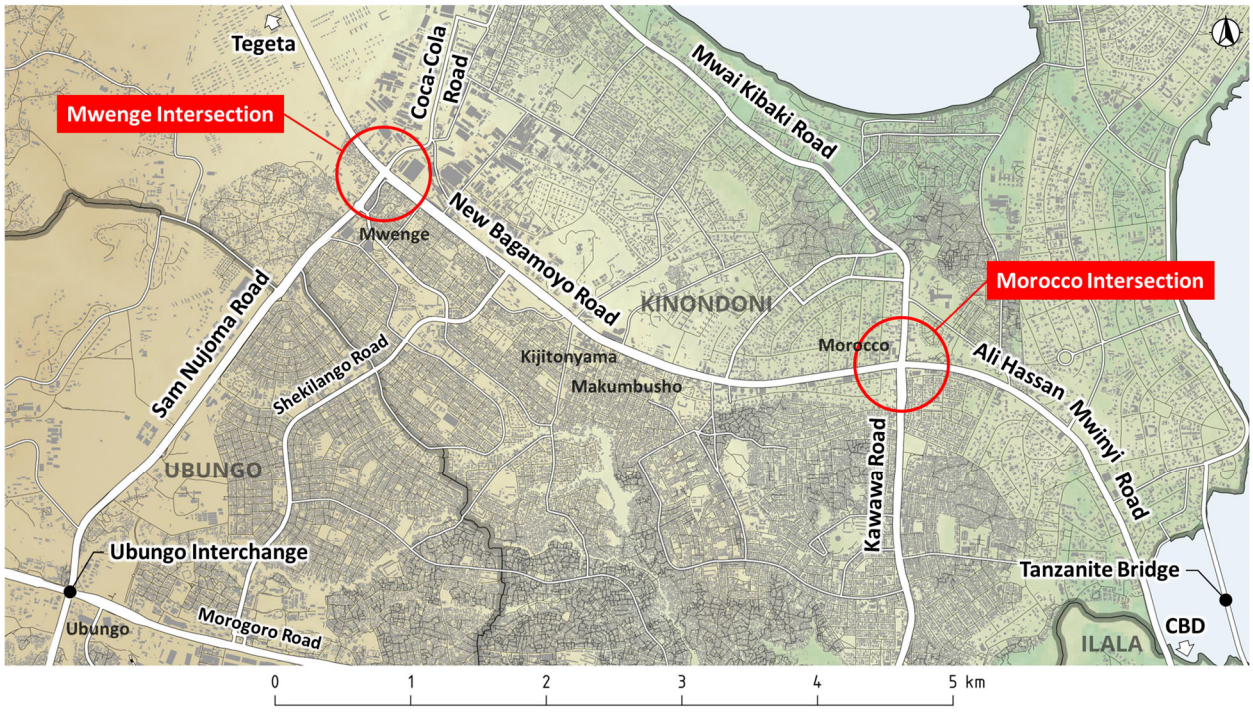
The project scope, based on the study results, is as follows:

Mwenge Intersection

- Grade-separated structure: Alternative 3 (Y-shaped grade separation from the suburban direction, combined with a straight flyover from the city center on New Bagamoyo Road)
- Straight Route: New Bagamoyo Road (two lanes in each direction), L = 1.5 km
- Right Turn: New Bagamoyo Road to Sam Nujoma Road (two lanes in one direction), L = 0.59 km

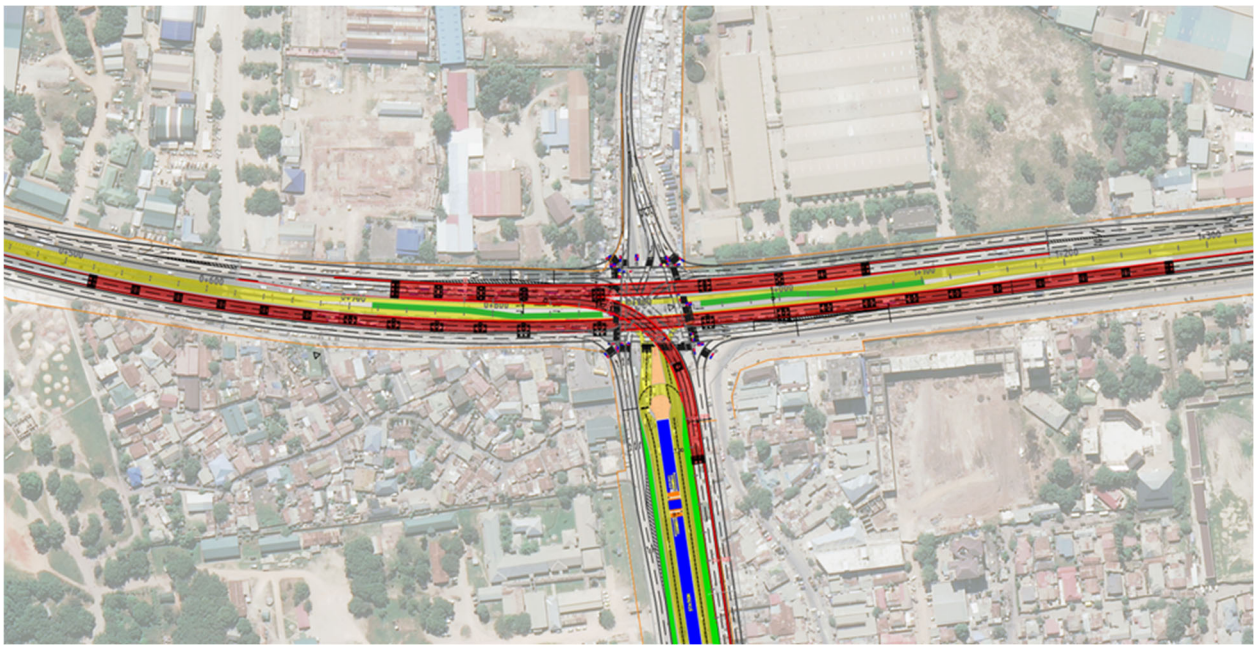
Morocco Intersection

- Grade-separated structure: Alternative 5 (Construction of a straight flyover along New Bagamoyo Road and Ali Hassan Mwinyi Road)
- Straight Route: New Bagamoyo Road to Ali Hassan Mwinyi Road (two lanes in each direction), L = 1.08 km



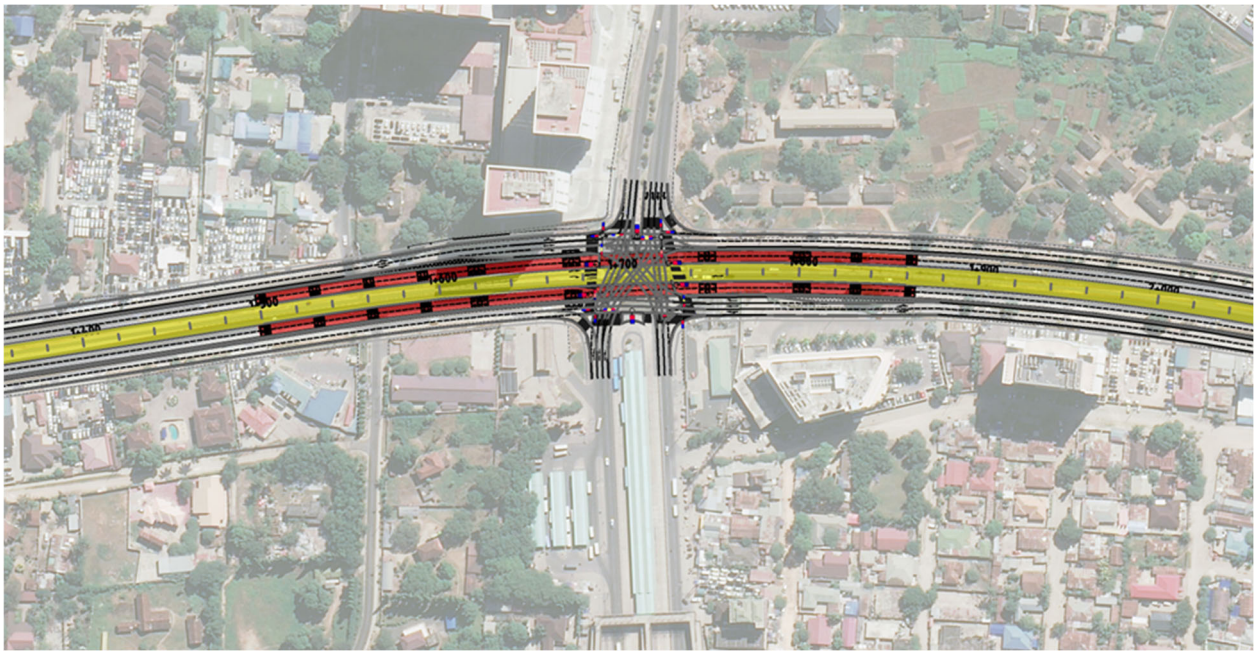
Source: JICA Survey Team

Figure 4.1.1 Intersection Location Map and Design Scope



Source: JICA Survey Team

Figure 4.1.2 Grade Separation at Mwenge Intersection



Source: JICA Survey Team

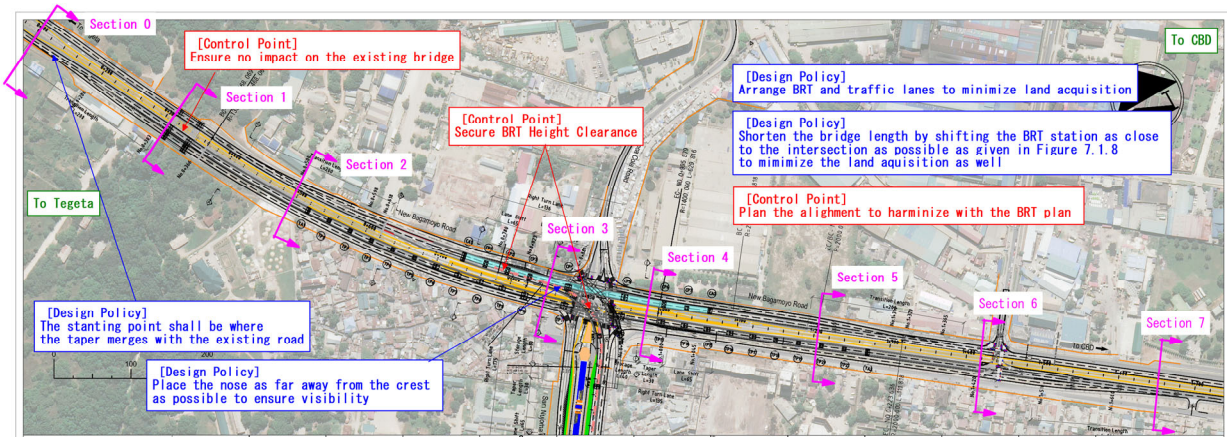
Figure 4.1.3 Grade Separation at Morocco Intersection

4.1.1 Design of Mwenge Intersection

(1) Horizontal Alignment

Through Flyover

The right-of-way (ROW) for New Bagamoyo Road near Mwenge Intersection varies between 60 and 70 m.

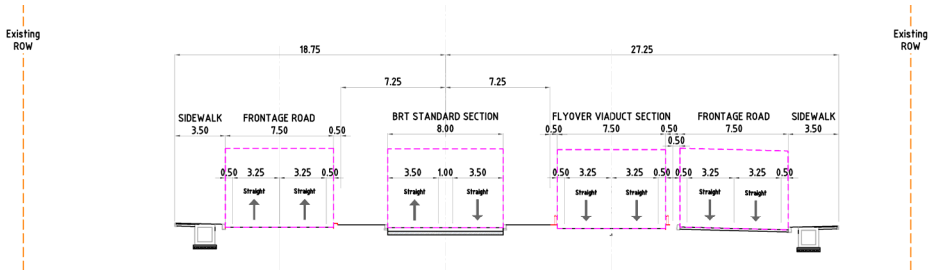


Source: JICA Survey Team

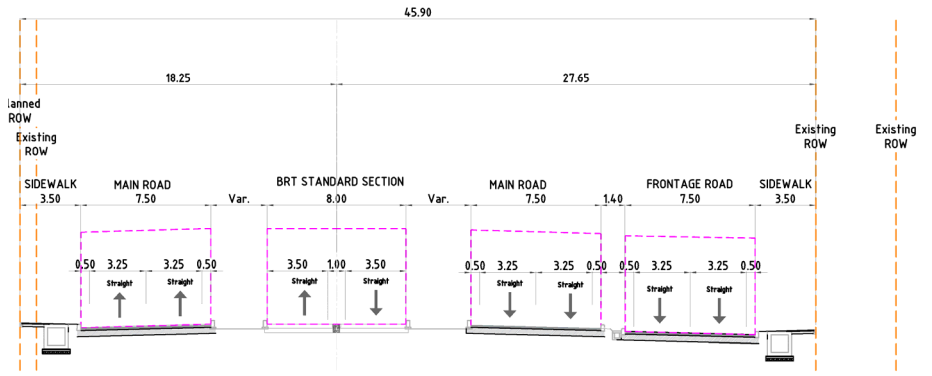
Figure 4.1.4 Design Policy for Horizontal Alignment (Mwenge Intersection)

(2) Typical Cross Sections

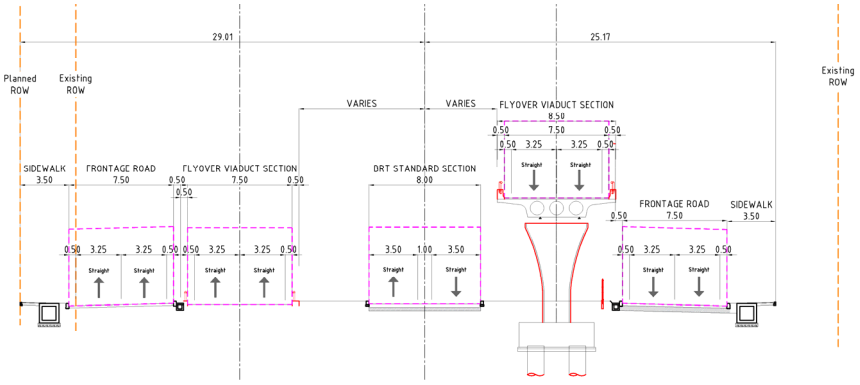
Based on the horizontal alignment established above, typical cross sections at key locations are shown in



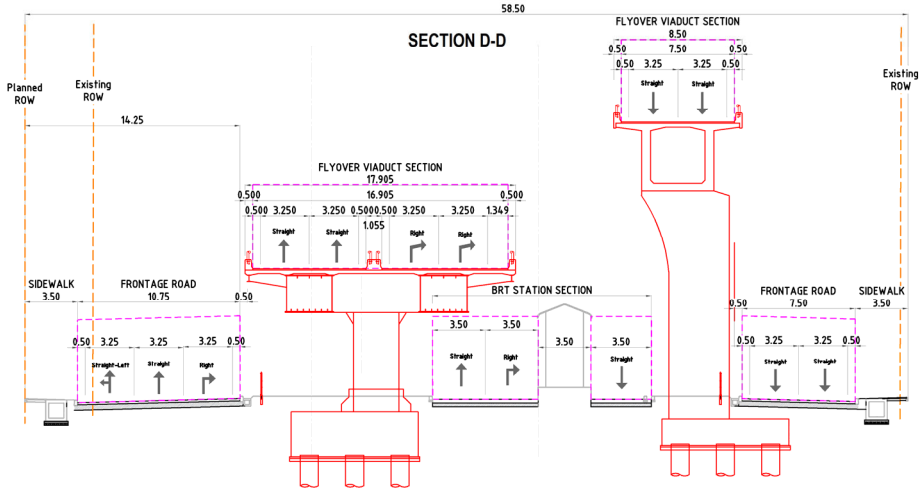
Typical Cross Section 0: Starting Point



Typical Cross Section 1: Merging Nose Position for CBD to Suburban (Tegeta) Direction (0+300)



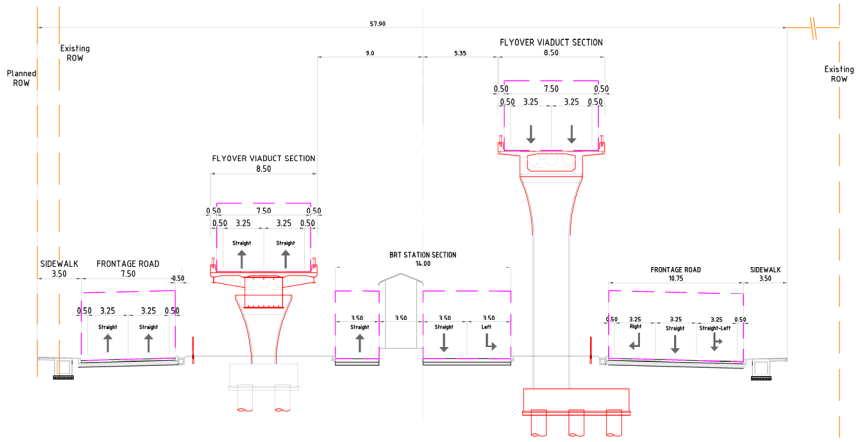
Typical Cross Section 2: Diverging Nose Position for Suburban (Tegeta) to CBD Direction (0+720)



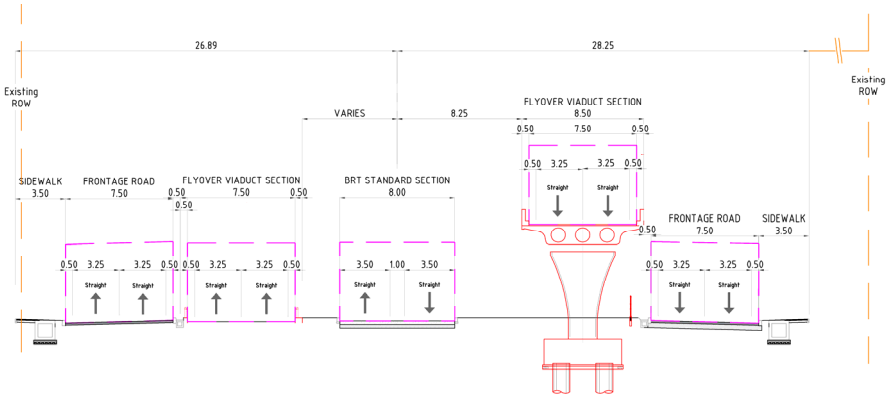
Typical Cross Section 3: Centerline Position at the BRT Station Section Near the Intersection (0+860)

Source: JICA Survey Team

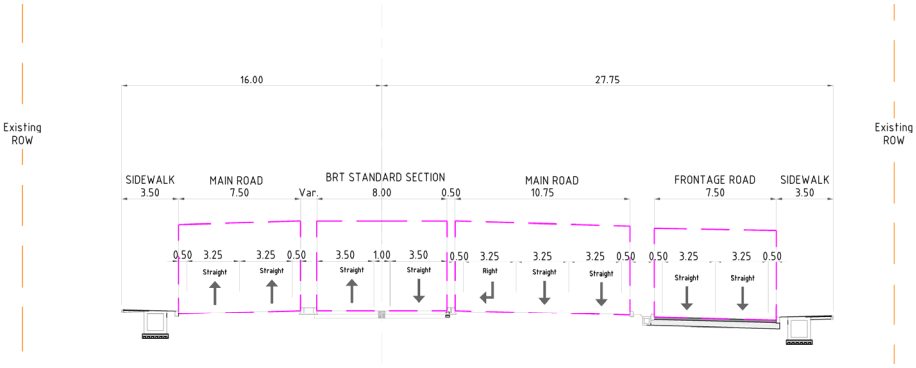
Figure 4.1.5 Typical Cross Sections at Mwenge Intersection (Tegeta Side of New Bagamoyo Road)



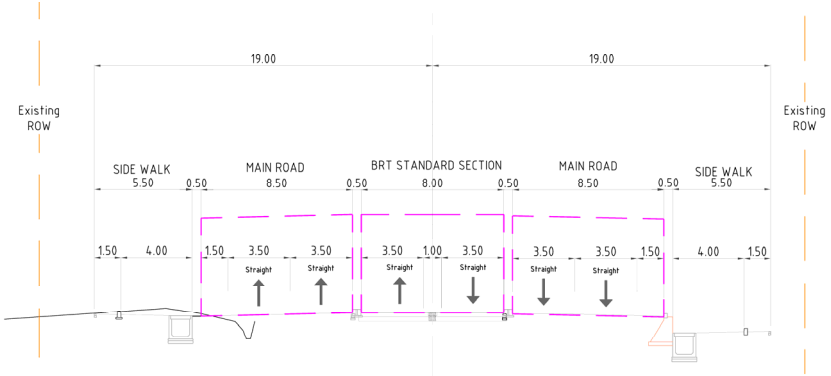
Typical Cross Section 4: Centerline Position at the BRT Station Section Near the Intersection (0+980)



Typical Cross Section 5: Merging Nose Position for Suburban (Tegeta) to CBD Direction (1+180)



Typical Cross Section 6: Diverging Nose Position for CBD to Suburban (Tegeta) Direction (1+480)

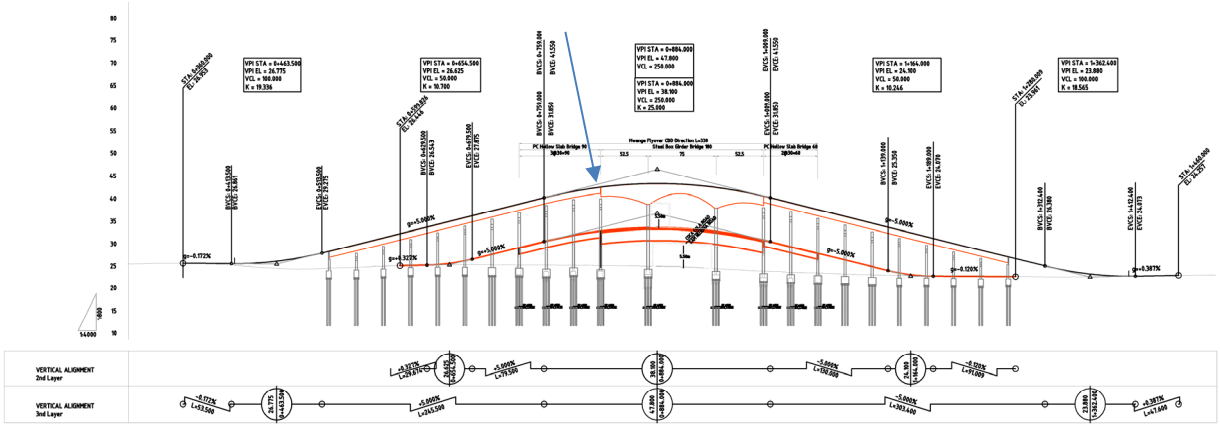


Typical Cross Section 7: End Point

Source: JICA Survey Team

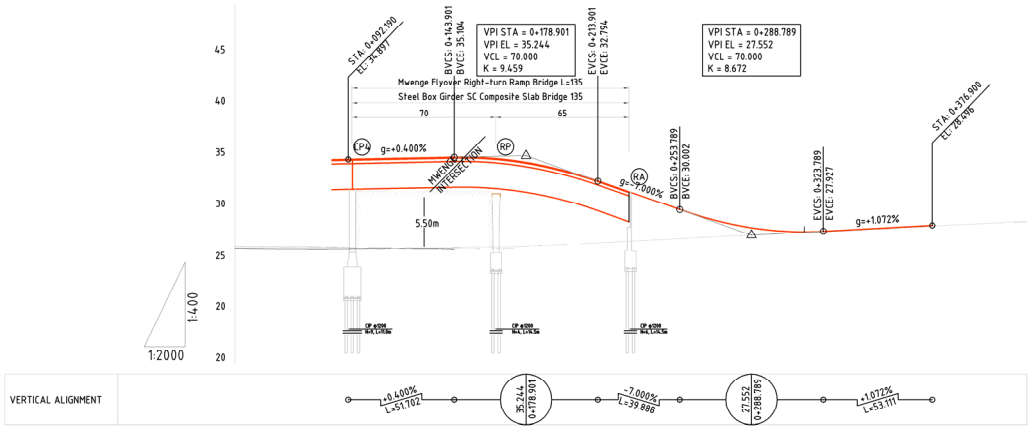
Figure 4.1.6 Typical Cross Sections at Mwenge Intersection (CBD Side of New Bagamoyo Road)

(3) Vertical Alignment



Source: JICA Survey Team

Figure 4.1.7 Vertical Alignment for the Through Flyovers in Tegeta to CBD Directions



Source: JICA Survey Team

Figure 4.1.8 Vertical Alignment for the Right-Turn Flyover

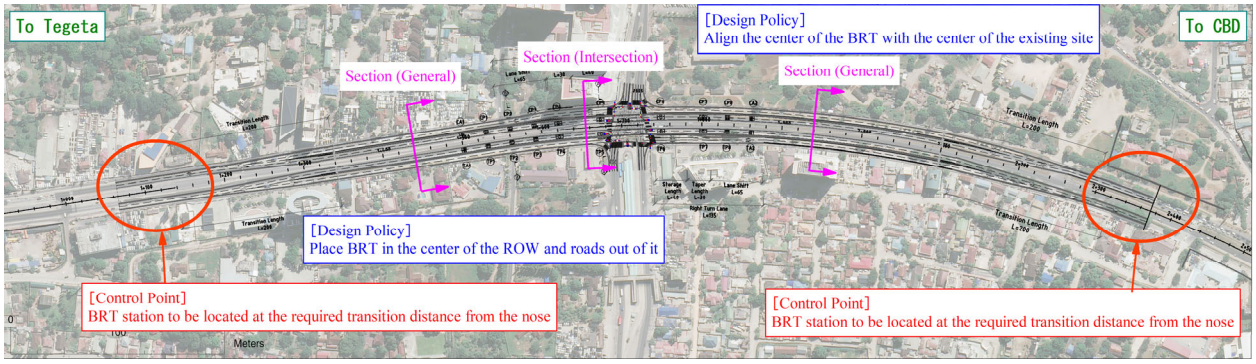
(4) Foundation

The depth of the bearing layer, based on the geotechnical investigation conducted for this study, is approximately 15 to 25 m below the surface. A foundation type that can accommodate deep depths, such as a pile foundation, is required. Considering this, a comparison was made between the commonly used "Cast-in-Place Pile Method" in Tanzania and other methods such as "Rotary Steel Pipe Piles" and "Pressed-in Caisson Foundation".

4.1.2 Design of Morocco Intersection

(1) Horizontal Alignment

The right-of-way (ROW) width of New Bagamoyo Road and Ali Hassan Mwinyi Road near the Morocco Intersection varies from 40 to 50 meters. Therefore, the centerline of the road was set to ensure the road width fits within the existing ROW as much as possible, considering the current conditions and required road width. In BRT Phase 4, currently under implementation, the BRT lanes are not aligned with the center of the ROW, so adjustments to the BRT lane alignment are necessary in this project section. The design concept for the horizontal alignment at Morocco Intersection is shown in Figure 4.1.9.



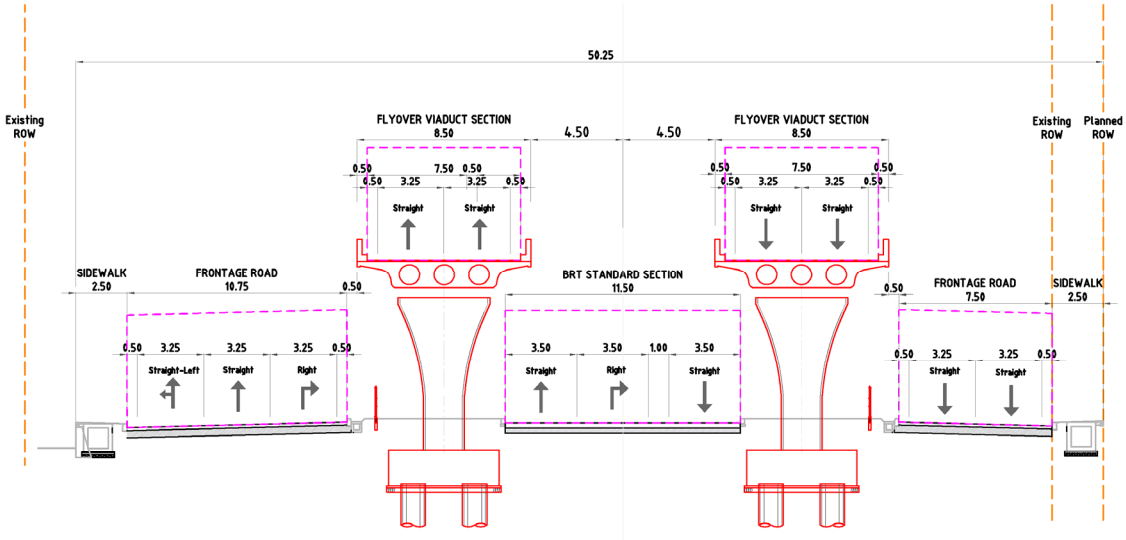
Source: JICA Survey Team

Figure 4.1.9 Design Policy for Horizontal Alignment (Morocco Intersection)

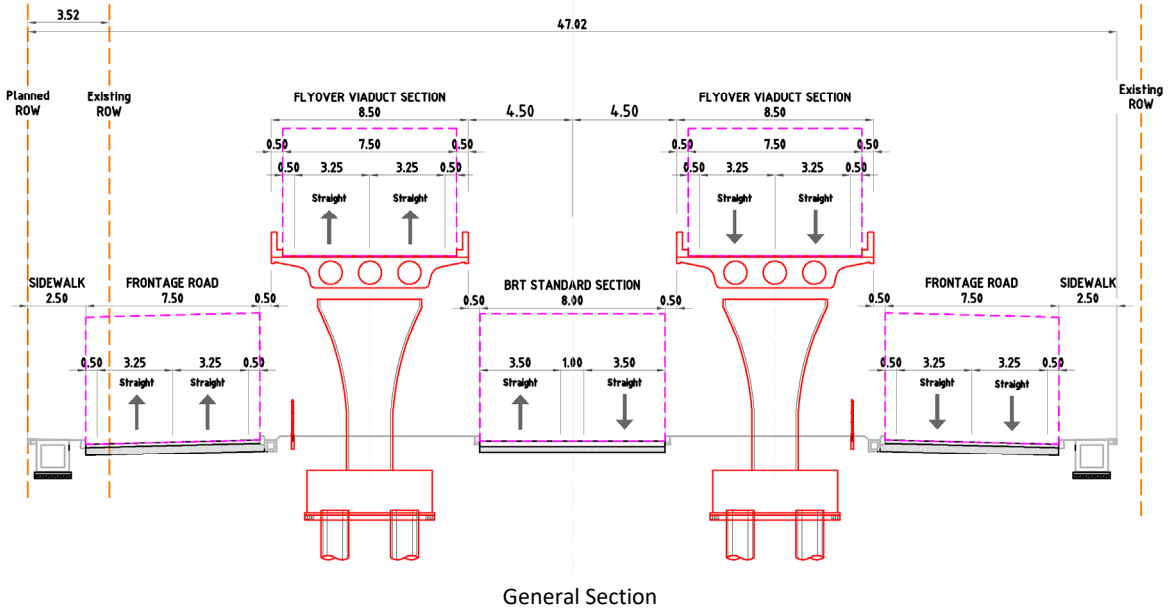
(2) Typical Cross Sections

The horizontal alignment of the flyover at the Morocco Intersection is consistently set at 8.75 m from the BRT lane centerline. At the intersection, an additional right-turn lane is provided for the BRT lanes, widening the BRT lane width at ground level. This requires consideration in the vertical alignment to accommodate the BRT lanes beneath the elevated flyover.

- CBD Direction: 8.75 m offset from the BRT lane centerline
- Tegeta Direction: 8.75 m offset from the BRT lane centerline



Intersection Section



General Section

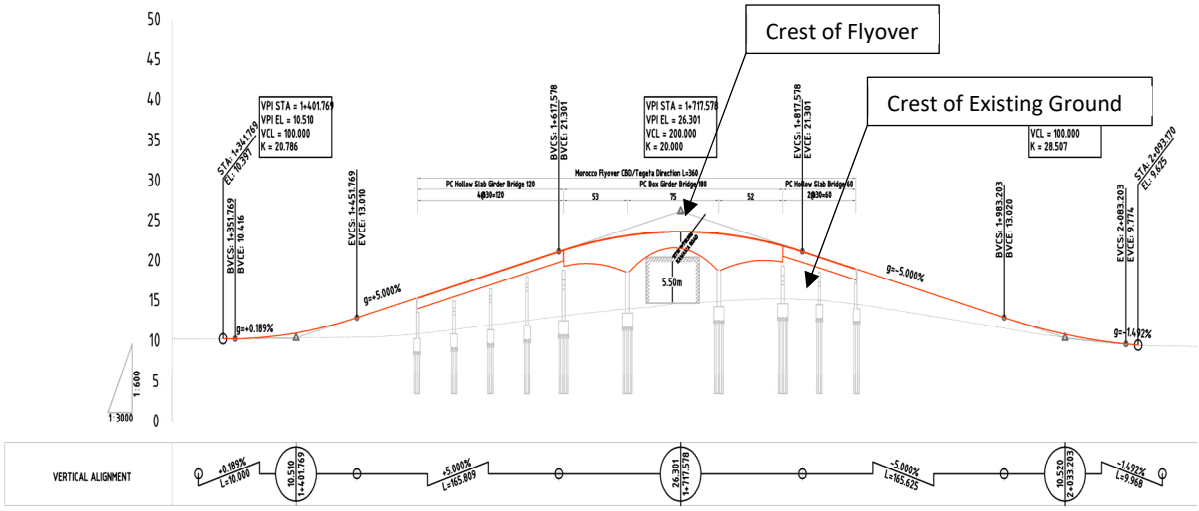
Source: JICA Survey Team

Figure 4.1.10 Typical Cross Sections at Morocco Intersection

(3) Vertical Alignment

The vertical alignment must ensure the necessary clearance for the widened BRT right-turn lanes and consider the bridge superstructure. The following factors were considered in developing the vertical alignment design:

- Ensuring a clearance of 5.5 m for channelized paths in the at-grade intersection, considering the bridge structure height (2.0–4.5 m).
- Like the Mwenge Intersection, the vertical gradient for the approach sections is standardized to the maximum slope of 5% for cost efficiency.
- Although the crest of the natural ground is offset to the east of the intersection center (the intersection center is not the natural crest point), the crest of the flyover was set at the intersection center for economic reasons. This allows the BRT stations on both sides of the intersection to be positioned in nearly symmetrical locations.



Source: JICA Survey Team

Figure 4.1.11 Vertical Alignment for the Morocco Flyover

(4) Foundation

The depth of the bearing layer, based on the geotechnical investigation conducted for this study, is approximately 15 to 25 m below the surface. "Cast-in-Place Pile Method" is recommended as the most advantageous foundation type for Morocco Flyover.

4.2 Pavement Structure

The pavement structure was planned as shown in Table 4.2.1 based on planned traffic volume conditions and existing road implementation examples in Tanzania.

Table 4.2.1 Pavement Structure

Roadway Pavement		Sidewalk Pavement	
Surface Course: Asphalt Concrete:	5 cm	Surface Course: Interlocking Blocks:	8 cm
Base Course: Asphalt Concrete:	5 cm	Base Course: Granular Sub-base + Sand:	10 cm
Upper Sub-base: Asphalt Stabilized:	20 cm	Subgrade:	5cm
Lower Sub-base: Cement Stabilized:	30 cm		
Upper Subgrade: CBR 15:	20 cm		
Lower Subgrade: CBR 10:	20 cm		
Improved Subgrade: CBR 7:	60 cm		

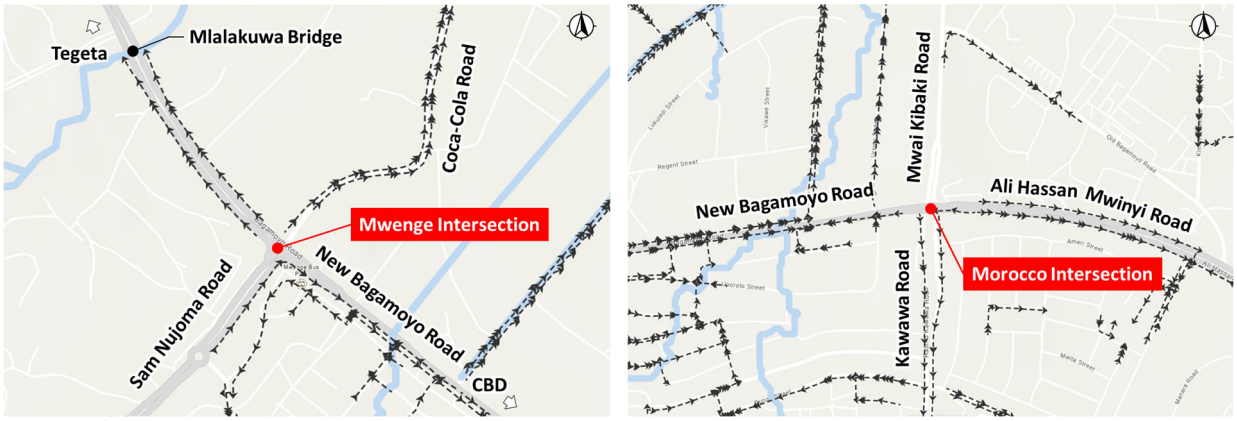
Source: JICA Survey Team

4.3 Roadside Facility Design

4.3.1 Drainage Plan

(1) Existing Drainage System

The layout of existing drainage facilities at the Mwenge and Morocco intersections is shown in Figure 4.3.1. In the project area, which includes New Bagamoyo Road, Sam Nujoma Road, and Ali Hassan Mwinyi Road, drainage facilities are already in place. Notably, New Bagamoyo Road has been equipped with a 1.0 m x 1.0 m covered drainage channel constructed through a Japan's grant aid project.



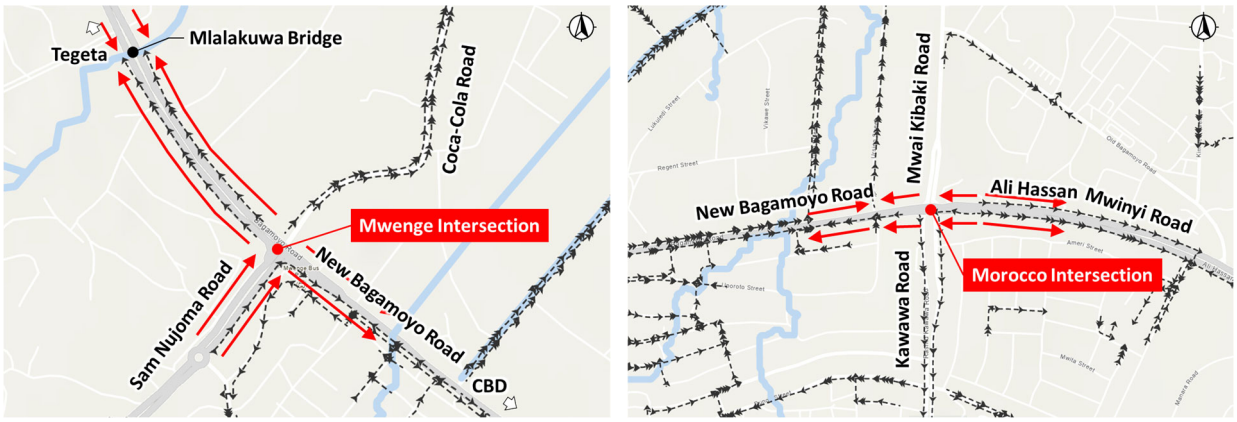
Mwenge Intersection　　Morocco Intersection

Source: JICA Survey Team

Figure 4.3.1 Existing Drainage System at Target Intersections

(2) Planned Drainage System

This project involves limited road improvements aimed at creating grade-separated intersections, with no significant modifications planned for the existing drainage system. The new drainage facilities for the flyovers will discharge into the current drainage system. Based on this approach, the planned drainage system for this project is outlined in Figure 4.3.2.



Mwenge Intersection　　Morocco Intersection

Source: JICA Survey Team

Figure 4.3.2 Planned Drainage System at Target Intersections

4.3.2 Safety Facility Plan

(1) Road Safety Facilities

Safety facilities are generally categorized into those for pedestrians and bicycles, and those for vehicles. Below is an overview of common safety facilities and their descriptions.

Table 4.3.1 Road Safety Facilities

Safety Facility	Description	Pedestrians	Bicycles	Vehicles
Guardrails / Barrier Fences	Fences installed at the boundary between the roadway and the sidewalk, or on the shoulder, to prevent pedestrians and cyclists from entering the roadway. In urban areas, designs that consider aesthetics are also available.	✓	✓	
Permeable Pavement (High-Performance Pavement)	Pavement that minimizes water accumulation by channeling rainwater into drains through voids in the pavement, reducing skidding, splash, and visibility issues in wet conditions.			✓
High-Visibility Lane Markings	Lane markings made of special materials that resist forming a water film, maintaining high visibility during nighttime or rainy conditions, aiding drivers in recognizing lanes for safe driving.			✓
Colored Pavement	Paved areas painted in specific colors (e.g., crosswalks, bicycle lanes) to alert drivers to the presence of pedestrians or cyclists.	✓	✓	✓
Speed Reduction Marks / Dot Lines	Visual markings on lanes designed to encourage drivers to slow down by creating a narrower lane appearance for a psychological speed-reducing effect.			✓
Rumble Strips	Corrugated road surfaces that generate noise and vibration as vehicles pass over, alerting drivers and helping prevent drowsy driving and lane deviation.			✓
Delineators	Signs installed along curves or complex road shapes to help drivers safely determine their direction, especially at night or during poor weather.			✓
Self-Luminous Delineators	Guide markers that emit light at night, enhancing visibility at curves and intersections to alert drivers.			✓
Tactile Paving for the Visually Impaired	Tactile blocks or other markings that provide route guidance, position, and directional cues for people with visual impairments.	✓	✓	
Lane Dividers	Installed along the outer or center lines to prevent vehicles from veering out of their lanes, supplementing lane regulation.			✓
Ribbed Road Markings	Lane markings with added texture to enhance visibility through light reflection, designed for clarity during nighttime or rainy conditions.			✓
Warning Signs	Signs alerting drivers to potential hazards, such as "Speed Limit" or "Merging Ahead."			✓
Lighting	Road lighting installed to enhance visibility at night and ensure the safety of pedestrians, cyclists, and vehicles, often installed continuously along streets and under overpasses.	✓	✓	✓
Median Barriers	Barriers installed in the center of multi-lane roads to prevent physical contact with oncoming traffic, improving overall traffic safety.			✓

Source: JICA Survey Team

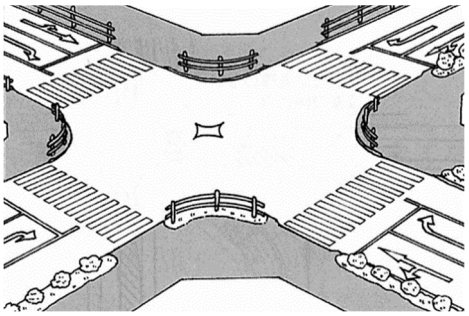
(2) Safety Facility Installation Plan

The proposed safety facilities to be installed under this project are outlined below.

Table 4.3.2 Proposed Installation of Road Safety Facilities

Safety Facility	Installation Location	Reason for Installation
Guardrails	New Bagamoyo Road (at lighting installation areas), intersection areas, and traffic islands	Currently, no guardrails are installed along New Bagamoyo Road. This project includes installing guardrails around lighting poles to enhance pedestrian safety. Additionally, guardrails will be installed at intersections and on traffic islands to improve pedestrian safety.
Deceleration Marks / Dot Lines	Right-Turn Flyover	The right-turn flyover has a steep descending gradient of 7.0% and is close to the intersection. Speed reduction marks and dot lines will be installed to alert drivers.
Rumble Strips	Shoulder-widening section of the right-turn flyover	The right-turn flyover has a small curve radius, requiring shoulder widening to ensure sight distance. Rumble strips will be installed to prevent vehicles from veering off the road, thereby enhancing safety.
Warning Signs	At intersections, crosswalks, and S-curves on the overpass	To alert drivers, warning signs will be installed at these locations.
Lighting	Installed along the entire roadway	Continuous lighting will be installed on both ground-level and elevated sections to improve driver visibility and reduce crime, thereby enhancing overall safety.

Source: JICA Survey Team



Examples of Guardrail Installation

Example of Lighting Installation at Intersections

Source: JICA Survey Team

Figure 4.3.3 Example of Guardrail and Lighting Installation at Intersections

(3) Road Signs

This project aims to ensure traffic safety by installing guidance, regulatory, warning, and instruction signs near intersections and merge/diverge areas based on the following principles.

Main Road Merge/Diverge Sections

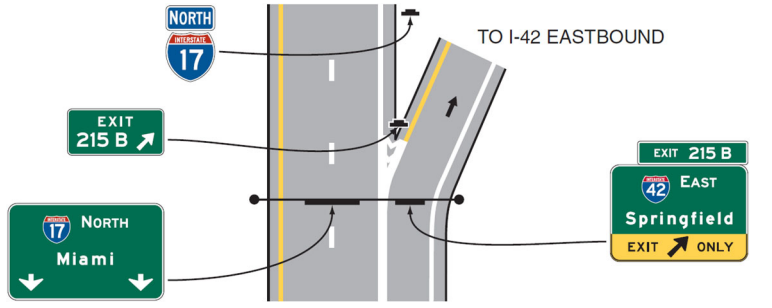
At the points where the main road splits into side roads, warning and instruction signs will be placed near the nose area.

Speed Limit　　Sharp junction ahead　　Sharp junction ahead

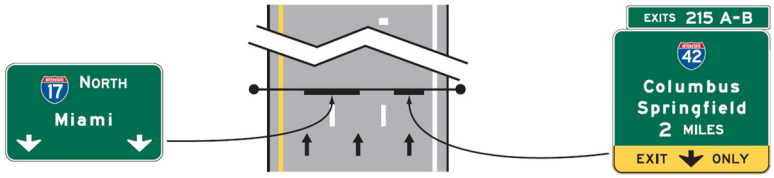
Source: A Guide to Traffic Signing, Ministry of Infrastructure Development, 2009

Figure 4.3.4 Example of Regulatory and Warning Signs Installed Near Merge/Diverge Nose

Additionally, guide signs will be installed near the diverging sections.



Guide Sign at Diverging Nose



Advance Notice

Source: Manual on Uniform Traffic Control Devices for Streets and Highways, FHWA, 2023

Figure 4.3.5 Example of Guidance Signs Installed Near Diverge Nose

Intersection Areas

At intersections, instruction signs, as shown below, will be installed near crosswalks and other areas.

Crossroad ahead　　Traffic signal ahead　　Pedestrian crossing ahead

Source: A Guide to Traffic Signing, Ministry of Infrastructure Development, 2009

Figure 4.3.6 Example of Warning Signs Installed Near Intersections

4.3.3 Signal and Lighting Plan

(1) Traffic Signal Installation Plan

In this project, traffic signals for both vehicles and pedestrians will be installed at intersections based on the following principles:

- Ensure that facing traffic signals are clearly visible, avoiding any risk of misinterpretation with signals for other directions.
- Place traffic signals in locations where approaching vehicles can see them clearly from a safe stopping distance.
- Install visors (cylindrical hoods, louvered hoods, etc.) to prevent misinterpretation with signals on other lanes or approaches.

(2) Road Lighting Installation Plan

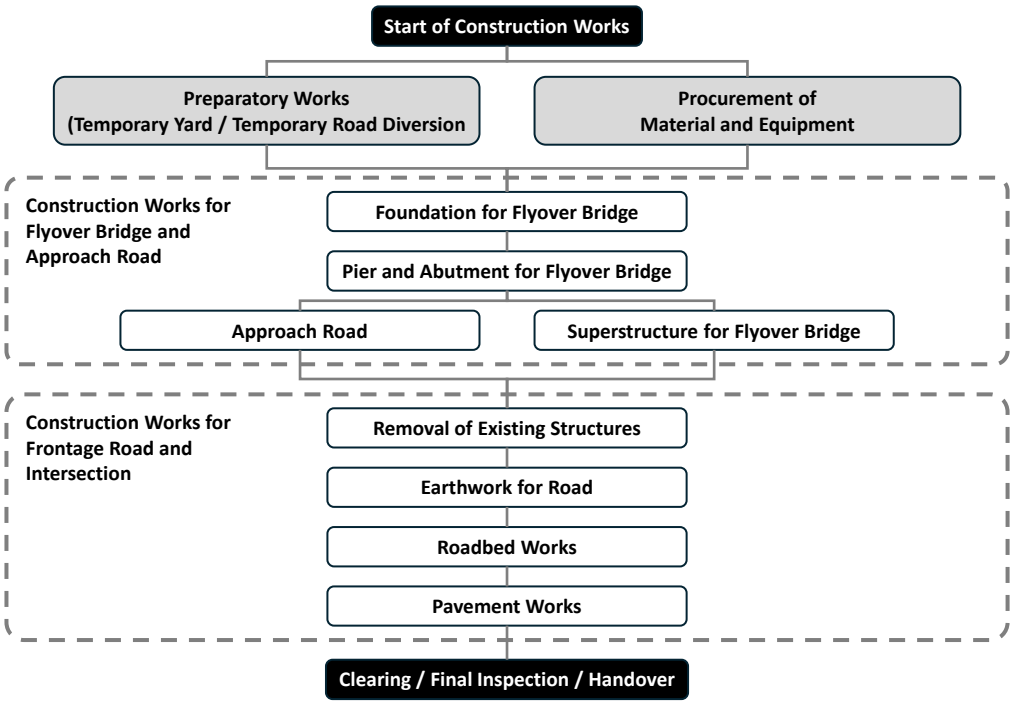
Road lighting will be installed based on the following principles:

- Plan appropriate brightness levels, considering the distance needed for road users' eyes to adjust to the lighting.
- Ensure consistent and continuous lighting across the entire road area.
- Use energy-saving LED lighting to minimize power consumption.
- Consider ease of maintenance, including regular replacement of parts and cleaning.
- Ensure adequate brightness levels, particularly at intersections and other areas where traffic safety is critical.

4.4 Construction Plan

4.4.1 Construction Sequence

The construction sequence for this project is shown in Figure 4.4.1.

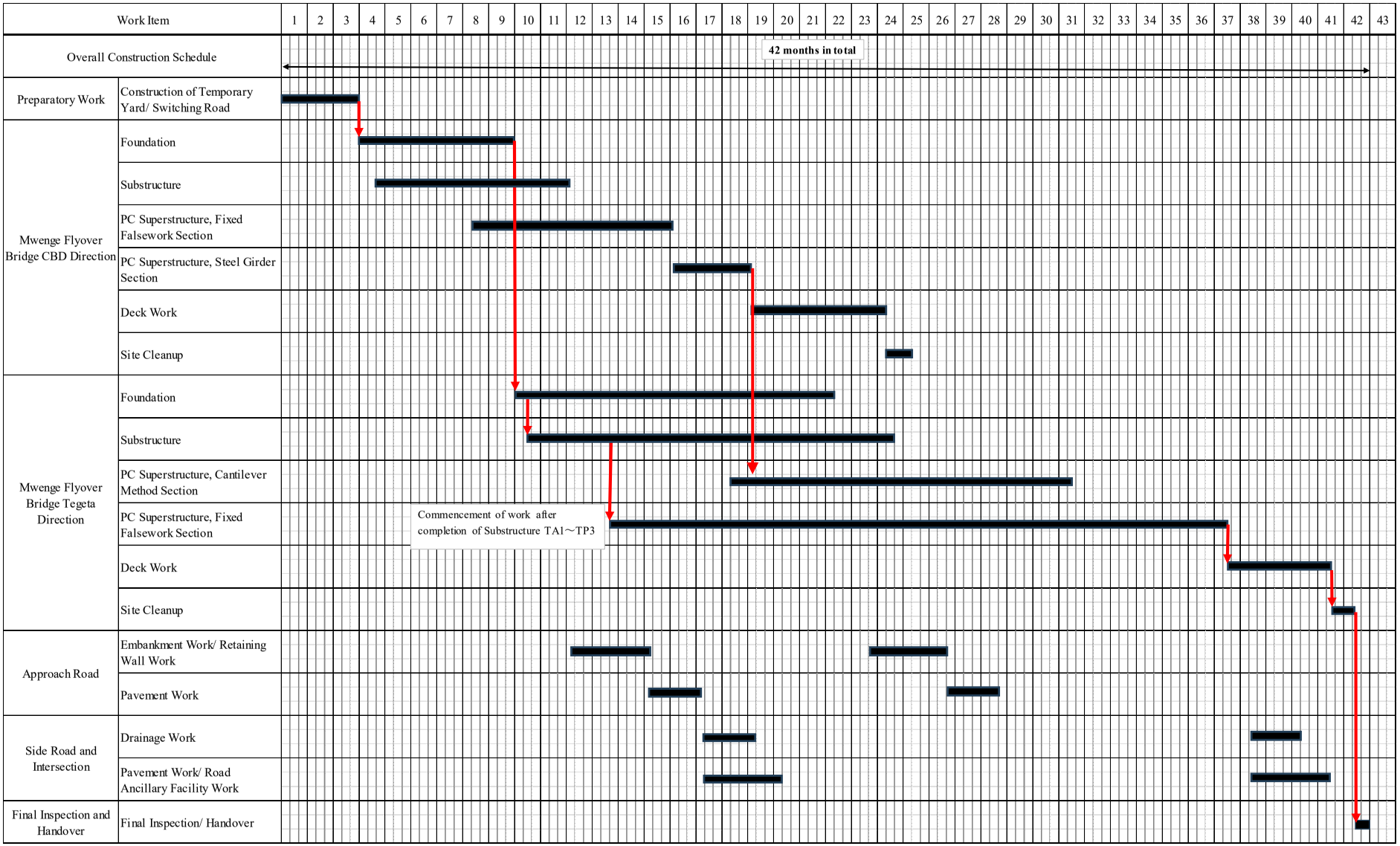


Source: JICA Survey Team

Figure 4.4.1 Construction Sequence

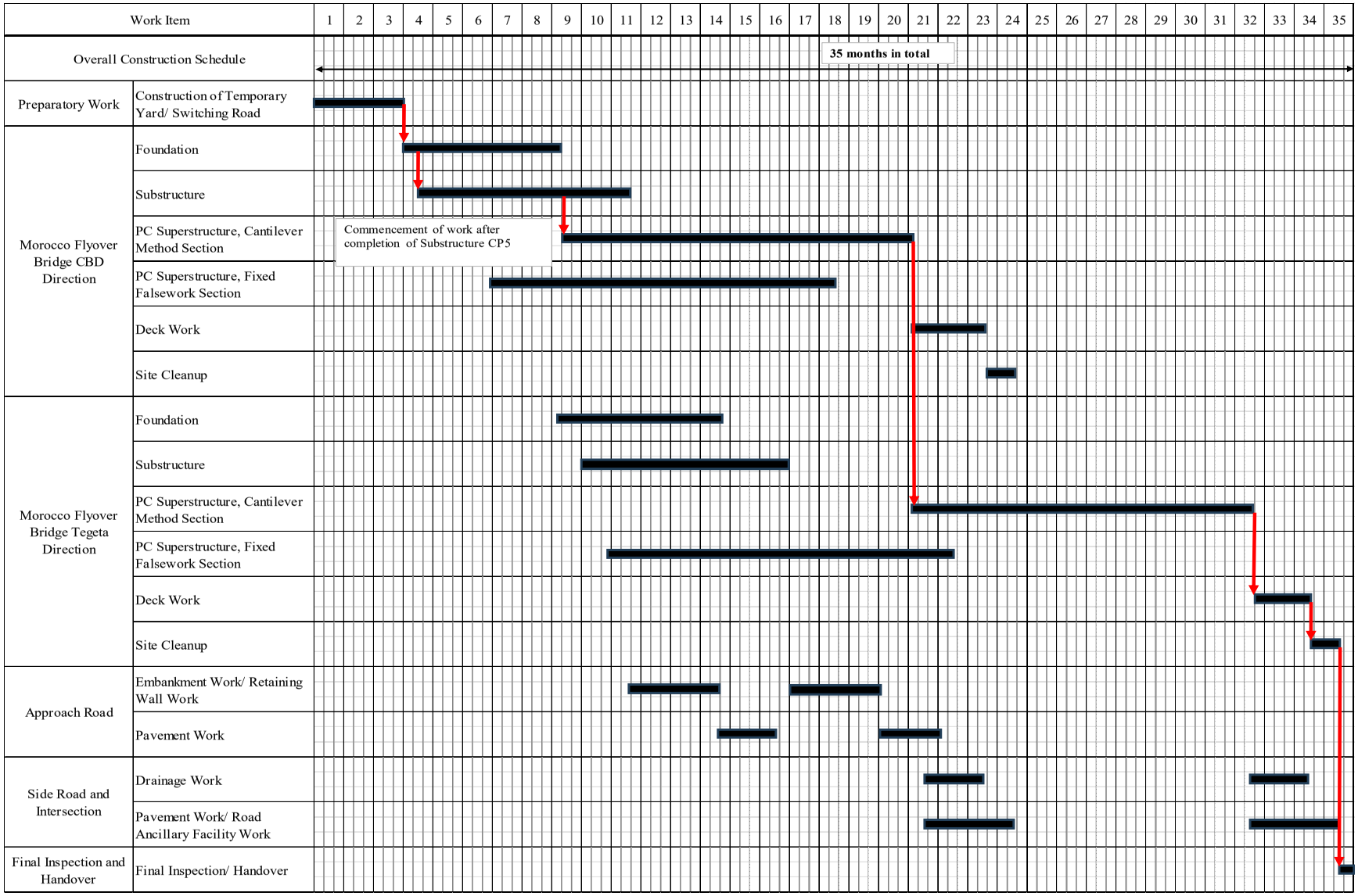
4.4.2 Construction Schedule

The construction schedules for the Mwenge Intersection Improvement and the Morocco Intersection Improvement are shown in Figure 4.4.2 and Figure 4.4.3, respectively. The overall construction period, with the red arrow indicating the critical path, will be 42 months for the Mwenge Intersection Improvement and 35 months for the Morocco Intersection Improvement.



Source: JICA Survey Team

Figure 4.4.2 Construction Schedule for Mwenge Intersection Improvement



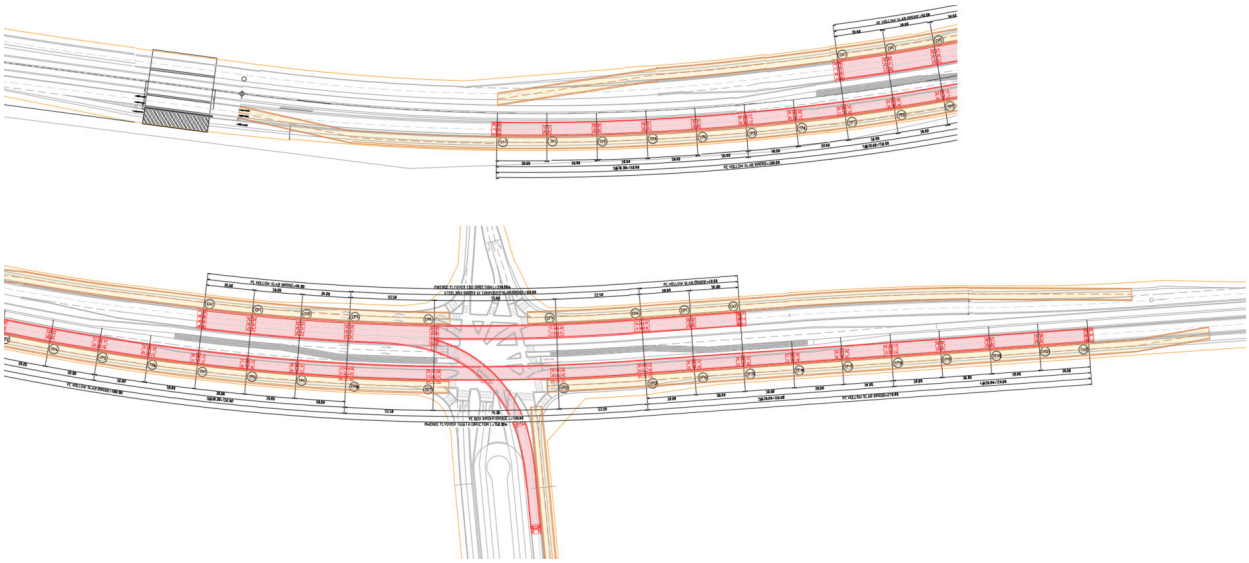
Source: JICA Survey Team

Figure 4.4.3 Construction Schedule for Morocco Intersection Improvement

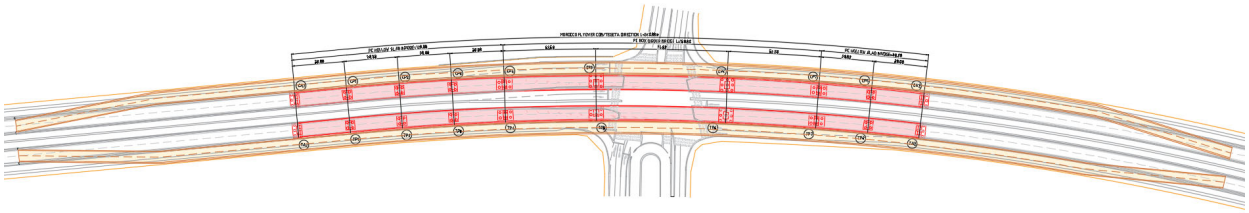
4.4.3 Traffic and Safety Management Plan During Construction

(1) Temporary Road Diversions

Before starting the main construction work, the existing two-lane traffic at each intersection must be diverted outside the construction area. The right-of-way (ROW) for New Bagamoyo Road is 50.00 to 55.25 meters near Mwenge Intersection and 45.00 meters near Morocco Intersection, allowing the establishment of temporary two-lane roads outside the construction area. Additionally, during the construction of the elevated right-turn structure at Mwenge Intersection onto Sam Nujoma Road, two-lane traffic will be maintained.



Mwenge Intersection



Morocco Intersection

Source: JICA Survey Team

Figure 4.4.4 Temporary Road Diversions

(2) Traffic Management Plan

The traffic diversion during the construction period will be managed within the road right-of-way as described in above section. Additionally, a lane for construction vehicles will be secured within the BRT site, with construction proceeding in the order of bridge foundations, abutments, and piers. Given that construction vehicles will include dump trucks, concrete mixers, and large cranes, sufficient lane width is required.

To ensure smooth traffic flow and safety, it is crucial to develop a traffic management plan that complies with Tanzanian traffic regulation laws. The following measures are particularly important in this project:

- Temporary Signals and Traffic Controllers: Install temporary signals or assign traffic controllers at the entrances to diversion roads and construction vehicle lanes, as well as within intersections, to prevent traffic accidents.
- Risk Management for Vehicles and Pedestrians: Install fences around the work area, and place no-entry signs and construction information boards to ensure the safety of vehicles and

pedestrians and to inform the surrounding community.

(3) Safety Management Plan

Safety measures will comply with Tanzanian occupational safety and health laws and related standards, and the "JICA Safety Standard Specifications (JSSS)" will be used as part of the contract documents. The JSSS was developed with the primary goal of prioritizing safety and protecting lives in Japanese ODA projects, aiming to instill a culture of construction safety through ODA projects. Particular attention will be paid to the following aspects:

- Fall Prevention for Work at Heights: Implement fall prevention measures during high-altitude work on the viaduct, and install access equipment for work at heights exceeding 2 meters.
- Heavy Rain Countermeasures: Implement measures to prevent submersion, displacement, and toppling of materials and equipment, and ensure safe evacuation to secure locations.
- Strong Wind Countermeasures: Take precautions to prevent the toppling of tall machinery such as cranes, pile drivers, and drilling rigs, halt work at heights, and prevent the scattering of debris.
- Safety Measures for Large Cranes: Employ experienced crane specialists, select the appropriate type and capacity of cranes, and plan the transportation, assembly, operation, dismantling, and removal of the equipment.
- Special Safety Measures for Foundation Pile Work: Verify ground conditions and the presence of obstacles, and use appropriate equipment and vehicles. For cast-in-place piles using the all-casing method, implement safety measures for excavation work.
- Safety Measures for Concrete Work: Ensure thorough safety measures during the planning stage for concrete pouring, pump operations, concrete mixer operations, and bucket placement. Also, for rebar and formwork, implement safety measures from the planning stage through fabrication, transportation, assembly, and dismantling.

4.4.4 Material and Equipment Procurement Plan

(1) Construction Materials

Based on the results of the site survey, the procurement of major construction materials will be planned according to the following guidelines (refer to Table 4.4.1):

- Procure locally produced materials as much as possible.
- If imported materials are consistently available in the domestic market, procure them locally.
- For materials that are difficult to source locally, procure them from Japan or third countries, considering factors such as cost, quality, and delivery time.
- Steel box girders will be sourced from outside Tanzania, fabricated at the steel manufacturer's plant, transported by sea to the Port of Dar es Salaam, and then erected on site.

Table 4.4.1 Procurement Classification of Major Construction Materials

Material	Procurement Classification			Remarks
	Tanzania	Japan	Others	
Asphalt mixture	✔			
Concrete Mixing Materials	✔			
Aggregate for Pavement	✔			
Aggregate for concrete	✔			
Reinforcement bar	✔			
Lumber (plywood, square timber, planks)	✔			
Fuel (gasoline, diesel)	✔			

Material	Procurement Classification			Remarks
	Tanzania	Japan	Others	
PC Wire		✔	✔	
Expansion and fusing devices		✔	✔	
Bearing		✔	✔	
Steel box girder		✔	✔	
Temporary steel materials (Bent, Sheet pile, H-beam, Casing tube, Tremie pipe)		✔	✔	

Source: JICA Survey Team

(2) Borrow Pits, Aggregate Sources, Spoil Disposal Sites, and Camp Yard Locations

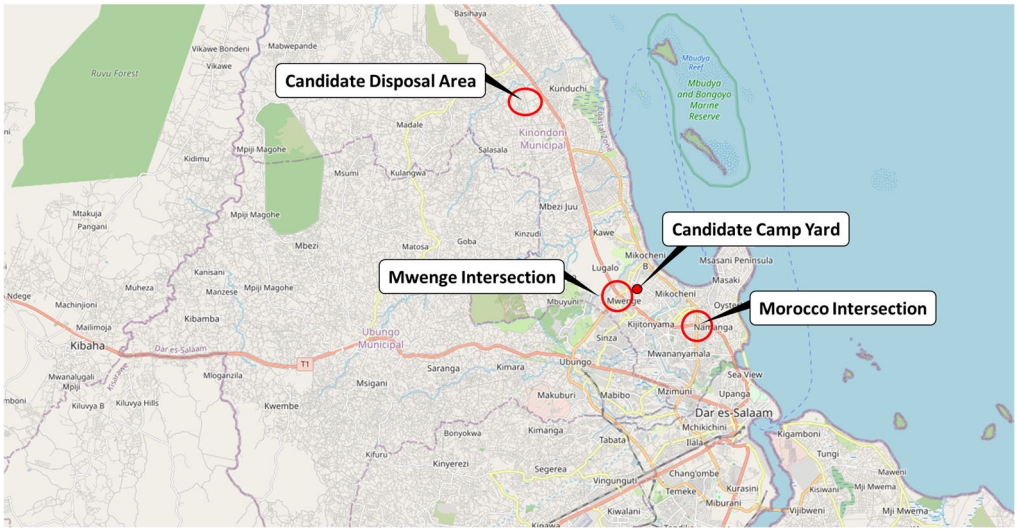
The crushed stone (coarse aggregate, paving aggregate) required for this project can be procured from aggregate sources in the Lubako area. Sand can be sourced from the Mbezi River basin in the Bunju area, while soil (subgrade and embankment material) can be procured from borrow pits in the Bunju area. The average hauling distances from each source location to the project site are summarized in Table 4.4.2.

Table 4.4.2 Average Hauling Distances from Borrow Pits and Aggregate Sources to the Project Site

Location	Material	Use	Ave. Hauling Distance (km)	Remarks
Rugoba District	Crushed stone	Coarse aggregate Aggregate for Pavement	150	
Mpiji River Basin (Bunju District)	Sand	Fine aggregate Sand for pavement	40	
Bunju District	Earth and sand	Roadbed and road body materials	40	

Source: JICA Survey Team

The disposal site for construction surplus soil is proposed to be in Kunduchi, located 10 km north of Mwenge Intersection, the same site used for the New Bagamoyo Road Widening Project (Phase 2). The camp yard is proposed to be in an open area in the industrial zone in the direction of Coca-Cola Road from Mwenge Intersection. The locations of the proposed sites are shown in Figure 4.4.5.



Source: JICA survey team

Figure 4.4.5 Proposed Locations for Spoil Disposal and Camp Yard

4.5 Preliminary Cost Estimation

Table 4.5.1 summarizes the total project cost estimated based on the estimated costs for the construction and the consultancy services and the following preconditions:

- Price Escalation: 3.24% for Foreign Currency, 3.31% for Local Currency

- Physical Contingency: 10.0% for Construction, 5.0% for Consultancy Services
- Rate of Interest during Construction: 1.95% for Construction, 0.55% for Consultancy Services
- Rate of Front End Fee: 0.2%

Table 4.5.1 Estimated Total Project Cost

Breakdown of Cost	Foreign Currency Portion (million JPY)			Local Currency Portion (million TZS)			Amount (million JPY)		
	Total Cost	JICA Portion	Others	Total Cost	JICA Portion	Others	Total Cost	JICA Portion	Others
Civil Works Cost	16,781	16,781	0	0	0	0	16,781	16,781	0
Price Escalation	3,394	3,394	0	0	0	0	3,394	3,394	0
Physical Contingency	2,018	2,018	0	0	0	0	2,018	2,018	0
Consulting Services	2,368	2,368	0	17,470	17,470	0	3,476	3,476	0
Interest during Construction	1,918	0	1,918	0	0	0	1,918	0	1,918
Front End Fee	51	0	51	0	0	0	51	0	51
Land Acquisition	0	0	0	0	0	0	0	0	0
Administration Cost	0	0	0	20,244	0	20,244	1,283	0	1,283
VAT	0	0	0	72,877	0	72,877	4,620	0	4,620
Import Tax	0	0	0	23,244	0	23,244	1,474	0	1,474
Other Taxes	0	0	0	0	0	0	0	0	0
Total	26,531	24,561	1,970	133,835	17,470	116,365	35,016	25,669	9,347

Source: JICA Survey Team

5. BASELINE DATA FOR EXISTING ENVIRONMENT

5.1 Introduction

Baseline data and information of a given project provide important insight for an informed ESIA. This section provides a description of relevant environmental, socio-economic profile of the project area as well as the project-impacted area of influence for the purpose of providing a contextual background to understand the social impacts of the proposed project. The proposed intersection project influences the whole of the Dar es Salaam city as the roads from the intersection joins other roads within the city. The environmental and socioeconomic influence of the Project is anticipated to extend beyond the limits of the Project area. Accordingly, the following sections include information related to the broader area of influence (i.e., Kinondoni Municipality, Dar es Salaam Region), where relevant. The geographic scope and level of detail in the following sections depends on the anticipated interaction between project activities and the particular environmental or socioeconomic aspect.

5.2 Social Environment

5.2.1 Population

The Dar es Salaam region is the centre for industrial, commercial and administrative activities of Tanzania. According to the 2022 Population and Housing Census of 31st October 2022, the region had a population of 5,383,728 where male was 2,600,018 and female was 2,783,710 with a growth rate of 5.6% per annum. It is estimated that Kinondoni has a population of 982,328 among of those 667,983.04 (68%) are man-power while the remainders are elders and children. The region had population density of 3,881 people per square kilometre in 2022. The region is estimated to have 1,550,066 households with an average of 3.5 persons per household. The following below present demographic data of the Dar es Salaam Region, Kinondoni Municipal Council and the project Wards from the 2022 census.

Table 5.2.1 Population of Dar es Salaam Region, Kinondoni Municipality and the project Wards

Name	Population Number			Sex Ration	Households (Number)	Average Household Size
	Total	Male	Female			
Dar es Salaam Region	5,383,728	2,600,018	2,783,710	93	1,550,066	3.5
Kinondoni Municipality	982,328	474,825	507,503	94	299,184	3.3
Mikocheni Ward	25,433	12,076	13,357	90	7,325	3.5
Makongo Ward	35,567	16,991	18,576	91	11,196	3.2
Kijitonyama Ward	39,932	19,018	20,914	91	12,957	3.1
Msasani Ward	40,406	19,985	20,421	98	12,397	3.3
Kinondoni Ward	17,337	8,380	8,957	94	5,823	3.0
Mwanayamala Ward	38,645	18,748	19,897	94	12,659	3.1

Source: JICA Survey Team

5.2.2 Local economy

The main economic activities taking place in the proposed project area can be categorized as mercantile business, retailing businesses including small and medium shops, hotels, bars and restaurants, transportation services, clearing and forwarding, agri businesses, medical businesses, handcraft businesses, banking businesses and construction business. These activities employ about 45% of the total population of the project area. The businesses play a significant role to the Municipals' economy in terms of revenue and in provision of job opportunities to the residents.

Agriculture and livestock sector is another important economic activity in Municipalities whereby about 13% of the population is employed in the sector. The livestock kept in the study area are cattle, goats, sheep, pigs, and chicken. Fishing in Indian Ocean also provides employment to a sizeable proportion of the people in the project area. The most significant industries include medium industries which process food, beverage, and textiles. Others include small scale industries which dominates wide range of food and textiles. The small-scale industries comprise hulling and milling and fruit processing machines which add value to agricultural primary products.

5.2.3 Land use and utilization of local resources

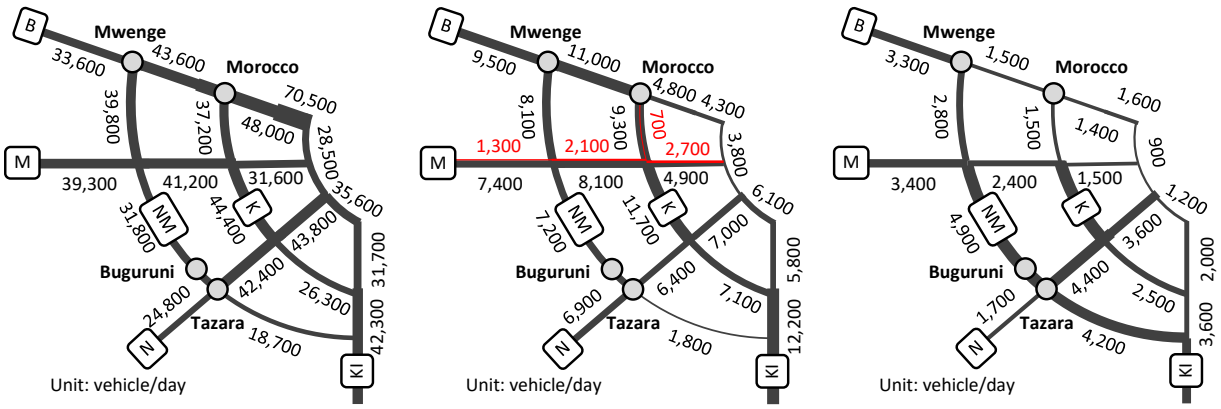
The project area is located in urban area where there is a mix of land tenure systems and different land uses. There are residents who have title deed (certificate of occupancy) provided by the ministry of lands and there are residents who own the land customary (inheritance or bought from previous owners). The land generally is occupied by industries, markets, institutions and government offices, residential houses, hotels, shopping centres, petrol stations, banks, schools, public services, restaurants, and recreational facilities. The land use planning within the project area is comprised of settlements with 106 streets whereby 49 streets (mitaa) are surveyed, 46 streets un-surveyed and 11 streets partially surveyed. Other uses of land include industrial area (Mikocheni Light Industry, and Wazo Hill Cement Factory), Pande Game Reserve, Public and Private Institutions, Military Area (Lugalo and Mbweni) and Agriculture which is mainly done at peri-urban areas.

5.2.4 Transportation System in Dar es Salaam

(1) Current Road Transport

The road network in Dar es Salaam comprises four (4) primary radial roads (namely, New Bagamoyo Road/Ali Hassan Mwinyi Road, Morogoro Road, Nyerere Road, and Kilwa Road) and two (2) ring roads (namely, Nelson Mandela Road/Sam Nujoma Road and Kawawa Road) within a 5- to 10-kilometer radius of the Central Business District (CBD) located on a harbour on the Indian Ocean. However, the traffic volumes on all these major roads have already surpassed their capacity (see Figure 5.2.1), as indicated by the findings of the traffic survey conducted for the revised Master Plan (M/P).

In the morning and evening peak hours, the average travel speed on the four radial roads originating from the CBD is significantly lower, approximately 10 km/h, than the standard indicator of traffic congestion, which is 20 km/h.



Total Traffic | Dala Dala (Black) & BRT Traffic (Red) | Truck Traffic

B=New Bagamoyo Road, M=Morogoro Road, N=Nyerere Road, KI=Kilwa Road, NM=N. Mandela Road, K= Kawawa Road

Source: Revised M/P

Figure 5.2.1 Current Traffic Volume on Major Arterial Roads in Dar es Salaam (2017)

(2) Current Public Transport

Daladala (Passenger Minibus Service)

The primary mode of public transportation in Dar es Salaam is the "daladala," a passenger minibus service that can carry 15 to 45 passengers and covers almost the entire city. However, these daladalas are privately owned and operate independently, so they do not follow a fixed schedule or coordinated system. As a result, travel times are unpredictable due to the varying behaviour in the operation of these vehicles and the presence of traffic congestion, making the daladala an unreliable transportation option.

Dala Dala

Loading and Unloading of Passengers at the Bus Stop

Source: JICA Survey Team

Figure 5.2.2 Dala Dala and Bus Stop

Bus Rapid Transit (BRT)

In order to enhance urban mobility and address the growing transportation needs of the city, the Dar Rapid Transit Agency (DART), with financial support from the World Bank (WB), the African Development Bank (AfDB), and Agence française de développement (AFD) introduced the Bus Rapid Transit (BRT). DART is responsible for planning, implementing, and operating the BRT system. The idea of implementing the BRT system in Dar es Salaam was first proposed in the late 1990s as a solution to the city's traffic congestion and limited public transportation options.

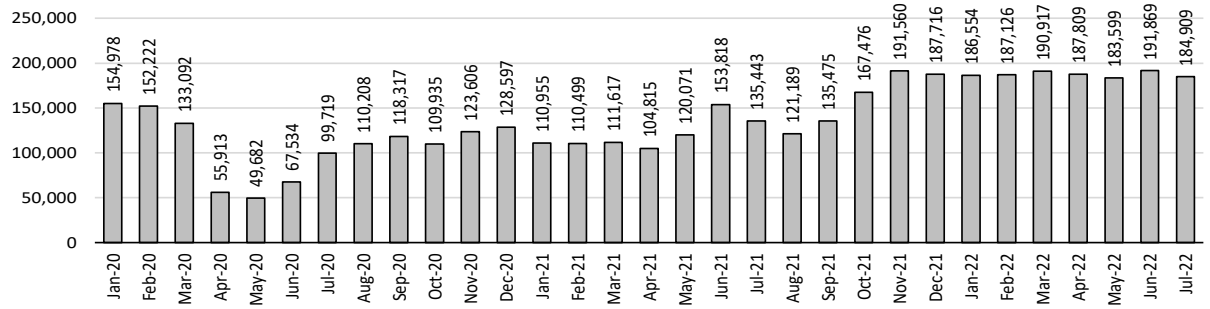
Phase 1 construction of the BRT infrastructure on Morogoro Road concluded in 2015, with bus operations commencing in May 2016. Since the introduction of BRT Phase 1, the average travel speed has increased to 30 km/h, even during peak hours. This improvement in mobility along the road can be attributed to the frequent and predictable service provided by the BRT. Currently, the BRT service serves approximately 200,000 passengers daily based on the statistical data of DART.

BRT Buses

Morocco BRT Terminal

Source: JICA Survey Team

Figure 5.2.3 BRT Bus and Station



Source: DART. 2022.11. 15th Joint Transport Sector Review

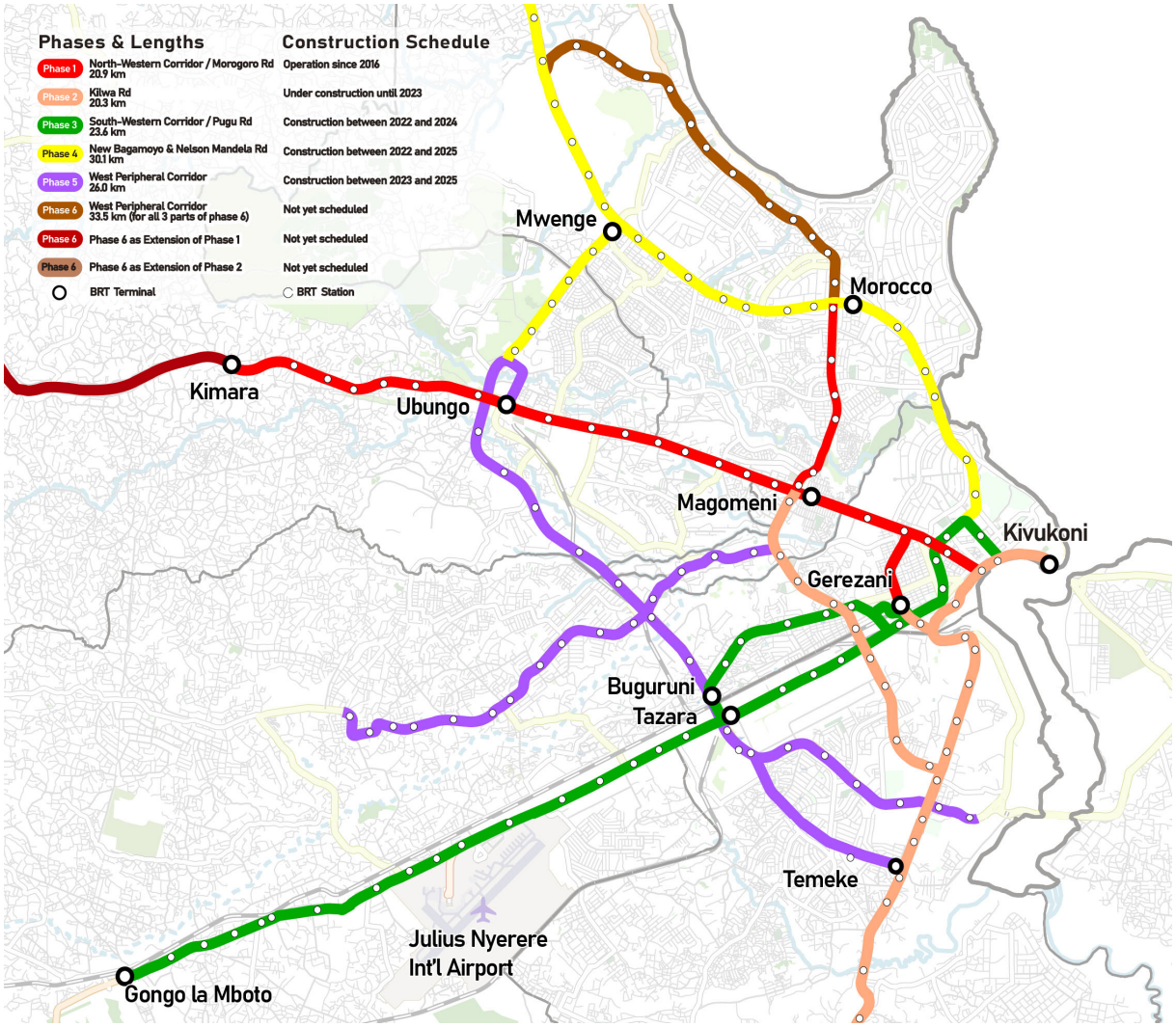
Figure 5.2.4 Average Daily Passengers on BRT System

Construction of the BRT Phase 2 infrastructure on Kilwa Road was completed in September 2023 and is expected to be operational in 2025. The implementation of the construction projects is also underway for BRT Phase 3 on Nyerere Road and BRT Phase 4 on New Bagamoyo Road. The construction of BRT Phase 5 on Nelson Mandela Road will also commence soon. DART aims to complete all five BRT phases shown in Figure 5.2.5 by 2026. Meanwhile, the Tanzania National Roads Agency (TANROADS) is responsible for the construction of the BRT infrastructure.

Table 5.2.2 Implementation Schedule of BRT Corridors

Phase	Road	Funding Source	Current Status
2	Kilwa Road, Kawawa Road	AfDB	Construction completed in 2023 (Yet to be operated)
3	Nyerere Road, Uhuru Street	WB	Construction ongoing (to be completed by 2025)
4	New Bagamoyo Road, Sam Nujoma Road	WB	Construction ongoing (to be completed by 2026)
5	Nelson Mandela Road,	AFD	Detailed design completed (to be constructed by 2027)
6	Old Bagamoyo Road	To be decided	

Source: JICA Survey Team



Source: JICA. 2023. Project for Transit Oriented Development (TOD) for Dar es Salaam

Figure 5.2.5 Planned BRT Corridors

Commuter Rail Services

Tanzania Railways Limited (TRL) launched commuter rail services between the CBD and Ubungo in 2016. Since the merger of TRL and Rail Assets Holding Company (RAHCO) to establish Tanzania Railways Corporation (TRC) in 2017, TRC has been operating commuter rail services from the CBD to Pugu and Ubungo. Presently, the commuter rail service offers three (3) trips during both the morning and evening peak hours.

Standard Gauge Railway (SGR)

TRC is currently constructing the Standard Gauge Railway (SGR) along the Central Corridor, which will facilitate intercity rail transportation for both passengers and freight from Dar es Salaam to Morogoro, Dodoma City and Kigali (Rwanda) in future. Construction of the SGR network covering 1,219 km is being implemented in five phases:

- Phase 1: Dar es Salaam – Morogoro (300 km)
- Phase 2: Morogoro – Makutupora (422 km)
- Phase 3: Makutupora – Tabora (294 km)
- Phase 4: Tabora – Isaka (130 km)
- Phase 5: Isaka – Mwanza (249 km)

The SGR commenced operations in July 2024. As of August 2025, there are a total of four round-trip services between Dar es Salaam and Dodoma, and one service between Dar es Salaam and Morogoro. In total, ten services operate daily. The travel time between Dar es Salaam and Dodoma is approximately 3.5 hours.

Source: TRC. 2023. Environmental and Social Impact Statement for SGR Lot 3 & 4

Figure 5.2.6 Planned SGR Network

5.2.5 Existing Social Infrastructures and Services

(1) Health facilities

Accessibility to health facilities in the project area is relatively good. According to the KMC, the model of health services delivery in the area is based on preventive, promotive and curative care. The line of operation starts from the Dispensary, Health center to the Municipal Hospital. There are a number of hospitals, health centers and dispensaries for government, voluntary, parastatal and private sectors in the project area. The health facilities include Mwananyamala Hospital, Hubert Kairuki Memorial Hospital, Lugalo Military Hospital, etc. However, there are no health facilities within the proximity (i.e., 100 meters) to the project area. The nearby hospital are Lugalo Military Hospital and Mwenge Hospital for Mwenge Intersection and Mount Ukombozi for Morocco Intersection.

(2) Education

The project area is served with a wide range of education facilities ranging from pre-school services to vocational colleges. Almost every ward in the project area has pe-primary, primary and secondary school. The KMC where the project is located has 161 Pre-Primary Schools out of which 78 belongs to Government and 83 are owned by private sectors. Also, Municipal has 163 Primary schools, whereby 79 are owned by Government and 84 Primary Schools are owned by Private Sectors. All 77 Government Primary Schools have a total number of 86,672 pupils from Pre-Primary level to Primary level and 1975 teachers and Private Schools has total 34,170 pupils.

(3) Water supply

Water supply in the project area is not uniform, the level of services differs from one area to another. Some of the areas have better services while others not. The project areas are better serviced compared to squatter areas. The main source of water supply for the project area residents is from Lower and Upper Ruvu which managed by the DAWASA and boreholes. In the project area the water from DAWASA systems contributes 81% of water being consumed daily and the rest is contributed by deep wells/boreholes which owned by both private and community. Vendors with bowsers (a mobile tanker with a pumping apparatus for transporting fuel or water) also supply areas where there is no network or no nearby boreholes. Further, it was reported that most of the boreholes produced saline water. During the survey, people reported that shallow wells produce unsafe water for drinking that contribute to the occurrence of water related diseases such as diarrhoea, intestinal worms and typhoid.

(4) Wastewater

The Water supply and sanitation Act 2018 section 20 gives the Urban Water Supply and Sanitation Authorities responsibility of development, provision and maintenance of water and sanitation works. The main sources of wastewater generated in the project area is households, institutions, commercial areas, markets, industries and stormwater. About 90% of the urban population depends on on-site sanitation systems (pit latrines and septic tanks). Emptying of septic tanks is carried out by cesspit emptier mostly owned by private operators who are supposed to discharge their septage at municipal waste stabilization ponds and other wastewater treatment systems. The public sewer systems in Dar es Salaam were constructed in between 1948 and 1950. The Mikocheni sewer system found within the project area is the only one that was constructed after the independence (1961); this was constructed in 1976. The Mikocheni public sewer is also dilapidated the same due to poor construction. Generally, the public sewer in the project area is more than 48 years old. These sewers provide services to only 7% of the residents. The rest of the residents (93%) use on site disposal services such as septic tank system and pit latrines. This situation imposes necessities for increasing the capacity of cesspit Emptying services, which is being provided by both Municipal council and private sector (Source: KMC, 2018).

The 2022 TDHS-MIS indicated that slightly more than half of Tanzanians (55%) have at least basic sanitation service, meaning they have access to improved sanitation facilities that are not shared with other households or have safely managed sanitation service where excreta are safely disposed of in situ or transported and treated off-site. Improved sanitation includes sanitation facilities that hygienically separate human excreta from human contact. Enhancing access to and use of improved and climate-resilient sanitation facilities can prevent transmission of disease and reduce sanitation-related morbidity and mortality. Better use of proper sanitation can also lead to other benefits including improving gender equality, promoting dignity, and preserving the environment. In the project area, 75% of households use improved toilet facilities (NBS, 2023). Overall, pit latrines with slabs (not washable) are the most common type of sanitation facility (23%), followed by flush/pour flush toilets that flush water and waste to a pit latrine (20%) and pit latrines with slabs (washable) (17%). Nine percent of households practice open defecation

(13% in rural areas and 1% in urban areas). Among households with a sanitation facility, 85% have the facility in their own yard/plot and 12% in their own dwelling.

5.2.6 Social Institutions and Local Decision-Making Institutions

Urban authorities in Tanzania consist of city, municipal, town councils, ward development committees (WDCs) and Mtaa. Most important local decisions are carried out at Mtaa level. The Mtaa assembly composed of all adult members elects a Mtaa council of up to six elected members comprised of men and women representatives (Residents elect three regular members, two women members and one chairperson of the council). Also, the council has an executive office headed by an Mtaa Executive Officer (MEO) appointed by the Municipal authority. The Mtaa council is responsible for overseeing day to day activities in the Mtaa as well as to make decisions on matter concerning the whole community. Functions of the Mtaa Assembly are the maintenance of peace and order the promotion of social welfare and economic development. The Council manages the Mtaa and implements decisions made by the assembly. The mtaa government is arranged into a series of committee's and overseen by the Mtaa Chairperson, MEO, and mtaa leader members of the council. The main committees include Finance and Planning, safety and security, construction and finally Education, and social services. The sub-committee of the latter includes the water and sanitation committee, health committee, Environment committee and the school committee.

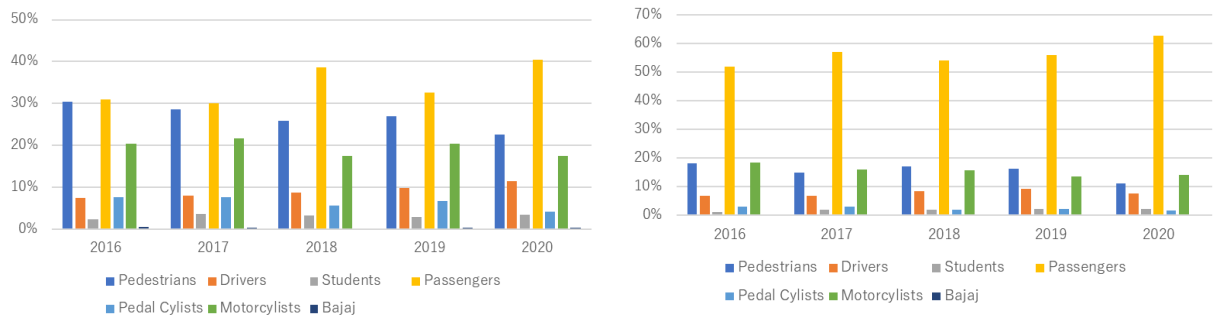
The Ward is technically an administrative unit and consists of Mtaa chairpersons in the ward, all MEOs, and non-voting members invited from civil society. The councillor of the ward, elected by its residents, chairs the WDC, and the Ward Executive Officer (WEO) appointed by the MED, is a salaried non-voting secretary. The WDC is responsible for coordinating development activities, planning at the ward level and linking plans with the district level. The KMC is governing body is the Full Council which comprises 34 Members with 20 Councilors who are elected from each Ward, 2 are Members of Parliament elected from constituencies representatives (MPs), 6 women special seats and 6 Presidential Appointees. The Municipality executes its administrative duties through: the Municipal Council, Ward Development Committees under the Chairmanship of the Councillor and Sub-Ward (Mtaa) Development Committees. Kinondoni Municipal Councill currently have total number off 4,161 employees.

5.2.7 Culture heritage

The dominant culture within the project area is the Swahili culture, which characterizes coastal areas of Tanzania. The Swahili culture is a mix of Arabic and Bantu cultures. Other tribes traditionally dominant in the area are the Zaramo, Makonde and Nyamwezi. However, there are now many other tribes from all over Tanzania represented in the area. Social capital formation largely revolves around CBOs that develop group-based capacity to solve problems or address government systems, especially in the underserved spontaneous urban settlements. Also, within the area, there are several historic and cultural heritage properties such as Makumbusho Village Museum and Kunduchi Ruins. Furthermore, there are curio shops along Sam Nujoma Road and Makonde carvings at Mwenge.

5.2.8 Road Traffic Accidents

The road traffic accident (RTA) data is consolidated at the central data base with the Traffic Police. The currently available data collected is for the entire country and not just Dar es Salaam. The road safety data management in Dar es Salaam is not properly managed and therefore the data is disintegrated.



Fatalities Injuries

Source: Data Collection Survey on Road Safety Data and Management in Dar es Salaam report, 2022

Figure 5.2.7 Trends of Fatalities and Injuries 2016-2020

5.3 Natural Environment

5.3.1 Climatic Condition

5.3.1.1 Temperature

The long-term highest monthly maximum temperature of 32.8 degrees is experienced in February while the lowest maximum temperature of about 29.7 degrees occurs in July. Long-term average highest monthly minimum temperature around 24.9 degrees is experienced in January, while the lowest minimum value of about 19.1 degrees is observed in August. Figure 4.4 shows the temperature timeseries and an annual cycle (bar graph) from 1991 to 2020). The temperature extreme values over a period of 1991 to 2020 are shown on table 4.7 and 4.8 below in which the maximum recorded temperature was 34.1 degrees occurred in May 2000 while the minimum recorded temperatures were 17.4 degrees in August 1997. (TMA, 2023).

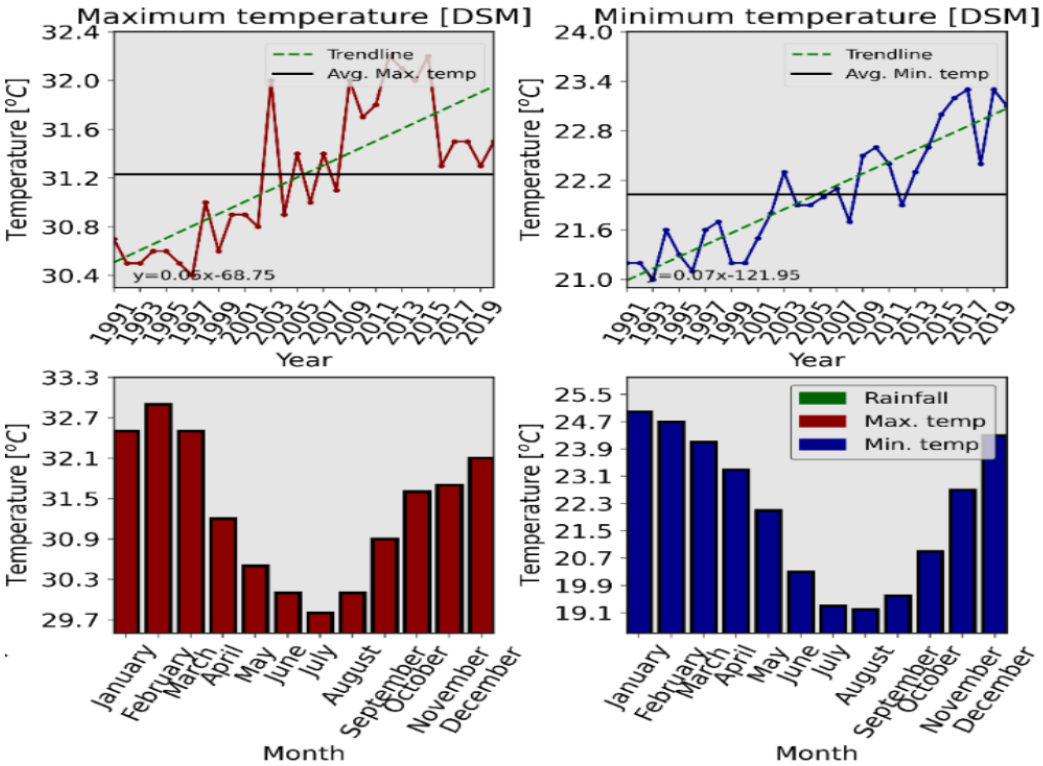


Figure 5.3.1 Temperature time series and annual cycle (bar graph) from 1991 – 2022

Source: TMA, 2023

Table 5.3.1 Monthly maximum temperature extreme values

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year	2012	1991	2000	1994	2001	2015	2013	1998	1993	2001	2016	2020
Tmax (°C)	33.7	34	34.1	33.3	31.6	31.6	31.2	31.8	32.1	32.8	33.6	33.6

Source: TMA, 2023

Table 5.3.2 Monthly maximum temperature extreme values

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year	2006	2019	2013	1994	2010	2013	2012	1997	2015	1996	2008	1995
Tmin (°C)	23.7	23.1	22.8	22.2	20.9	18.7	17.6	17.4	18.1	19	20.6	22.2

Source: TMA, 2023

5.3.1.2 Precipitation

The climatologically, the Mwenge and Morocco intersection area (Dar es Salaam) experienced the monthly highest average rainfall of about 263.6 mm in April and the lowest of about 15.8 in July. The area experiences a bimodal rainfall regime which are March – May (MAM) season, and October – December season. (TMA, 2022). Rainfall extreme values of the period of 1991 to 2020 is shown under table 4.9 below in which the highest rainfall reaching 569.4 mm was recorded in April 2002 while the minimum recorded was 60.1 mm occurred in 1995.

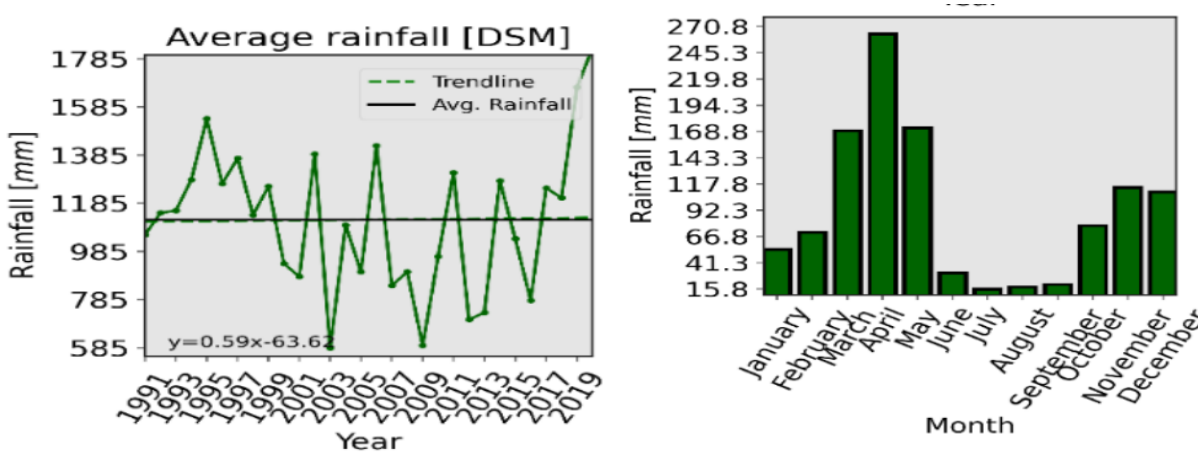


Figure 5.3.2 Rainfall time series and annual cycle (bar graph) from 1991 – 2022

Source: TMA, 2023

Table 5.3.3 Monthly rainfall extreme values

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year	2020	1996	2014	2002	2019	1997	1999	1995	1998	2019	2011	2017
Rainfall (mm)	222.3	225.8	426.3	569.4	445.9	154.2	60.1	106.5	68	342.7	316.5	377.2

Source: TMA, 2023

5.3.1.3 Wind Conditions

The long-term average of dominant wind direction of the area is east – south – east (ESE) by 62% frequency (1991 – 2020). The figure below shows a wind rose with wind speed and direction for Mwenge and Morocco intersection area (Dar es Salaam) that covers a time interval of 30 years (1991 – 2022). The wind speed is illustrated in colour and the frequency of occurrence in a specific direction.

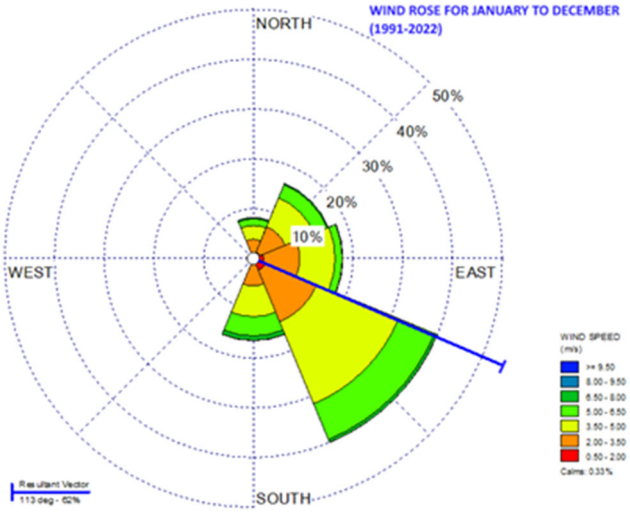


Figure 5.3.3 Wind rose for Mwenge and Morocco intersection area (Dar es salaam)

Source: TMA, 2023

5.3.2 General topography and geology and the project area

5.3.2.1 Topography

Topography of the both project areas at Mwenge and Morocco Intersections are generally flat and the whole area has been elevated and paved with good drainage system. However, the topography along the Ali Hassani Mwinyi and Bagamoyo Road Sections are mainly undulating with altitude ranging from 12 m to 28 m (m.a.s.l.). For Sam Nujoma Road Corridor the topography is dominantly flat with at altitude ranging from 28 m to 55 m (m.a.s.l.).

5.3.2.2 Geology of the project area

Generally, the geology of the project areas (Dar es Salaam) is characterized by various episodes of sea transgression and regression that led to both erosion and deposition of various layers of sands and clays. Evaluation of the rock, supported by existing data, indicates that the two dominant types of rocks typical of the bedrock of Dar es Salaam region are sandstone and limestone. The overburden is classified by geological age into two major periods. Quaternary deposits consist of three subgroups: alluvial deposits, coastal plain deposits, and limestone. The coastal plain and alluvial deposits are mostly of Pliocene to recent origin and are found mainly moving from the coast towards the mainland. These consist of sands, clay and sometimes clay-bound sands, gravels and pebbles. Fine- to coarse-grained sand occurs widely in valley creeks, deltas and mangrove sites. The main deltas are situated at the mouths of the Mzinga, Kizinga and Msimbazi Rivers. Limestone is mainly coralliferous and is found along the coastal strip. The limestone is generally weathered and normally covered on the surface by white buff sands or reddish-brown soils. It is found in the Kurasini and Kigamboni areas (Kasonta and Kasonta 1999). At the core project areas, the soils are changing SAND, loamy SAND and CLAY with good drainage properties.

5.3.3 Flora, Fauna and Biodiversity

5.3.3.1 Flora

Floristically, the vegetation of the project area has already been influenced by human developmental activities and thus there are no expected pristine environments. Most areas are covered by either secondary growth or planted exotic trees. Likewise, the specific project footprint areas depict the human ecology as most of indigenous plant species has long been cleared. The current vegetations are mainly planted ones along the road reserves for offering protection of the roads against erosion, acting as buffer for the road's pollution due to vehicular emission of both pollutants' gas and dust against nearby land uses/activities. Also, there is ongoing construction of the BRT road covering the project area of Mwenge and Morocco which has also cleared and is clearing some of the remaining vegetation especially at the middle section of the road. Based on the survey of the area there are generally tree species, herbs and grasses present. The survey of the tree species noted a total of 13 species in both areas with a total of 191 trees. *Cordia Sebestena* being higher recorded species with 69 trees equivalent to 36% followed by *Muntingia calabura (17%)* and *Leucaena leucocephala* (11.5%). (Table 5.3.4). All of the surveyed species in the area fall under Least Concern IUCN Conservation status. This implies that the species do not qualify for any of the categories that indicate a higher risk of extinction (such as Vulnerable, Endangered, or Critically Endangered). It is considered to be at a relatively low risk of extinction due to its wide distribution, abundant population, or because there are no significant threats currently affecting it to a degree that would warrant a higher risk category.

Table 5.3.4 Tree Species and Their Number in Mwenge and Morocco Project Areas

S/N	Species	Number of species	IUCN Conservation status
1	*Leucaena leucocephala*	22	Least Concern
2	*Millingtonia hortensis*	5	Least Concern
3	*Azadirachta indica (Neem trees)*	11	Least Concern
4	*Terminalia mantaly*	21	Least Concern
5	*Tecomaria capensis*	6	Least Concern
6	*Muntingia calabura*	32	Least Concern
7	*Sena siamea*	7	Least Concern
8	*Trichilia emetic*	7	Least Concern
9	*Saraca asoca (ashoka trees)*	2	Least Concern
10	*Syagrus romanzoffiana (Palm)*	6	Least Concern
11	*Pithecellobium dulce*	1	Least Concern
12	*Cordia Sebestena*	69	Least Concern
13	*Annona squamosal (custard apple)*	1	Least Concern
	Total	191	

Source: JICA Survey Team

Out of the two sections Morocco shows more species abundance with 13 species (100%) compared to Mwenge with 7 species (54%) in terms of number of species present and number of individual tree species (Figure 5.3.7and Figure 5.3.8). The stretch of Alli Hassan Mwinyi Road has more species as well as more larger and matured trees than the rest. The large trees with more than 1 meter girth were 20 recorded only at Morocco along the Ally Hassan Mwinyi Road. Medium and Small tree species were present in both intersections. (Appendix 1). Some of the common species in the project area are shown in the pictures of appendix 7. General vegetation features of both areas are shown on Figure 5.3.4, Figure 5.3.5 and Figure **5.3.6** below.

Figure 5.3.4 Vegetation along of Ally Hassani Mwinyi Road (Morocco Intersection)

Figure 5.3.5 Vegetation along of Bagamoyo Road (Mwenge Intersection)

Figure 5.3.6 Vegetation along of Sam Nujoma Road (Mwenge Intersection)

Figure 5.3.7 Map showing trees to be cleared at Morocco intersection area

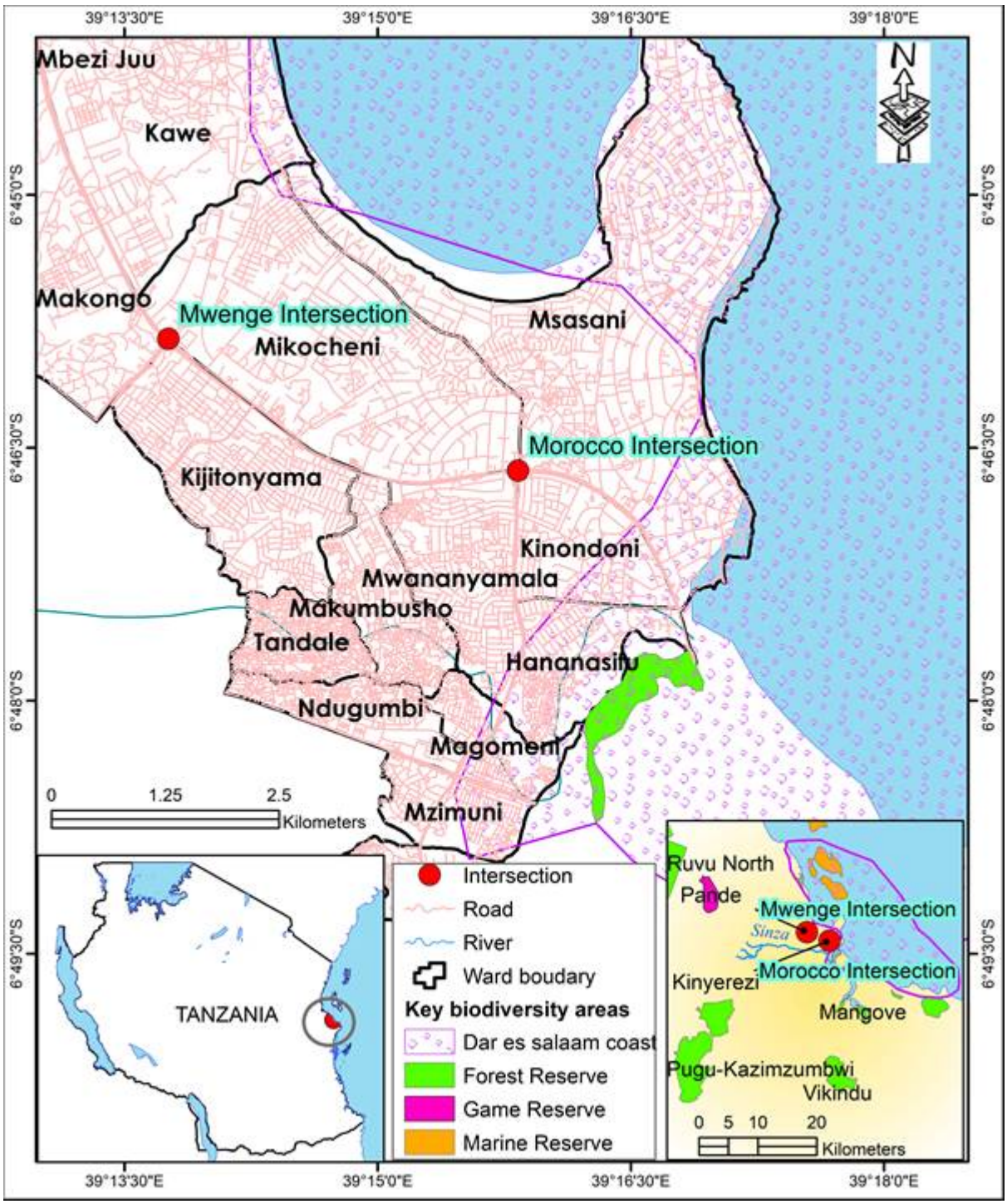
Figure 5.3.8 Map showing trees to be cleared at Mwenge Intersection area

5.3.3.2 Fauna

The urban nature of the area of the project site and the general surrounding does not indicate the presence of big wild animals. Furthermore, based on the described vegetation of the area which also gives the indication of the habitats of fauna, there are neither big wild animals nor species of ecological significance (i.e., rare or endangered species) that would require special attention in the area. However, common mobile small animals are expected in the area to include avifauna, reptiles, insects and earth invertebrates. Some of fauna species observed in the area include avifauna and insects. Avifauna observed include House sparrow *(Passer domesticus)* and Cape crow/Black crow *(Corvus capensis)* while insects were mainly grasshopper, butterfly tiny ground insects.

5.3.4 Rare, endangered and endemic species in the project area and its vicinity

The project area is not located within a nationally or internationally designated area which could represent the more sensitive ecosystem. As far as the scope of this ESIA study is concerned, there are no known endangered, threatened or endemic animals or plant species near the project area. A Key Biodiversity Area (KBA) (Dar es Salaam Coast) is identified near the project area, but the two target intersections are outside of this area". Figure 5.3.9 below show the location of the KBA range and the target intersections



Source: JICA Survey Team

Figure 5.3.9 The location of the KBA range and the target intersections

5.3.5 Landscape

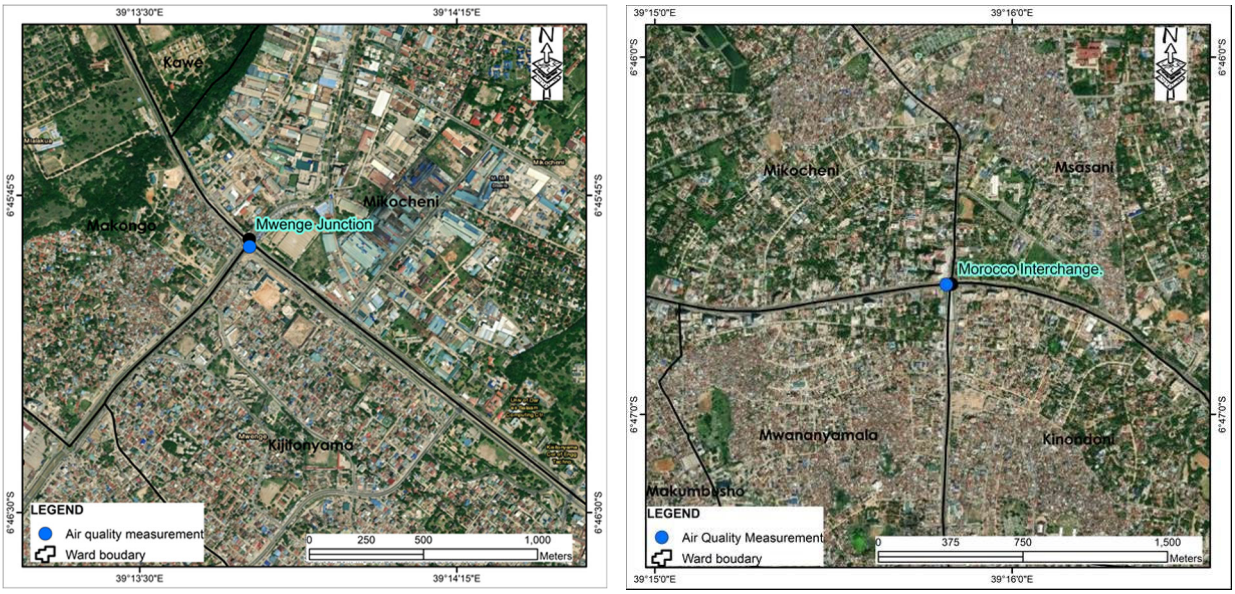
The project area and its surroundings are already urbanised and there are no natural, cultural or religious resources or facilities of conservation value in the landscape.

5.4 Living Environment (Pollution)

5.4.1 Air pollution

As there are no existing air quality measurements, air quality status survey was conducted at each of the targeted intersections. Survey location maps are shown in Figure 5.4.1.

The survey items were carbon monoxide (CO), nitrogen dioxide (NO2), sulphur dioxide (SO2), ozone (O3), particulate matter (PM2.5, PM10) and lead (Pb).



Mwenge Intersection　　Morocco Intersection

Source: JICA Survey Team

Figure 5.4.1 Air quality survey point location

All measured results were sufficiently small compared to the permissible limits for Tanzania. The results for NO2, PM2.5 and PM10 exceeded the WHO guideline values. However, the extent of the exceedances at roadside locations is understandable as these guideline values represent the recommended levels in residential areas.

Table 5.4.1 Air Quality Measurement Results; Mwenge Intersection

Date	CO mg/m³	NO_2 mg/m³	SO_2 mg/m³	O^3 mg/m³	$PM_{2.5}$ mg/m³	PM_{10} mg/m³
28/06/2024	1.17	0.060	0.003	0.006	0.013	0.040
29/06/2024	1.27	0.074	0.001	0.008	0.016	0.045
30/06/2024	1.03	0.047	0.00	0.008	0.013	0.029
1/07/2024	0.9	0.037	0.00	0.008	0.017	0.039
2/07/2024	1.16	0.034	0.00	0.009	0.023	0.047
3/07/2024	1.34	0.045	0.00	0.005	0.021	0.049
4/07/2024	1.22	0.052	0.00	0.008	0.023	0.047
Average	1.16	0.050	0.00	0.007	0.018	0.042
Local Stds Limits	15	0.12	0.5	0.120	0.075	0.15
WHO Guidelines	30	0.025	0.040	0.100	0.015	0.045

Source: JICA Survey Team
THE ENVIRONMENTAL MANAGEMENT (AIR QUALITY STANDARDS) REGULATIONS, 2007 Permissible weight concentration (emission limits) from the atmosphere to a receptor
WHO GLOBAL AIR QUALITY GUIDELINES,2021

Table 5.4.2 Air Quality Measurement Results; Morocco Intersection

Date	CO mg/m³	NO_2 mg/m³	SO_2 mg/m³	O^3 mg/m³	$PM_{2.5}$ mg/m³	PM_{10} mg/m³
21/06/2024	0.67	0.053	0.00	0.030	0.013	0.037
22/06/2024	0.47	0.040	0.00	0.045	0.015	0.045
23/06/2024	0.38	0.054	0.00	0.035	0.012	0.034
24/06/2024	0.86	0.049	0.00	0.021	0.011	0.038
25/06/2024	0.85	0.048	0.01	0.015	0.012	0.037
26/06/2024	1.00	0.044	0.00	0.004	0.013	0.037
27/06/2024	0.91	0.048	0.00	0.016	0.012	0.037
Average	0.73	0.048	0.00	0.024	0.013	0.038
Local Stds Limits	15	0.12	0.5	0.120	0.075	0.15
WHO Guidelines	30	0.025	0.040	0.100	0.015	0.045

Source: JICA Survey Team

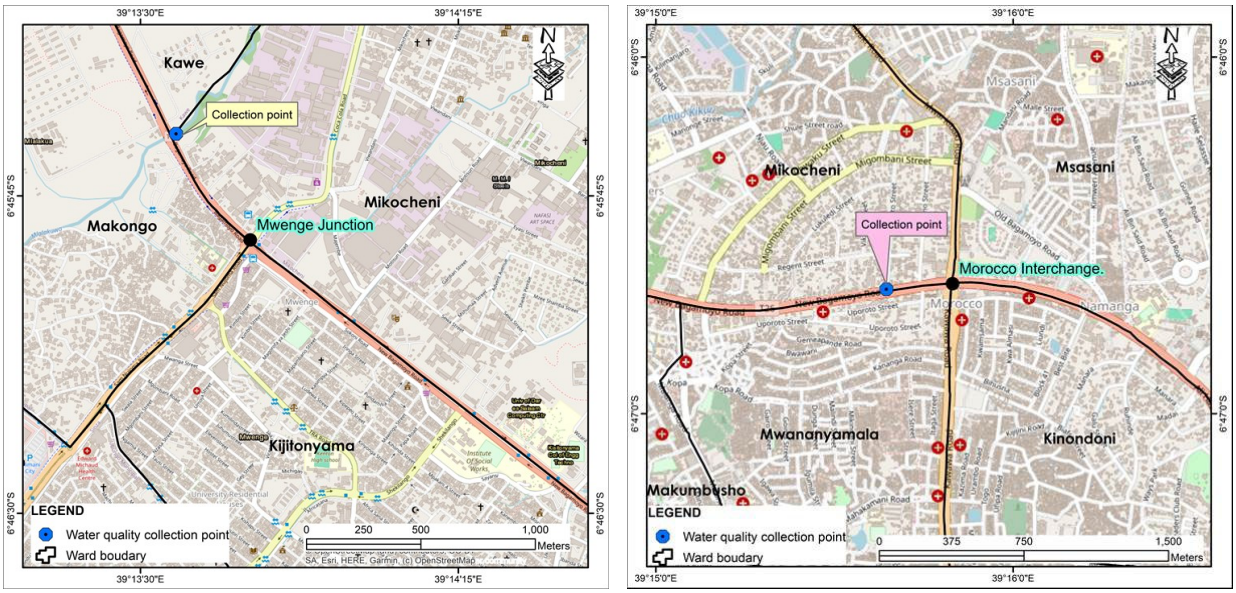
THE ENVIRONMENTAL MANAGEMENT (AIR QUALITY STANDARDS) REGULATIONS, 2007 Permissible weight concentration (emission limits) from the atmosphere to a receptor

WHO GLOBAL AIR QUALITY GUIDELINES,2021

5.4.2 Water Pollution

Water quality status surveys were conducted in the respective vicinity of the target intersections due to the non-availability of existing water quality measurements. As the project does not discharge any facility effluent other than rainwater, the survey items were physical and microbiological components of the items for which effluent standards have been determined.

The target project crosses the Mlalakuwa River west of the Mwenge intersection. This river has low flow or completely dries up during the dry season. The water sampling points are shown in Figure 5.4.2.



Mwenge Intersection Morocco Intersection

Source: JICA Survey Team

Figure 5.4.2 Water Quality Collection Point

The survey results are shown in Table 5.4.3. The survey results show that BOD exceeded the standard values, which could be due to the inflow of domestic wastewater.

Table 5.4.3 Water pollution Measurement Results

Sn	PARAMETER	Units	Mwenge	Morocco	Standards
			Mlalakuwa River (Bagamoyo Road)	Stormwater drainage (Bagamoyo Road)	
1	pH		7.93	8.13	6.5-8.5
2	Turbidity	NTU	72	46.0	300
3	Colour	Hazen	141	54	300
4	Biological oxygen demand (BOD)	mg/l	62.0	79	30
5	Total suspended solids (TSS)	mg/l	80.0	65.0	100
6	Total coliform	Count/100ml	$12*10^2$	$2*10^2$	10,000

Source: JICA Survey Team

THE ENVIRONMENTAL MANAGEMENT (WATER QUALITY STANDARDS) REGULATIONS, 2007 Permissible Limits for Municipal and Industrial Effluents

5.4.3 Waste

The local Government (Urban authorities) Act 1982 imposes under urban authorities the responsibility "to remove refuse and filth from any public or private place" (sect. 55 g) and to provide and maintain public refuse containers for the temporary deposit and collection of rubbish. The Municipal Council plays an important role in the financing, planning and providing waste collection and disposal services. Under the Municipal Council, waste management belongs to the structure of the Waste management Department, but other departments such as Works, Health and urban planning carry out part of its operation. Kinondoni municipality is estimated to generate about 1,223.6 tons of waste per day, (446,614 tonnes per year) according to the current generation projections based on the other informal sectors comprise this amount.

Solid waste collection in the project area is carried out by both the Municipal, some private companies, community-based organizations and informal sectors. Apart from collection activities, the Municipality is also responsible for supervising the franchisees involved in SWM. Currently the transportation of solid waste is done by both the Municipal council and the private sectors. The KMC have about ten Trucks for transportation of solid waste from different areas of the Municipal to the current dump site which is situated about 35 Km from the Centre of Kinondoni which makes the round trip to cover about 70Km. Other trucks are owned by the private sectors including contractors, Community groups and NGO's. Other equipment which are used to collect the waste and transportation is the Trailers owned by municipal Council and these are pulled by Municipal Tractors and other private owned tractors which are hired.

Table 5.4.4 The Waste Generation in The Project Wards

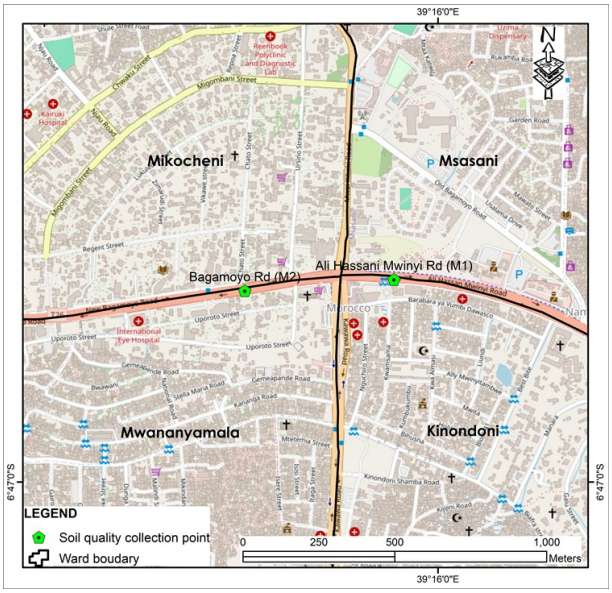
Ward	Wards					
	Mikocheni	Makongo	Kijitonyama	Msasani	Kinondoni	Mwanayamala
Amount in tones	84	50	101	92	55	108.5

Source: KMC, 2018

5.4.4 Soil Pollution

As there were no existing soil pollution measurements, soil pollution surveys were carried out in the vicinity of each of the target intersections. The survey sites were three at the Mwenge intersection and two at the Morocco intersection, considering the extent of the flyover construction. The survey sites are shown in Figures 10.2.5. Current soil concentrations in both areas were generally good and within local standards, except for cadmium. The reason for the large exceedance of the cadmium standard is that the topography of the project site consists of coastal terraces, and it is highly likely that cadmium of ancient seawater origin was detected.

Mwenge Intersection



Morocco Intersection

Source: JICA Survey Team

Figure 5.4.3 Soil Quality Collection Point

Table 5.4.5 Soil Quality for Mwenge Area

S/N	Parameter	Units	Bagamoyo Rd (MW-1)	Bagamoyo Rd (MW-2)	Sam Nujoma Rd (MW-3)	Local Standards
1	Cadmium	mg/kg	5.342	3.090	15.989	1
2	Chromium	mg/kg	6.005	6.253	8.838	100
3	Lead	mg/kg	15.868	11.068	18.935	200
4	Nickel	mg/kg	27.397	14.182	23.401	100
5	Zinc	mg/kg	68.790	46.764	89.495	150
6	Boron	mg/kg	0.264	0.240	0.216	N.M
7	Copper	mg/kg	5.731	3.929	4.110	200

Note: N.M – Not mentioned

Source: JICA Survey Team

THE ENVIRONMENTAL MANAGEMENT (SOIL QUALITY STANDARDS) REGULATIONS, 2007 SOIL QUALITY STANDARDS

Table 5.4.6 Soil Quality for Morocco Area

S/N	Parameter	Units	Ali Hassani Mwinyi Rd (MO1)	Bagamoyo Rd (MO2)	Local Standards mg/kg
1	Cadmium	mg/kg	5.409	7.998	1
2	Chromium	mg/kg	10.465	10.673	100
3	Lead	mg/kg	27.213	12.941	200
4	Nickel	mg/kg	20.079	20.103	100
5	Zinc	mg/kg	51.331	52.742	150
6	Boron	mg/kg	0.192	0.158	N.M
7	Copper	mg/kg	5.409	5.468	200

Note: N.M – Not mentioned

Source: JICA Survey Team

THE ENVIRONMENTAL MANAGEMENT (SOIL QUALITY STANDARDS) REGULATIONS, 2007 SOIL QUALITY STANDARDS

5.4.5 Noise and Vibration

Noise and vibration surveys were conducted in the vicinity of each of the target intersections due to the lack of existing noise and vibration measurements. Considering the project impact, survey sites were set at

locations along the project road and near sensitive facilities in the neighbourhood, such as schools, hospitals and churches. The survey sites are shown in Figure 5.4.4.

As shown in Table 5.4.7 and Table 5.4.8 the daytime and nighttime noise levels measured at most of the survey points exceed the Tanzanian daytime and nighttime noise standards, which is not a good condition for the living environment. As noise levels at roadside locations are greater than those near sensitive receptor, the main noise source is considered to be vehicular traffic noise.

Mwenge Intersection Morocco Intersection

Source: JICA Survey Team

Figure 5.4.4 Average Noise and Vibration Levels Measures

Table 5.4.7 Average Noise and Vibration Levels Measures at Mwenge

S/N	Location	Site Description	GPS Readings	Measured Parameters		
				Noise Levels in dBA		Vibration in mm/s PPV
				Average Daytime Noise	Average Nighttime Noise	Average Ground Vibration
1	Bagamoyo road near ITV bus stop	Road side	06°46`00.11S - 39°13`53.43''E	71.14	62.78	0.29
2	Bagamoyo Road near Lugalo Hosp	Road side	06°45`44.96S - 39°13`39.71''E	69.21	70.54	0.29
3	Sam Nujoma Road	Road side	06°45`55.48S - 39°13`41.03''E	69.09	66.48	0.28
4	Coca cola Road	Road side	06°45`47.16S - 39°13`51.52''E	65.15	66.97	0.16
5	Mwenge market Centre	Nearby Sensitive Receptor	06°45`58.92S - 39°13`43.26''E	62.72	67.97	0.14
6	Efatha Church	Nearby Sensitive Receptor	06°45`45.04S - 39°13`45.03''E	54.03	53.2	0.05
7	Mwenge Dispensary	Nearby Sensitive Receptor	06°46`01.86S - 39°13`53.55''E	60.21	50.54	0.04
8	Near Lugalo Hospital	Nearby Sensitive Receptor	06°45`52.42S - 39°13`40.03''E	54.77	49.83	0.098
Standards				60	50	5

Source: JICA Survey Team

THE ENVIRONMENTAL MANAGEMENT (Quality Standards for Control of Noise and Vibration Pollution) REGULATIONS, 2015 Quality Standards for Control of Noise and Vibration Pollution

Table 5.4.8 Average Noise and Vibration Levels Measures at Morocco

S/N	Location	Site Description	GPS Readings	Measured Parameters		
				Noise Levels in dBA		Vibration-mm/s PPV
				Average Daytime Noise	Average Nighttime Noise	Average Ground Vibration
1	Ali Hassan Mwinyi (to City Centre)	Road side	06°46`35.51S - 39°16`04.03''E	72.97	66.11	0.36
2	Bagamoyo Road (to Mwenge)	Road side	06°46`39.40S - 39°15`35.67''E	71.63	74.48	0.37
3	Mwai Kibaki Road	Road side	06°46`40.80S - 39°15`35.21''E	72.5	68.71	0.33
4	Kawawa Road	Road side	06°46`32.12S - 39°15`49.58''E	71.9	69.15	0.35
5	Sunrise Primary School	Nearby Sensitive Receptor	06°46`33.63S - 39°15`38.31''E	62.99	51.68	0.04
6	Kumbu Kumbu Primary School	Nearby Sensitive Receptor	06°46`48.13S - 39°15`56.73''E	69.62	44.21	0.01
7	Mt. Mkombizi Hospital	Nearby Sensitive Receptor	06°46`45.02S - 39°15`51.09''E	69.03	59.5	0.11
8	International Eye Clinic	Nearby Sensitive Receptor	06°46`42.64S - 39°15`27.43''E	66.35	68.11	0.2
Standards				60	50	5

Source: JICA Survey Team

THE ENVIRONMENTAL MANAGEMENT (Quality Standards for Control of Noise and Vibration Pollution) REGULATIONS, 2015 Quality Standards for Control of Noise and Vibration Pollution

6. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

6.1 Introduction

In establishing the project in the area, various environmental and social issues may arise at any phase of the project development i.e., from site selection to decommissioning phases. These issues need to be addressed so that the envisaged operations do not impair the integrity of the environment and ensure that they are in line with policies and legal regime operating in Tanzania. The policy, legal and administrative frameworks are the basis of ESIA. A policy framework is required to provide broad guidelines on areas of focus in undertaking environmental management activities in the sector. A legal and regulatory framework is essential for providing mandate, allocating specific responsibility and accountability to key factors and stakeholders, and also prescribes and enforces specific operating environmental procedures and standards. Further, an institutional framework is required to develop policies, guidelines and plans; to ensure compliance with laws and regulations; and to monitor, review and adapt policies, plans and regulations in the light of experience.

In preparing Environmental and Social Management plan (ESMP) and Environmental Monitoring Plan (EMP) for the ESIA, specific institutions take account of location, cumulative and strategic development issues, and define development objectives, economic and environmental standards and targets, and decision criteria. Without such a context the findings of any ESIA will have little meaning; the decision criteria will be inconsistent, and mechanisms for ensuring compliance with any recommendations will be lacking. In particular, there will be no mechanism for addressing cumulative and incremental environmental issues. The project for which this ESIA was prepared needs to comply with the JICA Guidelines, 2022; World Bank Environmental and Social Standards (ESSs), the Equator Principles agreed by leading international banks and Tanzania's national environmental policy and legislation. The legislation applicable to this project addresses two important aspects of environmental quality and proper management of natural resources.

For the appropriate implementation of the proposed project, the TANROADs and associated contractors are recommended to observe the policies, legislation and administrative issues pertaining to the environmental management as indicated below.

6.2 Relevant Policies

The Tanzania government has been developing and reviewing national policies to address and anchor environmental management in the various sectors that would be impacted by development. Among others, the objectives of these policies are to regulate the development undertaken within respective sectors so that they are not carried out at the detrimental expense of the environment. The relevant sectoral and cross – sectoral policies that address environmental management, as far as this project is concerned and which form the corner stone of the present study, are briefly discussed below:

6.3 The National Environmental Policy, 2021

The National Environmental Policy (NEP) sets broad goals committing Tanzania to sustainable development of its natural resources. The policy provides the framework for the formulation of plans, programmes and guidelines for the achievement of sustainable development. The effective implementation of this policy requires mainstreaming environmental issues at all levels, strengthening institutional

governance and public participation in the environmental management regime. The long-term vision of this policy is geared towards the realization of environmental integrity, assurance of food security, poverty alleviation and increased contribution of the environmental resources to the national economy. The key objectives of the policy are to:

- Enhance environmentally sound management of land resource for socio-economic development.
- Promote environmental management of water sources.
- Strengthen conservation of wildlife habitats and biodiversity.
- Enhance conservation of aquatic system for sustained ecological services and socioeconomic wellbeing.
- Enhance conservation of forest ecosystems for sustainable provision of environmental goods and services.
- Manage pollution for safe and a healthy environment.
- Strengthen the national capacity for addressing climate change impacts.
- Ensure safety at all levels of the application of modern biotechnology.
- Promote good governance in environmental management at all levels.
- Enhance predictable, accessible, adequate and sustainable financial resources for environmental management and promote gender consideration in environmental management.

The policy advocates using other relevant approaches in environmental management such as economic instruments, environmental standards, indicators and legislation. Also, The NEP advocates the adoption of Environmental Impact Assessment (EIA) as a tool for screening development projects which are likely to cause adverse environmental impacts. The project proponent will ensure mainstreaming of the NEP objectives and strategies into the project and will ensure there is collaboration with other stakeholders as required by the policy.

6.4 The Environmental Management Act, Cap 191

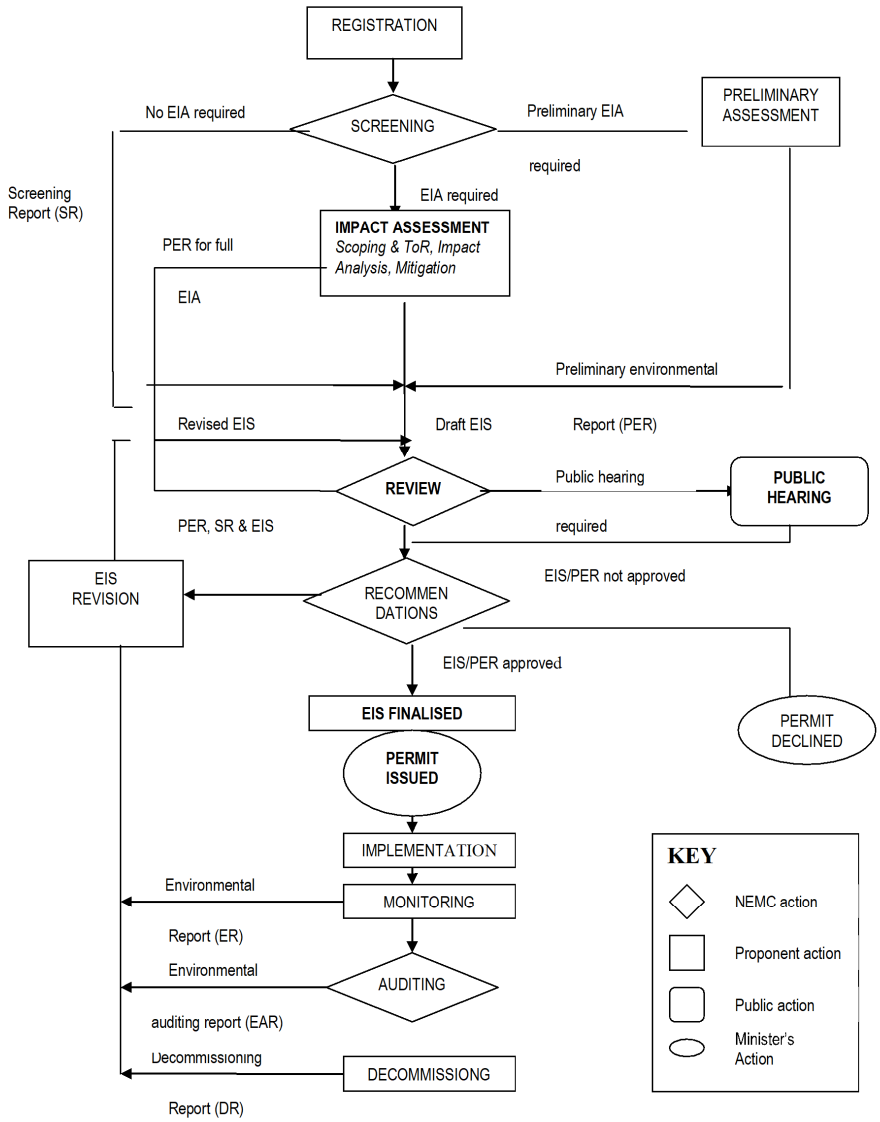
The Environmental Management Act cap 191 builds on NEP's vision of a consistent and coherent environmental management framework. The Act introduces a concept of the right of Tanzanians to a clean, safe and healthy environment and the right of Tanzanians to access various segments of environment for recreational, educational, health, spiritual, cultural and economic purposes (Section 4 (1) and (2)). The Act imposes an obligation on developers to:

- Comply with license conditions, including the EIA certificate (S.201). The act requires the developer to conduct an EIA before the commencement of the project to determine whether the project may/or is likely to have or will have a significant impact on the environment.
- As land users and occupiers to protect, improve and nourish the land and use it in an environmentally sustainable manner (S. 72)
- Abstain from discharging any hazardous substances, chemicals, oils or their mixture into waters or any segment of the environment (S.110)
- Comply with environmental quality standards (S.141)
- Control, manage, & dispose of waste including litter, liquid, gaseous and hazardous wastes (Part IX).

This Act also provides a legal framework necessary for coordinating harmonious and conflicting activities to integrate such activities into an overall sustainable environmental management system by providing key technical support to sector Ministries. As such, the proponent undertook, this study to comply with EMA requirement.

6.5 The Environmental Impact Assessment and Audit Regulations, 2005 as amended in 2018

These regulations have provided the list of projects which requires an Environmental Impact Assessment study. Since such a project is likely to have some adverse environmental impacts. An in-depth study is required to determine the scale, extent, and significance of the impacts and identify appropriate mitigation measures. Furthermore, the regulation provides explicitly procedures and guidelines for carrying out the Environmental Impact Assessment in Tanzania. This study has been carried out under these regulations.



Source: JICA Survey Team

Figure 6.5.1 Main steps in the EIA process at national level

6.6 The Environmental Management Regulations, 2021

Registration and Practicing of Environmental Experts

Section 83 of the EMA (2004) stipulates that the Environmental Impact Assessment shall be conducted by experts or firms of experts whose names and qualifications are registered by NEMC. The NEMC maintain a registry of EA and EIA experts. These regulations also set the code of practice of the experts for which

the Environmental Impact Assessment experts for this project subscribe. This study has been carried out by the registered expert by NEMC.

Environmental standards

Chapter 5 of the EMA specifies environmental standards. The areas covered include water quality, wastewater, air pollution, noise and vibration, soil pollution, hazardous waste management and electrical and electronic waste.

The items for which specific standards are specified are listed in Tables 10.1.1 to 10.1.10.

Table 6.6.1 Permissible weight concentration (emission limits) from the atmosphere to a receptor

Pollutant	Regulations in Tanzania			WHO Guidelines
	Guideline	Limit Level	Test Method	
Sulphur oxides, SOx	Annual mean of 40 – 60 µg/Nm^3 (0.05-0.08 mg/kg) Or 24 – hour average 100 µg/Nm^3 (0.129 mg/kg)	Daily average of hourly values shall not exceed 0.1 mg/kg 0.5 mg/Nm^3 for 10 minutes	TSZ 837	24hours 40µg/m^3
Carbon monoxide, CO	Aims at preventing carboxyhaemoglobin levels exceeding 2.5-3% in non-smoking people.	1. A maximum permitted exposure of 100mg/Nm3 for periods not exceeding 15 minutes. 2. Time-weighed exposures at the following levels: 100 mg/Nm^3 for 15 minutes 60 mg/Nm^3 for 30 minutes 30 mg/Nm^3 for 60 minutes 10 mg/Nm^3 for 8 hours. Or Daily average of hourly values shall not exceed 10mg/kg and average of hourly values in eight consecutive hours shall not exceed 20 mg/kg.	TSZ 837	24hours 4µg/m^3
Black smoke and suspended particulate matters (PM 10)	Black smoke 40 to 60 µg/Nm^3 (0.05-0.08mg/kg) PM 10 60 to 90 µg/Nm^3(0.05 – 0.116 mg/kg)	Daily average of hourly values shall not exceed 0.10 µg/Nm3 and hourly values shall not exceed 0.20 µg/Nm^3	TSZ 837	Annual average 15µg/m^3 24hours 40µg/m^3
Nitrogen dioxide. NOx	Annual mean of 0.1 µg/Nm^3	150 µg/Nm^3 for 24-hours average value 120 µg/Nm^3 for 8 hours	TSZ 837	Annual average 10µg/m^3 24 hours 25µg/m^3
Lead	Annual mean of 0.5 –1.0 µg/Nm^3	1.5 µg/Nm^3 for 24 – hours average value	ISO 9855	-
Ozone	Annual mean of 10 –100 µg/Nm^3	120 µg/Nm^3 for 8 – hours average value	-	8hours 100µg/m^3

Source: The Environmental Management (Air Quality Standards) Regulations, 2007

WHO Global Air Quality Guidelines,2021

Table 6.6.2 Emission Limits for Passenger Cars (>2.5 tonnes)

Compound	Limit(g/km)		Test Method
	Diesel	Petrol (Gasoline)	
CO	2.72	2.72	TZS 985 ISO 3929 TZS 986 ISO 393
HC	-	0.20	
HC + NOx	0.97	0.970	
NOx	0.50	0.50	
PM	0.14	-	

Source: The Environmental Management (Air Quality Standards) Regulations, 2007

Table 6.6.3 Emission Limits for Light Commercial Vehicles

Compound	Limit (g/km)				Test Method
	Diesel <1305kg	Diesel 1305kg-1760kg	Diesel >1760kg	Petrol (Gasoline) <1305kg	
CO	2.72	5.17	6.90	2.72	TZS 985 ISO 3929
HC	-	-	-	0.20	

HC + NOx	0.97	1.40	1.70	-	TZS 986 ISO 393
NOx	0.50	0.65	0.78	-	
PM	0.14	0.19	0.25	-	

Source: The Environmental Management (Air Quality Standards) Regulations, 2007

Table 6.6.4 Emission Limits for Heavy Duty (HD) Diesel Engines

Compound	Limit (g/km)	Test Method
CO	4.5 g/kWh	TZS 985 ISO 3929 TZS 986 ISO 393
HC	1.1 g/kWh	
NOx	8 g/kWh	
PM	0.612 g/kWh	
Black smoke	0.15 g/m	

Source: THE ENVIRONMENTAL MANAGEMENT (AIR QUALITY STANDARDS) REGULATIONS, 2007

Table 6.6.5 Exhaust Emission Limits for 3 and 2-Wheel Vehicles

Compound	Limit (g/km)		Test Method
	3 -Wheels Gasoline	2 - Wheels Gasoline	
CO	4.0	2.0	TZS 985 / ISO 3929 TZS 986 / ISO 393
HC＋NOX	2.0	3.6	

Source: THE ENVIRONMENTAL MANAGEMENT (AIR QUALITY STANDARDS) REGULATIONS, 2007

Table 6.6.6 Maximum Permissible Noise Levels for Places or Establishments of Entertainment

Facility	Noise Limit dBA (Leq)	
	Day	Night
Any building used as hospital, convalescence home, home for the aged, sanatorium and institutes of higher learning, conference rooms, public library, environmental or recreational sites.	45	35
Residential building	50	35
Mixed residential (with some commercial and entertainment)	55	45
Residential and industry small–scale production and commerce	60	50
Industrial area	70	60
Time Frame	6:00am -10:00 pm	10:00pm-6:00 am

Source: THE ENVIRONMENTAL MANAGEMENT (Quality Standards for Control of Noise and Vibration Pollution) Regulations, 2015

Table 6.6.7 Maximum Permissible Noise Levels for Construction Site

Facility	Noise Limit dBA (Leq)	
	Day	Night
Hospital, schools, Institutions of higher learning, homes for the disabled, etc	60	50
Building other than those prescribed in (i) above	75	65
Time Frame	6:00am -10:00 pm	10:00pm-6:00 am

Source: THE ENVIRONMENTAL MANAGEMENT (Quality Standards for Control of Noise and Vibration Pollution) Regulations, 2015

Table 6.6.8 Tolerance Limit for Ground Vibration at Sensitive Sites

Limit on ground vibration	Test method
5mm/s PPV	Seismograph

Source: THE ENVIRONMENTAL MANAGEMENT (Quality Standards for Control of Noise and Vibration Pollution) Regulations, 2015

Tabel 6.6.1 WHO Guidance on Environmental Noise

Noise source	Recommended average noise exposure (Sound pressure level)	
	Lden [dB]	Night exposure L_{night}[dB]
Road traffic noise	<53	<45
Railway noise	<54	<44
Aircraft noise	<45	<40
Wind turbine noise	<45	-

Source: Compendium of WHO and other UN guidance on health and environment 2022 update

Table 6.6.9 Permissible Limits for Municipal and Industrial Effluents

Parameter	Limit	Test Method
BOD5 at 20 oC	30 mg/l	TZS 861(Part 3):2006 – Five-day BOD Method
COD	60 mg/l	TZS 861(Part 4):2006 – Dichromate Digestion Method
Colour	300 TCU	ISO 7887: 1994, Water quality – Examination and determination of colour – Section 3: Determination of true colour using optical instruments
pH range	6.5-8.5	TZS 861(Part 2):2006 – Electrometric Method
Temperature range	20-35℃	
Total Suspended Solids (TSS)	100 mg/	TZS 861(Part 1):2006 – Gravimetric Method
Turbidity	300 NTU	APHA Standard Methods:2130 B. Nephelometric Method
Total Coliform Organisms	10,000counts/100mL	ISO 6222:1999, Microbiological methods

Source: The Environmental Management (Water Quality Standards) Regulations, 2007

Note: Inorganic constituents and organic constituents are also defined but are not described here.

6.7 Relevant Policies and Regulations

Other relevant policies and legislation are listed inTable 6.7.1.

Table 6.7.1 Other Relevant Policy and Regulations

Category	Title
Policy	The National Road Safety Policy, 2009
	The National Transport Policy, 2003
	The Water Policy, 2002
	The Land Policy, 1995
	The National Construction Policy, 2003
	The National Mineral Policy of Tanzania, 2009
	The National Health Policy, 2007
	The Energy Policy of Tanzania, 2015
	The National Policy on HIV/AIDS (2001)
	The National Employment Policy, 2021
	The National Women and Gender Development Policy, 2000
	The National Occupational Health and Safety Policy, 2009
Regulations	The Environmental Management Act, Cap 191
	The Road Act No. 13 of 2007
	The Road Traffic (Amendment) Act [Cap. 168 R.E 2019]
	The Land Act, [Cap. 113 R.E 2019]
	The Local Government (Urban Authorities) Act, [Cap. 288 R.E 2019]
	The Land Use Planning Act, [Cap. 116 R.E 2019]
	The Water Resource Management Act, [Cap. 331 R.E 2019]

	The Workers Compensation Act, [Cap. 263 R.E 2019]
	The Occupation Health and Safety Act, [Cap. 297 R.E 2019]
	The Contractors Registration (Amendments) Act, [Cap. 235 R.E 2019]
	The Engineers Registration Act, [Cap. 63 R.E 2019]
	The Public Health Act, [Cap. 99 R.E 2019]
	The HIV and AIDS (Prevention and Control) Act, [Cap. 431 R.E 2019]
	The Explosives Act (1963) [Cap. 45 R.E 2019]

Source: JICA Survey Team

6.8 Institutional Framework

6.8.1 Responsibilities and roles

The Tanzania EIA practice gives different functions and responsibilities to all parties involved in the ESIA process of any proposed development undertaking to which ESIA is obligatory. Table 3.3 provides key institutions to the proposed project. The Environmental Management Act (EMA, Cap 191) give mandate to NEMC to undertake enforcement, compliance, review and monitoring of environmental impact assessment and has a role of facilitating public participation in environmental decision-making, exercise general supervision and coordinating over all matters relating to the environment.

The EMA, Cap 191 give mandate to NEMC to undertake enforcement, compliance, review and monitoring of environmental impact assessment and has a role of facilitating public participation in environmental decision-making, exercise general supervision and coordinating over all matters relating to the environment. The Act empowers NEMC to determine whether a proposed project should be subjected to an ESIA, approves consultants to undertake the ESIA study, invites public comments and also has the statutory authority to issue the certificates of approval via the Minister responsible for environment. NEMC is currently the designated authority to carry out the review of ESIA including site visit and handling TAC meeting, monitoring and auditing of environmental performance of the project (periodic and independent re-assessment of the undertaking).

Table 6.8.1 Key Institutions to the ESIA Process

Level	Institution	Role and Responsibility
National level	President's Office – Regional Administration and Local Government	• Responsible for matters relating to Regional Administration and Local Government, including giving policy guidelines necessary for the promotion, protection and sustainable management of the environment.
	Vice President's Office (Division of Environment)	• Coordinate various environment management activities in Tanzania. • Advise the Government on legislative and other measures for the management of the environment. • Advise the Government on international environmental agreements • Monitor and assess activities, being carried out by relevant agencies in order to ensure that the environment is not degraded • Prepare and issue a report on the state of the environment in Tanzania. • Coordinate the implementation of the National Environmental Policy.

Level	Institution	Role and Responsibility
	National Environnent Management Council (NEMC)	• Carry out environmental audit and environmental monitoring. • Carry out surveys which will assist in the proper management and conservation of the environment. • Undertake and co-ordinate research, investigation and surveys in conservation and management. • Review and recommend for approval of environment impact statements. • Enforce and ensure compliance of the national environmental quality standards professional indemnity insurance. • Initiate and evolve procedures and safeguards for the prevention of accidents which may cause environmental degradation and evolve remedial measures where accidents occur. • Undertake in co-operation with relevant key stakeholder's environmental education and public awareness. • Render advice and technical support, where possible to different stakeholders.
	Ministry of Lands, Housing and Human Settlements Development	• Issuing rights of occupancy, • Overseeing land use planning and issues relating to compensation and physical and economic resettlement (if any)
	Ministry of Works	• The Ministry of Works is the parent ministry of TANROADS. It is the highest government institution to all the aspects pertinent to the planning, execution, and post execution operation and maintenance of the project road. • The ministry is charged with developing policies and guidelines for roads construction projects and maintenances. • Ensure compliance with the various regulations, guidelines and procedures issued by the Minister responsible for the environment
	Ministry of Water Basin Water Offices	• Responsible for issuing water use permits, • Enforcing laws and regulation of water quality and utilization, as well as permitted discharge levels. • Co-operate between sectors at the local level. • Resolve conflicts between water users.
	Occupational Safety and Health Authority (OSHA)	• Registration of the construction site, registration of workplace and inspection. • Issuance of OSHA Compliance certificate. • Inspection on OSH related aspects. • Enforcement of Occupational Health and Safety Act, 2003 (Act No. 5/2003).
	DAWASA	• Operating and maintaining all water supply and sewerage services in Dar es Salaam and its satellite towns of Bagamoyo and Kibaha. • Install, managing and maintain water supply and sewerage services facilities
	TTCL	• Managing and maintaining of landline telecommunication networks.
	TANESCO	• Install, managing and maintain electricity supply facilities.
Project Proponent	TANROADS	• Project implementation including mitigation measures. • Ensure environmental compliance • Liaise with the DoE and the NEMC on matters involving the environment and all matters with respect to which cooperation or shared responsibility is desirable or required. • Oversee the preparation of and implementation of ESIA‟s required for investments.
Project Funding Institutions	JICA	• Project financing • Ensure the project is carried out to the highest environmental standards strictly in accordance with the ESIA and JICA Guideline 2022. • Monitoring compliance and commitments made in the ESIA report through supervision.

Level	Institution	Role and Responsibility
Regional level	Dar es Salaam Regional Secretariat Office	• Responsible for environmental coordination of all advice on environmental management in the region and liaises with the Director and the Director General on implementation and enforcement of the Environment Act. • A Regional Environment Management Expert appointed by the Minister responsible for Regional Administration heads the secretariat. • Advising the local authorities on matters relating to the implementation and enforcement of the Environment Act. The Expert links the region with the Director of Environment and Director General. • Advice on implementation of development projects and activities at Regional level.
Municipal level	Kinondoni Municipal Council Executive Director Office	• Chief Executive Officer for all development activities in the Municipal level • Municipal Environmental Officer (MEMO) is responsible for project monitoring on environmental issues. • Responsible for all development activities, implementation and/or support in the Municipal. • Enforcement of laws and regulations. • Coordinate environmental matters at the Municipal level. • In charge of monitoring implementation of the project. • Advice on the implementation of the development of the project and activities at the local government level. • Overseeing community-investor relations.
	Municipal Land, Natural Resource Department	
Ward Level	Mikocheni, Makongo, Msasani, Kinondoni Mwananyamala and Kijitonyama Wards - Ward Councilor, WDC, WEO, Ward Environment Committee	• Oversee general development plans for the Ward. • Provide information on local situation and Extension services. • Technical support and advice. • Project Monitoring (watchdog for the environment, ensure well-being of Ward residents and participate in project activities. Rendering assistance and advice on the implementation of the project.
Community level	Mtaa Council (Chairman/ MEO, Environment Committee);	• Information on local social, economic, environmental situation. • View on socio-economic and cultural value of the sites and on proposed drilling operations. • Project Monitoring (watchdog for the environment, ensure well-being of residents and participate in project activities.
	Local communities, NGOs, CSOs, FBOs	• Project monitoring and management (as watchdogs) • Socioeconomic development in the area. • Provides assistance and advice on the implementation of the project. • Part of the project beneficiaries through employment opportunities, income generation and CSR projects.

Source: JICA Survey Team

7. SCOPING

7.1 Scoping Results

In order to assess the potential environmental and social impacts of the project, the "JICA Guidelines for Environmental and Social Considerations" (January 2022) were used as a scoping exercise. The results of this assessment are presented in Table 7.1.1 and consider the specific circumstances of the project area and the anticipated impacts of project implementation.

Table 7.1.1 Scoping Results

Category	No	Environmental Items	Status of selection		Basis and Reasons for Impact
			P/C Phase	O Phase	
Pollution	1	Air pollution	✔	✔	• P/C Phase: Gases and dust are temporarily generated due to operation of construction equipment and vehicles. • O Phase: Depending on the extent of the increase in traffic, vehicle emissions may have an impact.
	2	Water pollution	✔		• P/C Phase: There is a possibility that water pollution will be caused by wastewater from works sites, heavy machinery, vehicles and worker living quarters. • O Phase: Not change of water quality as there is no nearby stream or river at intersections
	3	Waste	✔		• P/C Phase: Waste such as excavated soil and used construction materials will be generated. Also, old transformer at Morocco TANESCO site will be relocated and/or disposed. Improper disposal or handling can lead to hazardous materials like transformer oil or PCBs contaminating the environment. • O Phase: No activities generating waste are envisaged.
	4	Soil contamination	✔		• P/C Phase: Oil leakages from construction equipment and vehicles are expected. • O Phase: No activities contaminating soil are envisaged.
	5	Noise and Vibration	✔	✔	• P/C Phase: Noise and vibration will be generated due to the operation of construction equipment and vehicles. • O Phase: Depending on the extent of the increase in traffic, noise and vibration impacts may be possible.
	6	Ground subsidence			• P/C Phase: There is no any work expected that could trigger ground subsidence • O Phase: No activities could trigger ground subsidence
	7	Odor			• P/C Phase: There is no any work expected that could generate odor • O Phase: No activities creating offensive odor are envisaged.
	8	Sediment quality			• P/C Phase: No activities that may impact sediment of the waterways are envisaged. • O Phase: There is no any work expected that impact sediment of the waterways are envisaged.
Natural environment	9	Protected area			• P/C Phase: There are no national parks or protected area around the project target site and environs. A Key Biodiversity Area (KBA) (Dar es Salaam Coast) is identified near the project area, but the two target intersections are outside of this area. • O Phase: None
	10	Ecosystem			• P/C Phase: Construction will be done on the existing road and there are no rare flora and fauna in the target area and no impacts on ecosystems envisaged • O Phase: None
	11	Hydrology		✔	• P/C Phase: There is no any work expected that could trigger changes in river water flow. There is no stream or river within the core project area • O Phase: The project is expected to change stormwater drainage conditions.
	12	Topography and geology			• P/C Phase: Construction will be done on the existing road and no major cutting or banking works are planned, no impacts on the terrain and geology envisaged. • O Phase: None
Social	13	Involuntary			• P/C Phase: Land to be affected have been identified and will be acquired and

Category	No	Environmental Items	Status of selection		Basis and Reasons for Impact
			P/C Phase	O Phase	
environment		resettlement			compensated accordingly. Since there is no residential area, involuntary resettlement will not be expected. • O Phase: No additional land acquisition or resettlement will be necessary
	14	The poor			• P/C Phase: There is no poor household found within the project area based on the available information from the National Household Budget Survey (HBS) data. • O Phase: None • The survey within the project area found out that there are no poor residential houses have been identified in and around the project area.
	15	Indigenous and ethnic people			• P/C Phase: There are no ethnic minorities in the project area as defined by the World Bank, ESS7. • O Phase: None
	16	Local economy such as employment and livelihood	✔	✔	• P/C Phase: Employment of locals or a new business opportunity could be ensured for the construction works. • O Phase: Improvement of the intersection will reduce the risks and time spent on road thus positive impact on local economy is expected.
	17	Land use and utilization of local resources			• P/C Phase: Because the Project entails upgrading of an existing road, there will be hardly any impacts on land use and local resources. • O Phase: None
	18	Water usage			• P/C Phase: No impact on water resources. • O Phase: None
	19	Existing social infrastructures and services	✔	✔	• P/C Phase: Construction works may require relocation of infrastructure. Traffic congestion due to increased construction work and construction vehicles is also expected. • O Phase: It is expected that unlawful use of the road will be regulated and contribution will be made to safety of pedestrians.
	20	Social institutions			• P/C Phase: The project entails construction on existing road, there will be hardly any impacts on social institutions. • O Phase: No impact on social organizations, such as social relationship capital and local decision-making bodies, is envisaged,
	21	Misdistribution of benefit and damage			• P/C Phase: There is no factor to cause the misdistribution of benefits and damages. • O Phase: None
	22	Local conflict of interests			• P/C Phase: The project entails construction on existing road, it will not cause any conflict of interests in the local area. • O Phase: None
	23	Cultural heritage			• P/C Phase: As the project entails construction on existing road, there is no cultural heritage, etc. in the project target area and environs. • O Phase: None
	24	Landscape			• P/C Phase: As the project entails construction on existing road, there is no activities causing impact on landscape are envisaged. • O Phase: None
	25	Gender	✔		• P/C Phase: Gender issues in the working environment may arise. • O Phase: No negative impacts on gender issues are envisaged.
	26	Right of children	✔		• P/C Phase: There are concerns that child labour could be induced. • O Phase: No negative impact on the rights of Children is envisaged.
	27	Infectious diseases such as HIV/AIDS	✔		• P/C Phase: Risk of infections could increase due to the influx of construction workers. • O Phase: No impact on infectious diseases such as HIV/AIDS is envisaged.
	28	Labor environment	✔		• P/C Phase: Some negative impacts may result regarding safe labor conditions if technically difficult tasks are carried out by local workers. • O Phase: No activities that may deteriorate working conditions are envisaged.
Others	29	Accidents	✔	✔	• P/C Phase: Risk of accidents may increase for workers and local residents due to increase in construction vehicles. • O Phase: the project will improve safety of vehicles and pedestrians.
	30	Cross boundary impacts and climate change		✔	• P/C Phase: No negative impact is envisaged given the modest size of project. • O Phase: With flyovers, the impact of Greenhouse gases emissions from vehicles is expected to be mitigated

Note:

P Pre- Construction

C: Construction
O: Operation
A+/-: Significant positive/negative impact is expected
B+/-: Positive/negative impact is expected to some extent
C+/-: Extent of positive/negative impact is unknown.
D: No impact is expected.

Source: JICA Survey Team

8. ALTERNATIVE ANALYSIS

8.1 Consideration of the Zero Option

If the Zero Option Alternative is selected, the land would be maintained in its current form.

Presently, chronic traffic congestion at both intersections is a major problem. The expected population and economic growth in the future will increase traffic volumes, leading to further traffic congestion and economic losses, which in turn will hinder the sustainable development of the local economy. Furthermore, the environment in the area surrounding both intersections is expected to be even worse due to traffic congestion and air pollution.

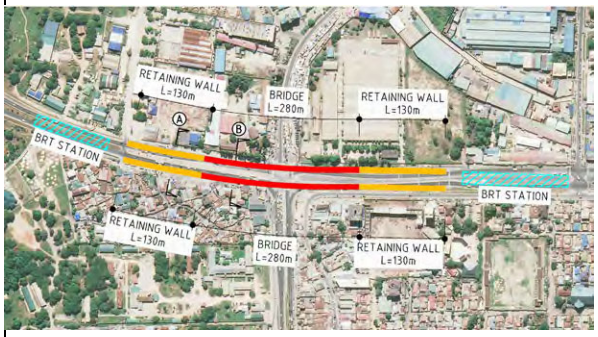
As the construction of the proposed flyovers at the Mwenge and Morocco intersections is expected to have a positive impact on the local economy and the surrounding environment, the zero option is considered undesirable.

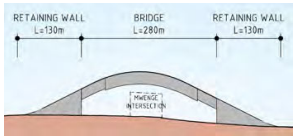
8.2 Comparative study of alternatives

Four alternatives with different structures were set up for the Mwenge and Morocco intersections, respectively, and compared in terms of traffic congestion mitigation, safety, social environmental impact (area of land to be acquired), maintenance, landscape, future expandability and construction costs. The alternatives are shown in and Figure 8.2.1 and Table 8.2.1.

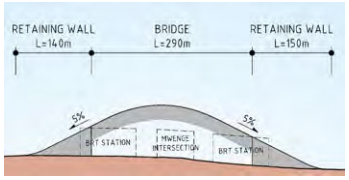
As shown in Figure 8.2.2 and Table 8.2.2 each of the alternatives 2 was found to be favourable after the comparative study. It should be noted that the selected alternative has the lowest social environmental impact at both intersections.

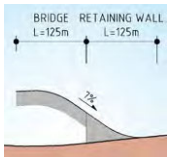
Alternative 1:
Parallel Flyovers along New Bagamoyo Road



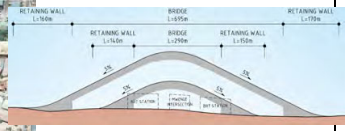


Alternative 2:
Y-shaped flyover for through traffic on New Bagamoyo Road from Tegeta to CBD, and right turn traffic to Sam Nujoma Road (Ubungo)

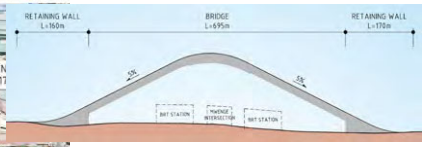


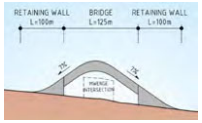


Alternative 3: Alternative 2 plus additional flyover for through traffic on New Bagamoyo Road from the CBD side to the Tegeta side



Alternative 4:
Double Flyover for New Bagamoyo Road and Sam Nujoma Road





Source: JICA Survey Team

Figure 8.2.1 Comparison of alternatives (Morocco intersection)

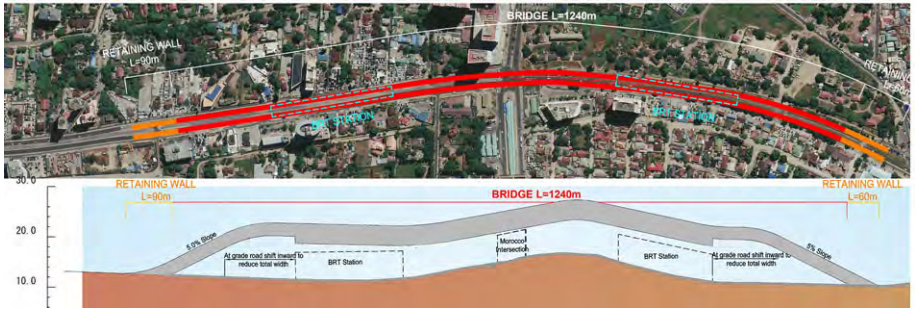
Table 8.2.1 Comparison of alternatives (Mwenge intersection)

Evaluation Items	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Traffic Congestion mitigation	Saturation rate in 2043 will be reduced to (AM) and 0.63 (PM).	Saturation rate in 2043 will be reduced to 0.52(AM) and 0.77 (PM).	Saturation rate in 2043 will be reduced to 0.45 (AM) and 0.37 (PM).	Saturation rate in 2043 will be reduced to 0.62 (AM) and 0.52 (PM).
Safety	A pedestrian safety measure is required to access BRT station.	A traffic safety measure is required at the Yshape diversion.	Same as Alternative 2	No specific problem.
Construction Period	30 months	30 months	42 months	42 months
Traffic Impact during construction	Temporary diversion of traffic for 1,080 m2	Temporary diversion of traffic for 830 m2	Temporary diversion of traffic for 1,850 m2	Temporary diversion of traffic for 2,990 m
Social Environment Impact	Acquisition of 2,400 m2 of land is required.	Acquisition of 1,500m2 of land is required.	Same as Alternative 2	Acquisition of 2,800 m2of land is required.
Landscape	This is a basic type of grade separation, and adverse effects are limited.	Adverse effects are higher than Alt-1 but lower than Alt-3 and 4.	Three-layer structure has the greatest adverse effects on surrounding environment.	Same as Alternative 3
Future Expansion Needs and Feasibility	Saturation rate in 2053 will be 1.08 (AM) and1.05 (PM), but further expansion is difficult.	Saturation rate in 2053 will be 0.77 (AM) and1.14 (PM), but possible to expand to Alt-3.	Saturation rate in 2053 will be0.77 (AM) and 0.67 (PM).	Saturation rate in 2053 will be 0.89 (AM) and 0.88 (PM).
Construction Cost USD million (Ratio)	Approx. 35(1.00)	Approx. 35 (1.00)	Approx. 80 (2.29)	Approx. 95 (2.71)

NOTE: The above construction costs are still tentative and are subject to change after the preliminary design and cost estimates to be carried out in the next stage of the study.

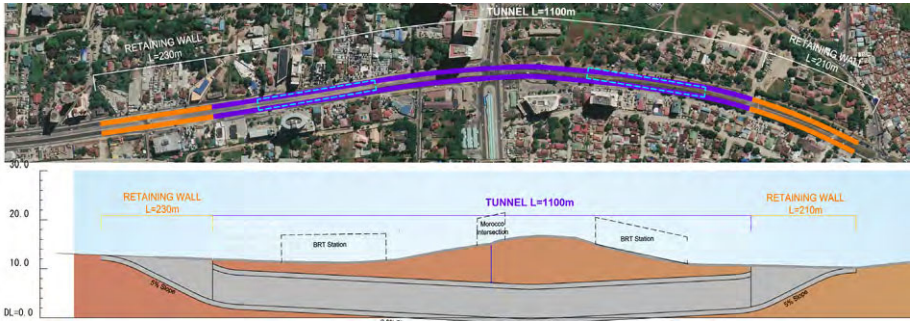
Source: JICA Survey Team

Alternative 1:
Parallel Flyovers along New Bagamoyo Road by retaining the proposed BRT station locations to be constructed under the BRT Phase 4 project

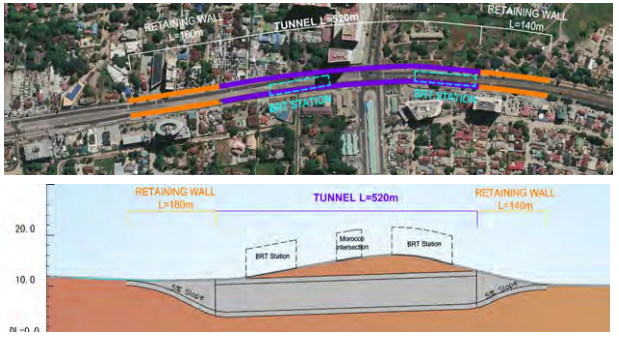


Alternative 2:
Parallel Flyovers along New Bagamoyo Road by optimizing the proposed BRT station locations to be constructed under the BRT Phase 4 project

Alternative 3:
Parallel underpass along New Bagamoyo Road by retaining the proposed BRT station locations to be constructed under the BRT Phase 4 project



Alternative 4
Parallel underpass along New Bagamoyo Road by optimizing the proposed BRT station locations to be constructed under the BRT Phase 4 project



Source: JICA Survey Team

Figure 8.2.2 Comparison of alternatives (Morocco intersection)

Table 8.2.2 Comparison of alternatives (Morocco intersection)

Evaluation Items	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Traffic Congestionmitigation	Saturation rate in 2043 will be reduced to 0.67 (AM) and 0.59 (PM).	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Safety	No specific problem.	No specific problem.	No specific problem.	No specific problem.
Construction Period	36 months	36 months	48 months	42 months
Traffic Impact during construction	Temporary diversion of traffic for 1,390 m	Temporary diversion of traffic for 1,130 m	Temporary diversion of traffic for 1,540 m	Temporary diversion of traffic for 840 m
Social Environment Impact	Acquisition of 1,000 m of land is required.	Same as Alternative1	Acquisition of 1,290 m of land is required.	Same as Alternative 3
Maintainability	Periodic re-paint in and other maintenance work is required.	Only ordinary maintenance work is required.	Tunnel safety facility and drainage pumping system are required.	Tunnel safety facility is required.
Landscape	Higher adverse impact than tunnel option	Same as Alternative 1	Less adverse impact than flyover option	Same as Alternative 3
Future Expansion Needs and Feasibility	Saturation rate in 2053 will be 0.96 (AM) and 0.74 (PM), but further expansion is not difficult. It is difficult to build a pedestrian bridge.	Same as Alternative 1	Saturation rate in 2053 will be 0.99 (AM) and 0.77 (PM), but further expansion and building a pedestrian bridge is not difficult.	Same as Alternative 3
Construction Cost USD million (Ratio)	Approx. 120 (1.50)	Approx. 80 (1.00)	Approx. 175 (2.19)	Approx. 90 (1.13)

NOTE: The above construction costs are still tentative and are subject to change after the preliminary design and cost estimates to be carried out in the next stage of the study.
Source: JICA Survey Team

9. ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS AND EVALUATION

9.1 Pollution Control

9.1.1.1 Air pollution

Pre-construction and Construction Phase

Dust pollution is expected during pre-construction due to the excavation and earth movement from borrow pits. Also, pre-construction Phase will involve mobilization of construction materials, equipment and machines from different sources in Dar es Salaam. The trucks will emit exhaust fumes such as oxides of nitrogen, hydrocarbons, carbon monoxide, SO2, NOx, CO2 and particulate matters. The quantity of pollutants emitted and the environmental impacts depend on the numbers of vehicles, function speed, condition of the road, application, the quantity of plant/machinery and the state of maintenance. Mobilization of the project equipment and machinery will be a one – off event, requiring limited number of trucks. With the low forecast number of vehicle movements, the limited quantity of equipment/machinery, and adoption of good maintenance regimes, the emissions of air pollutants from these sources will be limited. The impact is predicted to be negative, cumulative, short-term duration.

During construction phase vehicles, machines and equipment with internal combustion engines will be used. These can emit unwanted gases such as CO2, CO, NOx, SO2, and VOC. Emission levels, however, is a functioning speed, condition of the road, application etc. The effect of air pollution on local people depends on the distance between them and the project sites, wind direction, topography and other factors. The main direct effects are in the area closest to the intersections as the rapid dispersion and dilution of exhaust gases quickly reduces their concentrations to levels at which risks are minimal. The general guidelines for air quality standards for Tanzania and as recommended by the World Health Organization (WHO) are listed in Table 9.1.1 below:

Watering of the construction area is also carried out as necessary to prevent the dispersal of earth and sand from the construction surface.

Table 9.1.1 Air Quality Standards

Pollutant	Tanzania	WHO/IFC
PM_{10}	Annual mean of 60 to 90µg/Nm^3 (0.05 – 0.116 mg/kg)	• 24-hour mean of 150 µg/m3 • Annual mean of 50 µg/m3
SO_2	• 24 – hour average 100 µg/Nm3 (0.129mg/kg) or • Annual mean of 40 – 60 µg/Nm3 (0.05-0.08 mg/kg)	• 24 – hour average 150 µg/m3 or • Annual mean of 50µg/m3
NO_2	• 150 µg/Nm3 for 24-hours average value or • 120µg/Nm3 for 8 hours	• 150 µg/m^3 for 24-hours average value • Annual 100 µg/m^3
CO	Time-weighed exposures at the following levels: • 100 mg/Nm^3 for 15 minutes • 60 mg/Nm^3 for 30 minutes; • 30 mg/Nm^3 for 60 minutes • 10 mg/Nm^3 for 8 hours.	

Source: WHO

However, it is important to note that during construction stage, the number of equipment, machinery and vehicles involved will be minimal hence, the amount of SO2, CO2 and NOx generated will be significantly small compared to over twenty thousand of vehicles running along Mwenge and Morocco Intersection which emit same air pollutants. Additionally, from the above standards and based on the location and

duration of works on the project site, it is unlikely that the above threshold value will be exceeded. It can be concluded that the emissions impact has been predicted to be indirect and negative of low significance; and is expected to be short-term and temporary as it will occur only during construction phase.

Operation Phase

Construction of flyover at Mwenge and Morocco will reduce the current traffic congestion experienced and as a result air pollution caused moving vehicles along the intersections which leads to reduce of emissions CO; NOX; hydrocarbons (HC); SO2; carbon dioxide (CO2); and particulate matter (PM) in the atmosphere will be significantly reduced. Estimated reductions in air pollutant and greenhouse gas emissions if congestion is eliminated as a result of intersection improvements. The reductions are as follows. (i) Nitrogen oxides 30.9 %; Sulphur oxides 23.6%; Particulate matter 37.0% and Carbon dioxide 24.9%. Therefore, the impact of air pollution is predicted to be positive of long-term duration.

9.1.1.2 Water pollution

Pre-construction and construction phases

During construction phase, in the rainy season, storm water may cause water and soil pollution by run-off earth and sand. The nature of the project will require use of heavy machinery during site preparation mainly for earth movement and levelling for the project sites. This may lead to instability of the soil in the area and as a result the disturbed soil could be washed into the nearby storm water drainage and river with surface runoffs. Also, the batching plant to be used during the construction phase will be located on site, although the exact location is unknown. Wastewater treatment is also considered necessary during the construction phase. Treatment of effluent from truck washing and cement mixing plant washing, as well as water sprayed as a dust control measure, can reduce contamination of river water, soil and groundwater.

9.1.1.3 Waste

Pre-construction and construction phase

Preconstruction and construction activities will result in the creation of various solid wastes, principally surplus earth and rock (soil debris), metal scraps, plastics (wrappings and containers), cardboard, paper, wood, office wastes including e.g., used toner cartridges, food wastes, workshop wastes including e.g., used oil filters, and waste concrete. This waste would negatively impact the site and surrounding environment if not properly managed and disposed of at an approved dumpsite. Unmanaged disposal of spoil can result in sterilization of productive land and the creation of on-going erosion, sedimentation or drainage problems. Waste, if allowed to accumulate in drainage ways, could cause pooling and flooding. However, it is expected that solid waste generated during pre-construction and construction phase will be in small quantity and the impact is considered to be negligible.

Also, at the TANESCO Morocco site there are one abandoned old electric transformer which requires to be relocated or disposed-off to provide space for current operating transformers to be shifted to that area. Improper handling or disposal of the abandoned electric transformer can pose several problems and environmental hazards. The main issue is the presence of potentially dangerous materials like PCB (polychlorinated biphenyls) containing oil or other toxic substances. Leaking or damaged transformers can contaminate soil, water sources, and air, impacting ecosystems and human health. The PCBs are highly toxic and persistent in the environment and can bioaccumulate in the food chain, posing a risk to wildlife and human health. Other hazardous substances in transformer oil, such as PAHs and heavy metals, also contribute to environmental contamination. Based on the fact that in Dar es Salaam there are registered/licensed hazardous waste collectors, it is expected that relocation and disposal of the transformer will be appropriately handled. This impact is predicted to be negative, long-term and of moderate significance.

9.1.1.4 Soil contamination

Construction phase

Soil contamination during construction stage is primarily due to construction and associated activities. The use of stationary and mobile machines, vehicles and equipment's requiring refueling and maintenance of the same are likely to be contaminate the soil because of accidental leakage or spillage of fuel and lubricants. Unwarranted disposal of construction spoil and debris also may add to soil contamination. However, with appropriate management, this impact could be controlled.

9.1.1.5 Noise and vibration

Pre-construction and construction phases

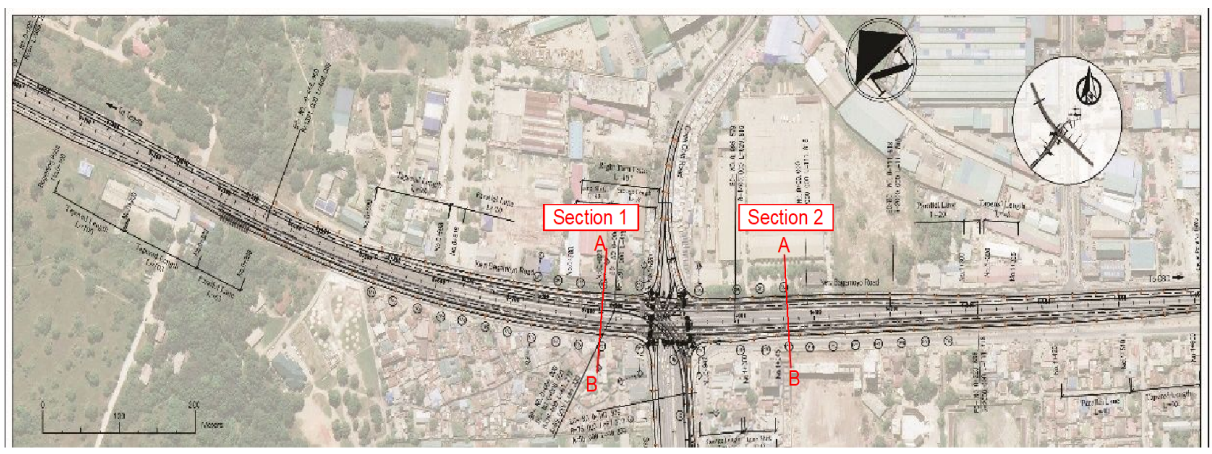
Noise and vibration will be generated from pre-construction and construction activities such as hooting by construction vehicles and communication from workers, delivery of materials by heavy trucks, operation of machinery/equipment including bulldozers, generators, grinders, mixers, compactors, crushers and drills and the general construction process.

As shown in Table 5.4.7and Table 5.4.8, the noise levels at both intersections exceed the noise standards set out in at most survey points. However, the degree of increase in noise levels is not considered to be significant as the number of construction work equipment operating in a single construction zone is limited. In addition, this adverse impact is considered to be short-term and not directly related to construction noise, as there is a certain distance to the hospital and other facilities that need to be considered.

Operation Phase

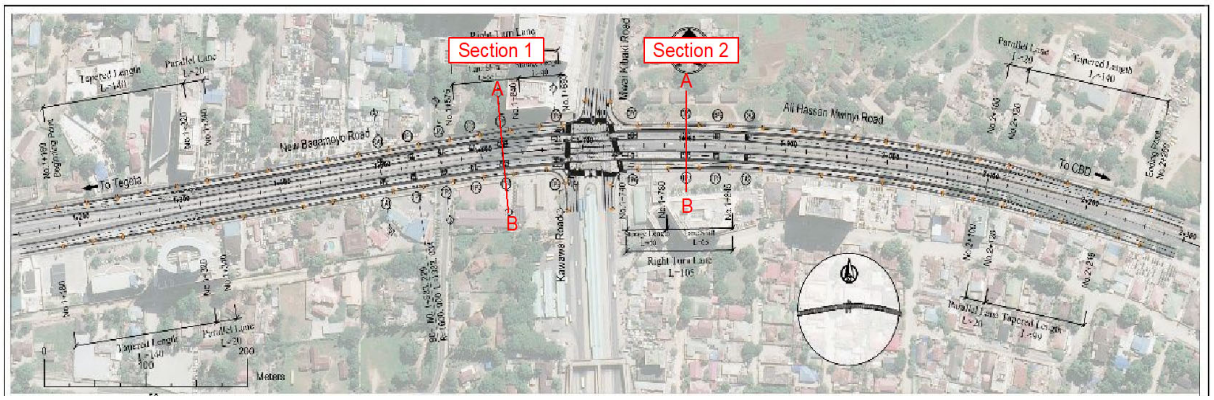
During operation noise and vibration impacts are expected significantly to be reduced due to the elimination of the congestion along the improved intersection. Also, during operation phase all equipment's and machines will be removed on site immediately after completion of the intersections. Furthermore, traffic noise levels in the intersection areas are expected to be reduced, as the main traffic passing through the intersection will be driving on the elevated section of the road. The effect is predicted for future traffic noise levels at distances of 0m and 20m from the road at the cross-sections shown in the figure 8.1 and figure 8.2. The predicted results are shown in Table 8.4.

At the Mwenge junction, the noise levels at 0 m from the road are between 64.6 dBA and 69.3 dBA during the daytime and between 61.5 dBA and 65.6 dBA at nighttime, indicating that traffic noise levels would be improved over the results of the baseline noise level survey. Likewise at the Morocco intersection, noise levels at 0 m from the road are between 65.8 dBA and 68.0 dBA during the day and between 58.7 dBA and 61.0 dBA at night, indicating that the situation would be improved. This impact is predicted to be positive, long-term.



Source: JICA Survey Team

Figure 9.1.1 Location of Cross Sections for Traffic Noise Prediction at Mwenge



Source: JICA Survey Team

Figure 9.1.2 Location of Cross Sections for Traffic Noise Prediction at Morocco

Table 9.1.2 Traffic Noise Level Prediction Results

Intersection	Sn	Noise Level in dBA							
		Daytime				Nighttime			
		0m		20m		0m		20m	
		A	B	A	B	A	B	A	B
Mwenge	1	64.6	64.6	61.9	61.5	57.5	57.6	54.8	54.5
	2	69.3	69.3	65.6	65.0	62.2	62.2	58.5	57.9
Morocco	1	67.9	68.0	63.7	63.1	60.8	61.0	56.7	56.0
	2	65.8	65.8	61.7	61.3	58.7	58.8	56.5	54.2

Source: JICA Survey Team

9.2 Natural Environment

9.2.1 Hydrology

Pre-Construction and Construction Phases

The topography of the project area is characterized by a flat terrain, which is prone to flooding during rainy seasons. Stakeholders pointed out that the construction of flyovers in both interchange of Morocco and Mwenge will disrupt existing storm water drainage in or around the area. Historically, the Morocco area specifically on Ali Hassani Mwinyi road is experiencing floods during heavy rains. Likewise, at Mwenge junction vicinity area currently when there are heavy rains it becomes challenge for the vehicles to pass through the flooded area. Thus, the construction of flyover in this area as also might disrupt the storm water drainage.

Operation Phase

Drainage facilities for resolving inundation; auxiliary facilities for securing the road functions; and traffic safety facilities for securing traffic safety will be installed. Therefore, the presence of drainage facilities associated with intersections ensure that the effects of effective drainage in terms of hydrology are maintained through to the operation phase.

9.3 Social Environment

9.3.1.1 Resettlement

Pre-Construction Phases

The project requires the acquisition of 3,163 m^2 of public land and 4,302 m^2 of private land, for a total of 1970 m^2, as shown in Table 9.3.1.

Interviews were conducted between Monday, 3 February and Tuesday, 5 March 2025, and found that all buildings affected by the land acquisition were used for business and commercial purposes, with no residents.

In addition, a temporary camp yard of 33 000 m^2 is required for material yards, concrete material production and equipment storage and repair. The potential camp yard is assumed to be located at the BRT project yard on military land (public land) on New Bagamoyo Road towards Tegeta.

Table 9.3.1 Summary of Land Acquisition

Sn	Item	Unit	Mwenge		Morocco		Yard	Total
			Sam Nujoma Road	New Bagamoyo Road		Ali Hassan Mwinyi Road		
1	Government Land							
1.1	Permanent	Sqm	1,941	0	0	1,222	0	3,163
1.2	Temporary	Sqm	0	0	0	0	33,000	33,000
1.3	Total Government Land	Sqm	1,941	0	0	1,222	33,000	36,163
2	Private Land							
2.1	Permanent	Sqm	899	850	1,205	1,348	0	4,302
2.2	Temporary	Sqm	0	0	0	0	0	0
2.3	Total Private Land	Sqm	899	850	1,205	1,348	0	4,302
2.4	Total Private Land by Intersection		1,749		2,553		0	4,302
4	Total Permanent Land	Sqm	2,840	850	1,205	2,570	0	7,465
5	Total Temporary Land	Sqm	0	0	0	0	33,000	33,000

Source: JICA Survey Team

A total of 38 buildings are affected by the project, 30 of which require relocation and 8 of which are partially affected and do not require relocation, as shown in Table 9.3.2.

Of these, 21 require relocation at the Mwenge intersection and 2 do not, making a total of 23 buildings on land owned by KMC, namely buildings owned by KMC under Tanzanian regulations.

Table 9.3.2 Summary of Affected Buildings

Location	Type of Structures	Total	Full	Partial
Mwenge	Businesses (commercial, industrial and business enterprises)	34	30	4
	Boundary wall	3	0	3
	Pavement	1	0	1
Morocco	Businesses (commercial, industrial and business enterprises)	4	0	4
	Boundary wall	16	0	16
	Pavement	11	0	11

Source: JICA Survey Team

The 30 buildings that will be 100% removed are used by 67 businesses. Among the 67, one is business owner and 66 are business tenants. It is estimated that the 67 businesses employ approximately 134 employees.

Regarding the partially affected buildings that would not require relocation, 26 (Mwenge Intersection: 5, Morocco Intersection: 21) are privately owned businesses (owners) on privately owned land that would require setbacks of the existing perimeter walls, but will not be closed during the construction of the Project.

Another 6 business tenants (2 business tenants on private land, 4 business tenants in buildings owned by KMC) will not require relocation, but their buildings may be required slicing. Out of the 6 businesses, one (MW-7-7) will only lose paved area along Sam Nujoma Road and will be able to operate during the Construction Phase. The 5 business tenants that may need short business closure during the Construction Phase employ approximately 10 employees.

-

Table 9.3.3 Summary of PAPs/residential PAH

	Group	Number	By Tenancy
1	Total Project Affected Households (PAHs) (Including commercial use and institution) (Line 2 + Line 9)	186 persons/ businesses/ tenants	Title Holders: 99 persons/ businesses/ tenants
			Non-Title holders: 87 persons
	Required for Relocation		
2	Fully Project Affected Households (PAHs) (Including commercial use and institution)	67 businesses/ tenants	Title Holders: 67 businesses/ tenants
			Non-Title holders: 0 HH / 0 persons
2-1	Resident owners who need to be resettled	0 HH / 0 persons	Title Holders: 0 HH / 0 persons
			Non-Title Holders: 0 HH / 0 persons
2-2	Residential tenants who need to be resettled	0 HH / 0 persons	Tenants: 0 HH / 0 persons
2-3	Business owners who need relocation	1 business owner	Title Holders: 1 business owner (MW-7-3)
			Non-Title Holders: 0 persons
2-4	Commercial Tenants on private land who need relocation	11 business tenants	11 business tenants MW-6: 2 tenants, MW-7: 9 tenants
2-5	Business tenants on Government (KMC) Land who need relocation	55 business tenants	55 business tenants (MW:55, MO:0)
3	Employees in the business lessees (excluded from Line 2 total)	134 employees*	134 employees*
	Not required for relocation		
4	Partly Project Affected Households (PAHs) (Including commercial use and institution)	119 persons/ businesses/ tenants	Title Holders: 32 persons/ businesses/ tenants
			Non-Title holders: 87 persons
4-1	Resident owners who do not need to be resettled	0 HH / 0 persons	Title Holders: 0 HH / 0 persons
			Non-Title Holders: 0 HH / 0 persons
4-1	Business owners who do not need relocation (Just small corner of the land is to be affected. Impact on employees is not considered.)	26 business owners	Title Holders: 26 business owners (MW:5, MO:21)
			Non-Title Holders: 0 HH / 0 persons
4-3	Commercial Tenants on private land who do not need relocation	2 business tenants	2 business tenants (MW-7-2-3, MW-7-7)
4-4	Business lessees on Government (KMC) Land who do not need relocation (Employer)	4 business tenants	4 business tenants (MW:4, MO:0)
4-5	Street vendors (Mobile vendors, stalls) without fixed location for business	87 persons	Non-Title Holders: 87 persons
5	Employees in the business tenants and lessees (Excluded from Line 9 Total)	10 employees*	10 employees* (Employees in MW-7-7 are excluded since the Project affects only the front pavement area)
6	Partially affected institutions	2 institutions	2 institutions (MW:0, MO:2) (TANESCO, Police)
7	KMC as the landlord who gets revenue from the tenant fee	Tenant fee consists of part of the annual income of KMC. Income of KMC will decrease by the Project since KMC will lose income from the 55 fully affected buildings and 4 partially affected buildings. After the Detailed Design of the Project, TANROADS shall inform KMC the area to be affected, and the income from the area will be reduced in 2028/2029 fiscal year. With the above advance notification, KMC shall not require	

	Group	Number	By Tenancy
		compensation for the loss of income regarding the tenant fee.	

Title Holders: people with formal ownership of land and structure.
Non-Title Holders: people without formal ownership of land, including commercial encroachers, and residential squatters.

MW: Mwenge Intersection, MO: Morocco Intersection

*: Number of employees are estimated from the site observation. Average size of the businesses is 1 employer and 2 employees.

Source: JICA Survey Team

9.3.1.2 Local economy, including employment and means of livelihood

Pre-Construction Phases

It was established that several informal traders (vendors) carrying out their businesses next to the road side/on the road reserve will be affected immensely by the construction activities at the Mwenge and Morocco intersection. From the survey conducted on 5th and 6th July, 2024, it was established that there are a total of 87 vendors across, Mwenge and Morocco intersections. The Morocco intersection accounted for 45% of the vendors, totaling 39 individuals, while the Mwenge intersection had 55%, amounting to 48 vendors.

Significant proportion of vendors at Morocco had fixed locations 37% and operated without carts or stalls 32%. In contrast, a higher percentage of vendors in Mwenge utilized stalls 43% and fixed locations 29%.

These findings provide insights into the varying levels of mobility and stability among the vendors, reflecting their different operational strategies and potential vulnerabilities. Since vendors are not residing or have permanent structure on the land, TANROADS believes that there shall be no problem removing these objects by the time of handing over the project site before the start of construction works. Moreover, since these stalls and so on are not authorized, they are not eligible for compensation under local environmental guidelines. The scope of compensation in line with resettlement and the method of assessing and calculating the amount of compensation and so on differ between the World Bank's safeguard policy and the JICA guidelines, while the Tanzanian side intends to deal with compensation according to its own domestic law.

Construction Phases

One of the main positive impacts during the project's construction phase will be the availability of employment opportunities, especially to casual workers and several other specialized workers (including designers, architects, contractors, crew, and other related workers). A number of local people will be involved with the project construction and recruitment of skilled labour is mostly of Contractor's choice. Apart from casual labour, semi-skilled and unskilled labour, formal employees are also expected to obtain gainful employment during construction.

Operation Phases

Due to the completion of the flyover the travel time is estimated to be reduced significantly due to the reduced congestion at the intersections. The reduction in travel times will reduce transportation costs, workers will be able to reach at their working place on time, commodities will be available in the markets on time and passengers will be able to make trips conveniently. This impact is predicted to be positive, long term.

(2) Existing social infrastructures and services

FPre-Construction and Construction Phases

The utilities and other items that will need to be relocated or removed by the Project are shown inTable 9.3.4. Stormwater drains, road lighting, electricity and telephone poles, traffic signals, bus stops, traffic policemen's rest stations, etc. will be relocated to appropriate locations prior to the start of construction of

the Project to ensure that they are in a condition to start service and that no service interruptions will occur as a result of the Project.

In addition, as the high-voltage transmission towers are located in the project area and the substation facilities are located on the land for the acquisition of the TANESCO substation, it may be necessary to review the power transmission and distribution network around the substation and relocate related facilities located outside the project area, in addition to acquiring the land for the substation in question, in order to implement the project The project area is located outside of the project area. In the future, TANROADS will need to understand the relocation of the transmission and substation facilities to be implemented in the BRT project, for which construction work has already started ahead of the project, and to study, discuss and agree with TANESCO on the specific facilities to be relocated in the project, the relocation sites and the costs for the relocation.

Table 9.3.4 Summary of Affected Utilities

Other structures and utilities to be affected	Target for Relocation		
	Mwenge	Morocco	Total
Billboards/Advertising Boards	29	34	63
Storm Drains	29	19	48
Guardrail	30	3	33
Manholes	26	5	31
Street Lights	7	24	31
Solar-Powered Street Lights	24	1	25
Electric pole, including high voltage tower	9	11	20
Telephone pole	3	13	16
Road Signs	10	5	15
Traffic signal	7	7	14
Rainwater drainage	11	0	11
Road Markings	6	3	9
Utility Cabinets (Electrical/Telecommunications)	2	4	6
Bus stops	4	2	6
Gas Pipes	4	0	4
Staircase (connecting the difference in elevation between road and private land)	2	0	2
Traffic policemen's rest stations	1	1	2
Drainage trench cross covers	2	0	2
KMC-owned perimeter fences	1	0	1
Oyster Bay Substation 33kV/11kv (TANESCO)	0	1	1

Source: JICA Survey Team

(3) Gender

Construction Phases

Gender-Based Violence (GBV) is acknowledged as a key social issue within Kinondoni Municipality and Tanzania in general. The proposed project is expected to employ construction workers, mainly men from local communities and other parts of Dar es Salaam. The potential gender common related impacts during the construction stage could be gender-based violence and harassment associated with interaction of local workforce with local women particularly when they are out of the project site. While project workers are away from their homes, these workers may exhibit inconsistent social behaviors that can potentially lead to sexual harassment of women and girls, exploitative sexual relations and illicit sexual relations with minors from the local community. However, the TANROADS has the Environmental and Social Management Policy which provides a number of genders based practical measures and strategic gender initiatives to help ensure women are not disproportionately impacted by the project. The policy requires contractors and consultants to develop and implement specific measures and arrangements for the promotion of gender

equality, identifying how to incorporate gender concern into road projects activities and ensuring that adequate resources and facilities are earmarked for that purpose.

(4) Right of children

Construction Phases

Due to high prevalence of child labour in Tanzania there could potentially be impacts associated with lack of work contracts, long hours with no pay and children working at supplier's sites. TANROADS has an environmental and social management policy, which requires contractors and consultants to develop and implement specific measures and arrangements to prevent child labour.

(5) Infectious diseases such as HIV/AIDS

Construction Phases

As a large number of construction workers are expected to be employed at the Mwenge and Morocco crossings, social interaction between workers is inevitable and may occur if construction workers' lives are not properly managed regarding sexually transmitted diseases, including HIV/AIDS.

(6) Labor environment

Construction Phases

Flyover construction work involves many tasks that may result in worker fatalities and other serious accidents, such as working at heights, etc. TANROADS and contractors must pay sufficient attention to preventing accidents during the work and provide training and guidance.

(7) Accidents

Construction Phases

As the project works are to be carried out on an in-service trunk road, in addition to accidents within the construction work area, there is a potential for accidents with public vehicles travelling on the trunk road. Therefore, a detour route should be set up around the construction area, safety monitoring should be carried out at the entrances and exits of the construction work area and at the site boundaries.

Operation Phases

Over the past few years, the number of vehicles in Dar es salaam City has significantly increased which has resulted in the increased congestion along the intersections. This congestion has uplifted the road accident graph, which has contributed significantly to traffic injuries and death numbers national wide. Traffic accidents affect both economic and social wellbeing of the community, hence the desire for accident rates to be reduced. The proposed project of improving the Mwenge and Morocco intersections project represent a straight forward opportunity to mitigate and reduction of the risk of vehicle-to-vehicle and vehicle-to-human traffic accidents inside the intersections. The impact is predicted to be positive of long-term duration.

(8) Cross boundary impacts and climate change

Operation Phases

Vehicle traffic is responsible for a significant amount of air pollution and greenhouse gas emissions. Traffic-related pollution is made worse by idling and traffic congestion, which causes a build-up of pollutants in specific areas. Traffic congestion can increase motor vehicle emissions as a result of increased vehicle volumes, stop-and-go driving conditions that prolong rush hour durations, and changes in emissions factors. During operations the improvement of Mwenge and Morocco Intersections will alleviate the existing traffic congestion as the result the impact of Greenhouse gases emissions from vehicles at the

intersection will be mitigated. The effect is estimated to be a reduction of approximately 25% compared to the present.

9.3.2 Impact Assessment Results

Based on the prediction results for each item, the impacts were assessed as shown in Table 9.3.5.

Table 9.3.5 Impact Assessment Results

Category	No	Environmental items	Status of selection		Rating		Basis and Reasons for Impact
			P/C Phase	O Phase	P/C Phase	O Phase	
Pollution	1	Air pollution	✔	✔	B-	B+	• P/C Phase: Gases and dust are temporarily generated due to operation of construction equipment and vehicles. • O Phase: With flyovers, the impact of CO_2, NOx and particulate emissions, etc. from vehicles is expected to be mitigated.
	2	Water pollution	✔	✔	B-	D	• P/C Phase: There is a possibility that water pollution will be caused by wastewater from works sites, heavy machinery, vehicles and worker living quarters. • O Phase: No change in water quality is expected.
	3	Waste	✔	✔	B-	D	• /C Phase: Waste such as excavated soil and used construction materials will be generated. Also, old transformer at Morocco TANESCO site will be relocated and/or disposed. Improper disposal or handling can lead to hazardous materials like transformer oil or PCBs contaminating the environment • O Phase: No activities generating waste are envisaged.
	4	Soil contamination	✔	✔	C	D	• P/C Phase: Oil leakage from construction equipment and vehicles is expected, but the extent is limited. • O Phase: No activities contaminating soil are envisaged.
	5	Noise and Vibration	✔	✔	B-	B+	• P/C Phase: Noise and vibration will be generated due to the operation of construction equipment and vehicles. • O Phase: As road traffic is smoothed and the main traffic volumes pass over the bridge, the effect is expected to be a reduction in noise levels around the intersection
	6	Ground subsidence			D	D	• P/C Phase: There is no any work expected that could trigger ground subsidence • O Phase: No activities could trigger ground subsidence
	7	Odor			D	D	• P/C Phase: There is no any work expected that could generate odor. • O Phase: No activities creating offensive odor are envisaged.
	8	Sediment quality			D	D	• P/C Phase: No activities that may impact sediment of the waterways are envisaged. • O Phase: There is no any work expected that impact sediment of the waterways are envisaged.
Natural Environment	9	Protected area			D	D	• P/C Phase: There are no national parks or protected area around the project target site and environs. • O Phase: None
	10	Ecosystem			D	D	• P/C Phase: Construction will be done on the existing road and there are no rare flora and fauna in the target area and no impacts on ecosystems envisaged • O Phase: None
	11	Hydrology			D	B+	• P/C Phase: There is no any work expected that could trigger changes in river water flow. • O Phase: It is expected that the project will improve the drainage of the area and control the existing flooding in the project area
	12	Topography and geology			D	D	• P/C Phase: Construction will be done on the existing road and no major cutting or banking works are planned, no impacts on the terrain and geology envisaged. • O Phase: None
Social Environment	13	Involuntary resettlement	✔	✔	B-	D	• P/C Phase: Land to be affected have been identified and will be acquired and compensated accordingly. Since there is no residential area, involuntary resettlement will not be expected. • O Phase: No additional land acquisition or resettlement will be necessary
	14	The poor			D	D	• P/C Phase: There is no poor household found within the project area

Category	No	Environmental items	Status of selection		Rating		Basis and Reasons for Impact
			P/C Phase	O Phase	P/C Phase	O Phase	
							based on the available information from the National Household Budget Survey (HBS) data. • O Phase: None
	15	Indigenous and ethnic people			D	D	• P/C Phase: There are no ethnic minorities in the project area as defined by the World Bank, ESS7. • O Phase: None
	16	Local economy such as employment and livelihood	✔	✔	B+	A+	• P/C Phase: Employment of locals or a new business opportunity could be ensured for the construction works. As Construction will be done on the existing road, no negative impacts on the local economy are envisaged. • O Phase: Improvement of the intersection will reduce the risks and time spent on road thus positive impact on local economy is expected.
	17	Land use and utilization of local resources			B-	D	• P/C Phase: Because the Project entails upgrading of an existing road, there will be hardly any impacts on land use and local resources. • O Phase: None
	18	Water usage			D	D	• P/C Phase: Water will be required for cement mixing, concrete preparations and other potable for the workers. No impact on water use is expected / No envisage depletion of local water resources • O Phase: None
	19	Existing social infrastructures and services	✔	✔	B-	B+	• P/C Phase: Traffic congestion due to increase of construction vehicles is expected. • O Phase: It is expected that unlawful use of the road will be regulated and contribution will be made to safety of pedestrians.
	20	Social institutions			D	D	• P/C Phase: The project entails construction on existing road, there will be hardly any impacts on social institutions. • O Phase: No impact on social organizations, such as social relationship capital and local decision-making bodies, is envisaged,
	21	Misdistribution of benefit and damage			D	D	• P/C Phase: There is no factor to cause the misdistribution of benefits and damages. • O Phase: None
	22	Local conflict of interests			D	D	• P/C Phase: The project entails construction on existing road, it will not cause any conflict of interests in the local area. • O Phase: None
	23	Cultural heritage			D	D	• P/C Phase: As the project entails construction on existing road, there is no cultural heritage, etc. in the project target area and environs. • O Phase: None
	24	Landscape			D	D	• P/C Phase: As the project entails construction on existing road, there is no activities causing impact on landscape are envisaged. • O Phase: None
	25	Gender	✔	✔	C	D	• P/C Phase: Gender inequality in job opportunity related to construction works is not expected as the contractor will follow TANROAD policy. • O Phase: No negative impacts on gender issues are envisaged.
	26	Right of children	✔	✔	C	D	• P/C Phase: No negative impacts on children's rights envisaged as a result of the project as the contactors will follow TANROADS policy. • O Phase: No negative impact on the rights of Children is envisaged.
	27	Infectious diseases such as HIV/AIDS	✔	✔	B-	D	• P/C Phase: Risk of infections could increase due to the influx of construction workers. • O Phase: No impact on infectious diseases such as HIV/AIDS is envisaged.
	28	Labor environment	✔	✔	B-	D	• P/C Phase: Some negative impacts may result regarding safe labor conditions if technically difficult tasks are carried out by local workers. • O Phase: No activities that may deteriorate working conditions are envisaged.
Others	29	Accidents	✔	✔	B-	B+	• P/C Phase: Risk of accidents may increase for workers and local residents due to increase in construction vehicles. • O Phase: the project will improve safety of vehicles and pedestrians.
	30	Cross boundary impacts and climate change			D	B+	• P/C Phase: No negative impact is envisaged given the modest size of project. • O Phase: With flyovers, the impact of Greenhouse gases emissions from vehicles is expected to be mitigated

Note:

A+/-:	Significant positive/negative impact is expected
B+/-:	Positive/negative impact is expected to some extent
C+/-:	Extent of positive/negative impact is unknown.
D:	No impact is expected.

Source: JICA Survey Team

10. Environmental and Social Management Plan (ESMP)

10.1 Environmental and Social Management Plan

The Environmental and Social Management Plan, which organises the mitigation measures, budget and responsible authorities for environmental impacts, is presented in Table 10.1.1. The objectives of the Environmental and Social Management Plan are also presented below.

- To bring the Project to comply with Government of Tanzania applicable national environmental and social legal requirements, policies and procedures;
- To guide on Environmental, Health and Safety (EHS) issues as required by the JICA Guideline 2022;
- To outline the mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate or compensate for adverse environmental and social impacts, or to enhance the project beneficial impacts; and
- To provide an operational reference and tool for environmental and social management during implementation of project activities.

Table 10.1.1 Environmental and Social Management Plan -

Category	Environmental Items	Potential Impacts	Mitigation Measures	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated costs in US$ /year
Pre-Construction and Construction Phases							
Pollution	Air pollution	Impairment of local air quality from gaseous /exhaust emissions	• Conduct training for construction workers on Environmental Management Plans prior to the commencement of construction work. • Construction vehicles drivers will be under strict instructions to minimize unnecessary trips, refill fuel tanks in the afternoon, and minimize idling of engines. • Equipments shall be properly tuned and maintained. • Use of vehicles that comply with regulations. • The project shall enforce vehicle load restrictions to avoid excess emissions from engine overloading. • Watering of the construction area	PM2.5 not to exceed 250 mg/Nm3 (peak readings), SO2: - average 100 µg/Nm3 (0.129mg/kg) for 24hour; NO2 : 150 µg/Nm3 for 24-hours average value; CO: 10mg/Nm3 for 8 hours; Black smoke PM10 : 40 to 60 µg/Nm3	Contractor, Consultants	TANROAD, KMC, OSHA	Included in normal construction cost
	Water pollution	Impairment of quality of water resources from the project activities	• Conduct training for construction workers on Environmental Management Plans prior to the commencement of construction work. • Sanitary arrangements shall be to the satisfaction of the Tanzania law's requirement. • An efficient waste collection and disposal system based on the principles of reduction, re-use and recycling of materials, shall be instituted at the project sites.	EM (WQS), faecal coliform level of not more than 100FC per 100ml; Nitrate 30 mg/l, Lead 0.05 mg/l, Sulphate 600 mg/l, Turbidity 30 NTU, DO Less than 75%;	Contractor, Consultants	TANROAD, KMC,Water Basin Office	Included in normal construction cost
	Wastes	Loss of environmental aesthetics due to haphazard disposal of solid waste	• Prepare a site waste management plan before commencement of construction works. • Ensure recycling of materials. • NEMC licensed hazardous waste collector will be engaged for disposal of the old transformer. Careful planning and execution of relocation and/or disposal of the transformer will be done to ensure safety, environmental compliance, and cost-effectiveness. • The debris resulting from the construction works will either be transported by a licensed waste transporter for dumping at an approved site.	EM (SWM), 2016 As minimum as possible; no complaints from the local people	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost

Category	Environmental Items	Potential Impacts	Mitigation Measures	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated costs in US$ /year
			• The contractors shall maintain the project area in neat and tidy condition • Removing any equipment and machinery that is not in use, as soon as possible.				
	Soil contamination	Soil contamination	• Conduct training for construction workers on Environmental Management Plans prior to the commencement of construction work. • Oils, hydrocarbons and other hazardous materials will be stored in designated locations with specific measures to prevent leakage and release of their contents including the positioning of the storage area away from storm water drains	EM (WQS) (hydrocarbons <10mg/l); No leakage /spillage of hydrocarbons	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost
	Noise and excessive vibrations	Nuisance and disturbance on/ offsite receptors from noise and excessive vibrations	• Conduct training for construction workers on Environmental Management Plans prior to the commencement of construction work • Use of construction methods and equipment with low noise and vibration levels. • Appropriate maintenance and management of construction equipment, etc. • Ensure that operations do not generate excessive noise and vibration. • Implement training on the environmental management plan before the start of work. • Prompt response to complain	EM (SCNVP) R, 2015 75 dB(A) (peak readings), daytime or 55 dB(A) (peak readings) at night	Contractor, Consultants	TANROAD, KMC, OSHA	Included in normal construction cost
	Hydrology	Increased flood hazards from surface water run-off	• Design appropriate stormwater drainage systems that do not cause flooding during the rainy season. • Coordination with relevant authorities (DAWASA)	As minimum as possible, No floods hazards	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost
Social Environment	Involuntary resettlement	Acquisition of additional land for proposed project	• Owners of private land to be acquired for the construction of intersection will be compensated fully for loss of land and any structures to be demolished on the affected land. This will be done at prevailing market value.	As minimum as possible; no complaints from PAPs	Contractor, Consultants	TANROAD, KMC	Cash compensation for the lost structure and other fixed assets

Category	Environmental Items	Potential Impacts	Mitigation Measures	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated costs in US$ /year
		Displacement of informal businesses along the roads	• Implementation of prior notification of the project • Implementation of compensation to operators for moving, relocation	As minimum as possible; no complaints from PAPs	Contractor, Consultants	TANROAD, KMC	Public notices
	Local economy such as employment and livelihood	Increased income to locals from employment opportunities	• Make efforts to give priority to local people in employment. • Provide education and training when hiring workers. • Set working wages above the government's minimum wage.	As maximum as possible	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost
		Improving growth of the economy	• Preferential procurement of materials from local sources.	As maximum as possible	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost
		Opportunities for local workforce skills acquisition and enhancement in construction industry	• Education and training in the hiring of workers.	As maximum as possible	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost
	Existing social infrastructure and services	Impact on the transportation of existing trunk roads.	• Providing both road and safety signs to the public and drivers at the core activity project site(s). • All large or over-size transport vehicles will be accompanied by escort cars equipped with flashing yellow warning lights while in transit on public roads. • Delivery of construction machines, equipment, and goods will be planned to minimize the total number of required trips and be scheduled outside of peak hour traffic times.	No injury and sufficient no of road signs	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost
		Interruption of existing public services infrastructure and utilities	• The flyover areas will be surveyed and clearly marked and cleared of obstacles before starting trenching in a particular area. • The proponent / contractor shall endeavour to obtain as much information as possible about underground services in the area (use maps) including: pipe lines, water mains, sewers, telephones, and power conduits, laid wires poles and guy wires or other underground or above ground structures and/or properties crossing or adjacent to the intersections.	As minimum as possible	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost

Category	Environmental Items	Potential Impacts	Mitigation Measures	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated costs in US$ /year
			• The roads will be half open during the construction phase and road closure will be avoided. Whenever required, closure of the roads and walkways shall be prepared in close co-operation with the local police traffic unit.				
	Gender	Increased Gender Based Violence	• The proponent and Contractor will conduct mandatory and periodic training for workers on required lawful conduct in host community and legal consequences for failure to comply with laws on gender-based violence (GBV). • Gender disaggregated data, separate bathing, changing, sanitation facilities for men and women will be provided. • Collect information about GBV and associated social ills on a monthly basis	As minimum as possible; No GBV victims	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost
	Right of children	Potential risks and hazards associated with child labour	• Comply with the provisions in the Employment and Labour Relation Act, 2004 and the ILO Convention No. 182. • The proponent has a transparent human resources policies and procedures for recruitment process, working conditions, terms of employment wages, worker-employer relations, non-discrimination policy, monitoring, roles and responsibilities. • Prohibit child labour (children under 18 years of age), pregnant women and the elderly from engaging in hard labour and dangerous activities.	Zero child labour in the construction activities	Contractor, Consultants	TANROAD, KMC	Included in normal construction cost
	Infectious diseases such as HIV/AIDS	Increased incidence of diseases transmission including HIV/AIDs & STDs	• Conduct awareness-raising and education campaigns on HIV/AIDS.	Tanzania AIDS/HIV Policy, no new HIV/AIDS victims recorded	Contractor, Consultants,	TANROAD, KMC	Included in normal construction cost
	Labour environment	Occupational accidents at the workplace	• Implement safety measures in compliance with Tanzanian (OSHA, 2003) and international legislation. • Implementation of occupational health and safety incentives for contractors.	Tanzania OSHA 2003, Low risk to workers and no exposure	Contractor, Consultants	TANROAD, KMC, OSHA	Included in normal construction cost
	Accidents	Accidents	• Set up a detour route around the construction area. • Public notice and dissemination of construction and road closure information • Install appropriate signage and traffic signals. • Cooperation with traffic police.	No injury and sufficient no of road signs	Contractor, Consultants	TANROAD, KMC and Police.	Included in normal construction cost

Category	Environmental Items	Potential Impacts	Mitigation Measures	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated costs in US$ /year
Operation Phase							
Pollution	Hydrology	Increased flood hazards from surface water run-off	• Design appropriate stormwater drainage systems that do not cause flooding during the rainy season. • Coordination with relevant authorities (DAWASA)	As minimum as possible, No floods hazards	Consultants	TANROAD, KMC	Included in normal construction cost
Social Environment	Local economy such as employment and livelihood	Improved transport system and accessibility	• Smoothing traffic through the implementation of projects.	As maximum as possible	Consultants	TANROAD, Kinondoni Municipality	Included in normal operational cost
		Reduction in travel time	• Efficient maintenance work to maintain smooth traffic	As maximum as possible	Consultants	TANROAD, KMC	Included in normal operational cost
	Existing social infrastructure and services	Impact on the transportation of existing trunk roads.	• Installation of information boards, road signs	No injury and sufficient no of road signs	Consultants	TANROAD, KMC	Included in normal construction cost
	Cross boundary impacts and climate change	Cross boundary impacts and climate change	• Promotion and awareness of the traffic facilitation benefits of project implementation, including greenhouse gas emission reductions.	As maximum as possible	Consultants	TANROAD, KMC, OSHA	Included in normal operational cost

Notes:
EM (AQS), 2007 =The Environmental Management (Air Quality Standards G. N. No. 237) Regulation, 2007
EM (SQS), 2007 =The Environmental Management (Soil Quality Standards) Regulation, 2007
EM (WQS) 2007 =The Environmental Management (Water Quality Standards G. N. No. 238) Regulation, 2007
EM(SCNVP), 2015 =The Environmental Management (Standards for Control of Noise and Vibration Pollution) Regulations, 2015
EM (HWCM) R =The Environmental Management (Hazardous Waste Control and Management) Regulations, 2019
Source: JICA Survey Team

10.2 Environmental and Social Monitoring Plan

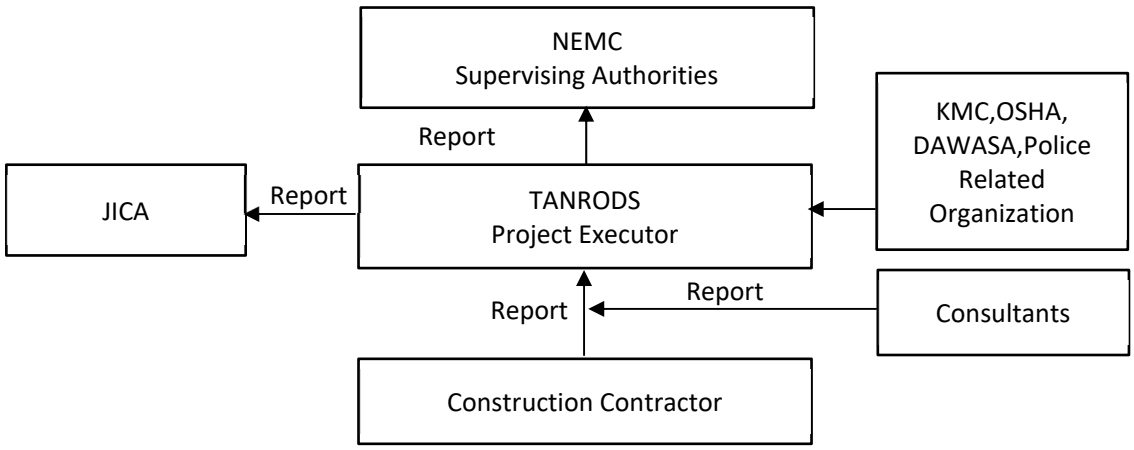
The correct and successful implementation of impact mitigation measures to reduce adverse impacts on environmental conditions needs to be ensured by a proper monitoring programme. The Environmental Monitoring Plan (EMoP) outlines the specific actions that shall be undertaken to ensure that the Project complies with all applicable laws and regulations related to environmental impacts and impact mitigation. The monitoring implementation structure is shown in Figure 10.2.1 and Figure 10.2.2 .

Implementation of the EMoP is solely the responsibility of the project proponent. The proponent shall supervise and monitor components of the monitoring plan and record monitoring outcomes. The proponent can provide the necessary supervisory oversight to ensure the mitigation measures are working and where they are not, remedial measures are established. Detailed parameters to be monitored and responsible institution(s) have been considered. The proponent will ensure that resources are available to implement the EMoP throughout all phases of project development and decommissioning. The EMoP will be subject to the principle of continuous improvement.

The roles and responsibilities of relevant institutions for ESMP and EMOP are shown in Table 10.2.1. Furrher details of environmental and social issues/impacts, proposed parameters to be monitored and timing agencies responsible for executing proposed actions are presented in Table 10.2.2 to Table 10.2.4 below.

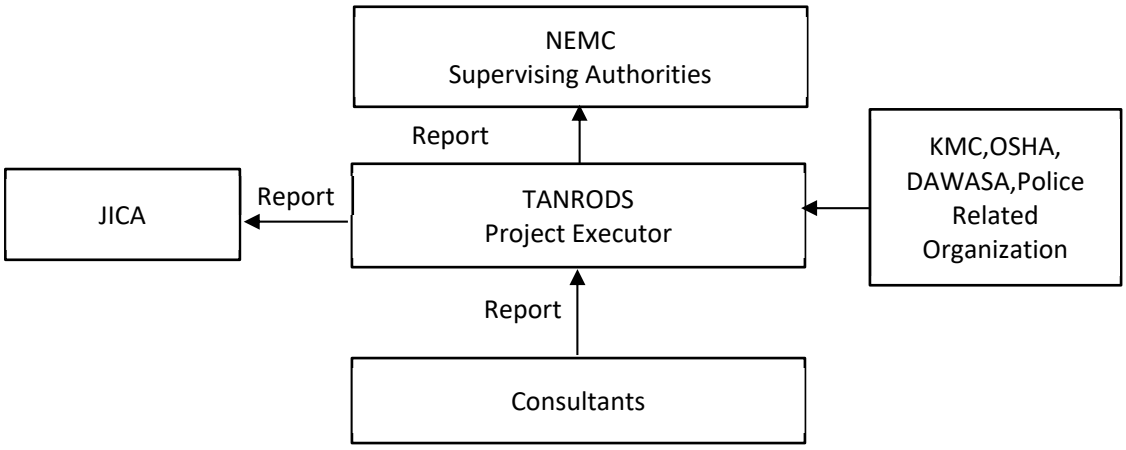
Monitoring shall be internal monitoring by the PIT (Project Implementation Team) of TANROADS. The PIT of TANROADS shall confirm the progress of land acquisition and payment of compensation and allowances on a monthly basis. Information from interviews with committees and other parties implementing resettlement procedures at different level shall be used to supplement as necessary.

The monitoring forms for pre-construction, during construction and operation phase are presented in Tables 10.7.4 to 10.7.6.



Source: JICA Survey Team

Figure 10.2.1 Monitoring Implementation Structure -Pre-Construction and Construction Phases



Source: JICA Survey Team

Figure 10.2.2 Monitoring Implementation Structure -Operation Phases

Table 10.2.1 Institutional Roles and Responsibilities for ESMP and EMoP

S/N	Institution	Institutional Roles and Responsibilities
1	TANROADS	Appropriate implementation based on ESMP for land acquisition and PAPs relocation Appropriate implementation of ESMP during pre-construction and construction phase Supervising and monitoring components of EMoP and recording monitoring outcomes Establish necessary oversight to confirm that ESMP are functioning appropriately and corrective measures in cases where they are not functioning Reporting to relevant organisations based on EMoP
2	JICA	Confirmation of appropriate construction conditions in accordance with ESMP, EMoP, and JICA guideline, and provision of advice to TANROADS
3	NEMC	Confirmation of ESMP implementation status and appropriate auditing based on The Environmental Impact Assessment and Audit Regulations
4	KMC	Collaborating with TANDROADS to acquire land, provide appropriate compensation, and monitor the implementation of these measures
5	OSHA	Confirmation and advice on whether workplace health and safety conditions are being properly maintained and functioning during construction work
6	DAWASA	Cooperation and advice regarding existing infrastructure facilities such as municipal water supply systems
7	Police	Cooperation and advice on traffic control and safety management during construction phase
8	Contractors	Implementation of environmental mitigation measures and measurement of environmental conditions based on ESMP
9	Consultants	Based on the ESMP, measurement of environmental conditions, consideration of additional environmental mitigation measures as necessary, and preparation of monitoring reports.

Source: JICA Survey Team

Table 10.2.2 Environmental Monitoring Plan during Pre-Construction Phase

Category	Environmental Items	Potential Impacts	Parameter to be monitored	Monitoring Frequency	Monitoring area	Measurement Units	Measurement method	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated Costs in US$ /year
Social Environment	Involuntary resettlement	Acquisition of additional land for proposed project	Confirmation of the implementation of EMP Number of affected people	Monthly inspection Reported once/three months	Project site	Numbers	ARAP, reported complains, Visual observation	As per the provision of ARAP and Land Act 1999	TANROADS, KMC	TANROADS, KMC, OSHA	Included in the ARAP operational cost
		Displacement of informal businesses along the roads	Confirmation of the implementation of EMP Number of affected people	Implemented monthly Reported once/three months	Project site	Numbers	ARAP, reported complains, Visual observation	As minimum as possible; no complaints from PAPs	TANROADS, KMC,	TANROADS, KMC, OSHA	Included in the ARAP operational cost

Source: JICA Survey Team

Table 10.2.3 Environmental Monitoring Plan during Construction Phase

Category	Environmental Items	Potential Impacts	Parameter to be monitored	Monitoring Frequency	Monitoring area	Measurement Units	Measurement method	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated Costs in US$ /year
Pollution	Air pollution	Impairment of local air quality	Confirmation of the implementation of EMP (Watering of the contracting area of overloading, etc.)	Monthly inspection	Project sites	-------	Visual observation	State of implementation of EMP	Contractor, Consultants	TANROADS, KMC, OSHA	One day measurement at one intersection once per every three months ($ 3,500 x 2 intersection x 4 months = 28,000)
			Dust level	Quarterly inspection	Project sites	µg/m^3	Dust level meter/ Mini-Vol Sampler	PM 2.5 not to exceed 250 mg/Nm3;			
			SO_2	Quarterly inspection	Project sites	Mg/l	Detector tubes	100 µg/Nm^3 (0.129 mg/kg) for 24hour			
			NO_2	Quarterly inspection	Project sites	Mg/l	Detector tubes	150 µg/Nm^3 for 24-hours value			
			CO	Quarterly inspection	Project sites	ppm	Mini-Vol Sampler	10mg/Nm^3 for 8 hours			
			Black smoke PM_{10}	Quarterly inspection	Project sites	ppm	Mini-Vol Sampler	40 to 60 µg/Nm^3			

Category	Environmental Items	Potential Impacts	Parameter to be monitored	Monitoring Frequency	Monitoring area	Measurement Units	Measurement method	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated Costs in US$ /year
	Water pollution	Impairment of quality of water resources from the project activities	Confirmation of the implementation of EMP(water treatment facilities, etc.)	Monthly inspection	Project sites	-------	Visual observation	State of implementation of EMP	Contractor, Consultants	TANROADS, KMC, OSHA	One day measurement at one intersection once per every three months (1,000 x 2 intersections = 2,000 x 4 month = 8,000
			Water turbidity	Monthly inspection	Project sites	NTU	Sampling & analysis (Spectrophotometer)	< 25 NTU			
			Suspended Solid	Quarterly inspection	Project sites	mg/L	Drying and weighing	200			
			Nitrate	Quarterly inspection	Project sites	mg/l	Sampling & analysis (Spectrophotometer)	30			
			Lead	Quarterly inspection	Project sites	mg/l	Sampling & analysis (Spectrophotometer)	0.05			
			Sulphate	Quarterly inspection	Project sites	mg/l	Sampling & analysis (Spectrophotometer)	600			
			pH	Quarterly inspection	Project sites		pH meter	6.5-9.2			
			DO	Quarterly inspection	Project sites	mg/l	DO meter	Less than 75% of saturation concentration			
			Petroleum/ hydro-carbons	Quarterly inspection	Project sites	mg/l	Sampling & analysis (Spectrophotometer)	Maximum 15 ppm for hydro-carbons			
	Waste	Loss of environmental aesthetics due to haphazard disposal of waste	Confirmation of the implementation of EMP(recycling of materials, etc.)	Monthly inspection	Project sites	-------	Visual observation	State of implementation of EMP	Contractor, Consultants	TANROADS, KMC, OSHA	Included in normal construction cost
			Amount of solid waste PCBs, PAHs and heavy metals	Monthly inspections	Project sites	Volume/ weight of waste	Site inspection, Observation, Quantity analysis	EM (SWM), 2016 As minimum as possible; no complaints from the local people			

Category	Environmental Items	Potential Impacts	Parameter to be monitored	Monitoring Frequency	Monitoring area	Measurement Units	Measurement method	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated Costs in US$ /year
	Soil contaminatio n	Soil contamination	Confirmation of the implementation of EMP(Hazardous materials management, etc.)	Monthly inspection	Project sites	-------	Visual observation	State of implementation of EMP	Contractor, Consultants	TANROAD S, KMC, OSHA	One day measurement at one intersection once per every three months 1,500 x 2 intersections = 3,000 x 4 = 12,000
			Fuel & material storage areas, re-fueling areas	Quarterly inspection	Project sites	mg/l	Sampling and analysis (Spectrophotometer)	EM (WQS) (hydrocarbons <10mg/l); No leakage /spillage of hydrocarbons			
	Noise and excessive vibrations	Nuisance and disturbance on/ offsite receptors from noise and excessive vibrations	Confirmation of the implementation of EMP(Construction methods and machinery with less noise and vibration, etc.)	Monthly inspection	Project sites	-------	Visual observation	State of implementation of EMP	Contractor, Consultants	TANROAD S, KMC, OSHA	One day measurement , 8 points for each intersection per month. 8 points x 2 x $ 400 = 6,400 x12 months = $ 76,800)
			Noise level	Monthly inspections	Transportatio n route, Project site	dBA	Noise level meter	EM (SCNVP) R, 2015; 75 dB(A) daytime or 55 dB(A) at night			
			Vibration levels / PPV	Monthly inspection	Transportatio n route, Project site	mm/s PPV	Vibration meter	0.3 mm/s PPV or			
	Hydrology	Increased flood hazards from surface water run-off	Confirmation of the implementation of EMP(Appropriate stormwater drainage system, etc.)	During design of stormwater drainage facilities	Project sites	-------	Visual observation	State of implementation of EMP	TANROADS, KMC	TANROAD S, KMC, OSHA	Included in normal construction cost
			Flood tendencies	Quarterly inspections	Project area	Number of incidences	Visual inspection	As minimum as possible, No floods hazards			
Social Environmen t	Local economy such as employment and livelihood	Increased income to locals from employment opportunities	Confirmation of the implementation of EMP(Local people employed and training conducted)	Continuousl y during operation	Project records	Numbers of local people employed	Numbers of local people employed	Maximum number as possible	TANROADS, KMC,	TANROAD S, KMC, OSHA	Included in normal construction cost

Category	Environmental Items	Potential Impacts	Parameter to be monitored	Monitoring Frequency	Monitoring area	Measurement Units	Measurement method	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated Costs in US$ /year
		Improving growth of the economy	Procurement records; Taxes paid etc	Continuously during construction	Project records	Amount	Amount	As maximum benefits as possible	TANROADS, KMC	TANROADS, KMC	Included in normal construction cost
		Opportunities for local workforce skills acquisition and enhancement in construction industry	Confirmation of the implementation of EMP (Local people employed and training conducted)	Continuously during construction	Project records	Numbers of local people employed	Numbers of local people employed	As maximum as possible	TANROADS	TANROADS,	Included in normal construction cost
	Existing social infrastructure and services	Impact on the transportation of existing trunk roads	Confirmation of the implementation of EMP (Traffic control measures in place)	Monthly inspections	Transport routes and project area	Number & incidence of disruption	Visual inspection	No injury and sufficient no of road signs	TANROADS, KMC	TANROADS, KMC, OSHA	Included in normal construction cost
		Interruption of existing public services infrastructure and utilities	Confirmation of the implementation of EMP (Traffic control measures in place)	Monthly inspections	Transport routes and project area	Incidence and duration of disruption	Visual inspection	As minimum as possible, No floods hazards	TANROADS, KMC	TANROADS, KMC, OSHA	Included in normal construction cost
	Gender	Increased Gender Based Violence	Confirmation of the implementation of EMP (Training for workers, etc.) Assaults/harassment, GBV and VAC cases	Quarterly inspections	Project site	Number of women employed	GBV reports/ cases	As maximum number as possible;	TANROADS, KMC	Contractor, Consultants, TANROADS, KMC, OSHA	Included in normal construction cost
		Gender inequity in employment	Confirmation of the implementation of EMP (Training for workers, etc.) Recruitment/ procurement rules and procedures	Quarterly inspections	Project site	Number of GBV cases	GBV reports/ cases	Increased women opportunities	TANROADS, KMC	Contractor, Consultants, TANROADS, KMC, OSHA	Included in normal construction cost

Category	Environmental Items	Potential Impacts	Parameter to be monitored	Monitoring Frequency	Monitoring area	Measurement Units	Measurement method	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated Costs in US$ /year
	Right of children	Potential risks and hazards associated with child labour	Confirmation of the implementation of EMP (Training for workers, etc.) Recruitment/procurement rules and procedures	Quarterly inspections	Project site	Number of children employed	Workers register book	As minimum as possible	Contractor, Consultants	TANROADS, KMC, OSHA	Included in normal construction cost
	Infectious diseases such as HIV/AIDS	Increased incidence of diseases transmission including HIV/AIDs and STDs	Confirmation of the implementation of EMP (Education for workers, etc.) Medical reports of HIV/AIDS or other disease,	Quarterly inspections	Project site	Number of people infected	HIV blood tests and surveys, Covid 19 test/ PCR test	Tanzania AIDS/HIV Policy, No HIV/AIDS victims	Contractor, Consultants	TANROADS, KMC, OSHA	Included in normal construction cost
	Labour environment	Occupational accidents at the workplace	Confirmation of the implementation of EMP (Education for workers, etc.) Registered worker Injury /illness, PPE	Quarterly inspections	Project site	Number of cases/injuries , PPE	Medical records and site inspection	Tanzania OSHA 2003, Low risk to workers and no exposure	Contractor	TANROADS, KMC, Police	Included in normal construction cost
	Accidents	Accidents	Confirmation of the implementation of EMP (Traffic control measures in place)	Quarterly inspections	Project site	Number & incidence of disruption	Visual inspection	No injury and sufficient no of road signs	TANROADS, KMC	TANROADS, KMC, Police	Included in normal construction cost

Source: JICA Survey Team

Table 10.2.4 Environmental Monitoring Plan during Operation Phase

Category	Environmental Items	Potential Impacts	Parameter to be monitored	Monitoring Frequency	Monitoring area	Measurement Units	Measurement method	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated Costs in US$ /year
Pollution	Air pollution	Impairment of local air quality	Dust level	3 years after start of operation Quarterly inspection	Project sites	$\mu g/m^3$	Dust level meter/ Mini-Vol Sampler	PM 2.5 not to exceed 250 mg/Nm3;	Consultants	TANROADS, KMC, OSHA	One day measurement at one intersection once per every three

Category	Environmental Items	Potential Impacts	Parameter to be monitored	Monitoring Frequency	Monitoring area	Measurement Units	Measurement method	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated Costs in US$ /year
			SO_2	3 years after start of operation Quarterly inspection	Project sites	Mg/l	Detector tubes	100 µg/Nm^3 (0.129 mg/kg) for 24hour			months ($ 3,500 x 2 intersection x 4 months = 28,000)
			NO_2	3 years after start of operation Quarterly inspection	Project sites	Mg/l	Detector tubes	150 µg/Nm^3 for 24-hours value			
			CO	3 years after start of operation Quarterly inspection	Project sites	ppm	Mini-Vol Sampler	10mg/Nm^3 for 8 hours			
			Black smoke PM_{10}	3 years after start of operation Quarterly inspection	Project sites	ppm	Mini-Vol Sampler	40 to 60 µg/Nm^3			
	Noise and excessive vibrations	Nuisance and disturbance on/ offsite receptors from noise and excessive vibrations	Noise level	3 years after start of operation Quarterly inspection	Project site	dBA	Noise level meter	EM (SCNVP) R, 2015; 75 dB(A) daytime or 55 dB(A) at night	Consultants	TANROADS, KMC, OSHA	One day measurement, 8 points for each intersection once per every three months 8 points x 2 x $ 400 = 6,400 x4 months = $ 25,600)
			Vibration levels / PPV	3 years after start of operation Quarterly inspection	Project site	mm/s PPV	Vibration meter	0.3 mm/s PPV or			
	Hydrology	Increased flood hazards from surface water run-off	Confirmation of the implementation of EMP(Appropriate stormwater drainage system, etc.)	During design of stormwater drainage facilities	Project sites	-------	Visual observation	State of implementation of EMP	TANROADS	TANROADS, KMC, DAWASA	Included in normal Operation cost
			Flood tendencies	3 years after start of operation Quarterly inspection	Project area	Number of incidences	Visual inspection	As minimum as possible, No floods hazards			

Category	Environmental Items	Potential Impacts	Parameter to be monitored	Monitoring Frequency	Monitoring area	Measurement Units	Measurement method	Target Level / Standard	Implementing Institution	Responsible Institution	Estimated Costs in US$ /year
Social Environment	Cross boundary impacts and climate change	Cross boundary impacts and climate change	Confirmation of the implementation of EMP (Traffic control, Awareness-raising, etc.)	Quarterly inspections	Project site	Traffic volume and Travel Speed	Visual inspection	Traffic Smoothness		TANROADS, KMC, Police	Included in normal Operation cost

Source: JICA Survey Team

Table 10.2.5 Monitoring Form Pre Construction Phase

Land Acquisition

		ARAP Plan	Most Updated Information	Achievement at Last Month		This Month Achievement		Total Achievement		Remaining	
		Person /TZS/ m^2	Date of Update (DD.MM.YY)	Person /TZS/ m^2	Progress %	Person /TZS/ m^2	Progress %	Person /TZS/ m^2	Progress %	Person /TZS/ m^2	Progress %
1	No. of Person/ Business Entitled (No. finished payment)	Employer 99 Full:67 Partial: 32 Employee 144 Full:134 Partial:10									
2	Compensation Payment at Replacement Cost (Total paid)	7.2 bil									
3	Allowance Payment (Total paid)	14.0 bil									
4	No. of Relocation (No. finished relocation)	67									
5	No. of Relocation after receiving compensation (No. finished relocation)	67									
6	Land acquisition (Location)	35 (yard lease excluded)									
7	Land acquisition (area m^2)	7,465m^2									
8	Securing the yard	33,000m^2									
9	No. of grievances received	—	—								
10	No. of grievances solved	—	—								
11	No. of grievances ongoing	—	—								

Records of committees, grievances, etc.

SN.	Date(DD.MM.YY)	Location	Issues	Results (Solved/Ongoing)	Next Action

Tabel 10.2.1 Monitoring Form Construction Phase

Air Quality (Ambient Air Quality)

Item	Unit	Measurement results (Average)	Measurement results (Maximum)	Target Level (Local standard)	International standard (World Bank Guideline)	Monitoring frequency, Method
Dust (PM2.5)	mg/m^3			0.075	0.025	One-day measurement at one location per intersection once every three months.
SO_2	mg/m^3			0.5	0.5	
NO_2	mg/m^3			0.12	0.2	
CO	mg/m^3			15	30	
SPM	mg/m^3			0.15	0.05	

Water Quality (Measurements at Stormwater Drainage Points)

Item	Unit	Measurement results (Average)	Measurement results (Maximum)	Target Level (Local standard)	International standard	Monitoring frequency, Method
Water turbidity	NTU			300	—	One-day measurement at one location per intersection once every three months.
Suspended Solid	mg/L			100	—	
Nitrate	mg/L			15	—	
Lead	mg/L			0.1	—	
pH	-			6.5-8.5	—	
DO				—	—	
Sulphate	mg/L			1	—	
Petroleum/ hydro-carbons	mg/L			10	—	
Temperature				—	—	

Solid Waste

Item	Status during Reporting Period
Overburden volume, hazardous waste volume	

Soil Contamination (Ambient environmental measurements)

Item	Unit	Measurement results (Average)	Measurement results (Maximum)	Target Level (Local standard)	International standard	Monitoring frequency, Method
Cadmium	mg/kg			1	—	One-day measurement at one location per intersection once every three months.
Chromium	mg/kg			100	—	
Lead	mg/kg			200	—	
Nickel	mg/kg			100	—	
Zinc	mg/kg			150	—	
Boron	-			-	—	
Copper	mg/kg			200	—	

Noise and Vibration

Item	Unit	Measurement results (Average)	Measurement results (Maximum)	Target Level (Local standard)	International standard	Monitoring frequency, Method
Noise level	dB			Daytime: 75 Nighttime: 65	—	One-day measurement at eight locations per intersection once a month.
Vibration level	mm/s			5	—	

Hydrology

Item	Status during Reporting Period
Flood tendencies	

Implementation of Mitigation Measures

Environmental Items	Mitigation Measures	Status during Reporting Period
Air pollution	Conduct training for construction workers on Environmental Management Plans prior to the commencement of construction work.	
	Construction vehicles drivers will be under strict instructions to minimize unnecessary trips, refill fuel tanks in the afternoon, and minimize idling of engines.	
	Equipment shall be properly tuned and maintained.	
	Use of vehicles that comply with regulations.	
	The project shall enforce vehicle load restrictions to avoid excess emissions from engine overloading	
	Watering of the construction area	
Water pollution	Conduct training for construction workers on Environmental Management Plans prior to the commencement of construction work.	
	Sanitary arrangements shall be to the satisfaction of the Tanzania law's requirement.	
	An efficient waste collection and disposal system based on the principles of reduction, re-use and recycling of materials, shall be instituted at the project sites.	
Wastes	Prepare a site waste management plan before commencement of construction works.	
	The debris resulting from the construction works will either be transported by a licensed waste transporter for dumping at an approved site.	
	The contractors shall maintain the project area in neat and tidy condition	
	Removing any equipment and machinery that is not in use, as soon as possible.	
Soil contamination	Conduct training for construction workers on Environmental Management Plans prior to the commencement of construction work.	
	Oils, hydrocarbons and other hazardous materials will be stored in designated locations with specific measures to prevent leakage and release of their contents including the positioning of the storage area away from storm water drains	
Noise and	Conduct training for construction workers on Environmental	

Environmental Items	Mitigation Measures	Status during Reporting Period
excessive vibrations	Management Plans prior to the commencement of construction work	
	Use of construction methods and equipment with low noise and vibration levels.	
	Appropriate maintenance and management of construction equipment, etc.	
	Ensure that operations do not generate excessive noise and vibration.	
	Implement training on the environmental management plan before the start of work.	
	Prompt response to complain	
Hydrology	Design appropriate stormwater drainage systems that do not cause flooding during the rainy season.	
	Coordination with relevant authorities (DAWASA)	
Local economy such as employment and livelihood	Make efforts to give priority to local people in employment.	
	Provide education and training when hiring workers.	
	Set working wages above the government's minimum wage.	
	Preferential procurement of materials from local sources.	
	Education and training in the hiring of workers.	
Existing social infrastructure and services	Providing both road and safety signs to the public and drivers at the core activity project site(s).	
	All large or over-size transport vehicles will be accompanied by escort cars equipped with flashing yellow warning lights while in transit on public roads.	
	Delivery of construction machines, equipment, and goods will be planned to minimize the total number of required trips and be scheduled outside of peak hour traffic times.	
	The flyover areas will be surveyed and clearly marked and cleared of obstacles before starting trenching in a particular area.	
	The proponent / contractor shall endeavour to obtain as much information as possible about underground services in the area (use maps) including: pipe lines, water mains, sewers, telephones, and power conduits, laid wires poles and guy wires or other underground or above ground structures and/or properties crossing or adjacent to the intersections.	
	The roads will be half open during the construction phase and road closure will be avoided. Whenever required, closure of the roads and walkways shall be prepared in close co-operation with the local police traffic unit.	
Gender	The proponent and Contractor will conduct mandatory and periodic training for workers on required lawful conduct in host community and legal consequences for failure to comply with laws on gender-based violence (GBV).	
	Gender disaggregated data, separate bathing, changing, sanitation facilities for men and women will be provided.	
	Collect information about GBV and associated social ills on a monthly basis	
Right of children	• Comply with the provisions in the Employment and Labour Relation Act, 2004 and the ILO Convention No. 182.	
	• The proponent has a transparent human resources policies and procedures for recruitment process, working conditions, terms of employment wages, worker-employer relations, non-discrimination policy, monitoring, roles and responsibilities.	
	• Prohibit child labour (children under 18 years of age), pregnant women and the elderly from engaging in hard labour and dangerous activities.	

Environmental Items	Mitigation Measures	Status during Reporting Period
Infectious diseases such as HIV/AIDS	• Conduct awareness-raising and education campaigns on HIV/AIDS.	
Labour environment	• Implement safety measures in compliance with Tanzanian (OSHA, 2003) and international legislation.	
	• • Implementation of occupational health and safety incentives for contractors.	
Accidents	• Set up a detour route around the construction area.	
	• Public notice and dissemination of construction and road closure information	
	• Install appropriate signage and traffic signals.	
	• Cooperation with traffic police.	

Records of committees, grievances, etc.

SN.	Date(DD.MM.YY)	Location	Issues	Results (Solved/Ongoing)	Next Action

Table 10.2.6 Monitoring Form Operation Phase

Air Quality (Ambient Air Quality)

Item	Unit	Measurement results (Average)	Measurement results (Maximum)	Target Level (Local standard)	International standard (World Bank Guideline)	Monitoring frequency, Method
Dust (PM2.5)	mg/m^3			0.075	0.025	One-day measurement at one location per intersection once every three months.
SO_2	mg/m^3			0.5	0.5	
NO_2	mg/m^3			0.12	0.2	
CO	mg/m^3			15	30	
SPM	mg/m^3			0.15	0.05	

Noise and Vibration

Item	Unit	Measurement results (Average)	Measurement results (Maximum)	Target Level (Local standard)	International standard	Monitoring frequency, Method
Noise level	dB			Daytime: 75 Nighttime: 65	—	One-day measurement at eight locations per intersection once a month.
Vibration level	mm/s			5	—	

Hydrology

Item	Status during Reporting Period
Flood tendencies	

Implementation of Mitigation Measures

Environmental Items	Mitigation Measures	Status during Reporting Period
Hydrology	• Design appropriate stormwater drainage systems that do not cause flooding during the rainy season.	
	• Coordination with relevant authorities (DAWASA)	
Local economy such as employment and livelihood	• Smoothing traffic through the implementation of projects.	
	• Efficient maintenance work to maintain smooth traffic	
Existing social infrastructure and services	• Installation of information boards, road signs	
Cross boundary impacts and climate change	• Promotion and awareness of the traffic facilitation benefits of project implementation, including greenhouse gas emission reductions.	

Records of committees, grievances, etc.

SN.	Date(DD.MM.YY)	Location	Issues	Results	Next Action

				(Solved/Ongoing)	

10.3 Stakeholder Identification and Support Holding Stakeholder Consultations

10.3.1 Objectives of stakeholder consultation

The objectives of the stakeholder consultations for the project were set as follows:

- Provide relevant, timely, accessible and appropriate information regarding the construction of the Mwenge and Morocco Intersections in an appropriate manner and understandable format to all stakeholders. Information will be disclosed as early and as comprehensively as possible,
- Identify structures through which information can be disseminated to stakeholders.
- Consult stakeholders on their opinions, concerns, preferences and perceived gains and risks with respect to the project planning and implementation, including the design and proposed management and mitigation measures to reduce potential impacts and to enhance possible benefits.
- Build mutually respectful, beneficial and lasting relationships with stakeholders (i.e., including regulators, communities, workers and shareholders), thereby securing and maintaining the project's social warrant to operate and to ensure compliance with both local regulatory requirements and international best practice, and
- Provide all stakeholders with the means to address concerns and grievances with the project, in a structured, reliable and responsive manner.

Table 10.3.1 List of Stakeholders Consulted

Sn	Stakeholders	Target Stakeholders
1	Project Proponent	TANROADS - Head Quarter
		Dar es Salaam Regional Manager Office
2	Land Transport Regulatory Authority	LATRA
3	Local government - Regional	Dar es Salaam Regional Commissioner Office
4	Local government - Municipality	Kinondoni Municipal Council
5	Wards - Mwenge intersection	Mikocheni, Kijitonyama and Makongo
6	Wards - Morocco Intersection	Msasani, Kinondoni, Mwananyamala and Mikocheni
7	Infrastructure / public companies/ authorities	Electricity, Telecommunication, Water, Drainage, etc.
8	Public transportation owners, managers, operators	BRT, bus, taxi, daladala, bodaboda, bajaj, etc.
9	Businesses and developers on and near to the target road section	National Housing Corporation
10	Others	Small Business Operators; Petrol Station Operators; Retail and Wholesale Shops Operators; Residents on and near to the target road section; Informal vendors, manager of such vendors, etc. on and near to the target road section

Source: JICA Survey Team

10.3.2 Status of stakeholder consultations

Stakeholder meetings (SHMs) for organisational stakeholders were held in two phases: the scoping phase and the reporting phase of the impact assessment results. The scoping phase was held on 28 June 2024 and the reporting phase of the impact assessment results on 27 September 2024.

Community targeted meetings (CMMs) were held in two phases, one at each intersection. For the commi-community around the Mwenge intersection, it was held on 1 July 2024, and for the commi-community around the Morocco intersection, it was held on 4 July 2024. The CMMs were publicized to local residents through Ward and MTAA representatives around each intersection, and were held in a manner that allowed residents, not just representatives, to participate.

Detailed records of stakeholder and community meetings are shown in.

Table 10.3.2 Participants of Stakeholders Meeting (Scoping Phase)

Date & Venue	Participants	
28th June 2024 PSSSF - Millenium Tower II	Organization 1	Kinondoni Municipal Council
	Organization 2	National Housing Cooperation (NHC)
	Organization 3	Tanzania Petroleum Development Cooperation (TPDC)/GASCO
	Organization 4	Dar es Salaam Commuter Bus, Owners Association (DARCOBOA)
	Organization 5	Umoja wa Watu Wenye Ulemavu waendesha Bajaji Mkoa wa Dar es Saalam (UWAWABADA),
	Organization 6	Chama cha madereva na wamiliki wa Pikipiki na Bajaji Mkoa wa Dar es Salaam (CMPD),
	Organization 7	Agenda for Environment and Responsible Development (NGO)
Number of total participants	Government: 6, NGOs and Community Specific Group: 5, JICA Survey Team (TRES) 4,	

Source: JICA Survey Team

Table 10.3.3 Participants of Stakeholders Meeting (Reporting Phase)

Date & Venue	Participants	
27th September 2024 PSSSF - Millenium Tower II	Organization 1	Tanzania National Roads Agency HQ (TANROADs)
	Organization 2	TANROADs – DSM Regional Office
	Organization 3	Kinondoni Municipal Council
	Organization 4	National Housing Cooperation (NHC)
	Organization 5	Dar es Salaam Water Supply and Sanitation Authority (DAWASA)
	Organization 6	Dar es Salaam Rapid Transit Agency (DART)
	Organization 7	Land Transport Regulatory Authority Agency (LATRA)
	Organization 8	Ward Executive Officers (Kijitonyama, Makongo, Mikocheni, Msasani, Kinondoni, Mwananyamala)
	Organization 9	Agenda for Environment and Responsible Development (NGO)
	Organization 10	Dar es Salaam Commuter Bus, Owners Association (DARCOBOA)
	Organization 11	Umoja wa Watu Wenye Ulemavu waendesha Bajaji Mkoa wa Dar es Saalam (UWAWABADA)
	Organization 12	Chama cha Madereva na Wamiliki wa Pikipiki na Bajaji Mkoa wa Dar es Salaam (CMPD)
Number of total participants	Government: 21, NGOs and Community Specific Group: 4, JICA Survey Team (TRES) 5,	

Source: JICA Survey Team

Table 10.3.4 Participants of Community Meeting at Mwenge

Date & Venue	Participants	
01st July 2024 Jamirex Hotel, Mwenge	Organization 1	Kijitonyama Ward
	Organization 2	Mikocheni Ward
	Organization 3	Makongo Ward
	Organization 4	Mwenge Mtaa
	Organization 5	Mikocheno B Mtaa
	Organization 6	Mlalakuwa Mtaa
Number of total participants	Government: 13, Community Specific Group: 2, JICA Survey Team (TRES) 3, Community members & PAPs; 12	

Source: JICA Survey Team

Table 10.3.5 Participants of Community Meeting at Morocco

Date & Venue	Participants	
04th July 2024 Chato Residency Conference Hall- Morocco area	Organization 1	Mwananyamala Ward
	Organization 2	Kinondoni Ward
	Organization 3	Mikocheni Ward
	Organization 4	Msasani Ward
	Organization 5	Mikoroshoni Mtaa
	Organization 6	Regent Mtaa
	Organization 7	Bwawani Mtaa
	Organization 8	Kumbukumbu Mtaa
Number of total participants	Government: 15, Community Specific Group: 1, JICA Survey Team (TRES) 3, Community members & PAPs; 15, Female 16, Male 18	

Source: JICA Survey Team

Source: JICA Survey Team

Figure 10.3.1 Stakeholder meeting held on 28th June 2024

Source: JICA Survey Team

Figure 10.3.2 Mwenge community meeting held on 01st July 2024

Source: JICA Survey Team

Figure 10.3.3 Morocco community meeting held on 04th July 2024

The major opinions from the stakeholder and community meetings are presented in Table 10.3.6 to Table 10.3.9. The Project objectives, Project schedule especially about the timing of the commencement of the Construction phase, and measures of compensation and assistance were fully explained to the relevant stakeholder institutions and local community, including the potential PAPs. No objections to the implementation of the Project were raised by the local community and stakeholders.

Detailed records of stakeholder and community meetings are shown in Appendix 6.

Table 10.3.6 Major opinion and summary of the discussion of SHM (Scoping phase)

Major opinion	Response from JICA Survey Team
• The business community who will be impacted/relocated by the project need to be informed early in advance and be given ample time in order to complete their stocks and hence to avoid conflicts and project delays due to court injunctions. • Likewise, compensation for the affected community should be done early in advance and be given ample time for their relocation of their properties/stocks. • The flyover designs should also consider dedicated road for bodaboda (motorcycle) and Bajaji (tricycle). • There is a need also for the roads designs to have gardens for both purposes i.e. beautification of roads and for carbon sequestration from the vehicular exhaust emissions. • Further beautification can be done to the concretes by painting with good colour other than the current practices of leaving concrete with cement colour. • There should be clear messages/information to the project affected on the issues regarding the time for relocation/compensation for the project. It should also be known who will provide these information when the time for compensation/relocation comes. • Generally in compensation issues when someone hears there will be compensation tend to either increase the value for the property or business just to create evidence for high amount for compensation. Thus, the information sharing with PAPs should be taken with great care to avoid escalated project costs due t some opportunistic people. • The construction of flyovers in both interchange of Morocco and Mwenge will disrupt existing storm water drainage in or around the area. Proper storm water management structures should be considered in the designs to avoid flooding issues during heavy rains. The Morocco intersection should collaborate with DAWASA who have constructed big storm water drainage and pipes to convey the same towards the Indian Ocean. • Likewise, at Mwenge junction and the point between Mwenge junction and ITV bus stand currently when there is heavy rains it becomes challenge for the vehicles to pass through the flooded area. Thus, the design of flyover in this area as also might disrupt the storm water drainage, the new storm water designs	• JICA Survey Team recorded all the opinions and promised to convey them to the Project planners and engineers, as well as to TANROADS.

Major opinion	Response from JICA Survey Team
should take into account the existing condition provide with sustainable solution on storm water of the area. A good measure if technically will be possible is to have huge drainage directing towards Mlalakuwa River that flow towards the Ocean. • Also, there is a need to work closely with the DAWASA for sewage infrastructures at Mwenge project area. • Generally the project is good to alleviate the increasingly congestion in these major interchanges and thus the project is supported by the office. • Between Mwenge and Morocco there are NHC land and building properties that might be encountered. It is recommended that, once evaluation has been done to the affected land/building properties under the NHC, the draft evaluation report should be shared with the NHC for reconciliation of the evaluated properties before sending to the Chief Government Valuer for endorsement ,to avoid future grievances that might delay the project take off. • TPDC has Natural Gas Pipeline at Mwenge Roads (Sam Nujoma Road and Bagamoyo Road) and during development of the BRT Roads these will be relocated to a new area and have a new gas alignment. Thus, it is the important for this study to consider the baseline of the new alignment under the BRT Roads which is currently ongoing other than the current condition. In this respect there is a need to work closely with DART. • UWAWABADA is honored to be part of stakeholders to contribute towards road infrastructures development project as representatives of people with disabilities. • The association have members who are disables, but due to accidents caused there are new members joining including bodaboda and Bajaji drivers as well as pedestrians, but large number is from bodaboda group. One of the cause of accidents that cause disabilities is lack of proper infrastructures for Bodaboda and bajaji. Thus, for this project it is crucial to consider in the designs dedicated roads/paths on the flyover for the bodaboda and Bajaji which we believe will reduce the accidents and new members in our group. • Some vehicle drivers tend to ignore bodaboda and Bajaji while on the road the aspect of which is risks to Bodaboda and Bajaji drivers but once will have dedicated roads this risk will be not be there. • It is important for the pedestrians crossings to consider people with disabilities and some of them uses wheel chair. These need to be factored in the designs. Currently some crossing under the BRT have put some short concrete poles to avoid tricycle using pedestrians crossing the aspect of which denies people with disabilities using wheel chair to cross in these areas. • The bumps on the roads should be friendly other than small on series bumps normally referred to as Rastas. • The lumps for people with disabilities in the BRT terminal and in the crossing bridges are quite long and tiresome for people with disabilities and thus if there will be lumps for these intersections they should be improved to have more friendly alternatives. • The previous contributors have pre-emptied our issues but it is worthwhile to stress on the issues which were part of the agender of the association to present. The issue of having dedicated road for Bajaji/Bodaboda for flyovers is important as this is long term infrastructures and thus they should be socially inclusive. Socially inclusive to include roads for pedestrians, vehicles and Bodaboda/Bajaji. • Since Ali Hassani Mwinyi and Bagamoyo roads will be impacted during construction it is advised to improve first alternatives roads to include old Bagamoyo road before starting construction as these will be more using during construction and hence to reduce the impact severity. • During project constructions there should be proper directions for smooth flow of traffics and thus to avoid congestions. • The issue of compensation noted by the previous speakers is important to note, the evaluation should be done as early as possible before starting the project to avoid opportunistic people who normally encroaches the project area just for the sake of compensation. • It is important for local communities to be involved in the project to include in the emerging project opportunities like employment and thus to have project economic trickle-down effect to the local people. This at large brings local ownership of the public infrastructures which enhanced security to the development public infrastructures. • Communication and collaboration between public institutions should be strengthened for smooth project implementation as there are examples whereby the project is delayed dispute the contract being on site due to delay on the	

Major opinion	Response from JICA Survey Team
relocation of public infrastructures which is done by different government agency	

Source: JICA Survey Team

Table 10.3.7 Major opinion and summary of the discussion of SHM (Reporting phase)

Major opinion	Response from JICA Survey Team
• The Municipal is developing a re-development plan for Morocco Mwenge corridor (i.e. Transit Oriented Development) that aim to enhance potential of attractive urban development with the coming new BRT line. This involve among others provision of walk-ways and bicycle dedicated ways. The Town Planner thus noted there is a need to coordinate the upcoming fly over with the plan by sharing information of the project in order to compliment each other.	• The Team requested the Municipal plan need to be shared with TANROADs and stakeholders.
• The Engineer from NHC noted that, there is a plan to construct a pedestrian bridge from the current BRT bus station to the Morocco Square Building to easy access to the building which will have a multipurpose commercial activities and thus integration of the design information is important to find appropriate alternative for integration. However, it was noted this is at initial stage and has not been shared to stakeholders including TANROADs. • The Engineer also requested for the project to consider provision of access to the Morocco Square building from the Road for easy traffic flow in and out of the building, without which will bring traffic flow problem in and out of the building. However, it was clarified that since there will be ground level road the entry to the building from Ali Hassani Mwinyi Road will not be closed but within the building compound enough space for vehicle entry/exit should be provided. • Likewise the Engineer noted that traffic flow in and out of the Morocco square should be looked at during construction to avoid nuisance to the public at the area. • Engineer also advised the TANROADs and DART to consider having parking space at the begging of the BRT Stations to allow public leave their car and take BRT to the CBD the aspect of which will reduce traffic at the CBD by capitalizing the BRT services. On this TANROADs representative from DSM Regional office noted that there are space provided for parking area on this phase 4 BRT stations. • The member from KMC recommended that institutions such as TANROADS, DAWASA, and NHC should meet to plan the relocation of their infrastructure when necessary. In this regard, it was clarified that TANROADS has the responsibility to inform the heads of these institutions, as they have already assessed the areas and have all the relevant information. Additionally, it was noted that the experience from other projects, like the BRT, would be useful in addressing challenges related to infrastructure relocation that may arise in this flyover project. • One member from NHC noted that from experience of Ubungo flyover the underneath space has been used as hideout for some people with illegal activities and hence there is a need to look on this. On this, it was clarified that, for the Mwenge and Morocco flyover the areas underneath will be used for the BRT and hence leaving no open space for misuse, unlike the Ubungo flyover. • The members from DAWASA emphasized the need to avoid damaging potable water and sewer pipelines passing through the project areas during construction. Additionally he suggested close cooperation between TANROADS and DAWASA when water infrastructure needs to be relocated or adjusted to prevent confusion that may lead to water loss. • The member from KMC suggested that, upon completion, the flyover should be painted to enhance its visual appeal. • A member from DARCOBOA noted that, there is a need to consider pedestrian crossing along Sam Nujoma where the landing of flyover will happen to easy access towards Lugalo Hospital by the public. During discussion it was noted at the very same point there is BRT Station and thus integration between TANROADS and DART will need to be done to ensure all	• JICA Survey Team recorded all the opinions and promised to convey them to the Project planners and engineers, as well as to TANROADS.

Major opinion	Response from JICA Survey Team
issues are integrated. • The Ward Executive Officer of Msasani advised that occupational health and safety issues should be considered, including the provision of temporary sanitary facilities such as mobile toilets during the construction phase. • The Ward officer from Msasani suggested the creation of alternative routes/roads for diversion, particularly during rush hours (morning and evening) to ease traffic congestion during the flyover construction around both Mwenge and Morocco areas. • A member from CMPD insisted for both ongoing projects of BRT and flyovers to consider providing a parking area for Bodaboda and Bajaji to avoid haphazard parking for Bajaji and Bodaboda as these services is important for the public in the BRT Station areas and intersections.	
• The Engineer from NHC recommended to TANROADs the construction of ring roads on the peripheries of the city to further alleviate congestion.	• On this it was noted by TANROADs Regional Office that ring road designs are underway to address the issues.

Source: JICA Survey Team

Table 10.3.8 Major opinion and summary of the discussion of CMM (Morocco Area)

Major opinion	Response from JICA Survey Team
• The member from Kumbukumbu Mtaa appreciated the initiatives of the government and international partners like JICA towards construction of flyovers in the two intersections to improve the transportation in the area. The member noted that the Morocco area specifically on Ali Hassani Mwinyi road is experiencing floods during heavy rains and the most affected area is Kumbukumbu area as there is no drainage to convey storm water towards the sea. With construction of flyover if this issue is not well considered will worsen the condition in the area. • Other members noted that the existing storm water drainage in the project area should be improved along with this project in order to address the flooding during heavy rains. • The members advised during construction of the project to pay attention on community health and safety issues to avoid construction hazards to the surrounding community and recommended some measures to include fencing the core construction site and putting and maintaining safety/warning signs. • It was noted that most road construction projects do not provide sanitary facilities for their workers and this becomes a challenge and public health concern, thus it was advised for this project to provide mobile toilets for the workers on site to address the issue. • One member recommended the inclusion of crossings for people with disabilities during the project's construction as in most cases this is ignored and becomes a challenge for people with disability to cross the road which is under construction. • Members also suggested that job opportunities arising from the project should be prioritized to the youth from the local areas where the project is being implemented. Additionally, the project's contractor should create an effective system to collaborate with the surrounding community by sharing the information regarding the emerging opportunities such as supply of construction materials etc. • It was noted that the Morocco and Mwenge are major junctions and the proposed measures of flyovers will only help for certain years and thus it is suggested if budget allows to have two flyovers on both junctions just like Ubungo interchange. It was also suggected if the budget does not allow there should be provisions for putting additional flyover in future. The essence is for designers to have designs that allows construction of another flyovers in future to avoid unnecessary costs if it is not considered at the beginning. • Members noted that at Morocco area there are infrastructures belonging to other institutions such as Airtel, Halotel and Vodacom Optic Fiber Cable, DAWASA water pipes that provide services to the community and thus involved of these institutions is important before the commencement of the project. • Members also noted that most project focus on specific project without considering possible indirect impacts to the surrounding community and thus it was suggested after completion of the project construction to do assessment of the project's impact and find solution to any unforeseen project impact. The example was given to some road projects after construction some drainage channels were blocked leading to flooding tendences in areas where there was	• JICA Survey Team recorded all the opinions and promised to convey them to the Project planners and engineers, as well as to TANROADS. • JICA Survey Team commented that proper sanigary facilities for the workers shall be provided on site. • JICA Survey Team commented that, together with the BRT project, sufficient area of road islands shall be designed in the Project Area to assist people with various movement abilities to cross the roads safely. • JICA Survey Team commented that the Team shall recommend the Contractor to announce job opportunities arising from the Project shall be notified to the local Mtaa for encouraging application.

Major opinion	Response from JICA Survey Team
none.	
• One member inquired if the increased number of people/workers due to project would still depend on existing health care infrastructures.	• JICA Survey Team commented that there will not be a significant increase in the number of people working on the project that would jeopardize the existing health care infrastructures. Further, it was elaborated that the intention is to reduce medical cases by putting measures to avoid accidents and health issues at work.

Source: JICA Survey Team

Table 10.3.9 Major opinion and summary of the discussion of CMM (Mwenge Area)

Major opinion	Response from JICA Survey Team
• The Participants stated that noise emission and air pollution due to dust emission during the construction are expected impacts especially to the residents with houses close to the main roads and to the business community around mwenge junction, and thus measures to minimize the same considered. • Also, the project will have impact to small traders in the area especially for those close or doing business along the roads. • Mwenge is one of the busy junctions in Dar es Salaam and currently traffic congestion is experienced and if the roads will be closed it will bring more inconveniences for people going and returning from works. To reduce the impact internal roads (some under TARURA) should be improved so that they can be used as alternative roads during construction period. • The participant mentioned that, the area near the PUMA petrol station, which is being discussed as part of the project for compensation, has underground fuel storage tanks, so proper procedures should be followed to avoid environmental pollution. However, the issue was clarified that the project will not affect the Puma Petrol Station;	• JICA Survey Team recorded all the opinions and promised to convey them to the Project planners and engineers, as well as to TANROADS.
• Member highlighted that, the proposed project area has several public infrastructures such as storm water drainage, DAWASA water pipeline/pipes, Sewer, Optic Fiber Cable, TANESCO high tension lines and electric poles, and TPDC natural gas pipelines, therefore, all concerned parties with infrastructures should be involved in the process before commencement of the project construction.	• JICA Survey Team informed that the Team held separate meeting with the utilities owners and further the study will engage them.
• It was stated that when these public development infrastructures are coming in the area the local community expects some of the related issues to be resolved by these projects however the experience shows that is not always the case. For instance when the road is flooded during heavy rains it is expected after construction/improvement of the same road the flood would be addressed. In the same vein Mwenge junction area is experiencing floods during the heavy rains and thus it is expected the project to address the same. Thus, this should be considered in the designs and eventually during construction.	• JICA Survey Team informed that early notification will be given on the notice boards at the Project Area promptly.
• It was advised for the business community to be affected at Mwenge to be given information early in advance before starting the construction activities in order to give them ample time. Early information helps to eliminate unnecessary conflicts and allow people to prepare adequately for upcoming changes.	• JICA Survey Team informed that the JICA Guidelines require 100 % of payment prior to physical relocation and land taking.
• Also it was added that, the early notification and appropriate compensation will help ensure that their rights are protected and their business operations are not adversely affected. This can also help build trust between the authorities/government and the citizens, and prevent conflicts that could delay the project and increase costs. It is also important to clarify the compensation procedures and ensure that all those eligible receive their compensation on time and in appropriate manner.	
• One member noted that, the issue of employment to the locals always it is heard during project preparations like these but when it comes during implementation contractors come with workforce from elsewhere and not from locality and thus this should be taken as a challenge for this project to address. One means is collaborate in sourcing laborer's with the local government offices.	• JICA Survey Team commented that the Team shall recommend the Contractor to announce job opportunities arising from the Project shall be notified to the local Mtaa for encouraging
• It was noted that, normally there is no proper point to channel an issue to the	

Major opinion	Response from JICA Survey Team
contractor during construction. Some laborers come to report to the local government offices for either being mistreated or not paid their salaries and as a leader you need to engage with the contactor and on this one faces difficulties. Other projects normally have committee to deal with community/employment issues and there is dedicated person (clearly known) to channel the issues to. Those kind of measures should be taken to ensure smooth project implementation during construction period. • Other members suggested that there should be scheduling of some activities to reduce the impact of congestions at the junctions especially at peak hours, example was given that transportation of construction materials such as sand, stones or aggregates could be done at night. • It is important for project contractor to consider occupational health and safety issues for the workers at site to include provision of Personal Protective Equipment (PPEs) to safeguards their health against construction related hazards.	application. • JICA Survey Team informed that heavy machines and construction materials shall be brought to the Project Area from the Yard avoiding peak hours. • JICA Survey Team informed that it is the responsibility of TANROADS to instruct and monitor the Contractor to follow proper occupational health and safety measures.

Source: JICA Survey Team

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APPENDIX 1: GAP ANALYSIS TABLE FOR ESIA

JICA GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS January 2022	Laws of Tanzania	Gap between JICA Guidelines and Laws of Tanzania	Policy taken in this Project
1. Basic Principles 1. Environmental and social impacts caused by projects must be assessed and examined at the earliest possible planning stage. Alternatives or mitigation measures must be examined, in order to avoid such impacts as much as possible, and to minimize, reduce or mitigate them when such avoidance is impossible. The result of the examinations must be reflected into the project plan.	Projects that require ESIA are listed in the Third Schedule of EMA, 191 and first schedule of the EIA and Audit Regulations of 2005 as amended in 2018 (hereafter "the ESIA regulations". The proposed project requires ESIA at its planning stage. As per ESIA Regulations it is necessary to consider alternatives and mitigation measures and development of the environmental and social management and monitoring plans.	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
2. Such examinations must be endeavored to include an analysis of environmental and social costs and benefits in the most quantitative terms possible, as well as a qualitative analysis, and to be in a close harmony with the economic, financial, institutional, social, and technical analyses of projects.	The Environmental Management Act 2004 and its subsequent regulations of 2015 requires analysis of environmental and social costs and benefits in the most quantitative terms possible, as well as a qualitative analysis, and to be in a close harmony with the economic, financial, institutional, social, and technical analyses of projects.	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
3. The findings of the examination of environmental and social considerations, including alternatives and mitigation measures, must be documented as an independent document or as a part of other documents. Environmental assessment reports must be prepared for projects with potential significant impacts.	Regulations 18. (1) requires the proponent to prepare and submit to NEMC, an independent environmental impact statement incorporating but not limited to the following information- the environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short term and long term effects anticipated; alternative technologies and processes available and reasons for preferring the chosen technology and processes; analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies etc	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
4. For projects which may have significant impacts in particular, or for controversial projects, a committee of experts may be formed so that projects may seek their opinions, in order to increase accountability.	Regulation 22-(1) requires the NEMC to set up cross-sectoral technical advisory committees at national level and, where appropriate at a local government authority level to advise it on reviews of environmental impact assessment related reports.	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.

JICA GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS January 2022	Laws of Tanzania	Gap between JICA Guidelines and Laws of Tanzania	Policy taken in this Project
2. Examination of Measures 1. Multiple alternatives must be examined in order to avoid or minimize adverse impacts by the project and to choose better project options in terms of environmental and social considerations. In the examination of measures, priority is to be given to avoidance of environmental impacts. When this is not possible, minimization, reduction, and then mitigation of the impacts must be considered, in accordance with the mitigation hierarchy. Compensation measures must be examined only when significant impacts are still remain even with the aforementioned measures.	Regulations 18. (1) requires the proponent to prepare and submit to NEMC, an independent environmental impact statement incorporating but not limited to the following information- the environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short term and long term effects anticipated; alternative technologies and processes available and reasons for preferring the chosen technology and processes; analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies etc	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
2.Appropriate plans and systems for measures, such as monitoring plans and environmental management plans, must be prepared. The costs of implementing such plans and systems, and the financial methods to fund such costs, must be determined. For projects with particularly significant impacts, detailed environmental management plans must be prepared.	The EMA Cap 191 requires preparation of the ESMP and EMP with details of project activities, impacts, mitigation measures, time schedule, costs, responsibilities and commitments proposed to minimize environmental impacts of activities, including monitoring and environmental audits during implementation and decommissioning phases of a project	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
3.Scope of Impacts to Be Assessed 1.The impacts to be assessed with regard to environmental and social considerations include impacts on human health and safety, as well as on the natural environment, that are transmitted through air, water, soil, waste, accidents, water use, climate change, biodiversity, and ecosystem services, including trans- boundary or global scale impacts. These also include social considerations such as: Migration of population including involuntary resettlement, local economy such as employment and livelihood, utilization of land and local resources, social institutions such as social capital and local decision-making institutions, existing social infrastructures and services, vulnerable social groups such as poor peoples and indigenous peoples, equality of benefits and losses and equality in the development process, gender, children's rights, cultural heritage, local conflicts of interest, infectious diseases such as HIV/AIDS, and working conditions including occupational safety.	Regulation 16. Provided that an environmental impact assessment shall take into account environmental, social, cultural, economic, and legal considerations, Also the regulations specify the items to be considered such as: Natural environment (e.g., biodiversity, wildlife, wetland, water resource, hydrology, vulnerable ecosystem etc). Social environment (e.g., economy, society, health, immigration/emigration, social infrastructure, culture, landscape, amenity, land use). Develop an environmental management plan with mechanisms for monitoring and evaluating the compliance and environmental performance which shall include the cost of mitigation measures and the time frame of implementing the measures.	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.

JICA GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS January 2022	Laws of Tanzania	Gap between JICA Guidelines and Laws of Tanzania	Policy taken in this Project
2,In addition to the direct and immediate impacts of projects, derivative, secondary, and cumulative impacts as well as impacts associated with indivisible projects are also to be examined and assessed to a reasonable extent. It is also desirable to consider the impacts through a project life cycle.	Regulation 24 states that the NEMC shall undertake review of an EIS report in accordance with the following criteria: (i) identification and evaluation of key impacts; (ii) residual impacts;(iii) cumulative impacts; (iv) prediction of impact magnitude; and (v) assessment of impact significance.	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
4. Compliance with Laws, Standards, and Plans 1. Projects must comply with the laws, ordinances, and standards related to environmental and social considerations established by host country governments, including local governments. Projects must also conform to the environmental and social consideration policies and plans of the host country governments.	The Tanzania government has been developing and reviewing national policies, laws, regulations and standards to address and anchor environmental management in all sectors. Among others, the objective of these efforts is to regulate the development/projects undertaken within respective sectors so that they are not undertaken on the expense of the environment.	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
2. In principle, Projects must be undertaken outside of areas that are specifically designated for conservation of nature or cultural heritages by the host country governments, unless the main purpose of the Projects is to promote or restore the protection of such areas. Also, projects shall not cause significant adverse impacts on such designated conservation areas.	The EMA Cap 191 require the Minister responsible for Environmental Management to protect the Protected Areas by considering flora and fauna, special feature, the interests of the local communities and in accordance to international treaties. Permission of all projects in National Parks is granted based on the finding of the ESIA study, which clarify positive and negative impacts of the project.	In Tanzania, even within National Parks, project permission can be granted depending on the EIA result. It is not prescribed as for the necessity of analyzing if the economic benefits outweigh environmental costs.	Avoid protected areas. Wherever feasible, the proposed project location is sited on lands already developed on the existing roads.
5. Social Acceptability 1.Projects must be adequately coordinated so that they are accepted in a socially appropriate manner for the countries and areas where the projects are planned. For Projects with potentially significant environmental and social impacts, sufficient consultations with local stakeholders, such as local residents, must be conducted via disclosure of information at an early stage, at which time alternatives for project plans are examined. The outcome of such consultations must be incorporated into the project plans.	The Regulation requires the project proponent constantly to liaise with relevant authorities and consult stakeholders including local communities in case of any new development or changes as regards to implementation of the project plan or activities. All stakeholders that will be negatively or positively impacted by the project should be identified from the start of the project. Environmental experts or firm of experts must ensure there is adequate stakeholder participation. The experts must ensure that concerns and views from stakeholders are fully taken into account during the assessment of impacts	No difference in general	Consider detailed and effective consultation and information sharing with affected persons
2.Appropriate considerations must be given to vulnerable social groups, such as women, children, elderly peoples, people in poverty, indigenous peoples, persons with disabilities, refugees, internally displaced persons, and minorities. Such vulnerable social groups are susceptible to environmental and	Regulations 13. (1) provided that ESIA shall be conducted in accordance with scoping and the ToRs during the scoping exercise by the developer or proponent. Section (4) provide that the scoping report shall contain among other things the stakeholder groups identified and how they were	In Tanzania, there is no effective and adequate participation of affected persons in the planning, implementation, and	Consideration will be given to ensure appropriate and effective participation of affected persons in the planning,

JICA GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS January 2022	Laws of Tanzania	Gap between JICA Guidelines and Laws of Tanzania	Policy taken in this Project
social impacts and may have little access to decision-making processes within society.	involved in the scoping exercise. This emphasis the considerations of vulnerable social groups.	monitoring processes of resettlement programs.	implementation, and monitoring processes of the resettlement plan.
6. Climate Change 1. For projects that are expected to generate more than a certain amount of greenhouse gas emissions, the total amount of greenhouse gas emissions will be estimated and disclosed before the project implementation.	Tanzania has ratified the UNFCCC and as such it has put consideration for the nature of the project, there is an apparent need to ensure the activities live within the carrying capacity of the environment and to avoid the emission of potentially atmospheric debilitating gases.	No difference in general	No negative climate change impact is envisaged given the modest size of project. The improvement of the intersection will reduce the levels of air pollution
7. Biodiversity 1. Projects must not involve significant conversion or significant degradation of critical habitats or critical forests.	The Environmental Policy and the EMA cap 191 requires the project to conserve biological diversity and promote the sustainable use of natural resources.	No difference in general	There are no national parks or protected area around the project target site and environs.
2.Illegal logging of forests must be avoided. Project proponents need to obtain logging permits from regulatory agencies, and are encouraged to obtain forest certifications for forestry projects, in order to ensure the prevention of illegal logging.	The Forest Regulations, 2003, provide that under (14. (1) and (2) "except where a permit or licence has been issued under these Regulations, no person shall use any land within any part of a forest for the purposes of erection of any building or structure, or occupation. No license or permit shall be issued under this regulation unless an ESIA has been submitted to and approved by the authorised officer.	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
8. Involuntary Resettlement and Loss of Livelihood 1.Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. If avoidance is not possible even after such examination, effective measures to minimize impacts and to compensate for losses must be taken upon agreement with the affected people.	Tanzania policies also insist on looking for best alternatives when implementing involuntary resettlement and loss of means of livelihood	No gap between JICA Guidelines 2022 and Tanzania policies. Thus, JICA Guidelines will be applied here	Consider alternatives to avoid unnecessary loss of livelihoods.
2.Project affected people, such as people to be resettled involuntarily and/or people who may lose their livelihoods by the project, must be provided sufficient compensations and supports by the project proponents in a timely manner. Compensations must be calculated at full replacement cost as much as possible, and provided in advance. Project proponents must make efforts for the affected people to improve or at least restore their standards of living, income opportunities and production levels to the pre-project levels. Measures to achieve this may include: Providing land or monetary compensations for losses of land or assets, supporting for alternative sustainable livelihood, supporting	The Land Acquisition Act and the Land Act 1999 have stated clearly that land owners, with or without formal legal rights, are entitled to full, fair and prompt compensation. They also get disturbance allowance, transport allowance, accommodation allowance and loss of profit if they were in actual occupation of the acquired property. Lost assets are limited to "unexhausted improvements", that is the land and developments on the land. The law does not cover economic and social impacts of relocation and as such socio-economic surveys are not part of the land acquisition process	There is no gap between Tanzania and JICA Guidelines as far as those with formal legal rights and those without formal legal rights are concerned. However, the lost assets in Tanzania are restricted to land and developments on land, and where relevant, loss of profits. The lost assets under JICA Guidelines are	Consider the replacement cost (market price and procedure costs included in compensation).

JICA GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS January 2022	Laws of Tanzania	Gap between JICA Guidelines and Laws of Tanzania	Policy taken in this Project
for expenses necessary for relocation, and supporting for re-establishment of communities at resettlement sites.		much wider than land and include loss of access to livelihoods and standard of living and seeks to improve them or at least to restore them to pre-displacement levels	
3. Compensation standards are disclosed and consistently applied. The project affected persons need to be aware of the compensation standards. In principle, the contents of the individual compensation to be agreed are explained to the project affected persons in writing, and the project affected persons can confirm the contents at any time.	Tanzanian law requires that compensation be full, fair and prompt. Prompt means it should be paid within six months, failure to do which attracts an interest rate equivalent to the average rate offered by commercial banks on fixed deposits. Legally, compensation for the acquired land does not have to be paid before possession can be taken, but in current practice it is usually paid before existing occupiers are displaced	In practice, compensation is not paid promptly most of the time, and delays are not rectified by paying the interest rate as required by the law	Consider adopting market price and cost required for procedure, instead of cost amortized price. Consider that compensation is paid promptly.
4.Appropriate participation of the project affected people and their communities must be promoted in the planning, implementation and monitoring of measures against involuntary resettlement and loss of livelihood.	Consultation with wide range of project stakeholders including individuals or groups affected by the project either positively or negatively also the host community is regularly held as a procedure towards resettlement exercise.	Tanzanian law make provisions requiring the government to pay special attention to vulnerable groups in the administration of compensation despite the consultations	Environmental and Social Standard (ESS) 5 of the World Bank's and JICA Guidelines are used as instrument during consultations to include tenants and vulnerable groups.
5.For projects that result in large-scale involuntary resettlement, a Resettlement Action Plans (RAP) must be prepared and made available to the public prior to the resettlement and provision of compensation and support. In preparing the RAP, consultations must be held with the project affected people and communities, based on sufficient information made available to them in advance. When consultations are held, explanations must be given in languages and forms that are understandable to the project affected people. It is desirable that the RAP includes elements laid out in the Environmental and Social Standard (ESS) 5 of the World Bank's environmental and social policies.	Compensation must be provided for large-scale resettlement (*Land Acquisition Act 1967 Part II Section 11 and Land Cap 113, Part II Section 3 (1) (g)).* However, there are a few cases where the government has provided both compensation and alternative land, but this has been done at its discretion. In general, the government feels that it has discharged its duty once compensation is paid, and it is up to the displaced persons to resettle and re-establish themselves else where	The legal system of Tanzania does not require the formulation of resettlement plans.	This is not a large project. However, preparation of ARAP will be undertaken in a consultative manner and final ARAP documents made available to the public
9. Indigenous Peoples 1.Any adverse impacts that a project may have on indigenous peoples are to be avoided when feasible by exploring all viable alternatives. If avoidance is not possible even after such examination, effective measures for indigenous peoples	There is no specific legislation referring to the rights of indigenous peoples or minorities. In addition, there are no legal provisions on indigenous peoples' plans, which set out measures for indigenous peoples. However, generally Tanzania legal system insist on	There are some gaps. However, indigenous people as defined by the World Bank, ESS7 are not identified in	There are no ethnic minorities in the project area as defined by the World Bank, ESS7.

JICA GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS January 2022	Laws of Tanzania	Gap between JICA Guidelines and Laws of Tanzania	Policy taken in this Project
must be taken to minimize the impacts and to compensate for the losses.	looking for best alternatives when implementing involuntary resettlement and any adverse impacts that a project may have on PAPs are to be avoided when feasible by exploring all viable alternatives.	the target project areas	
2.When projects may have adverse impacts on indigenous peoples, all of their rights in relation to land and resources must be respected in accordance with the spirit of the relevant international declarations and treaties, including the United Nations Declaration on the Rights of Indigenous Peoples. Efforts must be made to obtain the Free, Prior, and Informed Consent (FPIC) of the affected indigenous peoples.	Despite that there are no Indigenous people within the area, the Land Acquisition Act, the and Land Act 1999 and the Village Land Act 199 stated clearly that land owners including the indigenous peoples, with or without formal legal rights, are entitled to full, fair and prompt compensation.	There are some gaps. However, indigenous people as defined by the World Bank, ESS7 are not identified in the target project areas	There are no ethnic minorities in the project area as defined by the World Bank, ESS7.
3.Measures for the affected indigenous peoples must be prepared as an Indigenous Peoples Plan (IPP), which may constitute as a part of other documents for environmental and social considerations, and must be made public in compliance with the relevant laws and ordinances of the host country. In preparing the IPP, efforts must be made to obtain the FPIC of the affected indigenous peoples based on sufficient information made available to them in advance. When consultations are held, explanations are given in languages and forms that are understandable to the indigenous peoples concerned. It is desirable that the IPP includes the elements laid out in the ESS 7 of the World Bank's environmental and social policies.	Tanzania policies also insist on looking for best alternatives when implementing involuntary resettlement and any adverse impacts that a project may have on indigenous peoples are to be avoided when feasible by exploring all viable alternatives.	In Tanzania there are no specific regulations on indigenous peoples.	There are no ethnic minorities in the project area as defined by the World Bank, ESS7.
10. Monitoring 1. During the project implementation, project proponents monitor whether any unforeseeable situations occur, and the performance and effectiveness of the planned mitigation measures. Project proponents take appropriate measures based on the results of such monitoring.	Regulation 50. (1) states that in executing a project or development, after the EIS report has been approved the proponent shall take all practical measures to ensure the implementation of the environmental management plan by carrying out self-auditing annually. Also, during the project implementation, the NEMC shall conduct environmental monitoring in order to evaluate the performance of the mitigation measures following the prepared ESMP as well as Monitoring Plan.	There is no difference in general between the JICA Guideline and Tanzania Regulations	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
2.In cases where sufficient monitoring is deemed essential for appropriate environmental and social considerations, such as projects for which mitigation measures should be implemented while monitoring their	The Regulations requires the environmental experts or firm of experts prepare a Monitoring Plan and Environmental and Social Management Plan with details about institutional responsibilities, monitoring framework, parameters,	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.

JICA GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS January 2022	Laws of Tanzania	Gap between JICA Guidelines and Laws of Tanzania	Policy taken in this Project
effectiveness, Project proponents must ensure that the project plans include feasible monitoring plans.	indicators for monitoring and costs of monitoring were appropriate.		
3.Project proponents should make efforts to make the monitoring results available to local stakeholders involved in the project.	Regulation 39.-(1) provide that subject to the freedom of access to environmental information, any project brief, environmental impact statement, terms of reference, public comments, report of a person presiding at a public hearing, environmental impact assessment statement, decision letter or any other information submitted to the Council under these Regulations, shall be public documents. (2) The Council shall, grant any person who desires to consult any document referred to in sub-regulation (1), access to that document on such terms and conditions as the Council considers necessary.	No difference in general	The project will comply with both JICA Guideline 2022 and Tanzanian Environmental standards.
4.When third parties point out specifically that environmental and social considerations are not being fully undertaken, project proponents should make efforts to reach an agreement on the procedures to resolve the problems, through forums for discussions and examinations of the countermeasures with participation of stakeholders involved in the projects, based on sufficient information disclosure.	According to the EIA and Audit Regulations the proponent provides further information, if the proposed monitoring plan seems inadequate when the ESIA report is examined. However, there is no mention of disclosure of the monitoring results, when the third parties point out any issues.	There is a gap. Monitoring results are to be opened to the public. When the third parties point out any issues, it is needed to set up a system to discuss the matter and to settle down those issues.	
11. Grievance Redress Mechanism 1.A mechanism for handling concerns and grievances from people and communities affected by the project's environmental and social impacts must be in place.	The legal system in Tanzania provides mechanisms for dealing with complaints, including taking complaints to the courts. (Land Acquisition Act 1967, Sections 13 (1) and (2) and Land Act, Cap 113. Part XIII Section 167 (1))	The grievance mechanisms in Tanzania are not easily accessible to the affected persons.	ESS of the World Bank's and JICA Guidelines are used as instrument to provide the GRM for the project
2.The grievance redress mechanism (GRM) needs to be easily accessible for the project affected people and communities. Project proponents disseminate the information about the grievance redress mechanism through consultations with local stakeholders. The project affected people and communities must not be disadvantaged by filing a grievance.	The Project has to developed its own GRM by provided step-by-step approach for receiving, acknowledging, and registering, reviewing, investigating and resolving complaints and grievances from all PAPs.	The grievance mechanisms in Tanzania are not easily accessible to the affected persons.	Ensure that the established GRM is accessible to all stakeholders, including religious, gender, and other special groups.
3.Project proponents should make efforts to respond promptly to the grievances they receive, taking into account the concerns and needs of the project affected people and communities.	Under the funded project the GRM is intended to be accessible, collaborative, expeditious, and effective in resolving concerns through dialogue, joint fact-finding, negotiation, and problem solving. The proponent is required to provide a clear and known procedure with an indicative	The grievance mechanisms in Tanzania are not easily accessible to the affected persons.	Keeping parties to a grievance informed about its progress, and providing sufficient information about the mechanism's performance to

JICA GUIDELINES FOR ENVIRONMENTAL AND SOCIAL CONSIDERATIONS January 2022	Laws of Tanzania	Gap between JICA Guidelines and Laws of Tanzania	Policy taken in this Project
	timeframe for each stage, and clarity on the types of process and outcome available and means of monitoring implementation.		build confidence in its effectiveness and meet any public interest at stake.

APPENDIX 2: TERMS OF REFERENCE FOR ENVIRONMENT AND SOCIAL CONSIDERATION SURVEY

Investigation of environmental impact assessment will be conducted for the environmental and social contents that would be affected by the project implementation as shown above. As to the Terms of Reference (TOR) for investigation of environmental impact assessment, the survey items and method of each impact evaluation item, which was identified as A, B, or C by scoping as described in above, are shown in Table below. Among the items of this survey, baseline values of air quality, water quality, soil quality, noise level, flora/fauna, cultural heritage and hydrology are being confirmed through laboratory analysis and field survey.

Field Survey Methodology

In order to forecast, evaluate and analyze environmental items, which will be affected by the proposed Project, and which cannot be determined at the scoping stage, it is needed to implement a series of surveys to collect existing data and to identify baseline. Specific survey items and survey methods will be described in Table below.

TOR for Environment and Social Consideration Survey

Environmental items	Survey Item and Methodology	Methodology
Air pollution	Site measurement: 1 point per intersection Item: CO, NO2, SO2, PM10, PM2.5, Lead, Ozone Frequency: One Week (in dry season) Note: Collection of Secondary data, if available	Instrumental measurements: Dust level meter/ Mini-Vol Sampler; Fixed and portable monitoring equipment - Detector tubes, Mini-Vol Sampler
Water pollution	Site measurement (2 points at the nearest stream were discharged water run-off = 2 measurements) Item: BOD, pH, SS, temperature, Coliform, Color Frequency: Once Note: Secondary data collection, if any	Sampling and analysis (AAS i.e., Spectrophotometer), Qualitative forecast
Waste	Site survey: Registered land fill site near project site Item: Summary of the site (history, remaining capacity) Frequency: Once Note: Secondary data collection, if any	Available secondary data for the assessment of waste quantities and quality at collection points, transfer points, tipping point
Soil contamination	Site survey: 2 Points Item: 1. Cadmium, 2. Hexavalent chromium, 3. Mercury, 4. Lead, 5. Arsenic, 6. Cyanide, 7. Selenium, 8. Fluorine, 9. Boron Frequency: Once Note: Secondary data collection, if any	Site inspection, visual observation, sampling and laboratory analysis (atomic absorption spectrometer (AAS) type Varian Spectra AA240)
Noise and Vibration	Site measurement: 8 points (4 points along the road/ 4 points nearby sensitive receptor/background noise and vibration) per intersection	Digital sound level meter Sper Scientific type 850069 with a measurement range of 30 to 130dB (A).

	Item: Ambient/traffic Noise: LAeq, Continuous 24hr/weekday Ambient/traffic Vibration: 24hr/weekday - Traffic volume by type Frequency: Once (in dry Season (Not rainy day)) Note: Secondary data collection, if any	Vibration in mm/s PPV/ Vibration meter model VM 1970
Sediment quality	Site measurement is not required (refer Soil Contamination)	Site inspection, visual observation, sampling and laboratory analysis (AAS type Varian Spectra AA240)
Ecosystem	Site survey: Project Site Item: Fauna and flora, ecosystem, considerable species such as listed species on IUCN list Fauna: Mammals, Birds, Reptiles, Amphibians, Aquatic life, insects Flora: Land plants including street trees (all street tree's species, DBH: Diameter at Breast Height, Coordinates with GPS, compiled by google map KMZ file) Frequency: One time (dry season) Note) Secondary data collection, if any, *Record coordinates all recorded IUCN species, if any	Rapid flora Survey: site inspection, visual sampling of vegetation units, etc. consultation with locals,
Hydrology	Result surveyed by the JICA Survey Team (JST)	Collection of secondly data from JST
Topography and geology	Topography and Geology survey by JST	Collection of secondly data form JST
Involuntary resettlement	Site survey and preparation of ARAP	Preparation of ARAP based on the Tanzanian Lands Act, JICA Guidelines 2022; WB's ESS5, etc.
The poor / Income distribution	Literature survey on the Project Area: Income distribution in the area, minimum wage, poverty line, number and % of population below the poverty line, support available for the poor populations, etc. Frequency: Once	Social study: secondary data review; community observation; questionnaires; focus group discussions (FGD); interviews
Indigenous and ethnic people	Literature survey on the Project Area: Existence of indigenous and ethnic population in the area (name of the group, location, number of persons, etc.), disadvantage put on the population, support available for the populations, etc. Frequency: Once	Collection of secondly data and key informant interviews;
Local economy such as employment and livelihood	Literature survey on the Project Area: Structure of number of employments by the sector, Structure of economic scale by the sector, Major companies and businesses located in the area, etc. Frequency: Once	Collection of secondly data and interviews
Land use and utilization of local resources	Literature survey on the Project Area: Land use plan in the urban master plan, land use map of the surrounding area (residential, commercial, industrial, institutional, etc.), significant local resources (natural resource) produced in the area, etc. Frequency: Once	Collection of secondly data and interviews
Water usage	Site survey and literature survey on the Project Area:	

	Water supply in the area (piped, communal tap, communal well, well for individual house, special water source for industry, etc.), location of water source (water purification facility), location of water distribution facilities, location of sewer systems, location of sewer treatment facilities, any risk of competition for water resource during the construction phase, etc. Frequency: Once	Collection of secondly data and interviews
Existing social infrastructures and services	Site survey: 500m range from the project area Item: Location of public service and facility such as hospital/ clinic, school, religious place, community center and etc. Frequency: Once Note: Secondary data collection, if any	Collection of secondly data and interviews
Social institutions such as social infrastructure and local decision-making institutions	Site measurement is not required (but grasp opinions and information through stakeholder meetings)	Collection of secondly data, interviews and stakeholder meetings
Cultural heritage	Site survey: Project site Item: Nationally, locally, or internationally designated cultural heritages, monument, sacred place/trees/stone, buried cultural properties Frequency: Once Note: Secondary data collection, if any	Collection of secondly data and interviews
Landscape	Site survey: places people is gathering in 200m range from the project area Item: Taking photo Frequency: Once (Dry Season, if possible) Note: Secondary data collection of tourist spot or significant vista and/or scenery, if any	Collection of secondly data, taking photo and interviews
Gender	Interview and legal survey: Confirmation of the policy of TANROADS regarding gender equality and avoidance of gender-based violence's in their works, legal framework of the GoT on the issue Item: Gender equality and avoidance of gender-based violence's Frequency: Once Note: Secondary data collection of statistics and news articles on the issue in Dar es Salaam, if any	Collection of secondly data and interviews
Right of children	Interview and legal survey: Confirmation of the policy of TANROADS regarding child labor in their construction works, legal framework of the GoT on the issue; Item: Child labor Frequency: Once Note: Secondary data collection of statistics and news articles of child labor in Dar es Salaam, if any	Collection of secondly data and interviews
Infectious diseases such as HIV/AIDS	Literature survey: Risk population, number of patients in the Project area, medical services provided in the	Social and Health Baseline Study-secondary data review and interviews

	Project area, number of deaths, age characteristics of the patients, etc. Frequency: Once	
Labor environment	Interview and legal survey: Confirmation of the policy of TANROADS regarding working environment in their construction works, legal framework of the Government of Tanzania on the issue Item: work safety and work environment Frequency: Once Note: Secondary data collection of statistics and news articles on the issue in Dar es Salaam, if any	Collection of secondly data and interviews
Accidents	Site survey: visual survey of traffic safety at the intersection Item: Condition of traffic safety (cars and pedestrian) Frequency: Once Note: statistical data on traffic accidents and their locations for the latest 3 years shall be collected from traffic police	Collection of secondly data and interviews

APPENDIX 3: WATER ANALYTICAL RESULTS

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ENVIRONMENTAL ENGINEERING LABORATORY

Client: TRES Consult (T) Limited
Sampling Date: 24/06/2024
Date submitted to the lab: 24/06/2024
Source: Soil Sample from Mwenge and Morocco Junctions in Dar es Salaam

			Mwenge Junction			Morocco Junction	
S/N	PARAMETER	Units	Bagamoyo Road (MW-1)	Bagamoyo Road (MW-2)	Sam Nujoma Road (MW-3)	Ali Hassani Mwinyi Road (M1)	Bagamoyo Road (M2)
1	Cadmium	Mg/kg	5.342	3.090	15.989	5.409	7.998
2	Chromium	Mg/kg	6.005	6.253	8.838	10.465	10.673
3	Lead	Mg/kg	15.868	11.068	18.935	27.213	12.941
4	Nickel	Mg/kg	27.397	14.182	23.401	20.079	20.103
5	Zinc	Mg/kg	68.790	46.764	89.495	51.331	52.742
6	Boron	Mg/kg	0.264	0.240	0.216	0.192	0.158
7	Copper	Mg/kg	5.731	3.929	4.110	5.409	5.468

Sampling done by client

Reporting Officer

35176

Ndimbo A.M

APPENDIX 4: SOIL ANALYTICAL RESULTS

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ENVIRONMENTAL ENGINEERING LABORATORY

Client : TRES Consult (T) Limited
Sampling Date: 24/06/2024
Date submitted to the lab: 24/06/2024
Source: Water Sample from Mwenge and Morocco Junctions in Dar es Salaam

S/N	PARAMETER	Units	MWENGE	MOROCCO
			Mlalakuwa River (Bagamoyo Road)	Storm water drainage (Bagamoyo Road)
1	pH		7.93	8.13
2	Turbidity	NTU	72	46.0
3	Colour	Hazen°	141	54
4	Biological Oxygen Demand (BOD)	mg/l	62.0	79
5	Total Suspended Solids (TSS)	mg/l	80.0	65.0
6	Total coliform	Count/100ml	$12*10^2$	$2*10^2$

Sampling done by client,

Reporting Officer
Ndimbo A.M

APPENDIX 5: STAKEHOLDERS CONSULTED AND THEIR SIGNATURES

JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND MOROCCO INTERSECTIONS). (Environmental and Social Impact Assessment and Preparation of Abbreviated Resettlement Action Plan).

STAKEHOLDER MEETING (SHM) HELD AT PSSSF MILLENNIUM TOWER II (1ST FLOOR), KIJITONYAMA, DAR ES SALAAM.

REGISTRATION FORM

Date: 28th June, 2024

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND MOROCCO INTERSECTIONS). (Environmental and Social Impact Assessment and Preparation of Abbreviated Resettlement Action Plan).

STAKEHOLDER MEETING (SHM) HELD AT JAMIREX HOTEL BOARDROOM, MWENGE MTAA, KIJITONYAMA WARD IN KINONDONI MUNICIPALITY, DAR ES SALAAM REGION.

REGISTRATION FORM

Date: 01st July, 2024

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
	[redacted]					

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
	[redacted]					

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND MOROCCO INTERSECTIONS). (Environmental and Social Impact Assessment and Preparation of Abbreviated Resettlement Action Plan).

STAKEHOLDER MEETING (SHM) HELD AT CHATO RESIDENCY (Firs Floor) MIKOCHENI "B" MTAA, MIKOCHENI WARD IN KINONDONI MUNICIPALITY, DAR ES SALAAM REGION.

REGISTRATION FORM

Date: 04TH July, 2024

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

S/N	NAME	SEX F/M	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]						

JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND MOROCCO INTERSECTIONS). (Environmental and Social Impact Assessment and Preparation of Abbreviated Resettlement Action Plan).

REGISTRATION FORM

Date: 19th July, 2024

S/N	NAME	INSTITUITION	POSITION	CONTACT	SIGNATURE
[redacted]					

Name and Signature of Consulted Stakeholders

DATE/TAREHE	NAME/JINA	INSTITUTION/TAASISI	ADDRESS/SIMU	SIGNATURES/SAHIHI
[redacted]				

JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND MOROCCO INTERSECTIONS). (Environmental and Social Impact Assessment and Preparation of Abbreviated Resettlement Action Plan).

SECOND STAKEHOLDER MEETING (SHM) HELD AT PSSSF MILLENNIUM TOWER II (1ST FLOOR), KIJITONYAMA WARD IN KINONDONI MUNICIPALITY, DAR ES SALAAM REGION.

REGISTRATION FORM

Date: 27th September, 2024

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APPENDIX 6: DETAILED STAKEHOLDERS CONCERNS AND VIEWS

FIRST STAKEHOLDERS MEETING FOR JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND MOROCCO INTERSECTIONS). (Environmental and Social Impact Assessment and Preparation of Abbreviated Resettlement Action Plan).

Participants of the meeting

Date & Venue		Participants
28th June 2024	Organization 1	Kinondoni Municipal Council
	Organization 2	National Housing Cooperation (NHC)
	Organization 3	Tanzania Petroleum Development Cooperation (TPDC)/GASCO
PSSSF - Millenium Tower II	Organization 4	Dar es Salaam Commuter Bus, Owners Association (DARCOBOA)
	Organization 5	Umoja wa Watu Wenye Ulemavu waendesha Bajaji Mkoa wa Dar es Saalam (UWAWABADA),
	Organization 6	Chama cha madereva na wamiliki wa Pikipiki na Bajaji Mkoa wa Dar es Salaam (CMPD),
	Organization 7	Agenda for Environment and Responsible Development (NGO)
Number of total participants	Government: 6, NGOs and Community Specific Group: 5, JICA Survey Team (TRES) 4,	

Source: JICA Survey Team (TRES Consult Team)

Agenda for the 1st Stakeholders meeting

- Introduction and purpose of the meeting
- Presentation on the project (Project objectives, components and project area & ESS/ERAP)
- Stakeholders views, issues, concerns and discussion

Major opinion and summary of the discussion

TRES team initiated the proceedings and welcomed the invited members and made presentation about the project in brief and ESIA/ARAP studies on progress and some activities to commence. The meeting was then open for members to provide their views and concerns or issues for the project. Stakeholders were give enough time to air their views and where necessary some clarifications were made. Below is the summary of the opinions and views on the project per stakeholder.

Kinondoni Municipal Commercial officer

- The business community who will be impacted/relocated by the project need to be informed early in advance and be given ample time in order to complete their stocks and hence to avoid conflicts and project delays due to court injunctions.
- Likewise, compensation for the affected community should be done early in advance and be given ample time for their relocation of their properties/stocks.
- The flyover designs should also consider dedicated road for bodaboda (motorcycle) and Bajaji (tricycle).
- There is a need also for the roads designs to have gardens for both purposes i.e. beautification of roads and for carbon sequestration from the vehicular exhaust emissions.
- Further beautification can be done to the concretes by painting with good colour other than the current practices of leaving concrete with cement colour.

- There should be clear messages/information to the project affected on the issues regarding the time for relocation/compensation for the project. It should also be known who will provide these information when the time for compensation/relocation comes.
- Generally in compensation issues when someone hears there will be compensation tend to either increase the value for the property or business just to create evidence for high amount for compensation. Thus, the information sharing with PAPs should be taken with great care to avoid escalated project costs due t some opportunistic people.

Kinondoni Municipal Environmental Management Officer

- The construction of flyovers in both interchange of Morocco and Mwenge will disrupt existing storm water drainage in or around the area. Proper storm water management structures should be considered in the designs to avoid flooding issues during heavy rains. The Morocco intersection should collaborate with DAWASA who have constructed big storm water drainage and pipes to convey the same towards the Indian Ocean.
- Likewise, at Mwenge junction and the point between Mwenge junction and ITV bus stand currently when there is heavy rains it becomes challenge for the vehicles to pass through the flooded area. Thus, the design of flyover in this area as also might disrupt the storm water drainage, the new storm water designs should take into account the existing condition provide with sustainable solution on storm water of the area. A good measure if technically will be possible is to have huge drainage directing towards Mlalakuwa River that flow towards the Ocean.
- Also, there is a need to work closely with the DAWASA for sewage infrastructures at Mwenge project area.

National Housing Cooperation (NHC)

- Generally the project is good to alleviate the increasingly congestion in these major interchanges and thus the project is supported by the office.
- Between Mwenge and Morocco there are NHC land and building properties that might be encountered. It is recommended that, once evaluation has been done to the affected land/building properties under the NHC, the draft evaluation report should be shared with the NHC for reconciliation of the evaluated properties before sending to the Chief Government Valuer for endorsement ,to avoid future grievances that might delay the project take off.

Tanzania Petroleum Development Cooperation (TPDC)

TPDC has Natural Gas Pipeline at Mwenge Roads (Sam Nujoma Road and Bagamoyo Road) and during development of the BRT Roads these will be relocated to a new area and have a new gas alignment. Thus, it is the important for this study to consider the baseline of the new alignment under the BRT Roads which is currently ongoing other than the current condition. In this respect there is a need to work closely with DART.

BAJAJI DRIVERS WITH DISABILITIES (UWAWABADA**)**

- UWAWABADA is honored to be part of stakeholders to contribute towards road infrastructures development project as representatives of people with disabilities.
- The association have members who are disables, but due to accidents caused there are new members joining including bodaboda and Bajaji drivers as well as pedestrians, but large number is from bodaboda group. One of the cause of accidents that cause disabilities is lack of proper infrastructures for Bodaboda and bajaji. Thus, for this project it is crucial to consider in the designs dedicated roads/paths on the flyover for the bodaboda and Bajaji which we believe will reduce the accidents and new members in our group.
- Some vehicle drivers tend to ignore bodaboda and Bajaji while on the road the aspect of which is risks to Bodaboda and Bajaji drivers but once will have dedicated roads this risk will be not be there.

- It is important for the pedestrians crossings to consider people with disabilities and some of them uses wheel chair. These need to be factored in the designs. Currently some crossing under the BRT have put some short concrete poles to avoid tricycle using pedestrians crossing the aspect of which denies people with disabilities using wheel chair to cross in these areas.
- The bumps on the roads should be friendly other than small on series bumps normally referred to as Rastas.
- The lumps for people with disabilities in the BRT terminal and in the crossing bridges are quite long and tiresome for people with disabilities and thus if there will be lumps for these intersections they should be improved to have more friendly alternatives.

Boda boda and Bajaji Association

The previous contributors have pre-emptied our issues but it is worthwhile to stress on the issues which were part of the agender of the association to present. The issue of having dedicated road for Bajaji/Bodaboda for flyovers is important as this is long term infrastructures and thus they should be socially inclusive. Socially inclusive to include roads for pedestrians, vehicles and Bodaboda/Bajaji.

DARCOBOA

- Since Ali Hassani Mwinyi and Bagamoyo roads will be impacted during construction it is advised to improve first alternatives roads to include old Bagamoyo road before starting construction as these will be more using during construction and hence to reduce the impact severity.
- During project constructions there should be proper directions for smooth flow of traffics and thus to avoid congestions.
- The issue of compensation noted by the previous speakers is important to note, the evaluation should be done as early as possible before starting the project to avoid opportunistic people who normally encroaches the project area just for the sake of compensation.

Agenda for Environment and Responsible Development (NGO)

- It is important for local communities to be involved in the project to include in the emerging project opportunities like employment and thus to have project economic trickle-down effect to the local people. This at large brings local ownership of the public infrastructures which enhanced security to the development public infrastructures.
- Communication and collaboration between public institutions should be strengthened for smooth project implementation as there are examples whereby the project is delayed dispute the contract being on site due to delay on the relocation of public infrastructures which is done by different government agency.

MWENGE INTERSECTION COMMUNITY MEETING

MINUTES FOR FIRST COMMUNITY MEETING FOR JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND MOROCCO INTERSECTIONS). (Environmental and Social Impact Assessment and Preparation of Abbreviated Resettlement Action Plan).

Participants of the meeting

Date & Venue		Participants
01st July 2024	Organization 1	Kijitonyama Ward

	Organization 2	Mikocheni Ward
	Organization 3	Makongo Ward
Jamirex Hotel, Mwenge	Organization 4	Mwenge Mtaa
	Organization 5	Mikocheno B Mtaa
	Organization 6	Mlalakuwa Mtaa
Number of total participants	Government: 13, Community Specific Group: 2, JICA Survey Team (TRES) 3, Community members & PAPs; 12	

Source: JICA Survey Team (TRES Consult Team)

Agenda for the 1st Stakeholders meeting

- Introduction and purpose of the meeting
- Presentation on the project (Project objectives, components and project area & ESS/ERAP)
- Stakeholders views, issues, concerns and discussion

Major opinion and summary of the discussion

After project presentation and the Participants of the meeting understood the project and the goals of the meeting, views and issues of the project in the area were provided by participants and discussion was held with TRES Members as covered below;-

- The Participants stated that noise emission and air pollution due to dust emission during the construction are expected impacts especially to the residents with houses close to the main roads and to the business community around mwenge junction, and thus measures to minimize the same considered.
- Also, the project will have impact to small traders in the area especially for those close or doing business along the roads.
- Mwenge is one of the busy junctions in Dar es Salaam and currently traffic congestion is experienced and if the roads will be closed it will bring more inconveniences for people going and returning from works. To reduce the impact internal roads (some under TARURA) should be improved so that they can be used as alternative roads during construction period.
- The participant mentioned that, the area near the PUMA petrol station, which is being discussed as part of the project for compensation, has underground fuel storage tanks, so proper procedures should be followed to avoid environmental pollution. However, the issue was clarified that the project will not affect the Puma Petrol Station;
- Member highlighted that, the proposed project area has several public infrastructures such as storm water drainage, DAWASA water pipeline/pipes, Sewer, Optic Fiber Cable, TANESCO high tension lines and electric poles, and TPDC natural gas pipelines, therefore, all concerned parties with infrastructures should be involved in the process before commencement of the project construction. This was noted and members were informed that we had separate meeting with the utilities owners and further the study will engage them.
- It was stated that when these public development infrastructures are coming in the area the local community expects some of the related issues to be resolved by these projects however the experience shows that is not always the case. For instance when the road is flooded during heavy rains it is expected after construction/improvement of the same road the flood would be addressed. In the same vein Mwenge junction area is experiencing floods during the heavy rains and thus it is expected the project to address the same. Thus, this should be considered in the designs and eventually during construction.
- It was advised for the business community to be affected at Mwenge to be given information early in advance before starting the construction activities in order to give them ample time. Early information helps to eliminate unnecessary conflicts and allow people to prepare adequately for upcoming changes.

- Also it was added that, the early notification and appropriate compensation will help ensure that their rights are protected and their business operations are not adversely affected. This can also help build trust between the authorities/government and the citizens, and prevent conflicts that could delay the project and increase costs. It is also important to clarify the compensation procedures and ensure that all those eligible receive their compensation on time and in appropriate manner.
- One member noted that, the issue of employment to the locals always it is heard during project preparations like these but when it comes during implementation contractors come with workforce from elsewhere and not from locality and thus this should be taken as a challenge for this project to address. One means is collaborate in sourcing laborer's with the local government offices.
- It was noted that, normally there is no proper point to channel an issue to the contractor during construction. Some laborers come to report to the local government offices for either being mistreated or not paid their salaries and as a leader you need to engage with the contactor and on this one faces difficulties. Other projects normally have committee to deal with community/employment issues and there is dedicated person (clearly known) to channel the issues to. Those kind of measures should be taken to ensure smooth project implementation during construction period.
- Other members suggested that there should be scheduling of some activities to reduce the impact of congestions at the junctions especially at peak hours, example was given that transportation of construction materials such as sand, stones or aggregates could be done at night.
- It is important for project contractor to consider occupational health and safety issues for the workers at site to include provision of Personal Protective Equipment (PPEs) to safeguards their health against construction related hazards.

MOROCCO INTERSECTION COMMUNITY MEETING

MINUTES FOR FIRST COMMUNITY MEETING FOR JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND MOROCCO INTERSECTIONS). (Environmental and Social Impact Assessment and Preparation of Abbreviated Resettlement Action Plan).

Participants of the meeting

Date & Venue	**Participants**	
04th July 2024 Chato Residency Conference Hall- Morocco area	Organization 1	Mwananyamala Ward
	Organization 2	Kinondoni Ward
	Organization 3	Mikocheni Ward
	Organization 4	Msasani Ward
	Organization 5	Mikoroshoni *Mtaa*
	Organization 6	Regent *Mtaa*
	Organization 7	Bwawani Mtaa
	Organization 8	Kumbukumbu *Mtaa*
Number of total participants	Government: 15, Community Specific Group: 1, JICA Survey Team (TRES) 3, Community members & PAPs; 15, Female 16, Male 18	

Source: JICA Survey Team (TRES Consult Team), July 2024

Agenda for the 1st Stakeholders meeting

- Introduction and purpose of the meeting
- Presentation on the project (Project objectives, components and project area & ESS/ARAP)
- Stakeholders views, issues, concerns and discussion

Major opinion and summary of the discussion

TRES team initiated the proceedings, welcomed the invited members and made presentation about the project in brief and ESIA/ARAP studies on progress. The meeting was then open for members to provide their views and concerns or issues for the project. Stakeholders were given enough time to air their views and where necessary some clarifications were made. Below is the summary of the opinions and views on the project.

- The member from Kumbukumbu *Mtaa* appreciated the initiatives of the government and international partners like JICA towards construction of flyovers in the two intersections to improve the transportation in the area. The member noted that the Morocco area specifically on Ali Hassani Mwinyi road is experiencing floods during heavy rains and the most affected area is Kumbukumbu area as there is no drainage to convey storm water towards the sea. With construction of flyover if this issue is not well considered will worsen the condition in the area.
- Other members noted that the existing storm water drainage in the project area should be improved along with this project in order to address the flooding during heavy rains.
- The members advised during construction of the project to pay attention on community health and safety issues to avoid construction hazards to the surrounding community and recommended some measures to include fencing the core construction site and putting and maintaining safety/warning signs.
- It was noted that most road construction projects do not provide sanitary facilities for their workers and this becomes a challenge and public health concern, thus it was advised for this project to provide mobile toilets for the workers on site to address the issue.
- One member recommended the inclusion of crossings for people with disabilities during the project's construction as in most cases this is ignored and becomes a challenge for people with disability to cross the road which is under construction.
- Members also suggested that job opportunities arising from the project should be prioritized to the youth from the local areas where the project is being implemented. Additionally, the project's contractor should create an effective system to collaborate with the surrounding community by sharing the information regarding the emerging opportunities such as supply of construction materials etc.
- It was noted that the Morocco and Mwenge are major junctions and the proposed measures of flyovers will only help for certain years and thus it is suggested if budget allows to have two flyovers on both junctions just like Ubungo interchange. It was also suggected if the budget does not allow there should be provisions for putting additional flyover in future. The essence is for designers to have designs that allows construction of another flyovers in future to avoid unnecessary costs if it is not considered at the beginning.
- Members noted that at Morocco area there are infrastructures belonging to other institutions such as Airtel, Halotel and Vodacom Optic Fiber Cable, DAWASA water pipes that provide services to the community and thus involved of these institutions is important before the commencement of the project.
- Members also noted that most project focus on specific project without considering possible indirect impacts to the surrounding community and thus it was suggested after completion of the project construction to do assessment of the project's impact and find solution to any unforeseen project impact. The example was given to some road projects after construction some drainage channels were blocked leading to flooding tendences in areas where there was none.
- One member inquired if the increased number of people/workers due to project would still depend on existing health care infrastructures. This was clarified by the TRES team member that there will not be a significant increase in the number of people working on the project that would jeopardize the existing health care infrastructures. Further, it was elaborated that the intention is to reduce medical cases by putting measures to avoid accidents and health issues at work.

MINUTES OF THE CONSULTED STAKEHOLDERS FOR JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND

MOROCCO INTERSECTIONS). (Environmental and Social Impact Assessment and Preparation of Abbreviated Resettlement Action Plan).

S/N	Institutions / Date	Views and Concerns
1	Dar es Salaam Regional - Office, Tanzania National Roads Agency (TANROADs), July 19th, 2024	1. The officer informed that, the earmarked project areas have underground utility infrastructures to include the water pipes, gas pipeline which is marked and optic fibres which could be under TTCL, Vodacom, Tigo and/or Airtel which need to be considered in the course of the study. 2. The office clarified to the question of presence of duct in the project areas that, there is no duct however there could be some utility structures crossing the roads. He noted that provision of ducts has come recently and thus it is considered nowadays in the new road construction projects. 3. The office commented on BRT relocated utility structures that, if there has been relocated then would be few structures as BRT is mainly within main road section. However, he recommended to consult the Engineer for BRT Project from TANROADs HQ office.
2	Dar es Salaam Water Supply and Sanitation Authority (DAWASA) July 19th, 2024	1. The officer informed the team that in proposed project areas (Mwenge and Morocco Junction improvements) there is an ongoing construction of Bus Rapid Transport (BRT) project, and some of the infrastructures have already been assessed for relocation. Therefore, the officer requested a physical site verification to mark some of the infrastructures that have not yet been assessed and will be affected by the flyover project so that it can be evaluated for relocation;
3	Tanzania Electric Supply Company Limited (TANESCO) July 19th, 2024	1. The officer informed that, in the Morocco area there is a distribution substation for receiving electricity and for distribution to other areas. The area of substation is fully covered and thus if part of it will be affected then an alternative area on the back can be considered for acquisition for extension on that side. 2. He also noted there are two power cables carrying 33kV and 133kV electricity and electric poles on both sides which might require relocation the project. However, these do not pose major challenge. 3. On Mwenge side the office noted that there is a major power transmission line which carry 133 KV from the Ubungo station. This area presents a challenge because if the transmission line is affected by the project's in any way, it will need to be relocated. However, he noted to be very costly and highlighted that there was an attempt to relocate it for the BRT project but the attempt failed due to high costs, leading to a change in design of BRT. If this project could consider co-existing would be good but if it will be inevitable then all procedures must be followed, and TANESCO headquarters must be involved at every step. 4. Additionally, the officer explained the procedures required to relocate the infrastructure, including writing to TANESCO's Director General to explain the need for the project and identify the infrastructures that will be affected by the construction of the project so that the relocation process can begin.
4	Tanzania Telecommunications Corporation Limited (TTCL) July 19th, 2024	1. The team was informed that the BRT project has already conducted a survey to relocate TTCL infrastructures that will be affected by their project. Therefore, a physical verification of the project footprint is needed to confirm which infrastructures have not been assessed and will be affected by this flyover project on both the Mwenge and Morocco sides.

		2. The offices noted that, no major environmental impacts are anticipated if utility infrastructures are relocated following the proper procedures.
5	Dar es Salaam Rapid Transport Agency (DART) July 22nd, 2024	1. Based on the information provided about the development of the flyover project in the Mwenge and Morocco areas, the consulted officer emphasized that the Bus Rapid Transit (BRT) route should pass underneath to assist with passenger mobility, service connectivity, and to extend the lifespan of the BRT buses. In this respect there is no need for BRT to use flyovers. 2. The officer also advised that since the contractor for the BRT project is already onsite continuing with construction, it is important for the flyover designers to incorporate and protect BRT infrastructures to be built in the Mwenge and Morocco intersection areas. 3. The officer informed the team that not all utilities along the road have been assessed for relocation but only for those affected by the BRT construction project. 4. The officer shared the practice when dealing with utilities relocation in the project area that, DART has notified all stakeholders with utilities in the relevant areas to prepare their subcontractors ready for relocation should any of the utility required to be relocated during construction. Utilities are thus being relocated by the designated subcontractor of each utility owner. 5. The officer also noted that, DART is aware of upcoming Mwenge and Morocco flyovers project and thus DART have not yet started construction to those two areas, because they are waiting for the final designs that will incorporate both projects. He added that in both areas there are five BRT stations with the following details: two stations along Bagamoyo Road (Mlalakuwa Station and ITV Station) and another along Sam Nujoma Road (Mwenge Station near Military Hospital) which will have an overhead crossing. In Morocco, there will be two stations, one near Vodacom office building and another after the Airtel office building. The designs should consider the existence of these stations and maintain them. (The drawings are attached). 6. Finally, the officer said that, DART welcomes experts from JICA for discussions on the best way to combine all designs to avoid unnecessary costs in the construction of these road infrastructures, especially in the two intersection.

SECOND STAKEHOLDERS MEETING FOR JICA PREPARATORY SURVEY FOR DAR ES SALAAM INTERSECTION IMPROVEMENT PROJECT (MWENGE AND MOROCCO INTERSECTIONS). (ESIA AND PREPARATION OF ARAP).

Participants of the meeting

Date & Venue	Participants	
27th September 2024 PSSSF - Millenium Tower II	Organization 1	Tanzania National Roads Agency HQ (TANROADs) (1 person)
	Organization 2	TANROADs – DSM Regional Office (2 people)
	Organization 3	Kinondoni Municipal Council (3 people)
	Organization 4	National Housing Cooperation (NHC) (4 people)
	Organization 5	DAWASA (2 people)
	Organization 6	Dar es Salaam Rapid Transit Agency (DART) (2 people)
	Organization 7	Land Transport Regulatory Authority Agency (LATRA) (1 person)
	Organization 8	Ward Executive Officers (Kijitonyama, Makongo, Mikocheni, Msasani, Kinondoni, Mwananyamala) (6 people)
	Organization 9	AGENDA for Environment and Responsible Development (NGO) (1 -person)
	Organization 10	Dar es Salaam Commuter Bus, Owners Association (DARCOBOA) (1 person)
	Organization 11	Umoja wa Watu Wenye Ulemavu waendesha Bajaji Mkoa wa Dar es Saalam (UWAWABADA), (1 person)
	Organization 12	Chama cha Madereva na Wamiliki wa Pikipiki na Bajaji Mkoa wa Dar es Salaam (CMPD), (1 person)
Number of total participants	Government -21; NGOs and Community Specific Group – 4; and JICA Survey Team and TRES - 5.	

Source: JICA Survey Team (TRES Consult Team)

Agenda for the 2nd Stakeholders meeting

- Registration and administrative arrangements
- Mwenge and Morocco Intersections Design
- Stakeholders Views/Concerns and Discussion on design
- ESIA for Mwenge and Morocco Intersections findings
- ARAP for Mwenge and Morocco Intersections findings
- Stakeholders Views/Concerns and Discussion on ESIA/ARAP

Major opinion and summary of the discussion

TRES team initiated the proceedings and welcomed the invited members for the second meeting which aimed at providing feedback based on the study done. The officer from TANROADs HQ opened the meeting by welcoming the stakeholders for the fruitful meeting to the important two flyovers project and urge members to provide constructive comments for the project. Three presentations were thereafter done that included project Design, ESIA and ARAP findings. After each presentation members were welcomed to ask question(s) for clarification. After all presentations then the meeting was open for members to provide their views and concerns or issues for the project and discussion. Stakeholders were given enough time to air their views and based on that discussion was made along with clarifications to some issues. Below is the summary of the opinions and views on the project per stakeholder; -

i. A town planner from Kinondoni Municipality noted that, The Municipal is a developing a re-development plan for Morocco Mwenge corridor (i.e., Transit Oriented Development)

that aim to enhance potential of attractive urban development with the coming new BRT line. This involves among others provision of walk-ways and bicycle dedicated ways. The Town Planner thus noted there is a need to coordinate the upcoming fly over with the plan by sharing information of the project in order to complement each other. During discussion it was noted that the plan also needs to be shared with TANROADs as among stakeholders.

ii. The Engineer from NHC noted that, there is a plan to construct a pedestrian bridge from the current BRT bus station to the Morocco Square Building to easy access to the building which will have a multipurpose commercial activity and thus integration of the design information is important to find appropriate alternative for integration. However, it was noted this is at initial stage and has not been shared to stakeholders including TANROADs.

iii. The Engineer also requested for the project to consider provision of access to the Morocco Square building from the Road for easy traffic flow in and out of the building, without which will bring traffic flow problem in and out of the building. However, it was clarified that since there will be ground level road the entry to the building from Ali Hassani Mwinyi Road will not be closed but within the building compound enough space for vehicle entry/exit should be provided.

iv. Likewise, the Engineer noted that traffic flow in and out of the Morocco square should be looked at during construction to avoid nuisance to the public at the area.

v. Engineer also advised the TANROADs and DART to consider having parking space at the begging of the BRT Stations to allow public leave their car and take BRT to the CBD the aspect of which will reduce traffic at the CBD by capitalizing the BRT services. On this TANROADs representative from DSM Regional office noted that there is space provided for parking area on this phase 4 BRT stations.

vi. The member from KMC recommended that institutions such as TANROADS, DAWASA, and NHC should meet to plan the relocation of their infrastructure when necessary. In this regard, it was clarified that TANROADS has the responsibility to inform the heads of these institutions, as they have already assessed the areas and have all the relevant information. Additionally, it was noted that the experience from other projects, like the BRT, would be useful in addressing challenges related to infrastructure relocation that may arise in this flyover project.

vii. One member from NHC noted that from experience of Ubungo flyover the underneath space has been used as hideout for some people with illegal activities and hence there is a need to look on this. On this, it was clarified that, for the Mwenge and Morocco flyover the areas underneath will be used for the BRT and hence leaving no open space for misuse, unlike the Ubungo flyover.

viii. The members from DAWASA emphasized the need to avoid damaging potable water and sewer pipelines passing through the project areas during construction. Additionally, he suggested close cooperation between TANROADS and DAWASA when water infrastructure needs to be relocated or adjusted to prevent confusion that may lead to water loss.

ix. The member from KMC suggested that, upon completion, the flyover should be painted to enhance its visual appeal.

x. A member from DARCOBOA noted that, there is a need to consider pedestrian crossing along Sam Nujoma where the landing of flyover will happen to easy access towards Lugalo Hospital by the public. During discussion it was noted at the very same point there is BRT Station and thus integration between TANROADS and DART will need to be done to ensure all issues are integrated.

xi. The Ward Executive Officer of Msasani advised that occupational health and safety issues should be considered, including the provision of temporary sanitary facilities such as mobile toilets during the construction phase.

xii. The Ward officer from Msasani suggested the creation of alternative routes/roads for diversion, particularly during rush hours (morning and evening) to ease traffic congestion during the flyover construction around both Mwenge and Morocco areas.

xiii. The Engineer from NHC recommended to TANROADs the construction of ring roads on the peripheries of the city to further alleviate congestion. On this it was noted by TANROADs Regional Office that ring road designs are underway to address the issues.

xiv. A member from CMPD insisted for both ongoing projects of BRT and flyovers to consider providing a parking area for Bodaboda and Bajaji to avoid haphazard parking for Bajaji and Bodaboda as these services is important for the public in the BRT Station areas and intersections.

APPENDIX 7: SITE FLORA CHARACTERISTICS

MOROCCO SECTION

Area	S/N	Type of trees Spps	Number of trees	Small with (Girth of (0-50cm)	Medium with (Girth of 50cm-1m)	Large with (Girth of 1M and above)	IUCN Conservation status
Ally Hassan Mwinyi road section	i.	*Leucaena leucocephala*	10	3	3	4	Least Concern
	ii.	*Millingtonia hortensis*	5	2	1	2	Least Concern
	iii.	*Azadirachta indica (Neem trees)*	3			3	Least Concern
	iv.	*Terminalia mantaly*	21	9	8	4	Least Concern
	v.	*Tecomaria capensis*	6		1	5	Least Concern
	vi.	*Muntingia calabura*	8	8			Least Concern
	vii.	*Sena siamea*	4	1	3	1	Least Concern
	viii.	*Trichilia emetic*	4	3	1		Least Concern
	ix.	*Saraca asoca (ashoka trees)*	2	2			Least Concern
	x.	*Syagrus romanzoffiana (Palm)*	1	1			Least Concern
	xi.	*Pithecellobium dulce*	1			1	Least Concern
Bagamoyo Road section	S/N	Type of trees Spps	Number of trees	Small with (Girth of (0-50cm)	Medium with (Girth of 50cm-1m)	Large with (Girth of 1M and above)	IUCN Conservation status
	i.	*Cordia Sebestena*	16	16			Least Concern
	ii.	*Syagrus romanzoffiana (Palm)*	1	1			Least Concern
	iii.	*Annona squamosal(custard apple)*	1	1			Least Concern
	iv.	*Muntingia calabura*	2				Least Concern

Area	S/N	Type of trees Spps	Number of trees	Small with (Girth of (0-50cm)	Medium with (Girth of 50cm-1m)	Large with (Girth of 1M and above)	IUCN Conservation status
Bagamoyo - Mlalakuwa road section	i.	*Leucaena leucocephala*	12	9	3		Least Concern
	ii.	*Azadirachta indica (Neem trees)*	4	2	2		Least Concern
	iii.	*Muntingia calabura*	7	4	3		
	iv.	*Sena siamea*	4	3	1		Least Concern
	v.	*Syagrus romanzoffiana (Palm)*	1	1			Least Concern
Bagamoyo-Mikocheni Road section	**S/N**	**Type of trees Spps**	**Number of trees**	**Small with (Girth of (0-50cm)**	**Medium with (Girth of 50cm-1m)**	**Large with (Girth of 1M and above)**	**IUCN Conservation status**
	i.	*Cordia Sebestena*	53	53			Least Concern
	ii.	*Muntingia calabura*	5	5			Least Concern
	iii.	*Azadirachta indica (Neem trees)*	2	1	1		Least Concern
Sum Nunjoma Road	**S/N**	**Type of trees Spps**	**Number of trees**	**Small with (Girth of (0-50cm)**	**Medium with (Girth of 50cm-1m)**	**Large with (Girth of 1M and above)**	**IUCN Conservation status**
	i.	*Azadirachta indica (Neem trees)*	2	1	1		Least Concern
	ii.	*Muntingia calabura*	10	7	3		Least Concern
	iii.	*Trichilia emetic*	3		3		Least Concern
	iv.	*Syagrus romanzoffiana (Palm tree)*	3	3			Least Concern

MWENGE SECTION

Appendix 2: Dominant tree species in the project area

Morocco Area

Leucaena leucocephala (Ally Hassani Mwinyi Rd)

Cordia Sebestena (Bagamoyo Rd)

Trichilia emetic (Ally Hassani Mwinyi Rd)

Senna siamea (Ally Hassani Mwinyi Rd)

Mwenge Area

Azadrantica indica (Bagamoyo Rd)

Muntingia calabura (Bagamoyo Rd)

Muntingia calabura (Sam Nujoma Rd)

Senna siamea (Mlalakuwa River – Bagamoyo Rd)