Chapter 14 Environmental and Social Considerations

14.1 Project Component which Affect Environmental and Social Considerations

This project is for the construction of a bridge which will supplement the existing car ferry service connecting Mombasa Island and Mainland South. The project will improve traffic conditions between Mombasa Island and the Mainland and will contribute to the development of the local economy. However, the construction works and the existence and operation of the bridge may cause negative impacts on the environment and require land acquisition and involuntary resettlement for the development of approach roads.

Table 14.1-1 Outlines of the Project

Specifications	• Design speed: 50km/h • Composition of bridge section: 3.5m x 4 lanes+ 1.5m road shoulders (both sides) + 2.0m pedestrian walkway (one side) • Composition of ramp sections: 3.5m + 1.5m (shoulder)
Road Length	• Total: 10.5km • Main bridge: 1.4km • Approach road on Mombasa side: 2.8km • Approach road in Likoni: 4.7km • Widening of existing road (Likoni): 1.6km
Main Bridge	• Structure: Cable-Stayed Bridge • Span: 360m+720m+360m • Footing of main tower: Steel Pipe Sheet Pile Foundation (Mombasa Island)
Main Structure of Approach Road	• Viaduct (PC) • Embankment
Others (Spaces for Construction Activities)	• Construction yard (Unfixed) • Storage yards for large size steel materials (Unfixed. Required on both sides of the Mombasa Island and Mainland South side) • Temporary wharfs (Unfixed. Required on both sides of the Mombasa Island and Mainland South side) • Concrete plant and hot-mixed-asphalt (HMA) plant (Unfixed. Required on both sides of the Mombasa Island and Mainland South side) • PC girder fabrication yard (Unfixed. Required on Mainland South side) • Quarry site, borrow pit (Unfixed) • Temporary roads (Within ROW)

Figure 14.1-1 Design of the Project

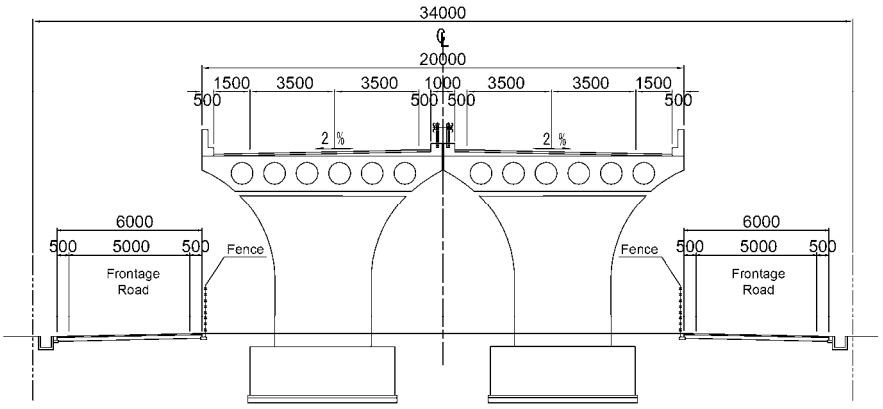


Figure 14.1-2 Typical Cross Section of Viaduct (Approach Road)

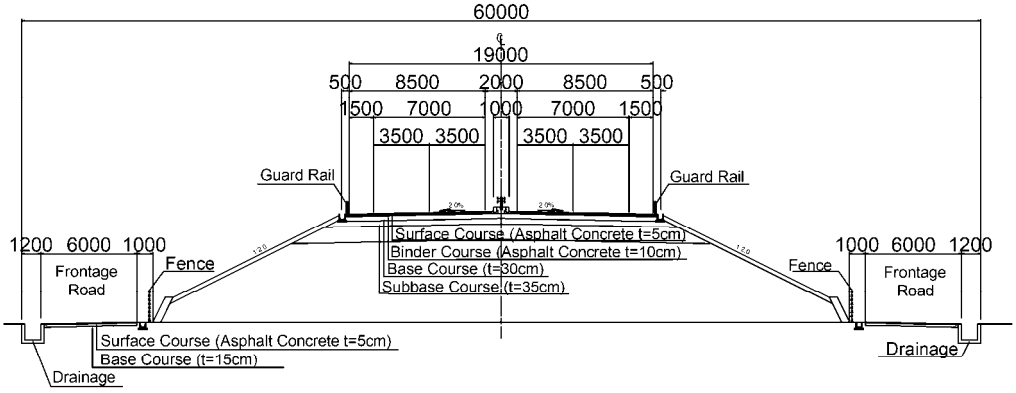


Figure 14.1-3 Typical Cross Section of Embankment (Approach Road)

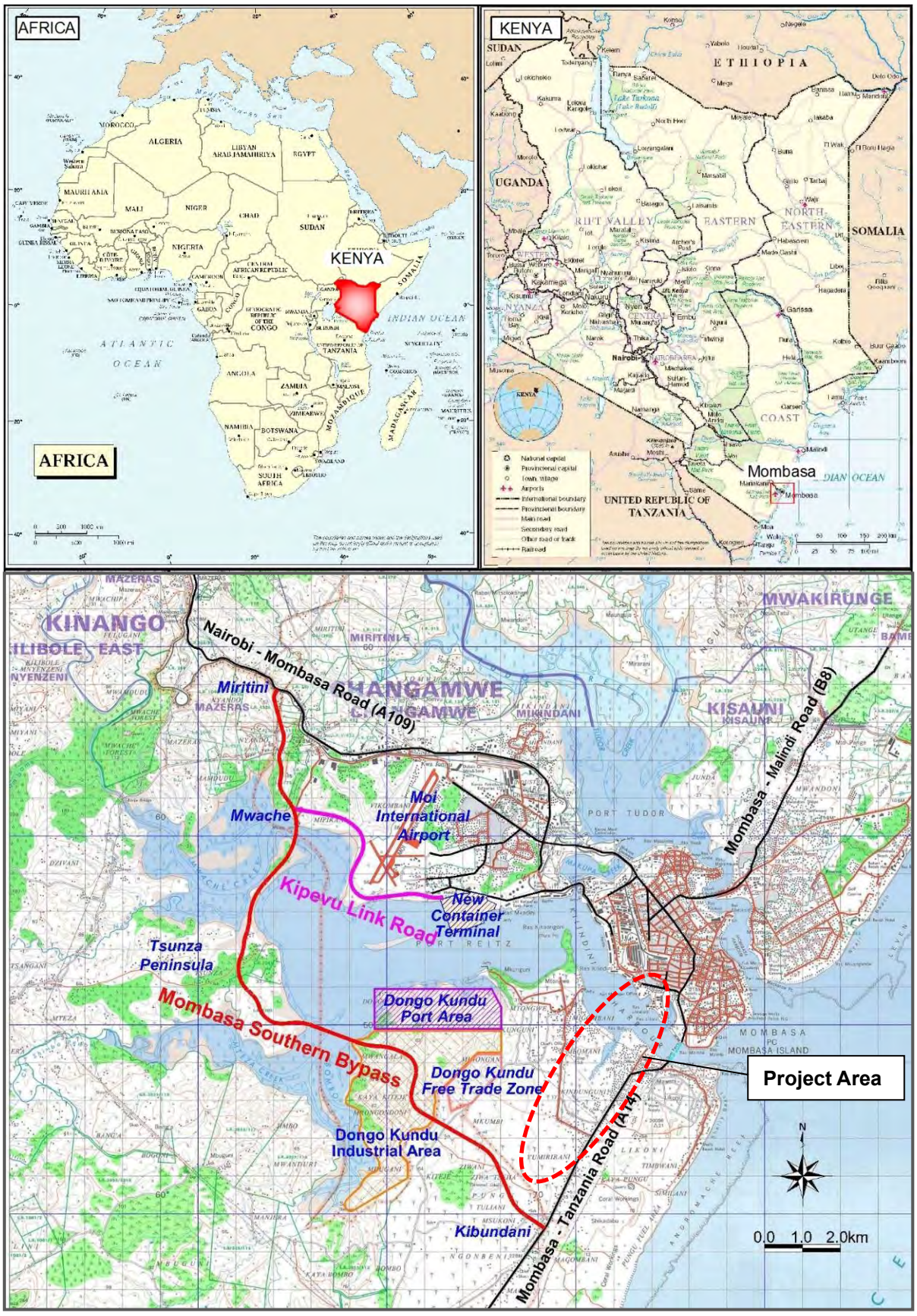


Figure 14.1-4 Location of the Project

Figure 14.1-5 Alignment and Location of the Project

Since this project is the development of a large-scale bridge, it corresponds to a sector that requires special attention within the JICA Guidelines for Environmental and Social Considerations (JICA Guidelines). Moreover, the project involves an activity that requires

careful consideration (i.e. large-scale involuntary resettlement). Accordingly, the project falls into Category A of the JICA Guidelines.

The scope of the survey for the environmental and social considerations for the project site includes the bridge, the approach roads, quarry sites, borrow pits and areas in the vicinity.

Construction activities will require temporary spaces as shown on Table 14.1-1. The activities undertaken on these spaces can generate negative impacts such as air pollution, water pollution, noise and vibration. To minimise these negative impacts, mitigation measures during these construction activities would be required as described in paragraph 14.6.

For this project, the development of a labuor camp is not required because the project site is close to the urban area.

Cumulative impacts caused by the project are not expected. The operation of borrow pits, quarry sites and construction yards have potential negative impacts, however as of now the location of these facilities are unfixed. However, in this survey the mitigation policies for negative impacts on these facilities are examined.

14.2 Outlines and Features of Environmental and Social Conditions

(1) Location and Climate

Mombasa County is located at the south eastern coastal area alongside the Republic of Kenya. The County is adjacent to the Indian Ocean. It is approximately 80 km from the boundary of Tanzania. The land area of the County is 229.9 square kilometers.

The coastal area of the Indian Ocean, including the Mombasa area, has a typically tropical climate being hot and humid throughout the year with monsoons generated by the Indian Ocean.

(2) Temperature

Monthly temperatures are shown on Table 14.2-1. The temperature between January and March, which is a dry season, is highest. The maximum temperature exceeds 32 degrees Celsius. On the other hand, the temperature in July and August, which is another dry season, is 28 degrees Celsius at a maximum and 20 degrees Celsius at a minimum. This season is the coolest.

(3) Precipitation

Precipitation records are shown on Table 14.2-1. The amount of precipitation for April and May is the highest and is considered to be the rainy season. Almost half of May is rainy. On the other hand, the precipitation record during the dry season, which includes January and February, is 20 mm per month.

(4) Wind Speed and Direction

The wind derived from the monsoon of the Indian Ocean is the prevailing wind throughout the year. Wind from the south prevails between April and October and wind from the east prevails between November and March. The wind speed is almost 5 m/s throughout the year. (observed at Moi Airport)

Table 14.2-1 Monthly Temperature, Precipitation and the Number of Precipitation Days

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum Temperature (deg C)	32.0	32.3	32.6	31.2	29.3	28.4	27.7	27.9	28.8	29.6	30.6	31.6
Minimum Temperature (deg C)	23.2	23.6	24.2	23.9	22.7	21.3	20.4	20.3	20.8	22.0	23.1	23.3

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly Precipitation (mm)	33	15	56	163	240	80	70	66	72	97	92	75
The number of Precipitation (days)	4	2	5	10	14	10	11	9	9	10	9	7

Source: World Weather Information Service (WMO)

(5) Population and Industry

The population of the Republic of Kenya is approximately 43 million (2014, estimated[1]). The population of Mombasa County is 939,370 (2009[2]) including 486,924 males and 452,446 females. Since the population of Mombasa County is increasing rapidly, the total population is estimated to reach 1.2 million by 2017.

The principal industries in Mombasa County are tourism (hotel industry), shipping industry and various private institutions. In addition, the Government of Kenya is also one of the principal sources of employment.

(6) Preservation Areas / Protected Lands

Kenya Government has designated 26 National Parks, 5 National Marine Parks/Reserves, 7 National Reserves and 3 Sanctuaries. There are two (2) preservation areas in and around Mombasa, *Mombasa Marine National Parks & Reserve* and *Shimba Hills National Reserve* (see Figure 14.2-1).

The Mombasa Marine National Parks and Reserve extends from Tudor Creek on the north of Mombasa Island to Mtowapa Creek. In the whole area, the national park is in part in front of Bambri area. The designated area is about 210 square km. The south end of the Reserve is located approximately 5 km from the Project site.

The Shimba Hills National Reserve is one of the biggest forests in the coastal area of East Africa. An area of 300 km^2 is designated. The National Reserve is located approximately 20 km southwest of the Project site.

The operation and maintenance of the national parks and reserves are conducted by Kenya Wildlife Service (KWS).

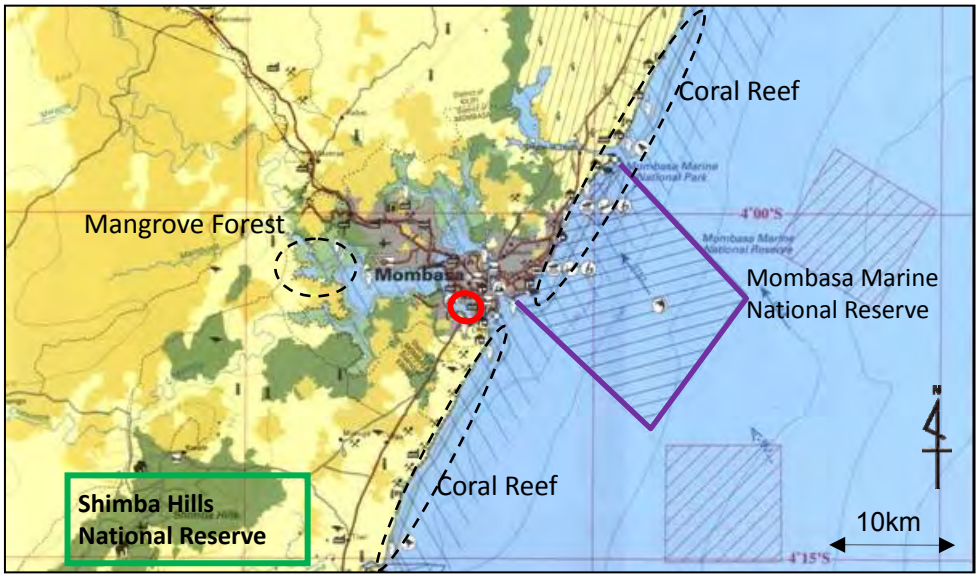
Considering distances from the project site to the National Park/Reserves, no direct impacts including air pollution, water pollution, or noise and ecosystem impacts to these Reserves are expected.

Table 14.2-2 National Parks and Reserves in/around Mombasa

	Mombasa Marine National Parks and Reserve	Simba Hills National Reserve
Base law	The Wildlife (Conservation and Management) Act 1985, revised 2009	The Wildlife (Conservation and Management) Act 1985, revised 2009
Established year	1986	1968
Park size	200 sq. Km (National Parks) 26sq.Km (National Reserve)	192 sq. Km
Definition	**Marine National Parks:** protected marine area where no fishing, construction work or any disturbance is allowed unless with written permission of the Director-General **Marine National Reserves:** a marine protected area where subsistence fishing is permitted;	**National Reserve:** an area of community land declared to be a national reserve under the Wildlife Conservation and Management Act, 2013
Distance from	approximately 5 km northeast	approximately 20 km southwest

[1] Kenya National Bureau of Statistics, 2015
[2] Mombasa County Government

	Mombasa Marine National Parks and Reserve	Simba Hills National Reserve
the project site		

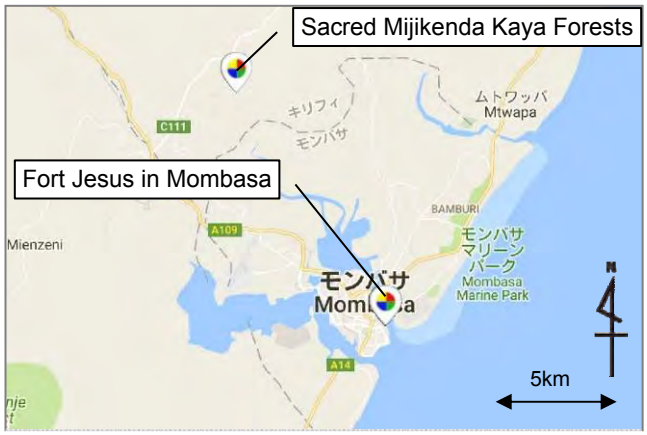


Source: SAPROF for Mombasa Port Container Terminal Expansion Project, JBIC, 2006

Figure 14.2-1 Natural Resources in/around Mombasa

(7) Cultural Heritage

In Mombasa, there are two world heritage sites, namely Fort Jesus in Mombasa Island (registered in 2011), and Sacred Mijikenda Kaya Forests (registered in 2008). Mombasa is a town which has flourished as a base for Indian Ocean trading from medieval times and is a historic town of Swahili culture. Historical remains and relics have been excavated in/around Mombasa Island.



Source: Online Guide of World Heritage (https://worldheritagesite.xyz/africa/kenya/)

Figure 14.2-2 World Heritage in /around Mombasa

In Mama Ngina Drive, to the east of Mombasa Ferry Terminal on Mombasa Island, historical remains and human bones have been excavated. Given this situation GOK designated the area as a Historical Site. Now the site is managed by the National Museum of Kenya (NMK).

Table 14.2-3 World Heritage in /around Mombasa

	Sacred Mijikenda Kaya Forests	Fort Jesus in Mombasa
Base law,	Convention Concerning the Protection of the World Cultural and Natural Heritage National Museums and Heritage Act Chapter 216 Revised Edition 2012 [2006]	Convention Concerning the Protection of the World Cultural and Natural Heritage National Museums and Heritage Act Chapter 216 Revised Edition 2012 [2006]
Registration year	2008	2011
Purpose of registration	The site is described as bearing unique testimony to a cultural tradition and for its direct link to a living tradition	Fort Jesus bears physical witness, in its structures and subsequent transformations to the interchange of

	Sacred Mijikenda Kaya Forests	Fort Jesus in Mombasa
		cultural values and influences between and among peoples of African, Arab, Turkish, Persian, and European origins.

(8) Kaya Forest

In the hinterlands of coastal areas of Kenya, there are fortified villages called “Kaya”. Kaya is a forest of religious importance (Kaya forest). Tree cutting activity is prohibited in Kaya forests. Sacred Mijikenda Kaya Forests on the northeast of Mombasa were registered as World Heritage sites in 2008. In addition to Kaya forests, there are other features of religious importance such as forests, trees and rocks in Kenya’s rural areas. These are considered to be the same as Kaya by local communities. There are no Kaya on the project site. However, in areas near the project site, including Mtongwe area, some Kaya forests were recognized. Figure 14.2-3 shows one of the Kayas at Mtongwe. The rock sticking out into seashore is a religious object.

Source: JICA Survey Team

Figure 14.2-3 One of Kayas Near the Project Site

(9) Ecosystem

1) Ecosystem

Mombasa County has natural forests of approximately 300 ha, agro-forestry of approximately 138 ha, three remarkable mangrove forests and the marine ecology of the Indian Ocean. To the north of Mombasa, there is an excavation site for limestone (Bambuli Cement). In this site Bambuli Cement, who are the project owners, are undertaking a restoration project of the ecosystem, and to create a natural park (Haller Park). Significant wild life of the Mombasa region can be observed in this park.

2) Endangered species

A previous survey[3] of the ecosystem around the project site has been reviewed. In this survey, no endangered species above the "Near Threaten" category of the IUCN Red List were observed.

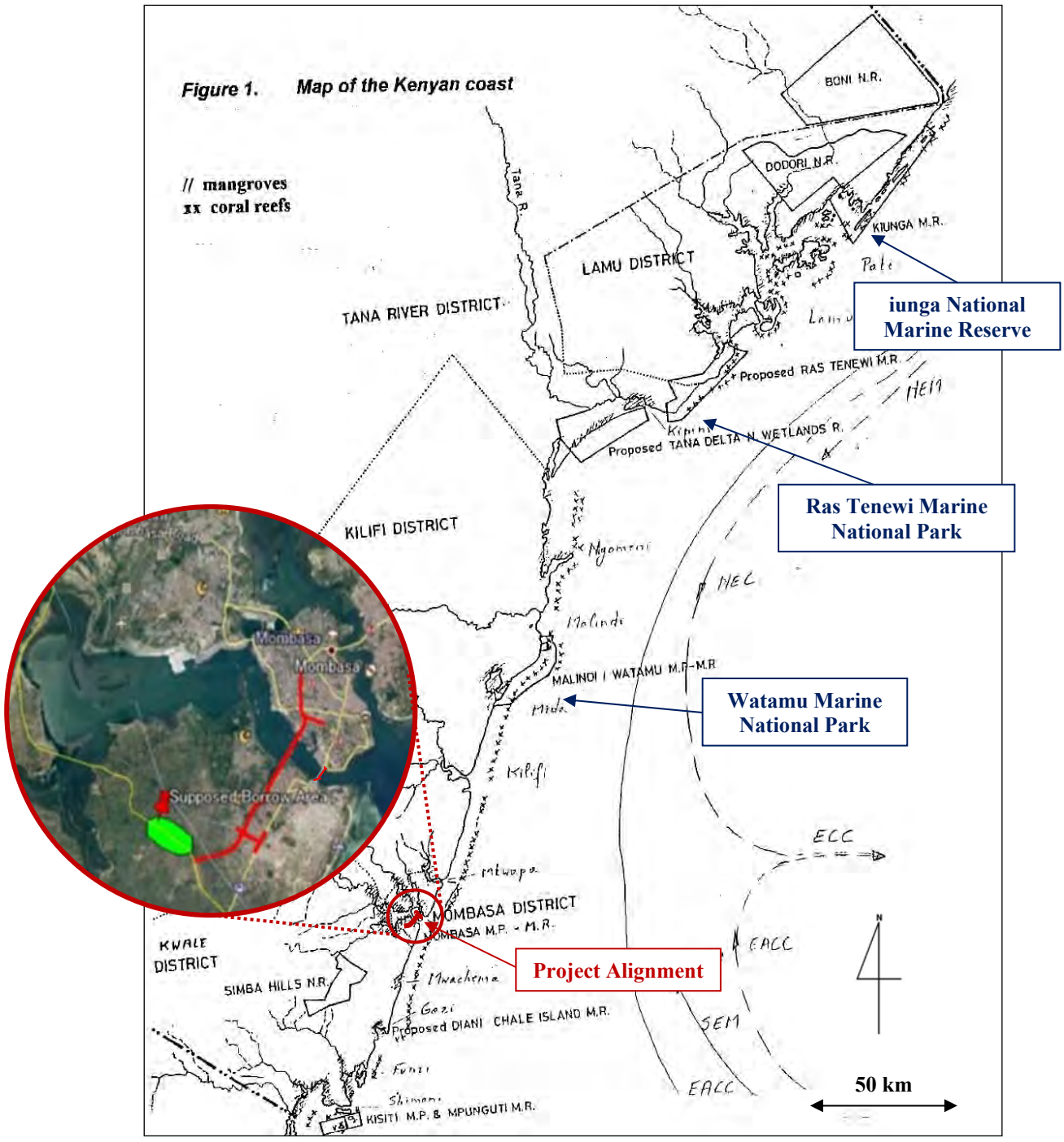
3) Mangrove Forest

Along the coastal area of Kenya adjacent to the Indian Ocean, mangrove forests are well established. Generally, since mangrove forests foster various ecosystems and support life including that of humans it is very important in regards to biodiversity. In Kenya, three major mangrove forests are designated as reserves (Figure 14.2-4 and Table 14.2-4).

Table 14.2-4 Major Mangrove Forests in Kenya

National Parks and Reserves that include Mangrove Forest	Location from the Project Site
Watamu Marine National Park	100 km to the north of Mombasa
Ras Tenewi Marine National Park	240 km to the north of Mombasa
Kiunga National Marine Reserve	320 km to the north of Mombasa

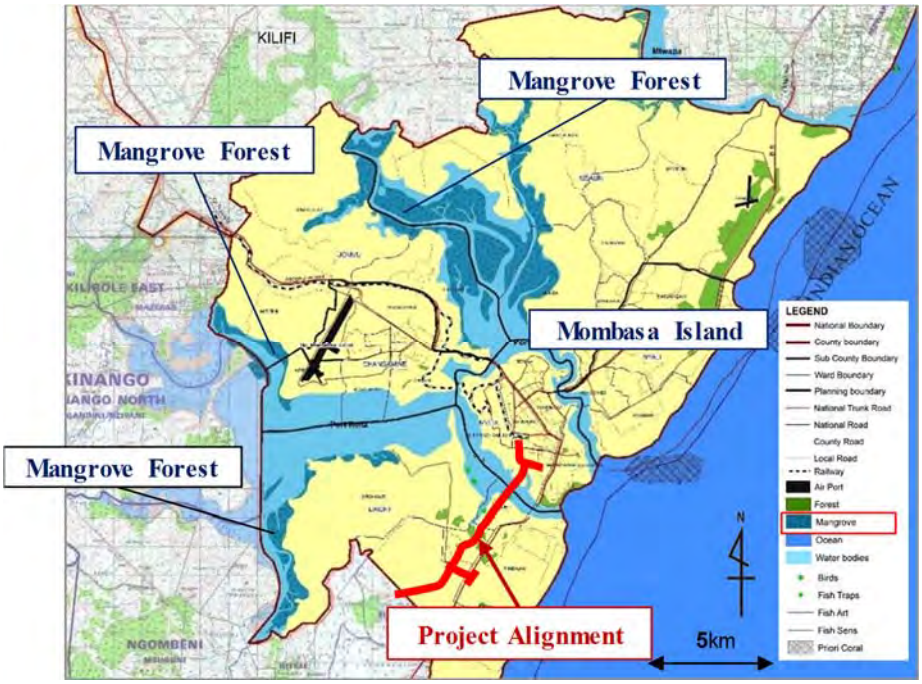
[3] Supplementary Environmental and Social Impact Assessment Study Report for the Mombasa Port Area Roads Development Project



Source: The Mangroves of Kenya, General Information (KWS Coast Region, 1996)

Figure 14.2-4 Major Mangrove Forests in Kenya

Around Mombasa Island, the Tudor Creek to the north of Mombasa Island and the interior zone of Kilindini Port (approximately 10 km from the project site) are vegetation zones for mangrove forests (see Figure 14.2-5). These mangrove forests are not designated as reserves.



Source: Environmentally Sensitive Areas, County Government of Mombasa

Figure 14.2-5 Distribution of Mangrove Forests in Mombasa Area

(10) Pollution Control

In Kenya, environmental standards and regulations relating to a number of sources of pollution have been established. However, since monitoring surveys for air quality, water quality, noise, and vibration have not been conducted, current conditions of pollution are unknown.

1) Air Quality

The Environmental Management and Coordination (Air Quality) Regulations, 2014 Arrangement of Regulations provides "Ambient Air Quality Tolerance Limits" and "Emission Limits" from stationary emissions.

Table 14.2-5 shows the Ambient Air Quality Tolerance Limits.

Table 14.2-5 Ambient Air Quality Tolerance Limits

Pollutants	Time-weighted Average	Industrial area	Residential, Rural & Other areas	Controlled areas	WHO Guidelines
SOx	Annual Average	80μg/m^3	60μg/m^3	15μg/m^3	
	24 hours	125μg/m^3	80μg/m^3	30μg/m^3	20μg/m^3
	Annual Average		0.019ppm/ 50μg/m^3		
	24 hours		0.048ppm/ 125μg/m^3		
	Instant Peak		500μg/m^3		
	Instant Peak (10 min)		0.191ppm		500μg/m^3
NOx	Annual Average	80μg/m^3	60μg/m^3	15μg/m^3	
	24 hours	150μg/m^3	80μg/m^3	30μg/m^3	
	Annual Average		0.2ppm		
	Month Average		0.3ppm		
	24 hours		0.4ppm		
	1 hour		0.8ppm		
	Instant Peak		1.4ppm		
NO_2	Annual Average	150μg/m^3	0.05ppm		40μg/m^3
	Month Average		0.08ppm		
	24 hour	100μg/m^3	0.1ppm		

Pollutants	Time-weighted Average	Industrial area	Residential, Rural & Other areas	Controlled areas	WHO Guidelines
	1 hour		0.2ppm		200μg/m^3
	Instant Peak		0.5ppm		
SPM	Annual Average	360μg/m^3	140μg/m^3	70μg/m^3	
	24 hours	500μg/m^3	200μg/m^3	100μg/m^3	
	Annual Average		100μg/m^3		
	24 hours		180μg/m^3		
RPM	Annual Average	70μg/m^3	50μg/m^3	50μg/m^3	20μg/m^3
	24 hours	150μg/m^3	100μg/m^3	75μg/m^3	50μg/m^3
$PM_{2.5}$	Annual Average	35μg/m^3			10μg/m^3
	24 hours	75μg/m^3			25μg/m^3
Pb	Annual Average	1.0μg/m^3	0.75μg/m^3	0.50μg/m^3	
	24 hours	1.5μg/m^3	1.00μg/m^3	0.75μg/m^3	
	Month Average		2.5		
CO / CO_2	8 hours	5.0mg/m^3	2.0mg/m^3	1.0mg/m^3	
	1 hour	10.0mg/m^3	4.0mg/m^3	2.0mg/m^3	
Hydrogen Sulphide	24 hours	150μg/m^3			
Non-methane hydrocarbons	Instant Peak	700ppb			
Total VOC	24 hours	600μg/m^3			
Ozone	1 hour	200μg/m^3	0.12ppm		
	8 hours (instant peak)	120μg/m^3	1.25ppm		100μg/m^3

Source: 2014 Arrangement of Regulations, the Environmental Management and Co-ordination (Air Quality) Regulations, WHO Guidelines: Air quality guidelines - global update 2005 (WHO)

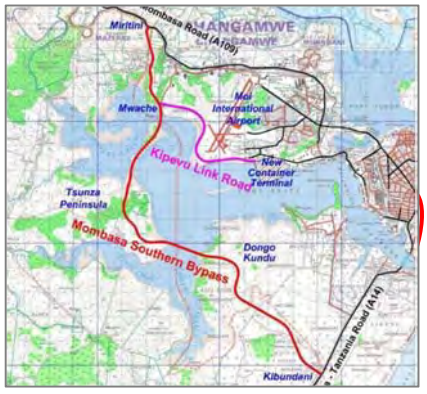
Table 14.2-6 shows the concentration of air contaminants which were measured in the Mombasa area. The concentration of the air contaminants is generally low level compared to the guidelines of WHO. The air quality in Mombasa city is satisfactory.

Table 14.2-6 Concentration of Air Quality in Mombasa Area (July, 2011)

Pollutant	Unit	Location					Kenya*1	WHO*2	Time weighted average
		P1 Miritini	P2 Port Reitz	P3 Tsunza	P4 Mwangala	P5 Kibundani			
PM_{10}	µg/m^3	11	12	17	15	14	100 50	50 20	24hours 1year
Sox (SO_2)	µg/m^3	ND	18	ND	ND	ND	80 60	20 -	24hours 1year
NOx (NO_2)	µg/m^3	ND	26	18	ND	8	80 60	 40 (NO_2)	24hours 1year
CO	µg/m^3	379	510	427	381	404	4,000 2.000	- -	1hour 8hours
O_3	ppm	ND	ND	ND	ND	ND	0.12 1.25	- 100	1hour 8hours
Lead	µg/m^3	ND	ND	4.4	ND	3.8	1 0.75	-	24hours 1year
Wind speed	m/s	3.8	3.5	3.5	4	4	-	-	-
Wind direction	-	SW	SW	S	SW	SE	-	-	-

Note: *1: The Environmental Management and Coordination (Air Quality) Regulations, 2008
*2: WHO Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide, Global Update 2005

Source: Supplementary Environmental and Social Impact Assessment Study Report for the Mombasa Port Area Roads Development Project (November 2011, JICA)



2) Water Quality

The Environmental Management and Coordination (Water Quality) Regulations, 2006 Regulations provide water quality standards including domestic, industrial and irrigation water and effluent discharge water. However, there are no standards for the quality of public waters. Quality standards for sources of domestic water are shown on Table 14.2-7.

Table 14.2-7 Quality Standards for Sources of Domestic Water

Parameter	Guide Value (maximum allowable)
pH	6.5 – 8.5
Suspended solids	30 (mg/L)
Nitrate-NO_3	10 (mg/L)
Ammonia –NH_3	0.5 (mg/L)
Nitrite –NO_2	3 (mg/L)
Total dissolved solids	1200 (mg/L)
E.coli	Nil/100 ml
Fluoride	1.5 (mg/L)
Phenols	Nil (mg/L)
Arsenic	0.01 (mg/L)
Cadmium	0.01 (mg/L)
Lead	0.05 (mg/L)
Selenium	0.01 (mg/L)
Copper	0.05 (mg/L)
Zinc	1.5 (mg/L)
Alkyl benzyl sulphonates	0.5 (mg/L)
Permanganate value (PV)	1.0 (mg/L)

Source: First Schedule of the Environmental Management and Co-Ordination (Water Quality) Regulations, 2006

Standards for effluent discharge into the environment are shown on Table 14.2-8.

Table 14.2-8 Standards for Effluent Discharge into the Environment

Parameter	Maximum Allowable (Limits)
1,1,1-trichloroethane (mg/l)	3
1,1,2-trichloethane (mg/l)	0.06
1,1-dichloroethylene	0.2
1,2-dichloroethane	0.04
1,3-dichloropropene (mg/l)	0.02
Alkyl Mercury compounds	Nd
Ammonia, ammonium compounds, NO_3 compounds and NO_2 compounds (Sum total of ammonia-N times 4 plus nitrate-N and Nitrite-N) (mg/l)	100
Arsenic (mg/l)	0.02
Arsenic and its compounds (mg/l)	0.1
Benzene (mg/l)	0.1
Biochemical Oxygen Demand (BOD 5 days at 20 oC) (mg/l)	30
Boron (mg/l)	1.0
Boron and its compounds – non marine (mg/l)	10
Boron and its compounds –marine (mg/l)	30
Cadmium (mg/l)	0.01
Cadmium and its compounds (mg/l)	0.1
Carbon tetrachloride	0.02
Chemical Oxygen Demand (COD (mg/l))	50
Chromium VI (mg/l)	0.05
Chloride (mg/l)	250
Chlorine free residue	0.10
Chromium total	2
cis –1,2- dichloro ethylene	0.4

Parameter	Maximum Allowable (Limits)
Copper (mg/l)	1.0
Dichloromethane (mg/l)	0.2
Dissolved iron (mg/l)	10
Dissolved Manganese (mg/l)	10
E.coli (Counts / 100 ml)	Nil
Fluoride (mg/l)	1.5
Fluoride and its compounds (marine and non-marine) (mg/l)	8
Lead (mg/l)	0.01
Lead and its compounds (mg/l)	0.1
n-Hexane extracts (animal and vegetable fats) (mg/l)	30
n-Hexane extracts (mineral oil) (mg/l)	5
Oil and grease	Nil
Organo-Phosphorus compounds (parathion, methyl parathion, methyl demeton and Ethyl parantrophenylphenylphosphorothroate, EPN only) (mg/l)	1.0
Polychlorinated biphenyls, PCBs (mg/l)	0.003
pH (Hydrogen ion activity----marine)	5.0-9.0
pH (Hydrogen ion activity--non marine)	6.5-8.5
Phenols (mg/l)	0.001
Selenium (mg/l)	0.01
Selenium and its compounds (mg/l)	0.1
Hexavalent Chromium VI compounds (mg/l)	0.5
Sulphide (mg/l)	0.1
Simazine (mg/l)	0.03
Total Suspended Solids, (mg/l)	30
Tetrachloroethylene (mg/l)	0.1
Thiobencarb (mg/l)	0.1
Temperature (in degrees celsius) based on ambient temperature	± 3
Thiram (mg/l)	0.06
Total coliforms (counts /100 ml)	30
Total Cyanogen (mg/l)	Nd
Total Nickel (mg/l)	0.3
Total Dissolved solids (mg/l)	1200
Colour in Hazen Units (H.U)	15
Detergents (mg/l)	Nil
Total mercury (mg/l)	0.005
Trichloroethylene (mg/l)	0.3
Zinc (mg/l)	0.5
Whole effluent toxicity	-
Total Phosphorus (mg/l)	2 Guideline value
Total Nitrogen	2 Guideline value

Remarks: Standard values are daily/monthly average discharge values. Not detectable (nd) means that the pollution status is below the detectable level by the measurement methods established by the Authority.

Source: Third Schedule of the Environmental Management and Co-Ordination (Water Quality) Regulations, 2006

3) Noise and Vibration

The Environmental Management and Coordination (Noise and Excessive Vibration Pollution control) Regulations, 2007 provides limits for noise. Limits of sound level (noise level) is provided for each land use. This standard is for the general environment, and limits for roadside noise are not provided (See Table 14.2-9).

Table 14.2-9 Sound Level Limits

Zone		Sound Level Limits dB(A)		Noise Rating Level (NR)	
		(Leq, 14h) Day	Night	(Leq, 14h) Day	Night
A	Silent Zone	40	35	30	25
B	Places of worship	40	35	30	25
C	Residential: Indoor	45	35	35	25
	Outdoor	50	35	40	25
D	Mixed residential (with some commercial and places of entertainment)	55	35	50	25
E	Commercial	60	35	55	25

Time Frame: Day: 6.01 a.m. -8.00 p.m. (Leq, 14h) Night: 8.01 p.m. -6.00 a.m. (Leq, 10h)

Source: The Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution control) Regulations, 2007

Permitted noise level on a construction site is showed on Table 14.2-10.

Table 14.2-10 Permitted Noise Level on Construction Site

Facility		Maximum Noise Level Permitted (Leq) in dB(A)	
		Day	Night
(i)	Health facilities, educational institutions, homes for disabled etc.	60	35
(ii)	Residential	60	35
(iii)	Areas other than those prescribed in (i) and (ii)	75	65

Time Frame: Day: 6.01 a.m. -6.00 p.m. Night: 8.01 p.m. -6.00 a.m.

Source: The Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution control) Regulations, 2007

Table 14.2-11 shows noise levels in the Mombasa area. Although some observation values show higher levels than the Kenyan regulations, they are generally at the same level.

Table 14.2-11 Noise Level in Mombasa Area (July, 2011)

dB(A)		Day (6:01a.m.-8.00p.m.)	Night (8:01p.m.-6.00a.m.)
Location		*LAeq* (Min.-Max.)	*LAeq* (Min.-Max.)
P1	Miritini (commercial)	61 (49 – 75)	47 (44 – 51)
P2	Port Reitz (residential)	49 (45 – 60)	47 (45 – 60)
P3	Tsunza (residential)	45 (43 – 58)	43 (40 – 51)
P4	Mwangala (residential)	57 (49 – 64)	45 (42 – 51)
P5	Kibundani(residential)	56 (49 – 75)	46 (44- 54)
Kenyan*1 Regulations		50 (residential) 60 (commercial)	40(residential) 55 (commercial)
IFC Guidelines*2		55 (residential) 70 (industrial)	45 (residential) 70 (industrial)

Note*1: The Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009.

*2: General EHS Guidelines; Environmental Noise Management, International Finance Corporation: IFC 2007

Source: Supplementary Environmental and Social Impact Assessment Study Report for the Mombasa Port Area Roads Development Project (November 2011, JICA)

(11) Basic Information on Social Economy

1) Population

The population of Kenya is 43 million persons (2014 estimation, Kenya National Bureau of Statistic). The population of Mombasa County is 939,370 as of 2009 (Mombasa County Government), including 486,924 men and 452,446 women. Since the population of Mombasa County is increasing rapidly, it is estimated that the population will reach 1.2 million by 2017.

2) Education

Kenya is making elementary and secondary education an obligatory right of children. There are 645 elementary schools in the County including both public and private schools. Pupil numbers per teacher at public schools are 41 (40 is recommended). The number of secondary schools is 28, and the number of students is 14,576. There are 4 technical colleges, an engineering training school and a teacher training school. In addition to this there exists the Mombasa campus of the University of Nairobi.

School enrolment ratios for compulsory education are shown on Table 14.2-12. Although Mombasa County Government is undertaking improvements to education facilities, the school enrolment ratios are lower than for other counties.

Table 14.2-12 School Enrolment Ratios for Compulsory Education

Category of School	Area	Man	Woman	Total
Elementary School	Mombasa County	80.6	81.6	81.1
	Whole of Kenya	90.6	92.3	91.4
Secondary School	Mombasa County	33.6	31.5	32.5
	Whole of Kenya	22.2	25.9	24.0

Source: First county Integrated Development Plan 2013-2017 (Mombasa County Government)

3) Health

In Mombasa County there are 3 large hospitals, 35 public clinics and 18 private clinics. Although Mombasa County Government proposes more improvements to health facilities, there are some problems such as inadequate arrangements of facilities and personnel. Populations per doctor and per nurse are 11,875 and 18,678. The number of health professionals is very small.

4) Employment, Income, and Poverty

According to the census survey of 2009 and estimates for 2013, the working population of Mombasa County is 543,303, and the unemployment rate is 15%. The youthful population of Mombasa County is 41% of the whole population and 61% of the youthful population is working. The causes of the high unemployment rate are lack of skilled labour and business depression

Regarding poverty, it is estimated that 38% of the Mombasa population are classified as poor. It is expected that this number will increase because investment and employment lag behind the rapid increase in population. The causes of poverty are the increase in livelihood costs, difficulty of loan access, lack of skilled labour and business ability, prevalence of HIV/AIDS, gender discrimination and other factors. Mombasa County Government is proposing various policies to solve the poverty issues. One of the policies is improvements to traffic infrastructure to reduce business costs.

5) Drug Abuse

Typical to the character of a port town, drug abuse in Mombasa area is increasing. The most affected group is the young who are an important part of the working population. With the drug abuse, the prevalence of HIV/AIDS is increasing as well.

6) HIV/AIDS

Mombasa County is one of the high prevalence ratio counties for HIV/AIDS. The causes are poverty, drug abuse (particularly the young jobless, truck drivers and tourism workers), a custom of indigenous people and other factors.

7) Economy, Industry, Business

Major employers in Mombasa County are government organizations including Kenya Port Authority and the private sector including the lodging industry, container terminal, and banks.

Regarding manufacturing, there are some major companies which generate a lot of employment. However the location of these companies is limited to the Mvita and Changamwe areas. Since this creates disparity with other areas such as Likoni and Nyali, the negative impacts to social structure are of concern.

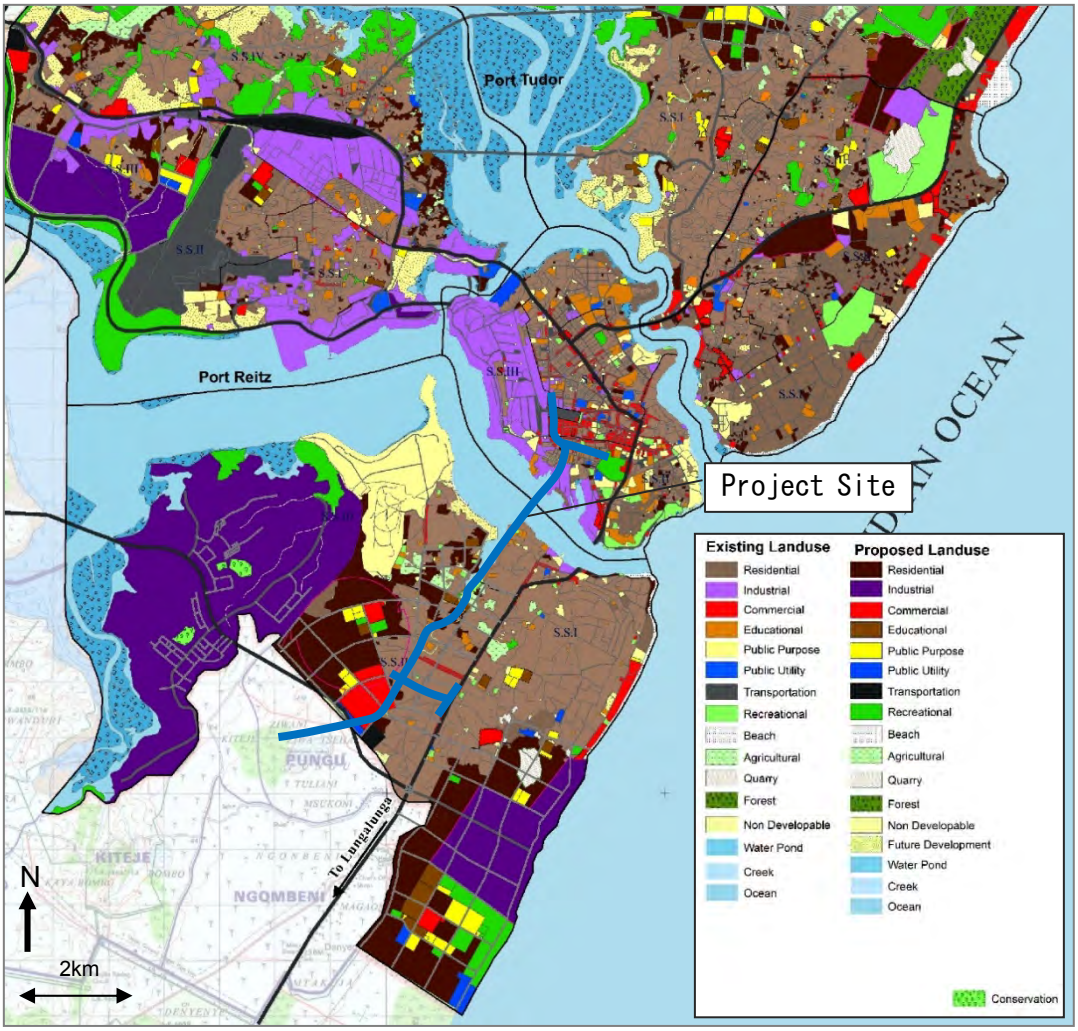
Regarding tourism, there are prominent tourism resources such as the world heritage site (Fort Jesus), the national park & reserves and beach resorts. The yearly occupation rate of the registered 201 premises offering accommodation reaches 64%.

With respect to the agriculture sector, crops including cassava, maize, vegetables, cane and so on are cultivated.

In regards to the fishing industry, the Indian Ocean has a high potential as a fishing ground. There are 14 fishing ports and 1 processing plant in the County. However, the fishing catch is low, the reason being an insufficiency of fishing gear.

8) Land Use

The land use in Mombasa area is shown on Figure 14.2-6. The project site on Mombasa Island is mainly industrial, residential and commercial areas. The South Mainland side is mainly residential and partially agricultural with areas for education.



Source: Mombasa County Government

Figure 14.2-6 Land Use in/around the Project Site

14.3 Legal and Institutional Framework Regarding Environmental and Social Consideration

14.3.1 Legal Framework

(1) Relevant Laws on Environmental Protection

Table 14.3-1 shows the major environmental laws and legislations of the Republic of Kenya.

Table 14.3-1 Relevant Laws on the Environment

Relevant Laws and Legislation	Contents
Environmental Management and Coordination Act, 1999 Revised 2016	Environmental conservation, general environmental management
Water Act, 2002 (Cap. 372)	Water resources conservation and management
Environmental Management and Coordination	Legal basis to undertake EIA

Relevant Laws and Legislation	Contents
(Impact Assessment and Auditing) Regulations, 2003, Legal Notice No. 101	
Environmental Management and Coordination (Air Quality) Regulations, 2008, Draft	Air pollution abatement and control.
Environmental Management and Coordination (Water Quality) Regulations, 2006, Legal Notice No. 120	Environmental water quality criteria for water usage and wastewater discharge limits.
Environmental Management and Coordination (Waste Management) Regulations, 2006, Legal Notice No. 121	Waste management and control.
Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006, Legal Notice No. 160	Conservation of biological diversity and resources, access to genetic resources and benefits sharing.
Environmental Management and Coordination (Noise and Excessive Vibration) Regulations, 2009, Legal Notice No. 61	Noise and vibration control.
Environmental Management and Coordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009, Legal Notice No. 19	Wetlands, riverbanks, lakeshores and seashore management.
Wildlife Conservation and Management Act (Cap 376), (1985) Revised Edition (23th Dec, 2014)	Wildlife conservation and management.
The Environmental Management and Co-ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009	Declaration of a protected wetland which has national and international significance.
The Forest Conservation and Management Act, 2016	Management of forests including public and private land. Declaration and conservation of forest reserves.
National Climate Change Action Plan 2013-2017	Kenya' action plans against climate change based on analysis of present state. The action plans cover multi-sectors on adaptation and mitigation.
Kenya National Adaptation Plan 2015-2030	Adaptation plans up to 2030 based on National Climate Change Action Plan 2013-2017.
The Climate Change Act (2016)	Basic law about climate change response measures and actions. The law describes; establish of the Climate Change Council and Climate Change Directorate, formulation of a National Climate Change Action Plan, and duties relating to climate change.
Public Health Act (Cap. 242)	Maintains a safe and healthy environment for land development.
Occupational Health and Safety Act (2009)	Safety management of construction workers
The National Museums and Heritage Act (Cap 216) (2006), revised 2009	Declaration of monuments to be protected (e. g. Fort Jesus and Mijikenda Kaya Forests). Requires cultural impact assessment studies coordinated by the National Museums of Kanya to proceed the development.
The County Government Act, 2012	The legal basis for county governments to establish the environmental law.

The legislations on Environmental Impact Assessment (EIA) are as follows:

1) Environmental Management and Coordination Act, 1999

The Environmental Management and Coordination Act (EMCA) is an essential law on environment policies in the Republic of Kenya. The Act stipulates essential matters on administrations, environmental protection, EIA, audit, monitoring, and offenses. Based on the

EMCA, legislations on the pollution control including air quality, water quality, waste, and noise have been provided.

2) Environmental Management and Coordination (Impact Assessment and Auditing) Regulations, 2003, Legal Notice No. 101

The Environmental Management and Coordination Regulations (EMCR) provides tangible procedures on EIA for the Republic of Kenya. Part II of the regulations mentions items to be described in a project report, which should be submitted before the implementation of an EIA study. Part III shows an expert license on EIA implementation. Part IV shows the contents which are required in an EIA study report and the matters of EIA license.

(2) Projects which Require an EIA Study

The Second Schedule of the EMCA shows "projects to undergo environmental impact assessment". The projects which require an EIA study cover broad fields. The projects on transport infrastructures which require an EIA study are shown below:

Projects which require the Submission of a Project Report

1. General
   - (a) an activity out of character with its surrounding;
   - (b) any structure of a scale not in keeping with its surrounding;
   - (c) major changes in land use.

3. Transportation including:-
   - (a) all major roads;
   - (b) all roads in scenic, wooded or mountainous areas and wetlands;
   - (c) railway lines;
   - (d) airports and airfields;
   - (e) oil and gas pipelines;
   - (f) water transport.

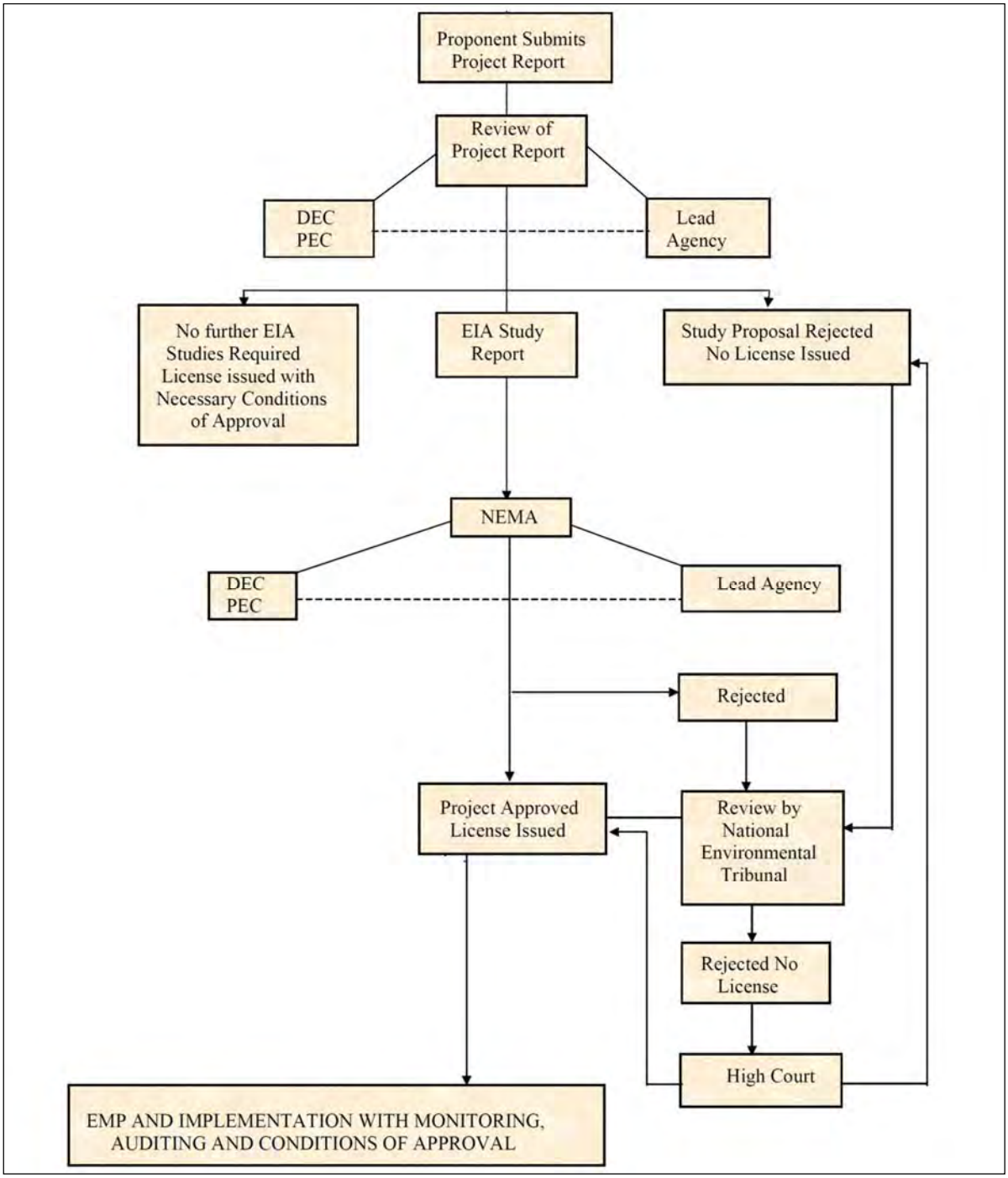
Source: Extracts from the Second Schedule of the EMCA

Although bridge projects are not listed in the schedule, the project corresponds to 1. (b), (c) and 3. (a) as it is to construct a large-scale bridge and its approach roads.

(3) EIA Procedure of Kenya

NEMA prepared a guideline, *Environment Impact Assessment Guidelines and Administrative Procedures* (November 2002, draft) to assist relevant persons involved in an EIA including project proponents. The targets of the Guideline which plainly explains the flow of the EIA procedure in the Republic of Kenya include the general public, project proponents, learning institutions, researchers, policy makers, EIA practitioners, development partners, Lead Agency staff and NEMA.

The Guideline shows the flow of an EIA process at Figure 14.3-1.



Note: DEC: District Environment Committee, PEC: Provincial Environment Committee. DEC and PEC, which are provided on EMCA for the purpose of decentralization of environment management, support the review of the EIA study.
Source: Guideline Environment Impact Assessment Guidelines and Administrative Procedures (November 2002, draft)

Figure 14.3-1 EIA Processes in Kenya

1) Project Report

In advance of an EIA study, project proponents are required to submit a project report to NEMA. The object of the project report is the screening of the requirements of an EIA study. The project report includes the following details:

a. Name of the proponent, PIN number, address and contact person
b. Title of the project
c. Objectives and scope of the project

d. Nature of the project
e. Location of the proposed project, including the physical area that may be affected by the project's activities
f. Types of activities that will be undertaken during the project construction, operation, and decommissioning phases
g. Design(s) of the project
h. Materials to be used, products and by-products, including waste to be generated by the project and the method(s) of their disposal
i. Potential environmental impacts of the project
j. Mitigation measures to be taken during and after implementation of the project
k. An action plan for the prevention and management of foreseeable accidents during the project cycle
l. A plan to ensure the health and safety of the workers, and neighbouring communities
m. Economic and social benefits to the local community and the nation in general
n. Project budget
o. Views of the public about the project, indicating representativeness of the potentially affected people; and
p. An environmental management plan (EMP) for the entire project cycle

NEMA reviews the submitted project report. When NEMA is satisfied that the project will not have significant negative impacts or that the proposed mitigation measures are adequate to address the identified impacts, NEMA may issue an EIA License with conditions of approval. In the event that the project has significant negative impacts and the project report does not disclose adequate mitigation measures, NEMA requires the project proponent to undertake an EIA study.

2) EIA Study Report

After preparing the terms of reference for an EIA study, the project proponents conduct the EIA study and prepare the EIA study report. The contents of the EIA study report include the following:

a. The proposed location of the project
b. A concise description of the national environmental legislative and regulatory framework, baseline information
c. Any other relevant information related to the project; the objectives of the project
d. The technology, procedures, and processes to be used, in the implementation of the project
e. The materials to be used in the construction and implementation of the project
f. The products, by-products and waste generated by the project
g. A description of the potentially affected environment
h. 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
i. Alternative technologies and processes available and reasons for preferring the chosen technology and processes
j. Analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design, and technologies
k. An environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment; including the cost, time frame and responsibility to implement the measures
l. Provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities or major industrial and other

development projects
m. The measures to prevent health hazards and to ensure security in the working environment for the employees and for the management of emergencies
n. An identification of gaps in knowledge and uncertainties which were encountered in compiling the information
o. An economic and social analysis of the project
p. An indication of whether the environment of any other state is likely to be affected and the available alternatives and mitigating measures
q. Such other matters as NEMA may require

3) Public Meeting

The project proponents have to hold at least three public meetings with the affected parties and communities to explain the project and its effects, and to receive their oral or written comments.

4) Submission of EIA Report and Audit

The project proponents submit the EIA report to NEMA. For the submitted EIA report, NEMA requests comments from relevant authorities and collects public comments. Moreover, NEMA holds public meetings to collect public opinions if necessary. NEMA examines the comments and argues about whether a project is right or wrong in the view of the environmental considerations.

5) EIA License

Accepting conformity with the environment, NEMA issues an EIA License to the project proponents.

6) EIA Expert

The EIA system of Kenya requires EIA experts for the preparation of the project report and the implementation of the EIA study. The EIA expert needs suitable qualifications and registration from NEMA.

14.3.2 Institutional Framework

Environment-related issues fall within the jurisdiction of the Ministry of Environment, Water and Natural Resources (MEWNR). However, in 2001, GOK established the administrative structures to implement EMCA 1999 as follows:

(1) The National Environment Council (NEC)

The National Environment Council (the Council) is responsible for policy formulation and directions for the purposes of EMCA 1999. The Council also sets national goals and objectives, and determines policies and priorities for the protection of the environment.

(2) The National Environmental Management Authority (NEMA)

Under EMCA 1999, the National Environmental Management Authority (NEMA) was created as the body charged with overall coordination of environmental protection in Kenya. NEMA has already devolved some functions to Counties. NEMA Head Office still retains regulatory control over major projects coordinating with respective County Offices. Under this arrangement,

environmental matters including licensing for projects will take place at the County or national level depending on the perceived environmental risk. NEMA has 400 staff in total. Currently, local offices are in charge of EIA assessments and the issuing of licenses. NEMA activities at county level are coordinated by county environmental coordinators (CEC).

(3) Public Complaints Committee

Under EMCA 1999, a Public Complaints Committee has been established to provide an administrative mechanism for addressing environmental harm. Membership of the Committee includes representatives from the Law Society of Kenya, Non-Governmental Organizations (NGOs) and business communities. The committee has the mandate to investigate complaints relating to environmental damage and degradation. Complaints emanating from the proposed project could be dealt with by this Committee.

(4) Institutional Framework under KeNHA

In the capacity of the implementing organization, KeNHA exercises jurisdiction over the overall technical quality of the proposed project including the EIA and RAP.

(5) The Mombasa County Government (MCG)

The County Government of Mombasa formulates environmental laws under the County Government Act in consultation with NEMA with which the proposed Mombasa Gate Bridge Project needs to comply. MCG has a full department of environment headed by a Chief Officer.

14.3.3 Comparison of JICA Guidelines and EIA System of Republic of Kenya

Table 14.3-2 shows the comparison of policies of JICA Guidelines and the EIA system of the Republic of Kenya, identifying gaps and policies for gap filling. Although basically there are no significant differences, environmental and social items which should be considered are limited. Since the project is large scale infrastructure, wide ranging items including pollution control should be considered.

Table 14.3-2 Comparison of JICA Guidelines and Republic of Kenya's EIA

Subject	JICA Guidelines	System of (Country)	Comparison/Gap and Project Policy
Underlying Principles	- Environmental impacts that may be caused by projects must be assessed and examined in the earliest possible planning stage. Alternatives or mitigation measures to avoid or minimize adverse impacts must be examined and incorporated into the project plan. (JICA Guidelines, Appendix 1.1)	- There is no system to examine alternatives and mitigation measures at an early stage.	On this survey, stakeholder meetings and public consultation meetings were held, and their opinions are reflected in route selection, alternatives and mitigation measures.
Information Disclosure	- EIA reports (which may be referred to differently in different systems) must be written in the official language or in a language widely used in the country in which the project is to be implemented. When explaining projects to local residents, written materials must be provided in a language and form understandable to them. - EIA reports are required to be made available to the local residents of the country in which the	- Language of EIA report is not designated. Official language is English, and EIA report will be written in English.	- There is no gap about the language or information disclosure. -

Subject	JICA Guidelines	System of (Country)	Comparison/Gap and Project Policy
	project is to be implemented. The EIA reports are required to be available at all times for perusal by project stakeholders such as local residents and copying must be permitted. (JICA Guidelines, Appendix 2)	-	
Consultations with Local Stakeholders	- For projects with a potentially large environmental impact, 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 may be examined. The outcome of such consultations must be incorporated into the contents of project plans. (JICA Guidelines, Appendix 1.5 Social Acceptability 1) - In preparing EIA reports, consultations with stakeholders, such as local residents, must take place after sufficient information has been disclosed. Records of such consultations must be prepared. - Consultations with relevant stakeholders, such as local residents, should take place if necessary throughout the preparation and implementation stages of a project. Holding consultations is highly desirable, especially when the items to be considered in the EIA are being selected, and when the draft report is being prepared. (JICA Guidelines, Appendix 2. EIA Reports for Category A Projects)	- Three stakeholder meetings on affected areas and communities are compulsory during an EIA survey. At the stakeholder meetings, project outlines and impacts are explained, and opinions are gathered. -	- At an early stage, the survey team held stakeholder meetings and public consultation meetings. The opinions expressed were taken into account.
Scope of Impacts to Be Assessed	- 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 usage, climate change, ecosystems, fauna and flora, including trans-boundary or global scale impacts. These also include social impacts, including migration of population and 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 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. (JICA Guidelines, Appendix 1.3 Scope of Impacts to Be Assessed 1) - In addition to the direct and immediate impacts of projects, their derivative, secondary, and cumulative impacts as well as the impacts of projects that are indivisible from the project are also to be examined and assessed to a reasonable extent. It is also desirable that the impacts that can occur at any time throughout the project cycle should be considered throughout the life cycle of	- For an EIA, the following items are to be examined (not limited): Ecosystem Economic and social impacts Landscape Land use Water area - Evaluation for the derivative, secondary, and cumulative impacts is not described. The impacts throughout the project cycle are not considered.	- Impact items of JICA Guidelines are included in EIA report. - In the event that derivative, secondary and cumulative impacts are expected, these impacts are to be evaluated in the EIA report.

Subject	JICA Guidelines	System of (Country)	Comparison/Gap and Project Policy
	the project. (JICA Guidelines, Appendix 1.3 Scope of Impacts to Be Assessed 2)		
Monitoring, Grievance Mechanism	- Project proponents etc. should make efforts to make the results of the monitoring process available to local project stakeholders. (JICA Guidelines, Appendix 1.8 Monitoring 3) - When third parties point out, in concrete terms, that environmental and social considerations are not being fully undertaken, forums for discussion and examination of countermeasures are established based on sufficient information disclosure, including stakeholders' participation in relevant projects. Project proponents etc. should make efforts to reach an agreement on procedures to be adopted with a view to resolving problems. (JICA Guidelines, Appendix 1.8 Monitoring 4)	- There is no description about disclosure of monitoring results. EIA documents submitted to NEMA are available in a prescribed manner.	- Easy access to the EIA report is encouraged and agreed with KeNHA.
Ecosystem and Biota	Projects must not involve significant conversion or significant degradation of critical natural habitats and critical forests. (JICA Guidelines, Appendix 1.6)	GOK may declare a lake shore, wetland, coastal zone or river bank to be a protected area and impose such restrictions as he considers necessary, to protect the lake shore, wetlands, coastal zone and river bank from environmental degradation.	There is no gap.
Indigenous Peoples	Any adverse impacts that a project may have on indigenous peoples are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures must be taken to minimize impacts and to compensate indigenous peoples for their losses. (JICA Guidelines, Appendix 1.8)	Constitution of Kenya describes obligation for needs of indigenous people.	In the event that the existence of indigenous people is confirmed in the project site, appropriate measurements will be applied.

14.3.4 Cultural Impact Assessment

The National Museum of Kenya (NMK) is an authority which executes the National Museums and Heritage Act, 2006. The responsibility of NMK includes the collection, study, maintenance and record of cultural heritage in Kenya. NMK is one of the audit organizations for EIA reports. For the audit of the EIA report that project proponents submitted, NEMA requests the opinions of NMK in relation to cultural protection. In response to this request, NMK states their required considerations. NMK also supervises the Cultural Impact Assessment (CIA) which is an initial survey of any archeological and cultural properties, positioned as a complement to the EIA in case negative impacts to cultural properties are expected.

For this project, NMK has requested the implementation of a CIA for each alternative considering the cultural importance of the Mombasa area.

14.4 Comparison of Alternatives

14.4.1 Environmental Conditions of the Alternative Locations

The Survey Team compared 9 long-listed alternative routes as shown in the aforementioned Figure 3.2-1. As a first step, the Survey Team evaluated the appropriateness of the long-listed alternative routes. As a result, Routes A2, A3 and D were identified as appropriate alternative routes. The reasons why the other routes were considered inappropriate are shown in Table 14.4-1 Comparison of the Alternatives on the Environmental and Social Considerations. The alignments of the short-listed alternative routes A2, A3 and D are shown in Figure 3.4-1 to Figure 3.4-3. The Survey Team assessed the impact of the Project for each of the three alternatives from environmental and social viewpoints, and compared the alternatives and "no action option" for which there would be no project implementation.

(1) Route A2

The main piers of the main bridge on Route A2 are located near the existing Likoni Ferry jetties. The existing ferry jetties would require to be relocated during the construction of the proposed bridge for the safety of the ferry users. The north of Mombasa Island along the Indian Ocean is designated as the Mombasa Marine National Park and Reserve. The Marine National Park & Reserve is about 5km far from the project site. In the vicinity of the ferry terminals on both sides, the queues of vehicles waiting for a ferry frequently cause road congestion around the terminals.

The ferry terminal on the Mombasa Island side is located beside Mama Ngina Park where old baobab trees live that provide good scenery for the public and it is an historic site where an ancient settlement is buried (see Figure 14.4-1). The approach road to the Mombasa Island side passes through Mbaraki Road, Archbishop Makarios Road, Mwakilingo Street and Lumumba Road then merges with Ronald Ngara Road. The approach bridge branches off towards to Mnazi Mmoja Road from Archbishop Makarios Road. The buildings along these roads are mixed with residences, offices, warehouses and shops (see Figure 14.4-2). The construction of the approach bridge requires demolition and land acquisition of some of the buildings along the route.

The ferry terminal on the Mainland South side is surrounded by small shops and a lot of small vendors and as a result it is crowded throughout the day (see Figure 14.4-3).

The Mainland South side approach bridge passes through the densely populated residential area of Likoni District towards the farming area at the west side of the residential area (see Figure 14.4-4). Then the approach road runs towards the proposed Mombasa Southern Bypass through a less populated residential area. The construction of the approach bridge and road requires land acquisition and demolition of the existing houses within the proposed road right-of-way (ROW).

Figure 14.4-1 Mama Ngina Park

Figure 14.4-2 Mbaraki Road

Figure 14.4-3 Small Venders around Ferry Terminal in Mainland South

Figure 14.4-4 Vicinity of Likoni Residential Area

(2) Route A3

The main piers of the main bridge on Route A3 are located on the west side of Mbaraki Berth in Mombasa Island and Titanium Shipping Berth in Mainland South (see Figure 14.4-5 and Figure 14.4-6).

The Mombasa Island side approach bridge passes through an industrial area where a ship building factory and storage tanks exist. The approach bridge extends through Mbaraki Road, Archbishop Makarios Road, Mwakilingo Street and Lumumba Road in the same way as Route A2. The construction of the approach bridge requires demolition and land acquisition of some of the buildings along the route.

The approach road on the Mainland South side passes through the densely populated residential area of Likoni District towards the farming area at the west side of the residential area. Then the approach road extends towards to the proposed Mombasa Southern Bypass in the same way as Route A2. The construction of the approach bridge and road requires land acquisition and demolition of the existing houses within the proposed road ROW.

Figure 14.4-5 Mbaraki Berth and Industry Area

Figure 14.4-6 Titanium Shipping Berth

(3) Route D

The main piers of the main bridge for Route D are located at the west side of the Fishing Berth in Mombasa Island and the northwest edge of Likoni District in Mainland South. The approach road on the Mombasa Island side passes through Archbishop Makarios Road, Mwakikingo

Street and Lumumba Road then merges with Ronald Ngara Road. The construction of the approach road requires demolition and land acquisition of some of the buildings along the route (see Figure 14.4-7). Food stalls and vendors occupy part of the route, which appears to be illegal (see Figure 14.4-8).

The approach road on the Mainland South side passes through the west side of Likoni District and the east side of Mweza Creek which is a low-density residential area. Since some fish traps are installed on the coast, it is presumed that a small fishery is being operated. Moreover, there is a kaya (holy tree) forest along the coast. A small mangrove forest is growing in Mweza Creek (see Figure 14.4-9). There are some educational facilities along the route. Alignment of the route was modified so as to not affect these schools (see Figure 14.4-10). The construction of the approach road requires land acquisition and demolition of the existing houses within the proposed road ROW.

Figure 14.4-7 Apartments in the Affected Area of Route D

Figure 14.4-8 Food Stalls and Vendors Who Occupy a Part of the Route D

Figure 14.4-9 Small Mangrove Forest in Mweza Creek

Figure 14.4-10 The Educational Facilities along Route D

14.4.2 Alternative Comparisons on Environmental and Social Grounds

(1) Alternative Comparisons on Project Locations

Since the alternatives are located in areas surrounding Mombasa Port, significant difference does not exist among the alternatives in terms of negative environmental impacts. However, after examining the current conditions of the alternatives, the items below were extracted as factors that may cause some differences among the alternatives:

1) Air Quality, Noise, and Vibration

The approach roads of Routes A3 and D will be constructed on undeveloped land on the Mainland South side. A traffic shift from the existing ferry terminal areas to these areas will cause air pollution, noise, and vibration along the approach roads. However, negative impacts are expected to be insignificant because the area is still low density. Route A2 will not change traffic flow in the area as it is using existing roads which are a local traffic hub. Rather, it will improve the traffic flow of the original location and will reduce the emission gasses from vehicles.

2) Protected Areas and Ecosystem

Route A2 is located close to the Mombasa Marine National Park & Reserve. Route D is located along a small mangrove forest in Mweza Creek. The deterioration of water quality with the construction activities of the Project may cause adverse impacts on each eco-system.

3) Landscape

Route A2 would be be constructed close to the Mama Ngina Park. As mentioned above, the Mama Ngina Park is an historically important place providing citizens with good scenery including old baobab trees. The bridge construction may degrade such views. On the other hand, if the bridge was designed to fit the current scenery, it might be recognized as a new landmark of Mombasa.

4) Cultural Heritage

It is well known that Mombasa hosts the origin of Swahili culture. A lot of archaeological evidence has been found in and around Mombasa Island. NMK mentions that appropriate considerations in this regard should be taken into account with respect to the location of all alternatives. Negative impacts on cultural heritage are unclear during the first reporting period. Among the three alternative routes, route A2 is nearest to the Mama Ngina Park. Therefore, route A2 has a higher possibility of negative impacts than the other routes.

5) Land Acquisition and Involuntary Resettlement

Regarding land acquisition, route D needs the most land acquisition; and route A2 needs the least land acquisition. However, the disparity between the alternatives is little. (206,800m^2 – 221,900m^2) Regarding resettlement, the expected impact of route D is least among the alternatives. It is because the approach road on Mombasa side is short and the approach road on the mainland side passes through a low population area. The impacts of A2 and A3 routes are expected to be almost the same.

Table 14.4-1 shows a comparison of the alternatives on environmental and social considerations including the evaluation of project effectiveness, engineering and project costs. The No Action Option has no negative impacts including land acquisition, large scale resettlement and loss of natural environment on the Mainland side. However, since significant traffic issues would not be resolved, the sound development of economic and social conditions in/around the Mombasa area would be hampered. Moreover, traffic congestion would generate environmental problems such as air pollution. In view of this, GOK cannot select the No Action Plan. Negative impacts on cultural heritage, landscape and protected areas are generally concerns for route A2. With respect to environmental and social considerations, the routes A3 and D are recommended. A comprehensive comparison of the alternatives were discussed in *Chapter 4* of the Report.

Table 14.4-1 Comparison of the Alternatives on the Environmental and Social Considerations

Impact Item		Alternatives			
		No Action Option	A2	A3	D
Outline of Main Bridge Alternatives *Area includes the Bridge and the approach roads		-	Length: 1,020m Main Span: 600m Maximum Height: 198m Area*: 350,000m^2 Location is near Likoni Ferry jetties	Length: 1,260m Main Span: 740m Maximum Height: 198m Area*: 329,000 m^2 Location is west side of Mbaraki Berth	Length: 1,440m Main Span: 720m Maximum Height: 198m Area*: 279,000m^2 Location is west side of Fishing Berth
Project Effectiveness and Engineering		Traffic issues in the area are not solved. Socio-economic losses will expand.	Routes A2, A3 and D mitigate congestion in Mombasa Island, provide efficient and safe commuting means and freight transportation route and support development in the Mainland South.		
Project Cost	Rough Construction Cost	-	Ksh 68 billion	Ksh 71 billion	Ksh 70 billion
	Maintenance Cost per 100 years	-	Ksh 33 billion	Ksh 33 billion	Ksh 33 billion
Land Use	Mombasa Island Side	-	- Passing area: Ferry jetty, port and public facilities - Along the approach bridge (Mbaraki Rd. Archbishop Makarios Rd. Mwakilig St. and Lumumba Rd.): Built up area with commercial/ office/ residential buildings and warehouses	- Passing area: industry area: Mbaraki Berth, ship building factory, storage tanks and warehouses - Along the approach bridge (Mbaraki Rd. Archbishop Makarios Rd. Mwakilig St. and Lumumba Rd.): Built up area with commercial/ office/ residential buildings and warehouses	- Passing area: bare land surrounded by port facilities and factories /warehouses, - Along the approach bridge (Archbishop Makarios Rd. Mwakilig St. and Lumumba Rd.): Built-up area with commercial/office/ residential buildings and warehouses
	The Mainland South side		- Passing area: Ferry jetty, commercial, Likoni bus station, fuel station, some houses - Along the approach bridge and roads: Residential area	- Passing area: Titanium shipping jetty, school, houses - Along the approach bridge and roads: Residential area	- Passing area: Schools, houses - Along the approach bridge and roads: Residential area
Environmental and Social Considerations	Pollution Control	The queue of vehicles waiting for a ferry emits air pollution gasses. (1)	Improving the current traffic flow, Route A2 reduces vehicle emission gasses and improves air quality around the ferry terminals. However, this increases in the densely populated Likoni area and west side of Mombasa Island area. (4)	Route A3 shifts traffic flow from original locations. Therefore, the route improves air pollution, noise and vibration in the original locations. However, this increases in the densely populated Likoni area and west side of Mombasa Island area. (3)	Route D shifts traffic flow from original locations. Therefore, the route improves air pollution, noise and vibration in the original locations,.However, this increases in the west side of the Likoni area and west of Mombasa Island area. Since

Impact Item		Alternatives			
		No Action Option	A2	A3	D
					there are several educational facilities in the Likoni side, appropriate considerations are required. (3)
	Natural environment	Current conditions are kept. (5)	The route A2 is close to the Mombasa Marine National Park & Reserve. Construction works including the installation of piers may cause water pollution affecting the protected areas and ecosystem. (2)	Although the west of the Likoni area is a residential area, some natural environment remains. Construction works including the installation of piers may cause water pollution affecting the ecosystem. (3)	Although the west of the Likoni area is a residential area, some natural environment remains. Construction works including the installation of piers may cause water pollution affecting the ecosystem of the mangrove forest. (3)
	Social environment	Land acquisition and involuntary resettlement are not required. Current social conditions are kept.(5)	**Land acquisition and involuntary resettlement** Scope of the resettlement is assessed as large. Approx. land acquisition area: Mombasa Island: 20,000 m^2 Mainland South: 188,000 m^2 Approx. no. of affected buildings: Mombasa Island: 83 buildings Mainland South: 276 houses (2) **Cultural Heritage** The project site and the vicinity may have cultural properties. The area is more important historically than the other routes. (2) **Landscape** The bridge construction may degrade the scenery in and around the Mama Ngina Park. (2)	**Land acquisition and involuntary resettlement** Scope of the resettlement is assessed as large. Approx. land acquisition area: Mombasa Island: 22,000 m^2 Mainland South: 200,000 m^2 Approx. no. of affected buildings: Mombasa Island: 86 buildings Mainland South: 236 houses (2) **Cultural Heritage** The project site and the vicinity may have cultural properties. (4) **Landscape** Since the bridge location is not known to the public, negative impacts on the landscape are less. (4)	**Land acquisition and involuntary resettlement** Scope of the resettlement is assessed as large. Approx. land acquisition area: Mombasa Island: 19,000 m^2 Mainland South: 204,000 m^2 Approx. no. of affected buildings: Mombasa Island: 56 buildings Mainland South: 125 houses (3) **Cultural Heritage** The project site and the vicinity may have cultural properties. (4) **Landscape** Since the bridge location is not known to the public, negative impacts on the landscape are less. (4)

Definition of score: 5: Superior 4: Relatively superior 3:Fair 2: Relatively inferior 1: Inferior

(2) Comparison of Bridge Types

In 7.*2 Comparison of Bridge Structure Types* of the Report, a preferable bridge type was identified from among some possible alternatives. Here, a preferable bridge type is re-examined from the environmental viewpoint. Table 14.4-2 outlines the environmental aspects of the alternatives.

Table 14.4-2 Environmental Comparison of Bridge Types

Bridge Types	Suspension Bridge (×)	Hybrid Cable-Stayed (△)	Steel Cable-Stayed (○)
Span Arrangement	330+720+330=1,380m	260+720+260=1,20m	360+720+360=1,440m
Construction Cost	High (×)	Low (○)	Low (○)
Construction Period	Long (×)	Short (○)	Short (○)
Appearance	Good (○)	Good (○)	Good (○)
Environmental Impact	Not significant (△)	Not significant (△)	Not significant (△)
Navigational Impact	Not significant (△)	Not significant (△)	Not significant (△)
Construction Waste	Excavation and concrete work is largest (×)	Piling work is large (△)	Excavation, concreting and pile work is least (○)
Environmental Views	Construction period is long and waste is large (×)	Construction period is short and waste is less (○)	Construction period is short and waste is least (○)

○: Good △: Fair ×: Bad

(3) Comparison of Approach Bridge Types

As with the main bridge types, preferable bridge approach types were discussed in 7.3 *Comparison of Bridge Structure Types* of the Report. Since none of the identified four bridge approach types have any clear advantage in terms of construction conditions and their appearances, there is no preference from an environmental viewpoint and because all types would be of PC construction, structural noise derived from passing vehicles would be mostly avoided.

14.5 Scoping and TOR of EIA

14.5.1 Scoping of Bridge Locations

Of the three alternatives (Routes A2, A3 and D), the potential environmental and social impacts were assessed on the basis of the available information on the Project and the baseline data obtained. After a comprehensive examination, Route D was selected as a location for the bridge. For Route D, an environmental scoping was prepared. The scoping is shown on Table 14.5-1.

Table 14.5-1 Result of Environmental Scoping: Route D

No.	Impact Item	Evaluation		Reason / Remarks
		Phase		
		Pre-Construction/ Construction	Operation	
		Activities		
		Land acquisition Construction works	Existence /Service	
Pollution				
1	Air pollution	B-	B±	**Construction Phase:** ・Construction works and operation of construction equipment will generate dust and exhaust gas. ・Traffic congestion on the construction site will increase exhaust gas from vehicles on both sides. **Operation Phase:** ・The Project may cause air pollution along the approach roads. On the other hand, air pollution around the Likoni Ferry jetties is improved.
2	Water pollution	B-	B-	**Construction Phase:** ・The construction works including pier installation may cause marine water contamination in the channel. ・Turbid runoff of construction work may affect the water quality of Mweza creek. **Operation Phase:** ・Dust on the road surface is washed away by rain and may cause water pollution.
3	Waste	B-	B-	**Construction Phase:** ・Construction works will cause waste and the construction office will produce general waste. **Operation Phase:** ・Solid waste from road users may be produced.
4	Soil pollution	D	D	**Construction Phase:** ・Because materials that cause soil pollution will not be used in the construction works, soil contamination is unlikely to occur. **Operation Phase:** ・Because materials that cause soil pollution will not be used in the maintenance works, soil contamination is unlikely to happen.
5	Noise and Vibration	A-	A±	**Construction Phase:** ・Construction works will cause noise and vibration. **Operation Phase:** ・The Project may cause noise and vibration along the approach roads. On the other hand, noise around the Likoni Ferry jetties are improved.
6	Ground subsidence	D	D	**Construction Phase:** ・No construction works causing ground subsidence are included in the Project. **Operation Phase:** ・Pressure from loading on the road will be too small to cause subsidence.
7	Offensive odours	D	D	**Construction Phase:** ・Because materials and equipment that create offensive odours will not be used in the construction works, offensive odours are unlikely to occur. **Operation Phase:** ・Activities which cause offensive odours are not expected.

No.	Impact Item	Evaluation		Reason / Remarks
		Phase		
		Pre-Construction/ Construction	Operation	
		Activities		
		Land acquisition Construction works	Existence /Service	
8	Bottom sediment	B-	D	**Construction Phase:** ・Pier installation work may disturb the bottom sediment under the channel. **Operation Phase:** ・Activities which will affect the bottom sediment are not expected.
Natural Environment				
9	Protected areas	C	D	**Construction Phase:** ・The Project site includes no protected areas. But the Mombasa Marine National Park & Reserve is located roughly 6 km from the Project site. **Operation Phase:** ・There are no activities which cause negative impacts on protected areas.
10	Ecosystem	B-	C	**Construction Phase:** ・Construction works including pier installation may disturb the marine ecosystem of the Kilindini harbor and connected marine areas. ・Vegetation will be lost due to construction works. ・Agricultural ecosystem will be lost or disturbed by construction works. **Operation Phase:** ・Because the Project mostly passes through developed areas, impact on biodiversity is unlikely to occur.
11	Hydrology	B-	B-	**Construction Phase:** **Operation Phase:** ・Water flow in the channel may be affected by the pier installation.
12	Geographical features	B-	D	**Construction Phase:** ・Since the Project needs a large quantity of aggregate, geographic features of the quarry site should be considered. **Operation Phase:** ・Impact on geographic features is unlikely to occur.
Social Environment				
13	Resettlement/ Land Acquisition	A-	D	**Pre-Construction Phase:** ・Large scale land acquisition and resettlement is anticipated. **Construction Phase:** ・Temporary lease of land for the construction work is expected. Additional small-scale resettlement may be required according to the designs and the phasing of the construction works. **Operation Phase:** ・Additional physical resettlement and land acquisition will not be required for this Project.

No.	Impact Item	Evaluation		Reason / Remarks
		Phase		
		Pre-Construction/ Construction	Operation	
		Activities		
		Land acquisition Construction works	Existence /Service	
14	Poor people	B-	B-	**Pre-Construction Phase:** ・Some of the poor people who do not have their own land living within the Right of Way (ROW) will be severely affected by resettlement. Vulnerable persons may be affected by conversion of transport measures. **Construction Phase and Operation Phase:** ・In the event that the Likoni Ferry operation is terminated due to the Bridge, it may affect mobility of the poor people as the ferry is the sole public transportation between the Island and the mainland.
15	Ethnic minorities and indigenous peoples	C	C	**Pre-Construction Phase:** **Construction Phase:** **Operation Phase:** ・The presence of ethnic minorities and indigenous people has not been identified in and around the Project site, which will be further confirmed through the census survey.
16	Local economies, such as employment, livelihood, etc.	B±	B±	**Pre-Construction Phase:** ・Land acquisition and resettlement may cause livelihood degradation of Project Affected Persons (PAPs). **Construction Phase:** ・Construction will create job opportunities for local people. ・Construction activities may have an impact on the local fishery. **Operation Phase:** ・Reduction of travel time will contribute to local economies. ・The Project may cause adverse impacts on local employment including the Kenya Ferry Service.
17	Land use and utilization of local resources	C	C	**Construction Phase:** ・Land acquisition for the ROW will require change of land use such as from agricultural land to road. **Operation Phase:** ・The areas around the approach roads will be changed and be developed economically.
18	Water usage	D	D	**Construction Phase:** ・The Project will not affect water usage around the Project site as water for the construction work will be brought from other water resources. **Operation Phase:** ・The Project will not affect the local water usage as it does not require water for its operation.

No.	Impact Item	Evaluation		Reason / Remarks
		Phase		
		Pre-Construction/ Construction	Operation	
		Activities		
		Land acquisition Construction works	Existence /Service	
19	Existing social infrastructures and services	B-	B±	**Pre-Construction Phase:** ・Relocation or protection of existing utilities, such as electric poles, water pipes and optical fibre cable will be required. ・In the event that the Likoni Ferry operation is terminated because of the Bridge, it may affect mobility of the people, particularly poor people, as the ferry is the sole public transportation between the Island and the mainland. **Construction Phase:** ・Temporary traffic congestion on construction sites will occur on both sides that may worsen the current traffic congestion. **Operation Phase:** ・Access to social services will be improved. ・Current ferry service will be affected. ・Split of local communities or widening disparity may occur along the new road. ・Conversion of transport facilities may affect the local population.
20	Social structure such as social capital and local decision-making institutions	B-	B-	**Construction Phase:** **Operation Phase:** ・Because the Project is mostly in developed areas, considerable impact on social institutions is unlikely to occur. ・Split of local communities or widening disparity may occur along the approach roads.
21	Misdistribution of benefits and damages	B-	C	**Pre-Construction Phase:** **Construction Phase:** ・Regarding compensation and entitlement, Unfairness among PAPs may occur. **Operation Phase:** ・Shifting of the traffic flow may cause changes in the local economic situation.
22	Local conflicts of interest	C	C	**Construction Phase:** **Operation Phase:** ・Decrease of Likoni Ferry users may cause local conflicts ・Unfairness to PAPs may occur.
23	Cultural heritage	C	D	**Construction Phase:** ・Because Mombasa is an historical area, construction works may affect cultural properties. **Operation Phase:** ・The operation of the Project will not affect the cultural properties.
24	Landscape	B-	B-	**Construction Phase:** **Operation Phase:** ・There are no landscape preservation areas. However, because an enormous artificial structure will appear in the area, an impact on the landscape is likely to occur.

No.	Impact Item	Evaluation		Reason / Remarks
		Phase		
		Pre-Construction/ Construction	Operation	
		Activities		
		Land acquisition Construction works	Existence /Service	
25	Gender	B±	B-	**Construction Phase:** ・There are some construction and related works women can undertake. ・Construction activities may affect community roads. **Operation Phase:** ・Women account for a considerable portion of the ferry passengers. Termination of the ferry service would have an impact on the women's activities.
26	Children's rights	B-	B-	**Construction Phase:** ・The practice of child labour is not uncommon in the area. Such practice should be avoided in the construction of the project. **Operation Phase:** ・School-commuting roads may be divided on the embankment section.
27	Infectious diseases such as HIV/AIDS	B-	B-	**Construction Phase:** ・Infection risks of HIV/AIDS may be increased among construction workers and relevant local businesses. **Operation Phase:** ・Since the Project facilitates transportation with long distances, there is a possibility of an increase of infectious diseases.
28	Working conditions (including occupational safety)	B-	D	**Construction Phase:** ・Works in elevated places may be a risk to worker's safety. ・Sanitary conditions around the construction site may get worse due to waste from workers and toilet facilities. **Operation Phase:** ・Considerable impact on working conditions is unlikely to occur.
29	Accidents	B-	B±	**Construction Phase:** ・There are construction work related risks which may involve construction workers and accidents. **Operation Phase:** ・Traffic accidents may happen in and along the approach roads and on the bridge. ・Accidents when vehicles board the ferry may be avoided.
Other				
30	Trans-boundary impacts or climate change	B-	B±	**Construction Phase:** ・Operation of construction equipment will generate CO_2. **Operation Phase:** ・The Project will solve the queue of vehicles waiting for a ferry, and reduce the emission gasses including CO_2. ・The Project will increase traffic volume and CO_2 emissions.

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)

D: No impact is expected

* Impact Items refer to "JICA Guidelines for Environmental and Social Considerations April 2010"

14.5.2 TOR of Environmental and Social Considerations Survey

For Route D which is proposed by the Survey Team, the TOR of an environmental and social considerations survey is shown on Table 14.5-2.

Table 14.5-2 TOR of Environmental and Social Considerations Survey

No.	Impact Item	Survey Item	Survey Measures
Pollution			
1	Air pollution	・ Environmental standards such as Kenya, Japan, etc. ・ Current conditions of air quality ・ Change of traffic volume ・ Land use and existence of sensitive facilities such as hospitals and schools ・ Outlines of Construction works ・ Air quality forecast along the approach roads ・ Air quality forecast during construction	・ Review of existing materials ・ Field reconnaissance and interview ・ Review of construction planning (methods, locations, duration, construction machinery, and number and routes of heavy vehicles) ・ Field survey (Ambient air quality) Locations: One station on each side (Mombasa Island and Mainland) Frequency: One time ・ Diffusion forecast of air pollutants by diffusion models
2	Water pollution	・ Environmental standards such as Kenya, Japan, etc. ・ Current conditions of marine water quality ・ Outlines of Construction works ・ Estimation of water quality during construction period	・ Review of existing materials ・ Field reconnaissance and interview ・ Review of construction planning (methods, locations, duration, construction machinery) ・ Field survey (Marine water quality) Locations: One sample from the channel around the Bridge Frequency: One time
3	Waste	・ Laws and regulations on waste treatment in Kenya ・ Waste management on construction works	・ Review of existing materials ・ Review of construction plan ・ Solid waste performance from road users
5	Noise and Vibration	・ Environmental standards such as Kenya, Japan, etc. ・ Current conditions of noise and vibration ・ Change of traffic volume ・ Land use and existence of sensitive facilities such as hospitals and schools ・ Outlines of Construction works ・ Forecast of traffic noise along the approach roads ・ Forecast of construction noise around the construction site	・ Review of existing materials ・ Field reconnaissance ・ Review of construction planning (methods, locations, duration, construction machinery, and number and routes of heavy vehicles) ・ Review of future traffic volume based on traffic demand forecast ・ Field survey (ambient noise and vibration) Locations: One station on each side (Mombasa Island and Mainland) Frequency: One time ・ Forecast by the noise forecast model
8	Bottom sediment	・ Environmental standards of WHO, etc. ・ Current conditions of bottom sediment ・ Construction plan	・ Review of existing materials ・ Review of construction planning (methods, locations, duration, construction machinery, and number and routes of heavy vehicles) ・ Field survey (pollutants included in bottom sediment) Locations: One sample from the bottom of the channel around the Bridge Frequency: One time
Natural Environment			
9	Protected areas	・ Outlines of National Parks or Reserves around the Project site ・ The distance of the protected areas from the Project site	・ Review of existing materials ・ Review of construction planning (methods, locations, duration, construction machinery, and number and routes of heavy vehicles) ・ Field reconnaissance
10	Ecosystem	・ Current conditions of vegetation and ecosystem in/around the Project site ・ Existence of endangered species	・ Review of existing materials including IUCN Red List ・ Field reconnaissance ・ Field survey (aquatic organisms) Locations: marine area around the Bridge Frequency: One time
11	Hydrology	・ Water flow in the channel	・ Review of existing materials ・ Information collection by interviews

No.	Impact Item	Survey Item	Survey Measures
12	Geographical features	・ Information on quarry site	・ Interview and reconnaissance of suitable quarry sites
Social Environment			
13	Resettlement/ Land Acquisition	・ Law and legislations on land acquisition and involuntary resettlement ・ Numbers of PAPs and PAHs ・ Preparation of Resettlement Action Plan	・ Review of existing materials on Kenya relevant laws ・ Socio-economic survey ・ Preparation of the Resettlement Action Plan based on Kenyan laws, JICA Guidelines and World Bank OP4.12
14	Poor people	・ Current socio-economic situation of poor people among the PAPs.	
15	Ethnic minorities and indigenous peoples	・ Existence of ethnic minorities and indigenous peoples among the PAPs.	
16	Local economies, such as employment, livelihood, etc.	・ Current situation of employment and livelihood, particular that of the poor people among the PAPs.	
17	Land use and utilization of local resources	・ Current land use and local resources ・ Expected effects by the Project implementation	・ Review of the existing materials on the current land use ・ Check of the current land use along the alignment by reconnaissance ・ Review of the Project outlines
19	Existing social infrastructures and services	・ Current situation of existing utilities such as electric poles, water pipes and optical fiber cable ・ Outlines of the Project including construction plan ・ Expected temporary traffic congestions on construction sites ・ Impacts on social services including the ferry service	・ Check of the existing utilities on/along the alignment by field reconnaissance ・ Review of the Project plan and construction plan ・ Information collection by interviews
20	Social structure such as social capital and local decision-making institutions	・ Considerable impacts on social structure	・ Collection of information and public opinions at the public meetings
21	Misdistribution of benefits and damages	・ Benefit and damage on the roadsides by the Project implementation ・ Change in local economic situation by the Project implementation	・ Check of the current situation of the roadsides of the approach roads by field reconnaissance ・ Collection of information and public opinions at public meetings
22	Local conflicts of interest	・ Future aspects of Likoni Ferry service ・ Economic and social situation of the PAPs	・ Collection of information on the Kenya Ferry Service ・ RAP survey
23	Cultural heritage	・ Possibility of existence of buried cultural properties	・ Review of existing materials ・ Interview of knowledgeable persons on the local history ・ Field reconnaissance ・ Archaeological excavations (maritime and terrestrial)
24	Landscape	・ Impact of the bridge on the existing landscape	・ Review of the proposed bridge plan ・ Collection of public opinions at the public meetings
25	Gender	・ Impacts on women's activities ・ Impacts on vulnerable road users	・ Information collection on the future operations of the existing ferry service ・ Collection of information and public opinions at the public meetings
26	Children's rights	・ Impacts on child labour during Project implementation ・ Impacts on vulnerable road users	・ Review of existing materials on child labour in the area ・ Collection of information and public opinions at the public meetings ・ Review of the Project planning on the considerations on vulnerable road users

No.	Impact Item	Survey Item	Survey Measures
27	Infectious diseases such as HIV/AIDS	・ Possibility of prevalence of infectious diseases	・ Prevalence status of infectious diseases ・ Collection of information on similar cases
28	Working conditions (including occupational safety)	・ Expected working conditions of construction workers	・ Review of the construction plan of the Project ・ Collection of information on similar cases
29	Accidents	・ Possibility of accidents during construction phase ・ Possibility of traffic accidents on/along the bridge and the approach roads	・ Review of the construction plan of the Project ・ Collection of information on similar cases on construction accidents ・ Review of the safety measures for the Project
Other			
30	Trans-boundary impacts or climate change	・ Change of CO_2 emission volume due to the Project implementation	・ Review of the current and future traffic volumes based on the traffic demand forecast ・ Review of basic units to estimate CO_2 emission by vehicle operation ・ Estimation of the change of CO_2 emission volume due to the Project implementation

14.6 The Results of the Environmental and Social Considerations Survey

14.6.1 Results of the Survey

Regarding the raised items on the TOR for the EIA, the results of the EIA survey are shown below.

(1) Air Pollution

1) Current Conditions of Air Pollution

An air quality survey was conducted at a number of locations along the project. Six points were selected along the approach roads. Table 14.6-1 and Figure 14.6-1 show the survey points. The survey was carried out between 4th and 27th April 2018.

Table 14.6-1 Air Quality Sampling Location

	No.	Category of location	Location	Land use
Mombasa Island	1	Road side	Lumumba Road in front of primary school	Industrial and commercial
	2	Road side	Archbishop road	Residential
South Mainland side	3	General environment	Jamvi la Wageni	Residential
	4	General environment	Mtongwe Polytechnic	Residential
	5	Road side	Mtongwe road	Residential
	6	General environment	Kiteje area (around the end point)	Field

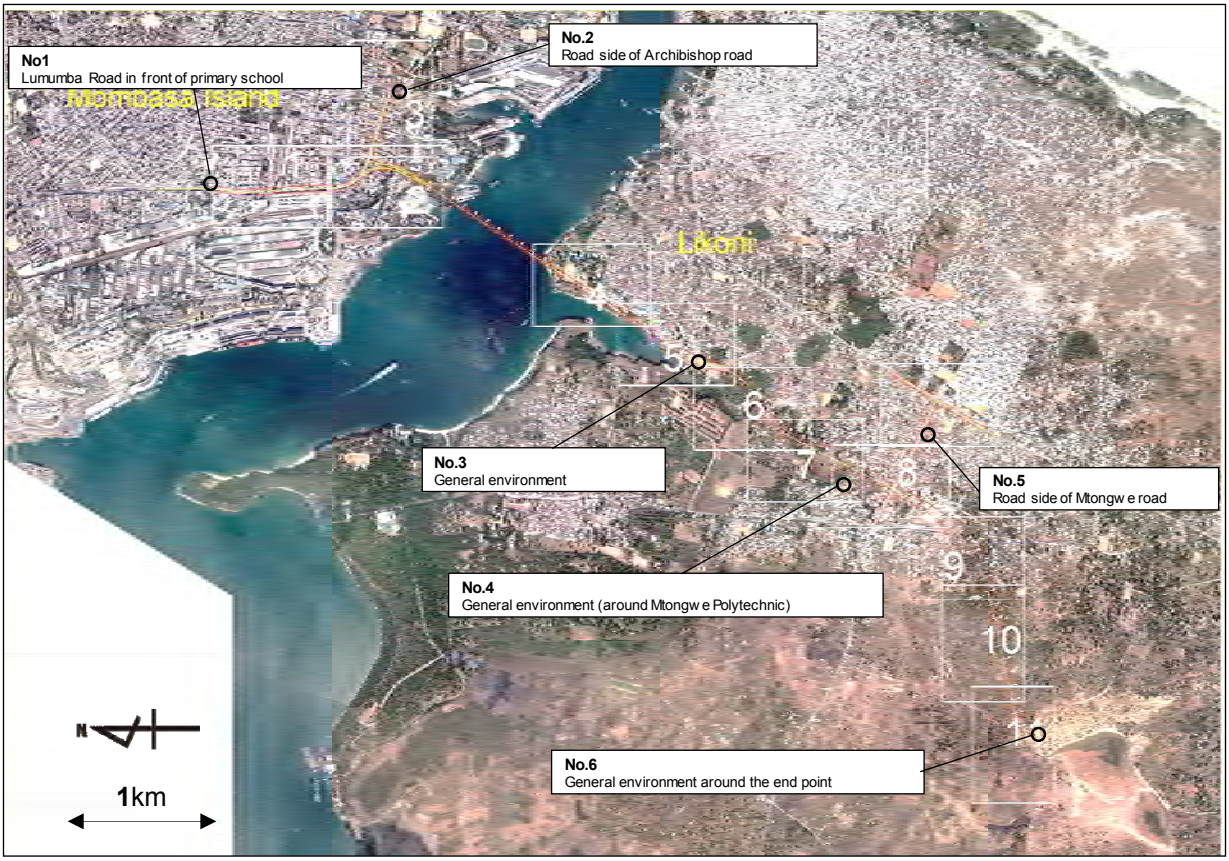


Figure 14.6-1 Air Quality Sampling Location

The extent of the surveys comprised six parameters (PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO, Pb) including "Ambient Air Quality Tolerance Limits" of Kenya.

Table 14.6-2 Ambient Air Quality around the Project Site

No.	Location		Concentration in µg/m^3					
			PM_{10}	$PM_{2.5}$	NO_2	SO_2	CO (mg/m^3)	Pb
1	Mombasa	Lumumba Road in front of primary school	126	97	16	BDL	3	BDL
2	Mombasa	the Road side of Archbishop road	78	58	11	BDL	3	BDL
3	Mainland	General environment	28	3	4	BDL	4	BDL
4	Mainland	General environment (around Mtongwe Polytechnic)	16	16	5	BDL	4	BDL
5	Mainland	Road side of Mtongwe road	103	31	15	BDL	4	BDL
6	Mainland	General environment around the end point	17	17	4	BDL	3	BDL
Ambient Air Quality Tolerance Limits[4] (µg/m^3 /24h)			150	75	125	150	4 (1hr) 2 (8hrs)	0.5-2.0
WHO Guideline			50	25	40	20	10ppm	0.5-2.0

Note: BDL- Below Detection Limit,. Hatching means exceeding the criteria.
Measurement time was 24 hours. Measurements were carried out between 4th and 27th April 2018.

[4] 2014 Arrangement of Regulations, the Environmental Management and Co-ordination (Air Quality) Regulations,

Results of the survey are shown in Table 14.6-2. Generally, most of pollutants except CO meet the criteria of Kenya. A possible reason for this is that the monsoon from the Indian Ocean blows throughout the year. On the other hand, the concentrations of PM_{10} and $PM_{2.5}$ exceed the criteria. This is also the case for figures of CO which exceed Kenya's criteria. However, these are lower than the WHO Guideline figure which has been converted to "ppm".

PM_{10} and $PM_{2.5}$ are high at the sides of main roads. This shows that high concentrations are due to urban activities, especially road traffic on undeveloped roads (see Figure 14.6-2).

Figure 14.6-2 Dusty Street in Mombasa Island (Moi Avenue)

The survey was conducted once within one season. Although during April when the survey was conducted is usually a rainy season, clear weather continued during the survey period. During the usual rainy season, the concentration of PM_{10} and $PM_{2.5}$ would be expected to be lower than these values.

2) Negative Impact of Pollutants caused by Construction Work (Dusts)

The implementation of the project may cause air pollution by the emission of air pollutants from construction activities such as the operation of construction machinery. Because long term and reliable ambient concentration of pollutants and meteorological data including wind and atmosphere stability are not available in Mombasa, it is difficult to predict air pollution by the application of a diffusion model. Therefore, as an evaluation of air pollution by the construction activities, the survey team applied a simple prediction method of dust generation. As a prediction method, the prediction method by National Institute for Land and Infrastructure Management (NILIM), Japan was referred to. On some typical construction work, the volume of falling dust was estimated as shown in Table 14.6-3 and it can be seen that even in the event of 30 working days per month, the results meet the criteria. The criteria adopted are those used to secure a living environment against spike tire dust in Japan.

Table 14.6-3 Estimated Falling Dust on Typical Construction Work

Construction Work	Unit of Falling Dust Near Construction Work ($t/km^2/8h$)	Working Day Per Month	Falling Dust Per Month ($t/km^2/month$)	Criteria ($t/km^2/month$)
Embankment	0.04	30	1.2	20
Slope Forming	0.07	30	2.1	
Piling (Earth Drill)	0.02	30	0.6	

Note: criteria: guideline on spike tire dust (NILIM)

Because the estimated volume of falling dust is lower than the criteria even in case of mulch operations, it is considered that the lower than negative impacts are not significant. However, since there is no tangible construction plan as of now, the estimation of dust caused by construction work has uncertainty. Therefore, appropriate mitigation measures and monitoring are essential. As a mitigation measure, water spray is effective to control dust.

3) Negative Impact of Pollutants caused by the Approach Roads

After implementation of the project, emissions from vehicles on the approach roads may cause air pollution around the project site.

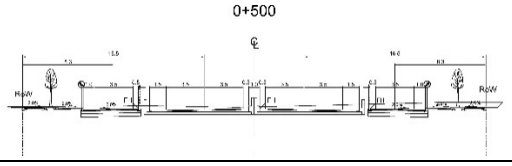
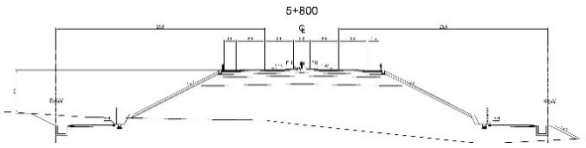
As mentioned above, since parameters for predictions are not available in Mombasa, quantitative prediction is impossible. However, based on simple assumptions of conditions quantitative prediction was applied.

・ Location of air quality prediction

For the location of air quality predictions, two points were selected. One was in Mombasa Island side (No.1, Figure 14.6-1) and the other was in South Mainland side (No.4 Figure 14.6-1).

The structure of the road and features of the locations are shown on Table 14.6-4.

Table 14.6-4 Location, Structure and Section of the Noise Prediction

No.	Location	Structure	Section	Remark
1	(Mombasa Island) Lumumba Road Industrial area	At grade		Close to school
4	(Mainland) Residential	Embankment		

・ Prediction model and process of computation

As a diffusion model of air contamination, a plume model was applied. Because the detail of meteorological elements was not clear, a single wind direction at right angles to the roads, and a wind speed of 1 m/s which is the minimum speed of the plume model was adopted.

The process of the air quality computation is shown on Figure 14.6-3. Conditions for computation such as meteorological data, road structure and traffic conditions are set. Based on these parameters, the plume model computes the prediction of concentration of air contaminants.

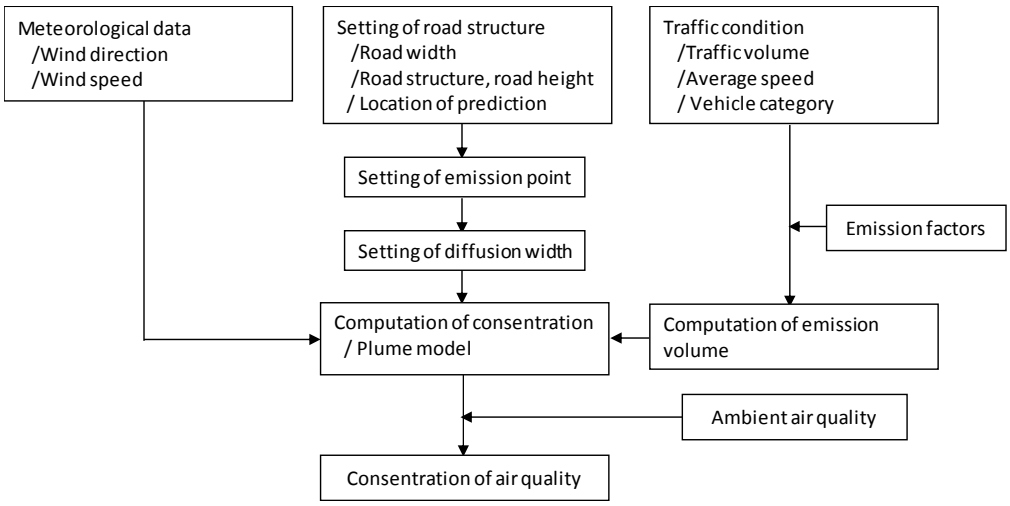


Figure 14.6-3 Process of Air Quality Computation

・ Parameters for air quality computation

The main parameters of the prediction are shown on Table 14.6-5.

Table 14.6-5 Main Parameters of the Air Quality along Road

Wind Condition	Speed	1.0 m/s
	Direction	At right angle with the approach road
Road Structure		As Figure
Traffic Volume		2040's estimation. Volume of each time depend on traffic on surrounding roads.
Traffic speed		40 km/h
Prediction Points		ROW. Height is 1.2m above road pavement.
Prediction Contaminants		PM_{10} (≒SPM)

Source: JICA Survey Team

・ Criteria: Ambient Air Quality Tolerance Limits (EMCR, 2014), 24 hours

Results of the prediction are shown on Table 14.6-6. Since the increase due to the project is 0.6~1.2μg/m^3, it is expected that the air quality would still be lower than the criteria (EMCR, 2014).

Table 14.6-6 Prediction of Air Quality (SPM (24 hours): μg/m^3)

No	Location of Prediction		Ambient Air Quality (1)	Addition by the Project (2)	Prediction (1) + (2)	Criteria (EMCR 2014)	
						Industrial Area	Residential, Rural & Other Areas
1	(Mombasa Island) Lumumba Road	Industrial area	126	1.2	127.2	500	200
4	(Mainland) Embankment	Residential	16	0.6	16.6		

Source: JICA Survey Team

Regarding future conditions of air quality, the following is anticipated:

・ Because the queues of vehicles at both of the Likoni ferry ports are resolved, the total quantity of discharged pollutants will be reduced.
・ Most sections of the approach roads are on viaducts and embankment structures. Since the height of emission sources would be high, diffusion of air pollutants would be greater.
・ On the embankment sections in Likoni area, since the neighborhood would be distant from the vehicle lanes, diffusion of air pollutants would be greater.

For these reasons, the negative impact of air pollutants caused by the approach roads are expected to be insignificant.

・ Negative Impacts to health

Particularly concentration of PM2.5 at Lumumba Road (974μg/m^3) is in the range of "Unhealthy" (65.5-150.4μg/m^3) of EPA's Air Quality Index. According to rough estimation based on the SPM estimation, contribution of PM2.5 due to the project is estimated roughly 0.02~0.04μg/m^3, and generally same as current status. Therefore, significant negative impacts on human health are not expected. However, considering the current status of ambient air quality, the Survey Team proposes planting space between carriageway and sidewalk (see Figure6.3-5). It is expected that green absorbs particulate matters and reduce negative impacts. On the viaduct section, noise barrier is installed. The noise barrier has an effect which raises the height of discharge source of vehicles. Therefore, noise barrier can mitigate PM and other pollutants emitted from vehicles

which run on the approach roads.

(2) Water Pollution

To understand current conditions of surface water quality along the project site, a water quality survey was conducted. Surface water samples were taken from 2 locations on the channel. Detail Sampling locations are shown in Figure 14.6-4. Water sampling was carried out on 27th March 2018 with the exception of Chemical Oxygen Demand (COD). Sampling of COD was carried out 29th June 2018.

Figure 14.6-4 Surface Water Sampling Location

1) Current Condition of Marine Water Quality

Analyzed marine water quality is shown on Table 14.6-7.

Table 14.6-7 Marine Water Quality

Parameter	Unit	Result		Environmental Standard for Marine Water Quality *1	
		Mombasa Island side	Mainland side	Environmental Conservation	Fishery Bathing
pH		8.04	7.99	7.0 – 8.3	7.8 – 8.3
Colour	u. Hazen	15	10	-	-
Dissolved Oxygen	mg/l	-	6.0*2	=>2	=>7.5mg/l
Turbidity	NTU	3.88	3.27	-	-
Oil and Greases	mg/l	<0.1	<0.1	-	ND
Total Suspended Solids	mg/l	5.00	<5.00	-	-
Chemical Oxygen Demand	mg/l	-	2.0*2	=<8	=<2

*1: MoE, Japan

*2: Dissolved Oxygen and Chemical Oxygen Demand were survey with PACKTEST (KYORITSU CHEMICAL-CHECK

Lab.,Corp.)
Note: Sampling was carried out on 27th March 2018 except COD. Sampling of COD was carried out 29th June 2018.

Because there are no environmental standards for marine water quality in Kenya, the results are compared with Japanese standards as a reference. Each parameter meets the criteria both for Environmental Conservation and Fishery/Bathing. The marine water quality is being maintained appropriately.

Figure 14.6-5 Sampling Area of Marine Water

2) Expected Negative Impacts on Water Quality by Construction Activities

For construction of the project, a main pier will be installed in the channel close to Mombasa island. The pier construction work may disturb the marine water in the channel.

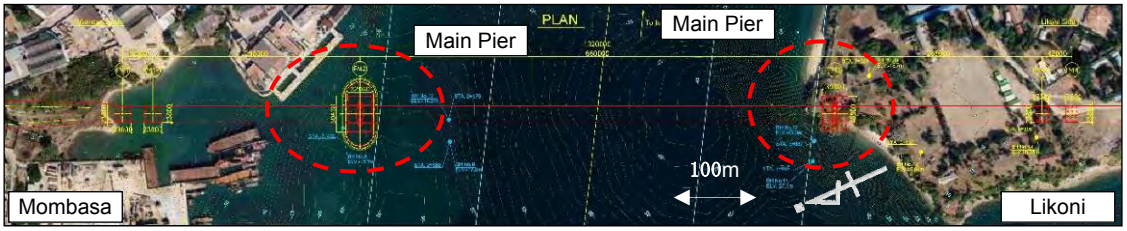


Figure 14.6-6 Location of the Piers

The pile driving work for steel pipe sheet pile foundations may agitate sediment, and pollute the marine water of the channel. Moreover, grouting work between pipes may pollute the marine water. These may become significant impacts with no mitigation measures. To prevent these possible sources of water pollution, a silt curtain to prevent the diffusion of pollutants is going to be installed around the main piers during construction. The main pier on Mombasa Island side is located within the harbor and the other main pier on Mainland side is installed on shore. However, because it is close to coast line, a silt curtain is going to be adopted the same as for Mombasa Island side to prevent water pollution.

In South Mainland area, the alignment runs close to Mweza creek which has a small mangrove forest. For the construction work on the embankment and viaduct footings, there is a possibility that filling soil and excavation soil are swept away and contaminate the water of Mweza creek or affect the mangrove forests. In particular, sedimentation of terrain soil by runoff may affect growth within the mangrove forest. To prevent water contamination of the creek and outflow of terrain soil, temporary drainage and sedimentation tanks would be provided for construction of

the project. In addition, a silt curtain would be installed for construction of the viaduct where it is close to the creek in the same way as for the main pier.

3) Expected Negative Impacts on Water Quality by Operation of the Project

When the project becomes operational, turbid runoff from the road pavement of the embankment sections may flow to the Mweza creek and pollute the water of the creek. The embankment section would be designed to include drainage on both sides of the embankment that would discharge into a collecting basin. Collected runoff would then be discharged to the main water body after the turbidity has decreased. Therefore, it is expected that the runoff would have no significant impact on the water quality of the creek.

In addition, other waste water which is generated by the construction activities such as piling, batching plant and sanitary waste from the contractor's yard would be disposed of after appropriate treatment. (see Chapter 9)

Water Pollution on the Coast of Mombasa[5]

In Mombasa, the problem of marine water pollution has been raised as one of the environmental problems. Since the population of Mombasa area is rapidly increasing, the increase of waste water can cause the marine water to become polluted. Regarding waste water treatment, Mombasa Water Supply and Sanitation Company Limited began the operation of water and sewerage services in Mombasa. Their operation covers areas including Mombasa island and Changmwe area on the Mainland. However, some treatment plants are not working due to management and operational problems. Hence untreated sewage from Mombasa town can be discharged directly into the Indian Ocean (for example, Kipevu treatment plant).

Source: Survey Team Prepared Based on Google Maps

Figure 14.6-7 Location of Wastewater Treatment Plant

Other areas such as Likoni, south of the island, and Nyali, Kisauni, north of the island, are not included in the sewerage system of the company, and they depend on septic tanks or latrine pits. There is a possibility that untreated waste water including domestic waste is directly discharged to the sea.

[5] Municipal Wastewater Management in the Western Indian Ocean Region: An Overview Assessment (draft), 2009, UNEP/Nairobi Convention Secretariat/WIOMSA

On the other hand, some hotels in Mombasa have installed their own wastewater treatment plants to avoid disposal of untreated wastewater to the ocean.

(3) Waste

1) Current Waste Disposal

In Kenya, waste disposal is managed by local authorities. However, most local authorities did not prioritize the establishment of proper waste management systems, and lacked technical and institutional capacities to manage waste. This has led to the current poor state of waste management.

The estimated quantity of generated waste in Kenya is shown on Table 14.6-8. Daily waste in Mombasa is estimated to 2,200 ton. Collected waste is 65% of total waste.

Table 14.6-8 Summary of Wastes Generation, Collection and Recovery Status in Major Towns

Name of Town	Estimated Waste Generated (tons/day)	Waste collected (%)	Waste Recovery (%)	Uncollected Waste (%)
Nairobi	2,400	80%	45%	20%
Nakuru	250	45 %	18%	37%
Kisumu	400	20%	Unknown	Unknown
Thika	140	60%	30%	40%
Mombasa	2,200	65%	40%	35%
Eldoret	600	55%	15%	45%

Source: NEMA, The National Solid Waste Management Strategy, 2015

In Mombasa, waste is collected by the County Government. The County Government operates various collection points / Centers within the County. Finally collected waste is transported to a designated dumpsite, Mwakirunge[6] (Fig. 14.6-8). On the other hand, some uncontrolled waste is informally dumped and buried.

Mwakirunge dumpsite can handle roughly one thousand ton per day. It is said that the capacity is sufficient but difficulty of access does not make the best use of the site. Since the site is used as dumpsite, sorting and recycling are not carried out.

Figure 14.6-8 Mwakirunge Dump Site

2) Expected Negative Impacts and Mitigation Measures during the Construction Stage

The construction activities of the project generate construction waste including cutting trees, debris of existing structures, excavation soil, and construction materials. Estimated major wastes are shown on Table 14.6-9. Considering the feature of the project, hazardous waste will be not generated.

Table 14.6-9 Estimated Weight and Volume of Major Wastes due to the Project

Category		Weight (ton)	Volume (cubic m)
Demolish Work		435,000	652,000
Construction Work	Concrete debris	-	3,900

[6] Although three dumpsites including Mwakirunge were operated before, two dumpsites were closed by NEMA.

	Asphalt concrete debris	-	11,100

Source: The survey team

The wastes that are generated on demolish work has vast volume. However according Kenya experiences, the wastes of demolition are almost reused by owners and hawkers as construction materials. Therefore, it is expected that volume of dumped wastes is small. Concrete and asphalt concrete debris on the construction work will reused as filling material for embankments as far as possible.

On the management of construction waste, a construction plan including the following procedure should be prepared, and implemented:

- measures for reducing waste quantity,
- measures for reusing waste,
- procedures for waste management and appropriate disposal

Because waste dump sites in the Mombasa area are generally poorly managed (see Figure 14.6-8), the generation of construction waste should be minimized as possible. The waste management plan of the project should be prepared with a view to reducing the volume of waste by means of reuse and recycling. It has to be confirmed by monitoring that construction wastes are appropriately treated.

3) Expected Negative Impacts and Mitigation Measures during the Operation Stage

Since the project is a road bridge project, it would not routinely generate bulk waste. Because a project operator would maintain the road facility and manage waste, there would be no significant negative impacts due to waste. For mitigation measure against solid waste disposal from road users, installation of road sign, establishment of penalty and arrangement of garbage collectors will be studied on Detail Design phase.

(4) Noise and Vibration

1) Current noise conditions

For the purpose of understanding the noise environment along the project site, an ambient noise survey was conducted. Six survey points were allocated along the approach roads. Table 14.6-10 and Figure 14.6-9 show the survey points. The survey points represent the noise environment in each area. The survey was carried out between 3rd and 13th April 2018.

Table 14.6-10 Noise Level Sampling Location

No.	Location		Category of Location	Geographic Coordinate
1	Mombasa Island	Lumumba Road	Road side	Main road having heavy traffic. Close to primary school.
2		Archibishop Makarius Road	Road side	Main road. Close to some school.
3	South Mainland	Jamvi la Wageni	General environment	Residential, agricultural area
4		Mtongwe Polytechic	General environment	Residential, agricultural area
5		Mtongwe Road	Road side	Main road having relatively medium traffic
6		Kiwani, Kieje , around the end point)	General environment	Undeveloped area. quiet

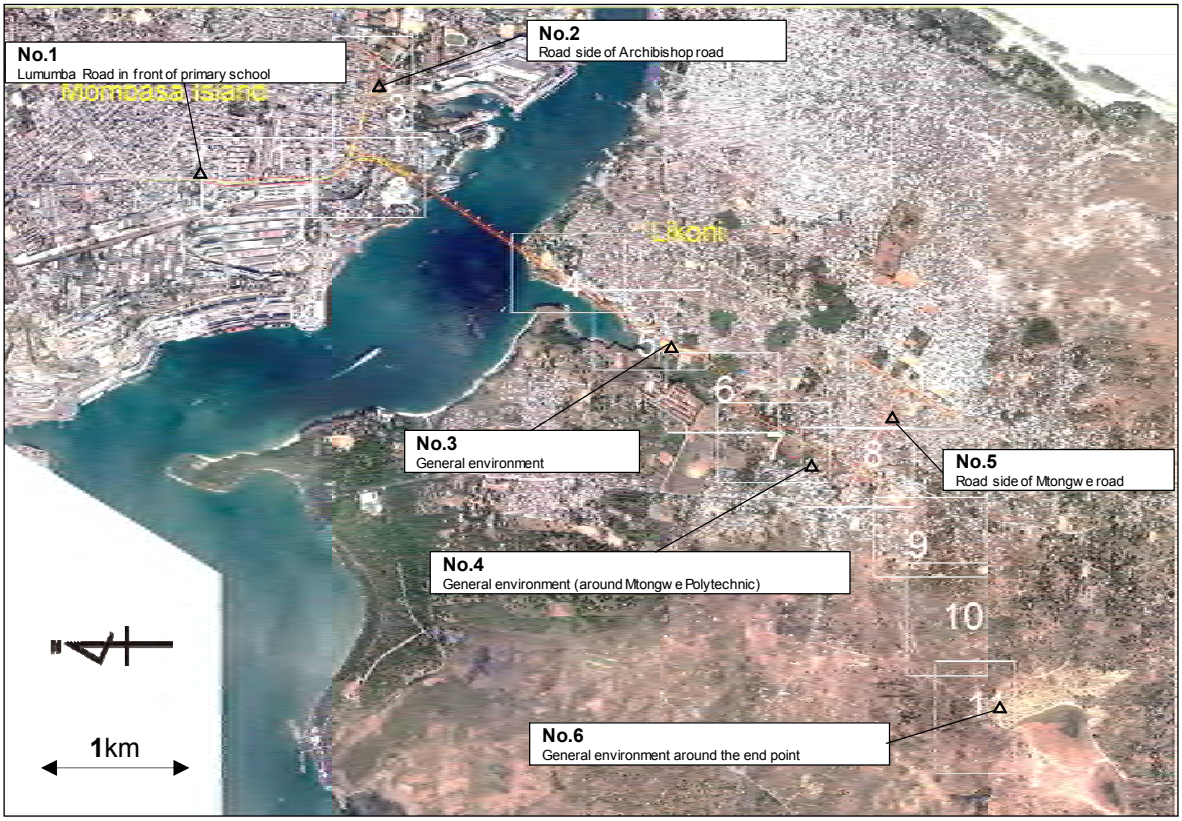


Figure 14.6-9 Noise Level Monitoring Locations

The results of the noise survey are shown on Table 14.6-11. All the results highly exceed the criteria of EMCR which shows the recommended criteria for ambient noise. In particular, noise levels on Mombasa Island side are very high throughout the day. It appears that heavy traffic on the main roads causes the crucial noise environment. The noise levels in South Mainland side are low by comparison to the Mombasa Island side. However, it is higher than the criteria by more than 10 dB(A) except for location No.6 which is most likely a remote area.

Table 14.6-11 The Results of Noise Survey (dB(A))

No.	Location		Morning (6:00-12:00)	Afternoon (12:00-20:00)	Night (20:00-6:00)	EMCR,2007 (Day/Night)	Noise Level Guidelines * (Day/Night)
1	Mombasa Island	Lumumba Road	78.8	74.6	66.4	55/35 Mixed Residential	55/45
2		Archibishop Makarius Road	76.7	82.1	64.8	55/35 Mixed Residential	55/45
3	South Mainland	General Environment	65.1	63.0	50.0	50/35 Residential	55/45
4		General Environment	67.7	60.2	53.7	50/35 Residential	55/45
5		Mtongwe Road	71.8	69.6	54.3	50/35 Residential	55/45
6		General Environment	51.7	52.1	44.1	50/35 Residential	55/45

Note *: Noise Level Guidelines for residential; institutional; educational (Environmental, Health, and Safety (EHS) Guidelines, IFC)

The survey was carried out between 3rd and 13th April 2018.

2) Expected Negative Impacts and Mitigation Measures on Construction Noise

Noise levels along the project route will temporally increase due to construction activities. Most of the noise will be generated by the operation of heavy equipment and machinery. On the Mombasa side, the construction work would be undertaken in developed areas including residential, commercial and industrial areas. On the other hand, the Mainland side (Likoni) is a rural area. It has a sparse but silent environment, where the construction work would be undertaken. The Survey Team has prepared a noise estimation for the typical construction work that is expected on the project.

- Prediction model: distance damping model of sound
- Condition of prediction: Noise source located on the center of road. Observed point is set on a road side. (Distance between noise source and observed point is 10m.) Installation of temporary wall (h=3m) is assumed as a mitigation measure.
- Noise source: Expected typical construction activities are set. (NILIM)

Results of the prediction are shown on Table 14.6-12.

Table 14.6-12 Results of Prediction of Construction Noise

Construction Work		Distance from the Edge of the ROW to Receiving Point (m)				Permitted Noise Level on Construction Site (EMCR, 2007) (Day/Night: dB(A))
Type	Power Level (dB)	0	5	10	15	
Without Temporary Wall						
Pile Drivers (earth drill)	106	78.0	74.5	72.0	70.0	Residential: 60/35 Other areas: 75/35
Pile Drivers (hydraulic pile hammer)	135	107.0	103.5	101.0	99.0	
Excavation	119	91.0	87.5	85.0	83.0	
Asphalt Pavement	108	80.0	76.5	74.0	72.0	
With Temporary Wall (3.0m)						
Pile Drivers (earth drill)	106	59.0	56.5	54.0	52.0	Residential: 60/35 Other areas: 75/35
Pile Drivers (hydraulic pile hammer)	135	88.0	85.5	83.0	81.0	
Excavation	119	72.0	69.5	67.0	65.0	
Asphalt Pavement	108	61.0	58.5	56.0	54.0	

Power Level: National Institute for Land and Infrastructure Management, Japan

For the situation without a temporary wall, generally noise levels are expected to be quite high. A temporary wall installed near the noise source has a remarkable effect in reducing construction noise. A temporary wall should be introduced as a noise mitigation measure. Kenya's regulation for construction noise is very hard to satisfy. (ex. 60 dB(A) comparing to 85dB(A) in the regulations of Japan) To mitigate the construction noise even more, it is desirable that the following measures are added.

- Operating areas of construction machinery are set apart from the neighborhood as far as possible.
- Construction work at night should be avoided.
- Operating hours of machinery should be as short as possible by rational construction management

- Cumulative Noise Level

Synthesis noise levels with ambient noise are shown on Table14.6-13~18. In Mombasa side, ambient noise is equivalent to or exceeding expected construction noise. Since there are some educational facilities around the project site (referred to Figure14.6-30), above mitigation measures should be strictly implemented.

Table 14.6-13 Synthesis Noise Level with Ambient noise (Location No.1 (Lumumba Road, Mombasa Island)

Construction Work	Ambient Noise (Morning or Afternoon)	Synthesis				Permitted Noise Level on Construction Site (EMCR, 2007) (Day/Night: dB(A))
		Distance from the Edge of the ROW to Receiving Point (m)				
Type		0	5	10	15	
Without Temporary Wall						
Pile Drivers (earth drill)	78.8	81.4	80.2	79.6	79.3	
Pile Drivers (hydraulic pile hammer)		107.0	103.5	101.0	99.0	Residential: 60/35
Excavation		91.3	88.0	85.9	84.4	Other areas: 75/35
Asphalt Pavement		82.5	80.8	80.0	79.6	
With Temporary Wall (3.0m)						
Pile Drivers (earth drill)	78.8	78.8	78.8	78.8	78.8	
Pile Drivers (hydraulic pile hammer)		88.5	86.3	84.4	83.0	Residential: 60/35
Excavation		79.6	79.3	79.1	79.0	Other areas: 75/35
Asphalt Pavement		78.9	78.8	78.8	78.8	

Table 14.6-14 Synthesis Noise Level with Ambient noise (Location No.2 (Archibishop Makarius Road, Mombasa Island))

Construction Work	Ambient Noise (Morning or Afternoon)	Synthesis				Permitted Noise Level on Construction Site (EMCR, 2007) (Day/Night: dB(A))
		Distance from the Edge of the ROW to Receiving Point (m)				
Type		0	5	10	15	
Without Temporary Wall						
Pile Drivers (earth drill)	82.1	83.5	82.8	82.5	82.4	
Pile Drivers (hydraulic pile hammer)		107.0	103.5	101.1	99.1	Residential: 60/35
Excavation		91.5	88.6	86.8	85.6	Other areas: 75/35
Asphalt Pavement		84.2	83.2	82.7	82.5	
With Temporary Wall (3.0m)						
Pile Drivers (earth drill)	82.1	82.1	82.1	82.1	82.1	
Pile Drivers (hydraulic pile hammer)		89.0	87.1	85.6	84.6	Residential: 60/35
Excavation		82.5	82.3	82.2	82.2	Other areas: 75/35
Asphalt Pavement		82.1	82.1	82.1	82.1	

Table 14.6-15 Synthesis Noise Level with Ambient noise (Location No.3 (Jamvi la Wageni, South Mainland))

Construction Work	Ambient Noise (Morning or Afternoon)	Synthesis				Permitted Noise Level on Construction Site (EMCR, 2007) (Day/Night: dB(A))
		Distance from the Edge of the ROW to Receiving Point (m)				
Type		0	5	10	15	
Without Temporary Wall						
Pile Drivers (earth drill)	65.1	78.2	75.0	72.8	71.2	
Pile Drivers (hydraulic pile hammer)		107.0	103.5	101.0	99.0	Residential: 60/35
Excavation		91.0	87.5	85.0	83.1	Other areas: 75/35
Asphalt Pavement		80.1	76.8	74.5	72.8	
With Temporary Wall (3.0m)						
Pile Drivers (earth drill)	65.1	66.1	65.7	65.4	65.3	
Pile Drivers (hydraulic pile hammer)		88.0	85.5	83.1	81.1	Residential: 60/35
Excavation		72.8	70.8	69.2	68.1	Other areas: 75/35
Asphalt Pavement		66.5	66.0	65.6	65.4	

Table 14.6-16 Synthesis Noise Level with Ambient noise (Location No.4 (Mtongwe Polytechic, South Mainland))

Construction Work	Ambient Noise (Morning or Afternoon)	Synthesis				Permitted Noise Level on Construction Site (EMCR, 2007) (Day/Night: dB(A))
		Distance from the Edge of the ROW to Receiving Point (m)				
Type		0	5	10	15	
Without Temporary Wall						
Pile Drivers (earth drill)	67.7	78.4	75.3	73.4	72.0	
Pile Drivers (hydraulic pile hammer)		107.0	103.5	101.0	99.0	Residential: 60/35
Excavation		91.0	87.5	85.1	83.1	Other areas: 75/35
Asphalt Pavement		80.2	77.0	74.9	73.4	
With Temporary Wall (3.0m)						
Pile Drivers (earth drill)	67.7	68.2	68.0	67.9	67.8	
Pile Drivers (hydraulic pile hammer)		88.0	85.6	83.1	81.2	Residential: 60/35
Excavation		73.4	71.7	70.4	69.6	Other areas: 75/35
Asphalt Pavement		68.5	68.2	68.0	67.9	

Table 14.6-17 Synthesis Noise Level with Ambient noise (Location No.5 (Mtongwe Road, South Mainland))

Construction Work	Ambient Noise (Morning or Afternoon)	Synthesis				Permitted Noise Level on Construction Site (EMCR, 2007) (Day/Night: dB(A))
		Distance from the Edge of the ROW to Receiving Point (m)				
Type		0	5	10	15	
Without Temporary Wall						
Pile Drivers (earth drill)	71.8	78.9	76.4	74.9	74.0	
Pile Drivers (hydraulic pile hammer)		107.0	103.5	101.0	99.0	Residential: 60/35
Excavation		91.1	87.6	85.2	83.3	Other areas: 75/35
Asphalt Pavement		80.6	77.8	76.0	74.9	
With Temporary Wall (3.0m)						
Pile Drivers (earth drill)	71.8	72.0	71.9	71.9	71.8	
Pile Drivers (hydraulic pile hammer)		88.1	85.7	83.3	81.5	Residential: 60/35
Excavation		74.9	73.8	73.0	72.6	Other areas: 75/35
Asphalt Pavement		72.1	72.0	71.9	71.9	

Table 14.6-18 Synthesis Noise Level with Ambient noise (Location No.6 (Kiwani, Kieje around the end point, South Mainland))

Construction Work	Ambient Noise (Morning or Afternoon)	Synthesis				Permitted Noise Level on Construction Site (EMCR, 2007) (Day/Night: dB(A))
		Distance from the Edge of the ROW to Receiving Point (m)				
Type		0	5	10	15	
Without Temporary Wall						
Pile Drivers (earth drill)	52.1	78.0	74.5	72.0	70.1	
Pile Drivers (hydraulic pile hammer)		107.0	103.5	101.0	99.0	Residential: 60/35
Excavation		91.0	87.5	85.0	83.0	Other areas: 75/35
Asphalt Pavement		80.0	76.5	74.0	72.0	
With Temporary Wall (3.0m)						
Pile Drivers (earth drill)	52.1	59.8	57.8	56.2	55.1	
Pile Drivers (hydraulic pile hammer)		88.0	85.5	83.0	81.0	Residential: 60/35
Excavation		72.0	69.6	67.1	65.2	Other areas: 75/35
Asphalt Pavement		61.5	59.4	57.5	56.2	

3) Expected Negative Impacts and Mitigation Measures on Road Traffic Noise

On some sections of the route the approach roads of the project face residential, educational, commercial and industrial facilities. Such facilities may be affected by road traffic noise. The Survey Team examined predictions of road traffic noise on the approach roads. In Kenya, there is no standard for road traffic noise. Therefore, the Survey Team adopted Japanese standards for road traffic noise[7] for this assessment.

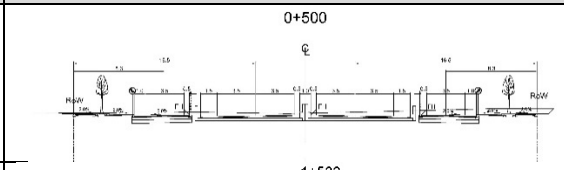
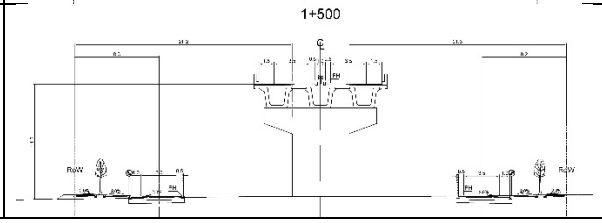
・ Location of noise prediction

The approach roads vary in that some are at-grade and some are elevated. Typical locations which represent the environment along the approach roads were selected as locations for noise prediction. The locations of the prediction are shown on Figure 14.6-19.

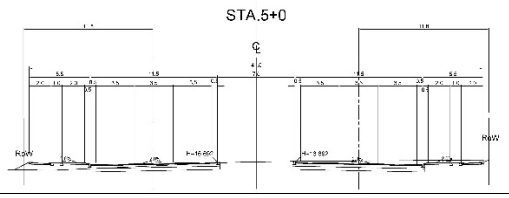
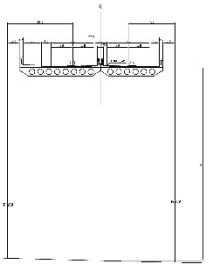
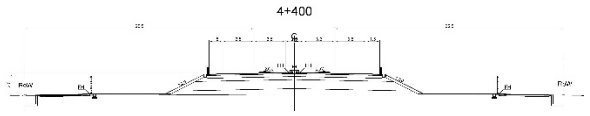
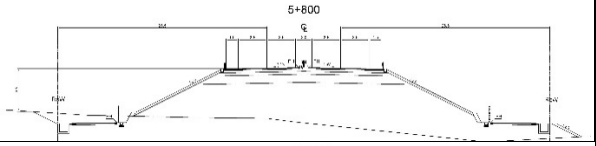
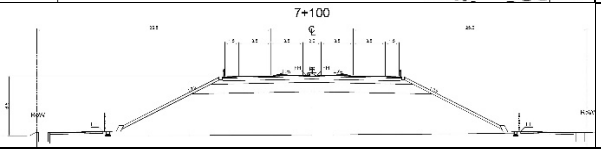
Figure 14.6-10 Locations for Noise Prediction

The structure of the road and features of locations are shown on Table 14.6-19.

Table 14.6-19 Location, Structure and Section of the Noise Prediction

No.	Location	Structure	Section	Remark
1	(Mombasa Island) Lumumba Road Industrial area	At grade		Close to school
2	(Mombasa Island) Archibishop Road Commercial and residential	Viaduct (concrete) with noise barrier (H=1.0m) with at grade		

[7] Ministry of Environment, Japan (MoE, J)

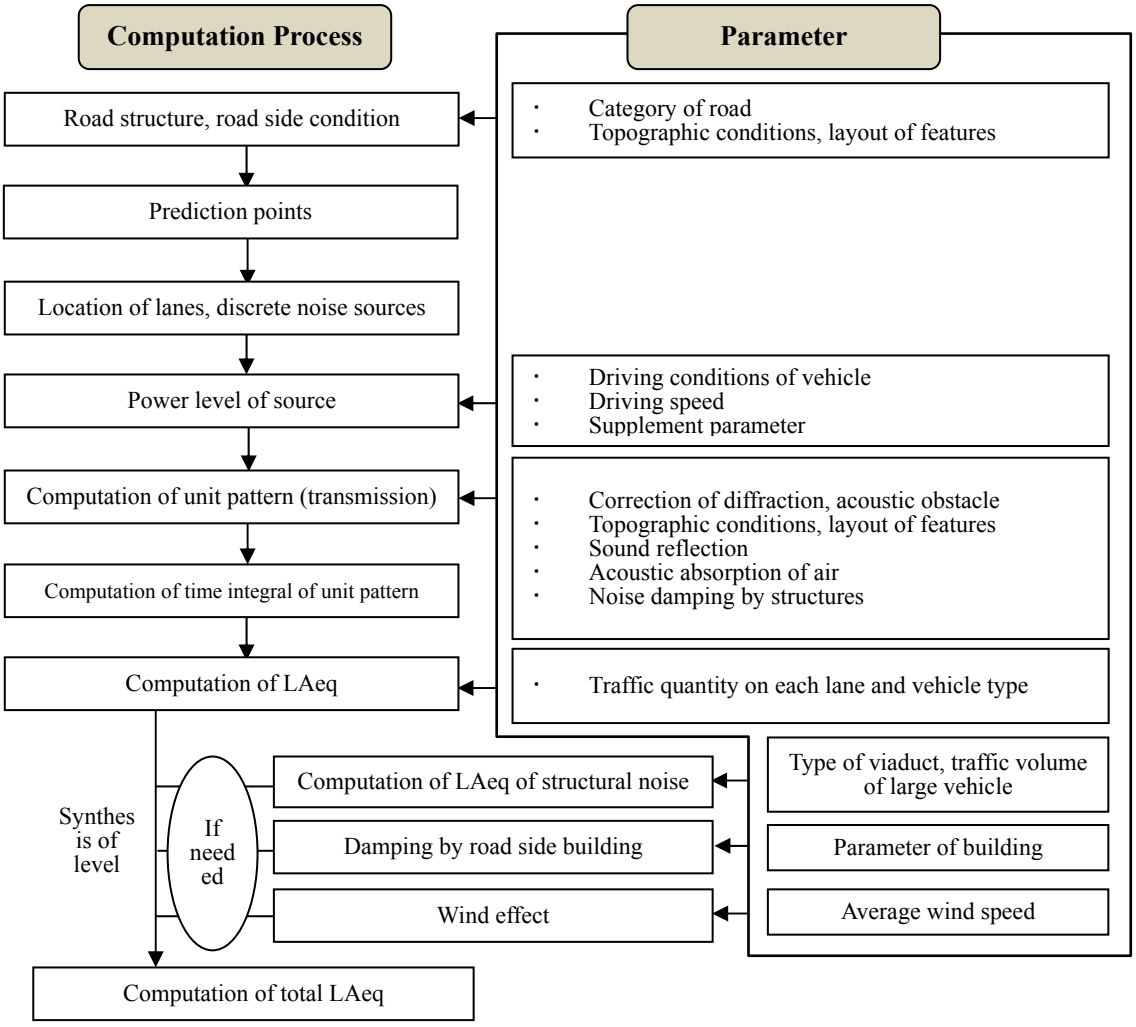
No.	Location	Structure	Section	Remark
3	(Mombasa Island) Archibishop Road Commercial and residential	At grade		Close to school
4	(Mainland) Near the sea shore Residential and educational	Viaduct with noise barrier (H=1.0m) (concrete)		Close to school
5	(Mainland) Residential and agricultural	Embankment		
6	(Mainland) Residential	Embankment		
7	(Mainland) Agricultural	Embankment		

・ Prediction model and process of computation

As a prediction model of road traffic noise, a Japanese model[8] was applied. The model, which adopts the road traffic noise standard of MoE Japan, estimates the equivalent sound level (LAeq: dB) at the road side.

The process of the road traffic noise computation is shown on Figure 14.6-11. Based on the power levels which are installed in the model, unit patterns and LAeq are computed. If needed, supplementary factors such as viaduct structure noise and damping by roadside buildings are considered.

[8] ASJ RTN-Model 2013 (Acoustic Society Japan)



Source: ASJ Vol.70. 4. P177

Figure 14.6-11 Process of Road Traffic Noise Computation

・ Parameters for road traffic noise computation

The main parameters of the prediction are shown on Table 14.6-20.

Table 14.6-20 Main Parameters of the Road Traffic Noise

Road Structure		As Figure
Traffic Volume		2040's estimation. Volume of each time depend on tendency of surrounding roads.
Category of Pavement		Density
Driving Condition	Speed	50 km/h
	Steady - Unsteady	Steady
Prediction Points		ROW. Height is 1.2m above road pavement and floor of buildings.
Mitigation Measures		Barrier on road sides (Height: 1 m)

・ Criteria: Standard for areas facing major roads for the environmental standard on road traffic noise (MoE, J) were applied because there are no standards for road traffic noise in Kenya. The standards designate 70dB (day time) and 65dB (night time).

Results of the prediction are shown on Table 14.6-21.

Table 14.6-21 Prediction of Road Traffic Noise Level (dB(A))

No.	Mombasa Island						Mainland							
	1 At grade		2 Viaduct with at grade		3 At grade		4 Viaduct		5 Embankment		6 Embankment		7 Embankment	
Height (m)	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
10.2	68.1	65.0	-	-	-	-	43.5	40.7	66.6	63.9	66.5	63.8	65.3	62.2
7.2	68.3	65.2	67.0	64.1	65.2	62.5	42.9	40.1	66.5	63.7	64.6	61.9	64.9	61.8
4.2	66.8	63.7	67.3	64.4	65.8	63.0	42.3	39.6	64.4	61.6	60.1	57.4	61.8	58.7
1.2	60.8	57.7	67.5	64.6	66.4	63.6	41.9	39.1	59.9	57.1	56.9	54.2	57.4	54.3

Criteria: Day 70dB, Night 65dB

On the basis of the above prediction of road noise, it is expected that all of the locations satisfy the criteria. In particular, viaduct sections have the advantage of keeping distance by height: Embankment sections have the advantage of keeping horizontal distance.

This prediction is an outline based on road designs developed for this feasibility study stage. At the detail design stage, road traffic noise should be re-studied and proposals made based on the final design.

・ Cumulative impacts

The above results for road traffic noise prediction do not include ambient noise. The ambient noise levels on Mombasa Island side are higher than the predicted road noise. Since the differences are about 10dB, overall noise levels will scarcely rise even if the two noises are combined. On the Mainland side, predicted road noise and ambient noise are approximately the same level. In this case, the overall noise level would rise about 1~2 dB(A).

Table 14.6-22 Synthesis Noise Level with Ambient Noise (dB(A))

No.	Mombasa Island											
	1 At grade				2 Viaduct with at grade				3 At grade			
	Day		Night		Day		Night		Day		Night	
Height (m)	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis
10.2	78.8	78.8	66.4	68.8	82.1		64.8		82.1		64.8	
7.2		78.8		68.9		82.2		67.5		82.2		66.8
4.2		78.8		68.3		82.2		67.6		82.2		67.0
1.2		78.8		66.9		82.2		67.7		82.2		67.3

No.	Mombasa Island															
	4 Viaduct				5 Embankment				6 Embankment				7 Embankment			
	Day		Night		Day		Night		Day		Night		Day		Night	
Height (m)	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis	Ambient	Synthesis
10.2	65.1	65.1	50.0	50.5	67.7	70.2	53.7	64.3	71.8	72.9	54.3	64.3	52.1	65.5	44.1	62.3
7.2		65.1		50.4		70.2		64.1		72.6		62.6		65.1		61.9
4.2		65.1		50.4		69.4		62.3		72.1		59.1		62.2		58.8
1.2		65.1		50.3		68.4		58.7		71.9		57.3		58.5		54.7

・ Impacts to vulnerable facility

Along the project site, there are quite number of vulnerable facilities. (see Figure 14.6-29) Particularly, some educational facilities including primary school are close to the approach road. As the findings of the prediction of road traffic noise, road noise along the approach road is low relatively and, at some locations, lower than ambient noise. Therefore, it seems that

special measures are needless. However, on some points such as the approach roads connect with existing road or the structure of the approach road change (e.g. Lumumba road and Archbishop Road), more detail study for noise mitigation is needed based on detail design.

・ Reduction of vehicle noise at ferry ports

At Likoni ferry ports, there are vehicle queues which are awaiting ferry boarding. The idling noise of vehicles is 63~75dB[9]. This exceeds the Sound Level Limits of Kenya (60dB: Commercial, Daytime), deteriorating the noise environment. Since the project removes the queues of idling vehicles, it will reduce noise around the ports.

4) Road Traffic Vibration

Similar to road traffic noise, the approach roads of the project may generate negative impacts in the form of vibration to the residential, educational, commercial and industrial facilities in locations through which they pass. The survey team have prepared predictions of road traffic vibration for the project.

・ Location of vibration predictions

Three typical structures of the project (at grade, viaduct and embankment), were selected for vibration predictions. The prediction locations for vibration are No.1 (at grade), No.4 (viaduct) and No.5 (embankment) and are shown on Table 14.6-12.

・ Prediction model

The prediction model which forecasts the eighty percentile value of vibration level[10] was adopted. The model is as below.

$$L_{10} = L_{10} * -\alpha_1$$
$$L_{10} *= a \cdot log_{10}(log_{10}Q^*) + b \cdot log_{10}V + c \cdot log_{10}M + d + \alpha_\sigma + \alpha_f + \alpha_s$$

Here,
L_{10}: eighty percentile value of road traffic vibration (dB)
Q^*: equivalent traffic volume of 500seconds (vehicles/500s/lane)
V: average driving speed (km/h)
M: total lane number (vehicles)
α_σ: correction value for road flatness (dB)
α_f: correction value for ground predominant frequency (dB)
α_s: correction value for road structure (dB)
α_1: transfer damping (dB)

・ Criteria

The Government of Kenya has not yet established standards for road traffic vibration. Accordingly, the Japanese criteria for road traffic vibration, and the limits for road traffic vibration, have been adopted as the criteria (Table 14.6-23).

Table 14.6-23 Limit of Road Traffic Vibration

	Daytime	Night time
Silent area / Residential Area	65dB	60dB
Residential / Commercial / Industrial Area	70dB	65dB

Source: The enforcement regulation of Law of vibration regulation, MoE, J

・ Results of the prediction

[9] Bureau of Environment, Tokyo Metropolitan Government
http://www.kankyo.metro.tokyo.jp/noise/noise_vibration/daily_life_noises.html
[10] The model was developed by Public Works Research Institute, Japan.

Results of the prediction are shown on Table 14.6-24.

Table 14.6-24 Prediction of Road Traffic Vibration

Section Number	Structure Type	Location	Prediction Values Of Road Traffic Vibration (dB)	Criteria	
				Day	Night
No.1	At grade	Mombasa Island	40~46	65-70	60-65
No.4	Viaduct	Mainland	35~41		
No.5	Embankment	Mainland	37~43		

Source: Criteria Limit of road traffic vibration (The enforcement regulation of Law of vibration regulation, MoE, J)

On the basis of the foregoing it is expected that the predicted level of vibration falls below the criteria. Moreover, it is said that the human threshold for vibration is 55 dB. Since the predicted levels also fall below this threshold, the project will not generate vibrations that are felt by humans.

(5) Bottom Sediment

1) Current Conditions of Bottom Sediment

Kilindini harbor is an important marine facility that cate0rs for a significant number of freight vessels. Many industrial facilities including oil refining and manufacturing are located there. Pollutants including heavy metals and organic matters may leak from the facilities or freight vessels and form sediment on the bottom of Kilindini harbor. Should that sediment, including the pollutants, be agitated by construction activities, the marine water of Kilindini harbor may become polluted. The Survey Team sampled the bottom sediment around the project site within Kilindini harbor and analysed it. Two sampling points were tested, namely the Mombasa Island side and the mainland side where the installation of piers is planned. (Figure 14.6-12)

Figure 14.6-12 Sediment Sampling Location

As a result of the analysis of the sediment, while organic matters were almost undetectable, some heavy metals were detected. The results of the survey are shown on Table 14.6-25.

Table 14.6-25 Marine Sediment Quality

Parameter	Unit	Result		Guidelines	
		Mombasa Island Side	Mainland Side	ISQG	PEL
Antimony as Sb	mg/kg	5.23	3.68	-	-
Cadmium as Cd	mg/kg	<0.02	<0.02	0.7	4.2
Chromium as Cr	mg/kg	3.60	8.21	52.3	160
Copper as Cu	mg/kg	1.16	3.24	18.7	108
Lead as Pb	mg/kg	3.14	1.95	30.2	112
Nickel as Ni	mg/kg	1.65	4.92	-	-
Silver as Ag	mg/kg	<0.02	<0.02	-	-
Zinc as Zn	mg/kg	9.59	5.25	124	271
Arsenic as As	mg/kg	<0.005	<0.005	7.24	41.6
Mercury as Hg	mg/kg	<0.005	<0.005	0.13	0.70

Guidelines: Canadian sediment Quality Guidelines for the Protection of Aquatic Life (Canadian Council of Ministers of the Environment 1995), Interim marine sediment quality guidelines

ISQG: interim sediment quality guideline, PEL: probable effect level

2) Expected Negative Impacts during the Construction Stage

Because there are no guidelines for sediment quality in Kenya, Canadian guidelines for the protection of aquatic life were adopted as criteria. The concentrations of the detected heavy metals are significantly lower than the figures of the guidelines. Even so it is possible that hazardous sediments could affect marine water around the project site. As mentioned in "(2) Water Pollution", there is a concern that the pier installation work could agitate the sediment below the channel and increases the turbidity of the marine water. To prevent the diffusion of the turbidity, silt curtains are going to be adopted during construction. (See (2) Water Pollution)

(6) Protected Areas

1) Current Conditions of Protected Areas

Refer to 14.2 (6)

2) Expected Negative Impacts

A protected area in the vicinity of the project, namely the Mombasa Marine National Parks and Reserve, is located some 5 km from the Project site. In the event that the project creates water pollution in the vicinity of the Project site, negative impacts on the National Parks and Reserve should be examined. However, based on the results of the study of water pollution and sediment, significant negative impacts are not expected around the project site. Therefore, no negative impacts on the protected area are expected.

Another protected area, the Shimba Hills National Reserve, is located approximately 20 km southwest of the Project site. Due to its distance from the project site, negative impacts are not expected.

(7) Ecosystem

1) Outlines of Ecosystem on the Alignment

The project runs through various ecosystems from the urban area in Mombasa Island to the rural area in South Mainland. The ecosystems along the alignment are categorized in Table 14.6-26.

Table 14.6-26 Ecosystems along the Alignment

No.	Classification of Ecosystem	Location / Description	
1	Open Water Ecosystem	Kilindini Harbor and Mweza Creek The area beneath and around the bridge, including Kilindini harbor and Mweza creek, is marine water. This is an important area as a navigation artery for vessels and has a fairly natural ecological system which supports fishing as a livelihood for the local community.	
2	Mangrove Formations	Mweza Creek Shoreline Small scale mangrove forest borders the Mweza creek. The mangrove forest fosters characteristic ecosystems of mangrove forests.	
3	Secondary Thickets	Mweza Creek Cliffs Secondary thickets occur in the terrestrial zone of Mweza creek, namely the upper cliffs and upstream ephemeral channel. This area is characterized by a higher species count (48 indigenous spp) in addition to hosting the majority of special conservation needs species (those Near Threatened and Vulnerable). Some of the thickets along the eastern cliffs of Mweza Creek host sacred sites/shrines that serve diverse roles in the local Miji Kenda traditional religious order.	
4	Urban/Peri-urban Ecosystems	Mombasa City and Likoni-Mtongwe- settlements Urban and peri-urban ecosystems form the dominant landuse within the route corridor on both Mombasa Island and on South Mainland side. They are mainly characterized by landuse change whereby the original natural vegetation has been replaced by urban settlements for business and residential use accompanied by the introduction of largely exotic tree and shrub species.	
5	Farmlands	South Mainland In this vegetation type, indigenous trees are usually left on-farm or planted. These are mainly trees with use and/or value to the community and include various indigenous and exotic fruit trees.	

No.	Classification of Ecosystem	Location / Description	
6	Marshlands	South end point of the approach road (Ziwani Lake at the inter-change with Mombasa Southern Bypass) There is a seasonal swamp/marsh beyond the end point on the approach road on the Mainland side, this swamp hosts the seasonal lake (Ziwani lake) and is dominated by meso phytic leed species and supports diverse species of water birds. The lake is an important source of local water supply for both domestic and livestock use and an important dry season grazing ground.	

2) Ecosystem of Mainland Side

The project site extends from Mombasa Island to Likoni area. Mombasa Island contains well developed areas and there is no original nature ecosystem. On the Mainland side, the Likoni area from the channel to Mtongwe road is a developing area, and still retains a natural ecosystem. In particular it should be noted that a small mangrove ecosystem remains in addition to a terrestrial ecosystem. Moreover, a wetland ecosystem was observed beyond the south end point.

Source: Survey Team Prepared Based on Google Maps

Figure 14.6-13 Ecosystem of Mainland Side

・ Mangrove Community

On Mweza creek which is close to the approach road on the mainland side, there is a small mangrove community, where three mangrove species, *Avicenia marina*, *Ceriops targal* and *Rhizophora mucronata* are observed. Either species are not endangered species or are LC (Least Concern) on IUCN. Distribution of the mangrove species changes within only 1 km distance the creek. For example, *Avicenia marina* is concentrated upstream of the creek. Possible reasons for the deviation of the distribution, is that the features of the sediment vary and each species depends on the feature of sediments: rocky in the estuary of the creek, sandy-muddy upstream, and upstream the creek has remarkable salinity variation.

Source: Survey team

Figure 14.6-14 Mangrove Forest in Mweza Creek

The mangrove community has abundant benthic fauna including Crustacea and molluscs. The benthic fauna which was found in Mweza creek during the field survey together with secondary data are shown in the following table. It does not include any endangered species.

Figure 14.6-15 Distribution of Mangrove Forest in Mweza Creek

There is a large mangrove forest in Port Reitz which is the interior of Kilindini Harbor and connecting with Mweza Creek. The species in the port are counted 9 species including *Rhizophora mucronata, Bruguiera gymnorrhiza, Ceriops tagal, Avicennia marina, Xylocarpus granatum, X. moluccensis, Heritiera littoralis, Lumnitzera racemosa, Sonneratia alba*. The three species in Mweza Creek are including in the species in Port Reitz.

- Flora

As a result of the survey, a total of 124 plant species were recorded along the alignment of the approach roads. Trees form the majority at 56.5% followed by shrubs at 30.6%. Indigenous plants form the bulk (77.4%) of the total count.

Table 14.6-27 Analysis of Plant Occurrence in the MGB Project Traverse

Plant Form	Trees	%	Shrubs	%	Climbers	%	Grasses	%	Total Count (%)	
Indigenous	52	74.3	28	73.7	7	100	9	100	96	77.4

Plant Form	Trees	%	Shrubs	%	Climbers	%	Grasses	%	Total Count (%)	
Exotic	18	25.7	10	26.3	0	0	0	0	28	22.6
Total Count (%)	70		38		7		9	7.3	124	100

Within Mombasa Island, 17 out of 21 species counted were exotic while at the secondary thickets on the Mweza Creek cliffs, only 8 of 51 species counted were exotic.

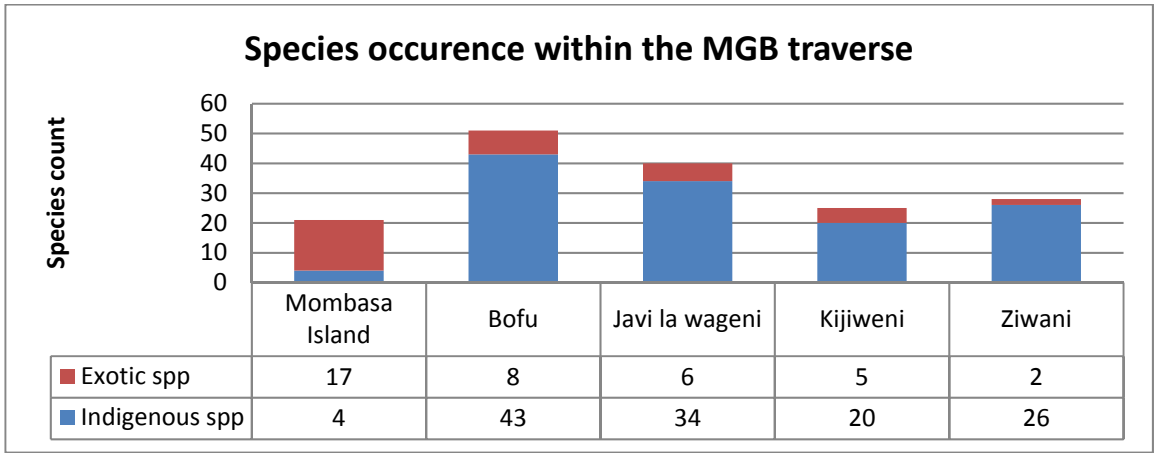


Figure 14.6-16 Tree Species Variation with Land Use along the Traverse

All 124 plant species were screened for conservation status based on the IUCN RED List Data with the following results:

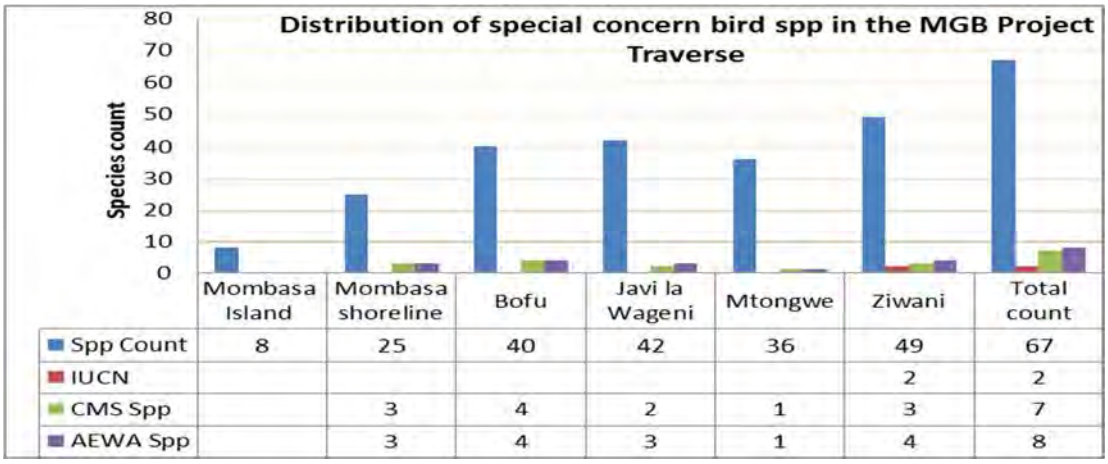
- Most of the floral species have not been assessed for IUCN Red List data,
- Of the 124 floral species counted, six tree species are listed as Near Threatened (4) and Vulnerable (2) under the IUCN Red Data List. None of the shrubs, climbers and grasses are listed.
- In addition, apparently the area has never been assessed for endemism but one species- *Ochna thomasiana* which is reportedly endemic to Kenya's south coast was recorded in the inventory.
- In total, twelve (12) species reported to be of special conservation concern were recorded in the southern section of the project.

Table 14.6-28 Analysis of Conservation Status for Plants within the Alignment

SN	Tree Species	Common Name	Site Location	Status (IUCN)
1	*Dalbergia melanoxylon*	African blackwood	Bofu	Near Threatened
2	*Dialium orientale*		Bofu	Near Threatened
3	*Pseudobersama mossambicensis*	False white ash	Kijiweni	Near Threatened
4	*Erythrina sacleuxii*	No Common Name	Kijiweni	Near Threatened
5	*Saraca asoca*	Ashoka/ Sorrowless tree	Mombasa Island	Vulnerable
6	*Lasiodiscus ferrugineus*	*Lasiodiscus pervillei sub spp ferrugineus*	Ziwani	Vulnerable (other reports n)
7	*Psychotria punctata*	Dotted wild Coffee	Javi la wageni	Not assessed for IUCN yet genus reported in other reports being endangered
8	*Premna chrysoclada*	Premna	Kijiweni	Ditto
9	*Pavetta mangallana*	Pavetta	Javi la wageni	Ditto
10	*Pavetta crebrifolia*		Javi la wageni	Ditto
11	*Pavetta subacana*		Ziwani	Ditto
12	*Ochna thomasiana*	Mickey mouse plant	Javi la wageni	endemic to Kenya coast

・ Fauna (1) Avian

Birds were counted and ranged between 8 species for Mombasa town to 49 at the end point within the vicinity of the seasonal marsh/lake at Ziwani, with a total of 67 species being recorded on the alignment.



	Mombasa Island	Mombasa shoreline	Bofu	Javi la Wageni	Mtongwe	Ziwani	Total count
Spp Count	8	25	40	42	36	49	67
IUCN						2	2
CMS Spp		3	4	2	1	3	7
AEWA Spp		3	4	3	1	4	8

Mombasa Island and Mombasa shoreline are in Mombasa Island. The others are in Mainland.

Figure 14.6-17 Occurrence of Bird Species within the Traverse

Two species are Vulnerable and Near Threatened on the IUCN Red List. Eight species are listed in the Agreement on the Conservation of African-Eurasian Migratory Water Birds. Seven species are listed on CMS.

Nine out of the 12 special concern bird species, including the two IUCN Red List Spp, were recorded in the Ziwani seasonal marsh.

Table 14.6-29 Special Concern Birds in the MGB Traverse

SN	Migratory Species		Relevant Convention
1	Eurasian honey buzard	*Buteo buteo*	C, IUCN
2	Roseat tern	*Sterna dougallii*	C, A
3	Greater crested tern	*Thalasseus bergii*	C, A
4	Sooty gull	*Larus hemprichii*	C, A
5	Black headed heron	*Ardea melanocephala*	A
6	Grey heron	*Ardea cinerea*	A
7	Cattle egret	*Bubulcus ibis*	A
8	Black kite	*Milvus migrans*	C
9	Senegal lapwing	*Vanellus lugubris*	C, A
10	Scred ibis	*Threskiornis aethiopicus*	C, A
11	Woolly necked stork	*Ciconia episcopus*	IUCN: Vulnerable
12	African darter	*Anhinga melanogaster*	IUCN: Near Threatened

C: CMS, A: AEWA

・ Fauna (2) Insects

The most common insects occurring in literally all habitats are butterflies namely;- African emigrant (*Catopsilia florella*), African Clouded (*Colias electa*), Natal Pansy (*Junonia natalica*), Common Leopard Fritillary (*Phalanta phalanta*), Friar (*Amauris niavius*) and Small Spotted Sailer (*Neptis saclava*). Others include;- Gold-Banded Forester (*Euphaedra neophron*), Danaid Eggfly (*Hypolimnas misippus*), *Byblia ilithyia, Tirumala petiverana, Eurema regularis, E.*

floricola, Colotis danae (Crimson tip), Orange Acraea (*Acraea eponina*) among others.

- Fauna (3) Heperto fauna

  As reptile species within the alignment, Red-headed Rock Agama (*Agama agama*), Yellow-throated Plated Lizard (*Gerrhosaurus flavigularis*), Speke's Lizzard were observed mainly in rocky areas while snakes such as the White-lipped Snake (*Crotaphopeltis hotamboeia*), green and black mambas, puff udders were reported to be common.

- Fauna (4) Fish

  Fishing activities around Mweza creek are artisanal, with fishers using pen (fence) traps. According to Likoni BMU (Beach Management Unit), daily fish catch is approximately 100kg in the area. 30 species of fish were recorded by local names, based on the landed catch and lists derived from interviews with fishermen. The fish were then identified to species level using a fish database system (http://www.fishbase.org). Among these fish, no threatened species are included.

Table 14.6-30 Fish Species landed at Mweza Creek

Family	English Name	Local Name	Scientific Name
Sphyranidae	Barracuda	Tengezi	*Sphyraena jello*
Chanidae	Milk Fish	Mwatiko	*Chanos chanos*
Scombridae	King Fish	Nguru	*Acanthocybium solandri*
Chronimustol	Queen Fish	Pandu	*Scomberoides lysan*
Istiophoridae	Sail Fish	Sulisuli	*Istiophorus platypterus*
Arangidae	Bonito/ Tuna	Jodari	*Katsuwonus pelamis*
Colyphaenidae	Dorado	Falusi	*Coryphaena hippurus*
	Octopus	Pweza	*Octopus vulgaris*
Squimosae	Squids	Ngisi	*Loligo vulgaris*
Lenthridae	Rabbit fish	Changu	*Siganus sutor*
Lutjanidae	Snappers	Tembo	*Lutjanus monostigma*
Scaridae	Parrot fish	Pono	*Leptoscarus vaigiensis*
Acanthuridae	Surgeon	Karazanga	*Acanthurus nigrofuscus*
Acanthuridae	Unicorn	Puju	*Naso brevirosyris*
Haemuridae	Grunter	Pamamba	*Plectorhinchus gaterinus*
Serranidae	Pouter	Chaa	*Cephalopholis argus*
Haemulidae	Black skin	Fute/Makoe	*Gaterin sordidus*
Mulidae	Goat fish	Mkundaji	*Parupeneus spilurus*
Lutjanidae	Streaker	Pali	*Aprion virescens*
Serranidae	Rock Cod	Tewa/ Kivungwi	*Pseudophycis barbata*
Aridae	Cat Fish	Fumi	*Bagre marinus*
Palinuridae	Lobsters	Kamba-mawe	*Penulirus spp*
Penaeidae	Prawns	Kamba-wadogo	*Paenus spp*

3) Seasonal Trend on Ecosystem of Mombasa Area

The condition of the ecosystem around Mombasa area depends on the monsoon of the Indian Ocean. From November to March, the northeast monsoon (NEM) blows gently and keeps sunny and dry conditions. By contrast, the southeast monsoon (SEM), from April to October, blows strongly with rough seawater conditions and frequent rain. Seasonality has a significant impact on fishing along the coast, with records of higher fish landings during the calm NEM season compared to the rough SEM.

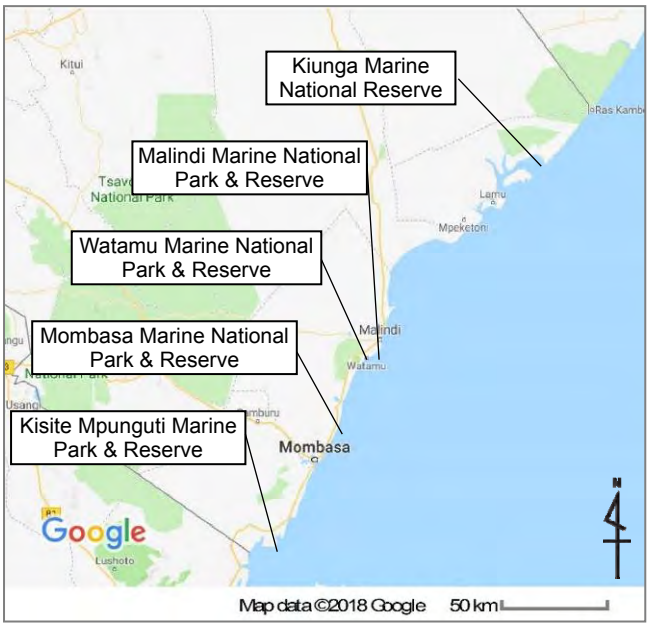
Marshland (Ziwani lake which is located beyond the end point of the project) is also seasonal marsh. The area of the marsh increases during the rainy season and decreases during the dry season.

4) Marine Ecosystem of Mombasa Area[11]

Kenya has a coast line of roughly 450km facing the Indian Ocean, and has a rich diversity of marine and coastal ecosystems. These ecosystems include mangrove wetland, coastal forest, estuaries, sandy beaches, coral reefs, and seagrass beds that support marine and coastal species. Moreover the ecosystem has supported local communities as an important life-support system.

However, immense pressure has been exerted on Kenya's marine resources by increasing human population and demand for natural resources. Recognizing the value of its coastal and marine resources and the imminent threats, Kenya adopted the use of Marine Protected Areas (MPAs). The locations of MPAs in Kenya are shown on Figure 14.6-17.

[11] Protection of Marine Areas in Kenya, The George Wright Forum, vol. 29, no. 1, pp. 43-50, 2012
Status of coral Reef Fish Communities within the Mombasa Marine Protected Area, Kenya, monre than a Decade after Establishment, Cosmas N. Munga et. All, 2001



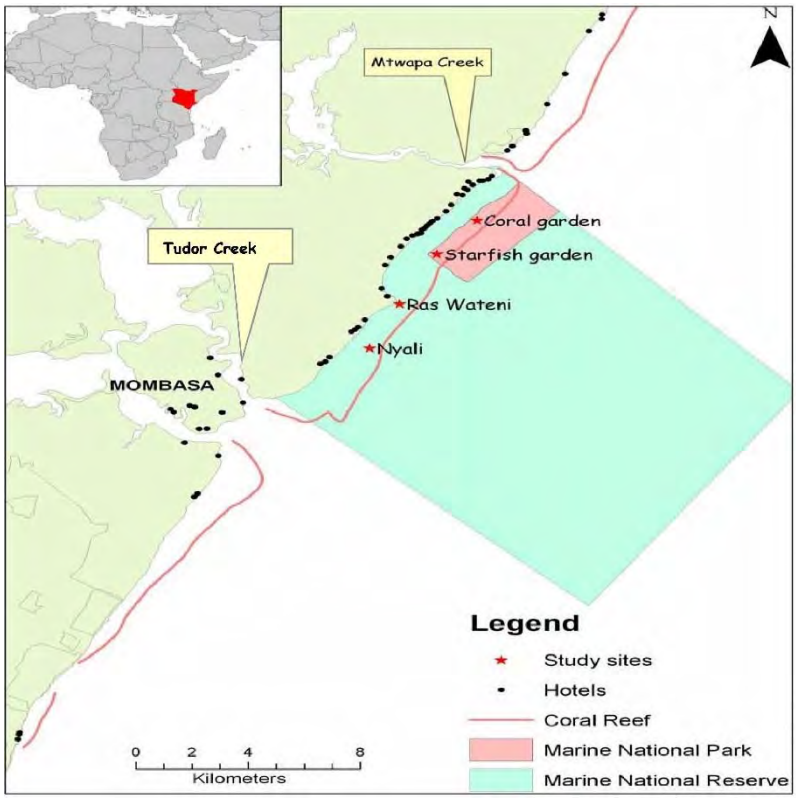
Source: Survey Team Prepared Based on Google Maps

Figure 14.6-18 Location of MPAs in Kenya

MPAs in Kenya have two categories of protection.

- ✓ Marine National Park: Total protection from any type of consumptive utilization. Research and recreation (tourism) are the only uses allowed, for a fee.
- ✓ Marine National Reserve: Traditional harvesting of resources is allowed as well as research and tourism.

Mombasa coast consists of a coral reef directly facing the Indian Ocean and mangrove forests along estuaries such as Mtwapa Creek and Tudor Creek. GOK, in 1986, designated the north area from Nyali to Mtonge as Mombasa Marine National Park & Reserve. The Mombasa MPA is cited as "a good example" of MPAs. The coral cover and fish biomass of Mombasa MPA increased significantly in the first 10 years of its establishment. Increasing fish biomass is enhancing "emigration" from the boundary to other areas.



Source: Ecological and Socio-economic Assessment of Mombasa Marine Park and Reserve, Kenya, 2008, Cosmas Nzaka Munga

Figure 14.6-19 Current Status of MPA in Mombasa Area

There are some concerns about the preservation of the coastal ecosystem of Kenya as follows:

- ✓ Marine water warming by climate change is causing coral bleaching.
- ✓ The sporadic infestation of coral reefs by the invasive crown-of-thorns starfish.
- ✓ The high poverty levels of coastal communities causes the over-exploitation of marine resources.
- ✓ The growing coastal populations cause high demands for fishery products
- ✓ The loss of mangrove cover due to overharvesting of mangrove wood

5) Bird Migration[12]

In Kenya, migratory birds visiting or passing through Kenya use the Rift Valley, coast, eastern bushlands, and central and western grasslands as their migration route. It is said that most international airline routes through Kenya are along the bird migratory routes, especially the Rift Valley. There are two important migration routes. One of these is the Rift Valley, which has a chain of alkaline and freshwater lakes from Lake Turkana in the north to Lake Magadi in the south. The other route is along the coast, which includes the beaches, reefs and mangrove creeks. Important water bird sites lie close to these major migration routes. (Table 14.6-31)

[12] Bird Migration and Bird Strike Situation in Kenya, Oliver Nasirwa, NMK

Table 14.6-31 Numbers of Water Birds in Major Migration Routes in Kenya

Site	Estimated Total
Amboseli Wetlands	3,600
Lake Turkana	215,000
Lake Victoria	3,500
Nairobi Wetlands	18,000
North Coast	32,000
South Coast	54000
Southern Rift Valley	970,000
Tana Delta	75,000
Upper Tana Dams	34,000

Source: Bird Migration and Bird Strike Situation in Kenya, Oliver Nasirwa, NMK

For the above table, South Coast means the area which is located to the south of Mombasa, including Diani Beach to the border of Tanzania. This is to the south of the project, being over 20km from the project site. However, there is a possibility that the project site is included in the migration route of migratory birds.

6) Expected Negative Impacts and Mitigation Measures

As mentioned above, the route of the project has various ecosystems. Since the project is a linear project, it is expected that any negative impacts would not be concentrated in a specific area. However, in addition to the fact that some endangered species were observed, there is a mangrove forest that supports the local community through fishing. Effective mitigation measures and a monitoring survey especially during the construction stage should be undertaken for the protection of the ecosystem. Water pollution is one of the concerns. Therefore, mitigation measures against water pollution are proposed in "(2) Water Pollution". Table 14.6-32 shows the outlines of impacts, mitigation measures and aspects of the mitigation effects.

Table 14.6-32 Impacts, Mitigation Measures and Expected Effects

Species		Flora	Fauna		
			Mammal	Birds	Aquatic life
Impact factors	**Disappearance / Decrease**	Whole plant species within the ROW disappear.	Whole mammals within the ROW are forced to move out of the ROW.	If there are nesting places in the ROW, the nesting places are lost. Birds within the ROW are forced to move out of the ROW.	There is no disappearance or decrease of habitat.
	Dividing of moving route	-	Moving routes for mammal may be divided.	There are no impacts on moving routes for birds.	There are no impacts on moving routes for aquatic life.
	Qualitative change of habitat	Habitat within ROW is lost.	Habitat within ROW is lost.	Habitat within ROW is lost. Runoff from construction and operation activities may affect the water quality of Mweza creek and Ziwani lake.	Runoff from construction and operation activities may affect the water quality of Mweza creek and Ziwani lake.

Species	Flora	Fauna		
		Mammal	**Birds**	**Aquatic life**
Avoidance and mitigation measures	Creation of alternative sites including reforestation (For mangrove forest on Mweza creek) To install settling basins for drainage of embankments to avoid the direct influx of turbid water to Mweza creek.	Installation of culvert boxes beneath the embankment road to secure moving routes (see 14.6.1 (23))	To install settling basins for drainage of embankments to avoid the direct influx of turbid water to Mweza creek and Ziwani lake. To install silt curtains for pier construction to avoid diffusion of turbid water in Kilindini harbor	To install settling basins for drainage of embankments to avoid the direct influx of turbid water to Mweza creek and Ziwani lake. To install silt curtains for pier construction to avoid diffusion of turbid water in Kilindini harbor
Effect of avoidance and mitigation measures	Habitat is compensated by creation of alternative habitats around the project site.	Negative impacts are decreased by securing moving routes	Protection of water quality of habitats can minimize negative impacts.	Protection of water quality of habitats can minimize negative impacts.

Source: JICA Survey Team

The project needs to cut a lot of trees within the ROW. On the Mainland, 16,713 trees will be fallen for the construction of the approach road. The Survey team is proposing reforestation not less than cut trees. The space in the ROW of the project can be reforested. (Toll booth: 2,000m2, Shoulder of embankment: 42,000m2) Tangible planning of reforestation will be prepared during D/D stage by reference to previous instances such as Mombasa Port Area Road Development Project (MPARDP). In Kenya, community participation for forest management has been developed. Participatory Forestry Management was introduced to Kenya in 1997 and it led to the formation of Community Forest Associations (CFAs). CFAs are legally registered under the Society's Act and under the Forest Act, and comprise groups of persons who are resident in an area close to the specified forest. In the MPARDP, the Mombasa Kilindini Community Forest Association was committed to KeNHA who is a project proponent, and is mainly taking part in the reforestation of mangrove forests. The project will adopt the same procedures as the reforestation program.

Moving routes for mammal may be divided by the project. The survey team is proposing installation of culvert box to keep community roads. This is effective even as the moving routes for mammals. mitigate the routes. So far, culvert boxes are planned to be installed every 500m for main roads and every 100~200m for community roads.

(8) Hydrology

As part of the project, piers for the bridge would be installed in Kilindini Harbor. The installation of these piers may affect the tidal condition of the harbor.

1) Current Conditions (Tidal condition of Kilindini Harbor)

Tidal data for Kilindini Harbor is shown in Table 14.6-33. HAT (highest astronomical tide) is +4.1m: LAT (lowest astronomical tide) is -0.1m. The difference between highest and lowest tide is 4.2m.

Table 14.6-33 Tidal Data of Mombasa Port

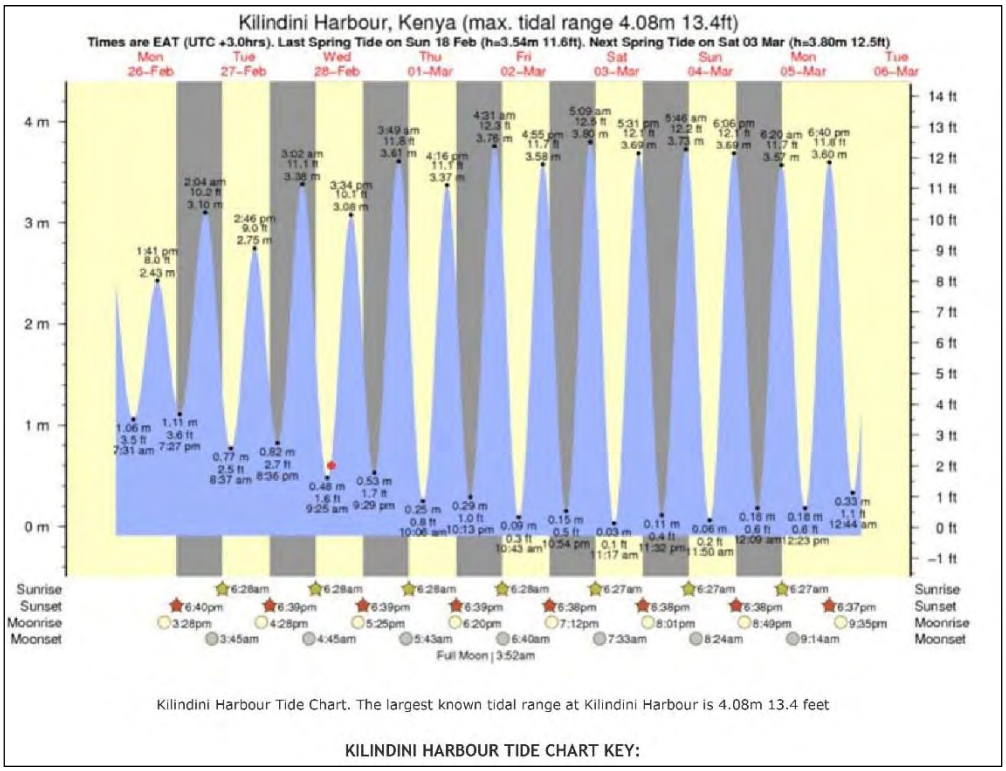
Tide	Height

Tide	Height
HAT	+4.1m
MHWS	+3.5m
MSL	+1.88m
LAT	-0.1m

Source: KPA

The water surface of Kilindini Harbor is very calm because the harbor is narrow and the estuary is protected by a coral reef. The current speed of the tide is approximately 2.5 knot at a maximum.

A feature of tide movements in the Mombasa area is that they are semi diurnal and sinusoidal. At spring tide, the water level changes significantly in a short interval of time.



Source: tide-forecast, 2018 Tide Times & Tide Charts for the World (https://www.tide-forecast.com/)

Figure 14.6-20 Tidal change in Kilindini Harbor (26Feb-5Mar, 2018)

2) Cross Section of Kilindini Harbor

A cross section of Kilindini Harbor and the bridge for the project is shown in Figure 14.6-21. The width of the channel is approximately 700m. Since the center of the channel is deep, it makes the navigation of large vessels possible. It is shallow nearer both shores especially on Mombasa Island side.

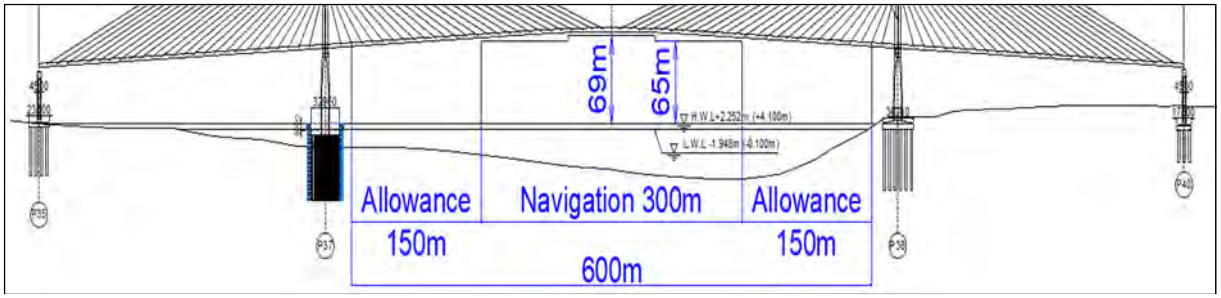


Figure 14.6-21 Section of the Project and Kilindini Harbor

3) Expected Negative Impacts due to Construction Activities

For the basic design of the bridge, main piers for the bridge would be installed at only two locations. The pier on the Mainland side would be installed on shore. Only the pier on Mombasa Island side would be installed in the channel. Even though it is in the channel, the pier's location on the Mombasa Island side is in a shallow area close to the shore, and the profile area of the pier is small compared to the whole profile area of the channel (approximately 3.6%). Therefore the installation of the pier would incur no negative impacts on the tidal current of Kilindini Harbor.

(9) Geographical Features

1) Gathering of Aggregate and Filling Soil

For the construction of the project, gravel and sand for concrete and filling soil for embankments are required. Expected quantities are shown on Table 14.6-34.

Table 14.6-34 Expected Quantity of Major Raw Materials

Items	Expected Quantity for the Project (thousand m^3)
Gravel	453
Sand	220
Filling Soil	683

According to other projects close to this project, there are potential quarry sites and borrow pits in the vicinity of the project site (see Figure 14.6-22).

To the south of the project site, there are some borrow pits. Limestone derived from coral is extracted. These materials are suitable for embankment material. However, hard stone for aggregate is not extracted here. Quarry sites for hard stone are located on the north side of the mainland (roughly 50km from the project site).

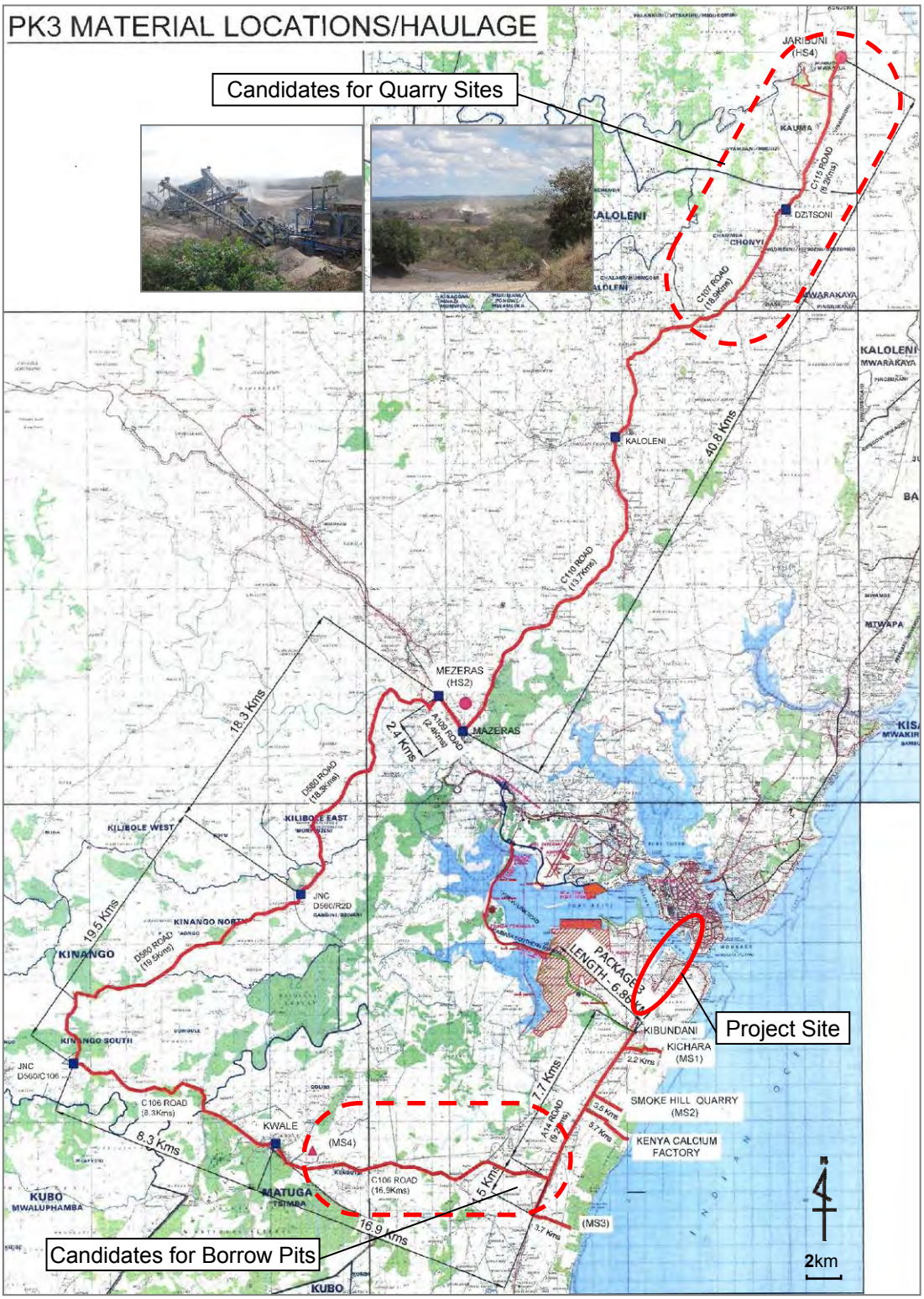
2) Expected Negative Impacts

Generally, procurement of major construction materials is decided by contractors. Although the quarry and borrow pits which are shown in Figure 14.6-22 are strong candidates, quarry sites and borrow pits are not decided during F/S and D/D stage.

Significant gathering of aggregate and filling soil may affect the environment around quarry sites and borrow pits.

In Kenya, mining projects, including quarrying and open-cast extraction of aggregates, for sand

and gravel require an environmental license[13]. On the implementation of the project, quarry sites and borrow pits have to be selected from licensed sites to avoid or mitigate negative impacts.



Source: Survey Team prepares based on a material of Mombasa Southern Bypass Project

Figure 14.6-22 Borrow Pits and Quarry Sites around the Project Site

(10) Resettlement and Land Acquisition

[13] EMCA, 1999 No.8, SECOND SCHEDULE (s.58(1), (4))

The project will have a direct impact (displace) on 2,523 PAUs PAHs including residential households, CBEs, landowners and wage earners.

All these losses will be compensated and it is expected that they will find their own place or means to resettle and rehabilitate themselves. Certainly the project will extend additional support to the vulnerable APs. Without RAP, restoration of livelihood would be very difficult for them.

A total of 62.8 ha land and 763 plots will be required to be acquired and 82.4% of acquired land is residential or residential cum commercial land.

(11) Poor People

A monthly household income of less than Ksh 20,000 is defined as being poor in Kenya. As a result of the socio-economic survey, 41.2% of affected persons are estimated as poor. The poor households will get special assistance under the policy of RAP. Special assistance will be paid to those households that are headed by women, the elderly and physically handicapped, and those supported by income generation activities under LIRP.

(12) Ethnic Minorities and Indigenous Peoples

1) Current Conditions

In Kenya, the people who identify with the indigenous movements are mainly pastoralists and hunter-gatherers, as well as some fisher people and small farming communities.

Table 14.6-35 Ethnic Minorities and Indigenous People in Kenya

Pastoralist		Hunter-gatherers	
· Turkana	· Ilchamus	· Ogiek	· Boni (Bajuni)
· Rendille	· Somali	· Sengwer	· Malakote
· Borana	· Gabra	· Yaaku	· Wagoshi
· Maasai	· Pokot	· Waata	· Sanya
· Samburu	· Endorois	· El Molo	

Source: Indigenous peoples in Kenya, IWGA web site (https://www.iwgia.org/en/kenya/655-indigenous-peoples-in-kenya#)

Pastoralists are estimated to comprise 25% of the national population of 38.6 million (2009 census), while the largest individual community of hunter-gatherers numbers approximately 79,000.

These people mostly occupy the arid and semi-arid lands in northern Kenya and towards the border between Kenya and Tanzania in the south. Since the vicinity of the project site is not included in these areas but in developed or developing areas, the settlement and activity areas of ethnic minorities and indigenous people are not included in the project site.

2) Expected Negative Impacts

Apart from the above mentioned, there is an issue about religious minorities. Most Kenyans today profess to be Christian, and Muslims are a religious minority in Kenya. However, Mombasa is historically an Islamic area, and more than half of PAPs are Muslim as found in the RAP survey. The RAP should be developed to avoid misallocation or unfairness for this religious minority.

(13) Local Economies, such as Employment, Livelihood, etc.

1) Current Conditions

Many of the affected Employees are found at Majengo, Likoni and Shika Adabu. At Majengo (Mombasa Island) 79% of affected employees are permanent workers. Even if the buildings are displaced fully or partially, they will be employed continuously. On the other hand, temporary wage earners might be affected due to less traffic, even if the ferry service is not suspended. Pedestrians, hand-cart and bicycles carrying heavy goods will not simply disappear. How the Income and Livelihood Restoration Programme (LIRP) can be implemented for socially vulnerable people is important. The CRO KeNHA and PMU will recommend eligible members of affected vulnerable households with their relevant profile to the LIRP implementing organization through KeNHA. Short-term livelihood regeneration assistance under the RAP and long-term income generation program under the LIRP will be organized.

2) Expected Impacts due to Construction Activities

Construction activities of the project, especially pier installation near the marine area, may affect the fishing around Kilindini harbor and Mweza creek. Fishermen are engaged in fishing based on traditional fishing methods, such as pen trap, line, boating with fishing nets, diving etc. The fishing ground must be moved according to the season due to the influence of monsoon. During southeast monsoon season, Mweza creek is the only fishing ground available and small-scale mangrove forest in Mweza creek is important for marine ecosystem of the creek. To mitigate the negative impacts on fishing, effective mitigation measures and monitoring should be undertaken. On the other hand, the construction activities will contribute to the creation of new employment for local people.

3) Expected Impacts during the Operation Stage

On the basis of the traffic demand forecast, travel times in the Mombasa area are expected to decrease. This will contribute to stimulating the local economy.

Even after the opening of the project, the Kenya ferry service will continue to operate their service because the demands of pedestrian and non-motorized vehicles will remain. Therefore, significant negative impact on the local economy relating to the ferry is not expected.

(14) Land Use and Utilization of Local Resources

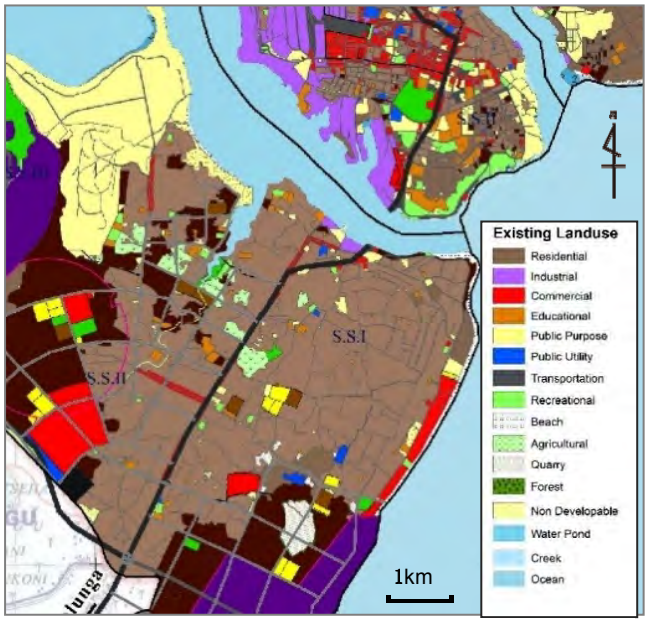
1) Current Condition of Land Use

Refer to 14.2 (8)

2) Expected Impacts

In Mombasa Island, the approach road to the project utilizes existing roads. By contrast, on the Mainland side, the approach road passes through residential, commercial and agriculture zones (see Figure 14.6-23). Therefore, land utilization will be converted. However, since the project is a linear project, conversion of the land utilization is not concentrated in a single place.

Private properties including land, farm land and structures will be appropriately



Source: Mombasa County Government

Figure 14.6-23 Land Use in/around the Project Site

compensated under the RAP.

Regarding the ecosystem, especially on the Mainland side, some trees and grassland will be lost. Loss of the cut trees would be mitigated by replanting. The ecosystem would be monitored during the construction period. If problems occurred, appropriate mitigation measures would be taken.

Since the project is a road bridge project, the project operation does not have factors changing land use and utilization of local resources.

(15) Existing Social Infrastructure and Services

The project area covers both Mombasa Island and the Mainland with five administration locations. In Majeenro on Mombasa Island, power distribution infrastructure, telecommunication ducts and wires, sewer lines and storm drainage lines will be removed in advance after coordination with relevant agencies. In the Mainland, power lines in Mtongwe and Shika Adabu will be removed prior to the start of civil work for the project.

The detail location of social infrastructures and services will be studied on the detail design study, and KeNHA and a design team will discuss with authorities about seamless relocation. The affected existing social infrastructure will be moved appropriately by KeNHA before the start of construction.

(16) Social Structure such as Social Capital and Local Decision-Making Institutions

On the Mainland side, the approach road of the project is on embankment. The embankment, which is several kilometers in length, may cause a split in local communities or create a widening disparity along the approach roads.

To avoid this negative impact, culvert boxes will be installed every 100~200m beneath the embankment road. Total number of the culvert boxes is estimated as seven for main roads and ten for community roads. The culvert boxes would avoid the splitting of local communities.

(17) Misdistribution of Benefits and Damages / Local conflicts of interest

The benefits of the project will not be distributed evenly to all the people along the alignment of the route. Certainly the people who use the bridge and its approach road in general will benefit the most. However, only the affected people will have to bear the burden of damages like loss of assets and livelihood. It is envisaged that the economically solvent affected people will be able to recover their damages through receiving compensation and utilizing the locational opportunity of the new infrastructure provided by the project. But the vulnerable and marginal PAPs would be in difficulty without assistance and they would need support on income generation activities under LIRP.

Due to the implementation of the project, operations of the Likoni Ferry may decrease. This may cause local conflicts of interest. At an interview with the Likoni Ferry operators , it was confirmed that they intend to continue their operations even after the implementation of the project. Therefore no negative impacts are expected on local conflicts of interest.

(18) Cultural Heritage

1) Current Condition

Refer to 14.2 (7)

・ Cultural Impact Assessment

As mentioned on 9.2 (10), Mombasa is a historical important area. In view of this, the Survey Team consulted with NMK from the initial stage of route selection. As a result of consultations, the opinions of NMK are outlined below[14]:

- Since Mama Ngina Park is a remarkable historical area, NMK cannot accept development activities in the Park.
- Regarding the alternative route options, it seemed likely that the possibility of relic existence would be lower than for the route through Mama Ngina Park. However, because the possibility still remained, a CIA survey would be required even for other locations.
- Although NMK is undertaking the protection of historical heritage, the activity of NMK does not anticipate restrictions against development projects in Mombasa. However, records of historical heritage are required before development takes place.
- The CIA survey shall be completed before implementation of the project.
- NMK is thinking that an ESIA report should include a CIA report.

- Fort Jesus

Fort Jesus, which is located on the southeast of Mombasa Island, is known as one of the World Heritage sites of UNESCO[15]. Since the surrounding area including the Old Town is an area for potential archaeological research, in 1990 the area was designated as a conservation area. According to 36 COM of Convention Concerning the Protection of the World Cultural and Natural Heritage, Fort Jesus has to be protected along with the buffer zone of the surrounding Mombasa Old Town[16]. As of 2011, nominated buffer zones that International Council on Monuments and Sites proposes are shown on Figure 14.6-24.

Source: ICOMOS

Figure 14.6-24 Fort Jesus

[14] Consultation meeting with Coast Region Office of NMK held on 4 April, 2016

[15] Brief synthesis (6 COM of Convention Concerning the Protection of the World Cultural and Natural Heritage)
Built by the Portuguese at the end of the 16th century at the southern edge of the town of Mombasa, over a spur of coral rock, and kept under their control for one century, Fort Jesus, Mombasa, bears testimony to the first successful attempt by Western civilization to rule the Indian ocean trade routes, which, until then had remained under Eastern influence. The design of the fort, with its proportions, its imposing walls and five bastions, reflects the military architectural theory of the Renaissance. Fort Jesus, Mombasa, bears physical witness, in its structures and subsequent transformations, also to the interchange of cultural values and influences between and among peoples of African, Arab, Turkish, Persian and European origin that fought to gain and maintain their control over this strategic port.

[16] Integrity
The boundaries of the property have been delineated to include the underwater archaeological remains in the expanse of sea in front of Fort Jesus as well as the moat area adjacent to Mombasa Old Town. Minor changes inside the Fort bear witness to its history and do not threaten its integrity. The property is in good conditions and there is no urban or development encroachment in its immediate vicinity. Mombasa Old Town, which is integral to Fort Jesus' historic context, acts as the buffer zone of the Fort.
Protection and management requirements
The legal protection system for the property is adequate: Fort Jesus, Mombasa, was originally designated a National Park in 1958, the protected area included the Fort itself and a 100-meter strip around it; today it falls under the National Museums and Heritage Act, 2006. The buffer zone has been formally declared a Conservation Area, however, a discrepancy between the size of the designated Conservation Area and the size of the Buffer Zone has not been amended yet.

Source: 2011 Addendum Evaluations of Nominations of Cultural and Mixed Properties ICOMOS report for the World Heritage Committee, 35th ordinary session UNESCO, June 2011

Figure 14.6-25 Nominated Property of Fort Jesus as World Heritage Site

In a management plan for Fort Jesus[17] which was prepared by NMK, a strategic plan was raised. The strategic plan is proposing 6 items (Table 14.6-36). Tangible measures of conservation are not described in the management plan.

Table 14.6-36 Strategic Plan of Management Plan of Fort Jesus

Items	Contents
Management	To implement the NMK organizational structure To improve participatory management system
Establishing Sustainable Funding System	To generate more income by way of increasing and diversifying its income base
Site Presentation and Interpretation	To carry out site presentation and interpretation needs
Conservation Works	To draw up a rehabilitation/restoration plan
Promotion and Tourism	To draw up a marketing plan
Education and Research	To identify education needs To increase public education

Source: Revised Management Plan of Fort Jesus, 2008

[17] Revised Management Plan of Fort Jesus, January 2008, NMK

2) Expected Impacts on Buried Cultural Heritage and Mitigation Measures

Construction of the project may affect buried cultural heritage.

Given the opinions of NMK, KeNHA is planning a CIA study on the project site. The study would be implemented before or after the ESIA study for the project. The CIA study would be conducted by NMK[18]. TOR for the study are shown in Table 14.6-37.

Table 14.6-37 TOR for the CIA Study

Item	Content
Archaeological excavations	・ Maritime / Underwater Archaeology assessment ・ Terrestrial / Land archaeology Assessment
Curative management of collections from the site	・ On –site documentation ・ On – site storage and packaging ・ Analysis, dating etc ・ Museum storage

3) Expected Impacts on Fort Jesus

The project site is approximately 2.4 km from Fort Jesus and the buffer zone. These areas will not form part of construction sites and will not be access routes for construction vehicles. Therefore, no direct impacts of construction activities such as air pollution and noise are expected. Regarding impacts on the landscape of Fort Jesus, since the project is separated by the urban area of Mombasa Island, there would be no direct impacts on the landscape and World Heritage registration

Source: The Survey Team Preparing Based on Google Maps

Figure 14.6-26 Locations of the Project Site and Fort Jesus

4) CIA study

On December 2018, NMK showed a preliminary cultural heritage impact assessment report for the project to KeNHA. According to the report, a field survey identified some historical heritages in/around the ROW of the project. The identified heritages cover a wide area including tangible / intangible cultural assets. Summary of the identified heritage and proposed mitigation measures are shown on Table14.6-38.

[18] As of October 2018, NMK is implementing the CIA study for the project site under contract with KeNHA.

Table 14.6-38 Identified Impacts to Cultural Heritage and Proposed Mitigation Measures

Heritage Category		Location	Type	Mitigation	Responsibility
1	Traditional Sites	Foreshore	Caves/Panga	Documentation and relocation	KeNHA
			Mizuka	Documentation and relocation	KeNHA
			Kaya	Relocation	KeNHA
2	Technologies	Intertidal	Fishing styles	Documentation and relocation	KeNHA
	Sites		Landing sites	Excavation and relocation	KeNHA
	Building		Monument	Retain / Restore negotiate with KeNHA	KeNHA
3	Archaeology	Underwater	Stone Anchor	Rescue / Retrieval / Conservation	KeNHA
4	Post project heritage management	Fort Jesus Museum	・Analysis of stone anchor ・Conservation of anchors ・Publication of anchor ・Storage / Exhibition		KeNHA

Source: Preliminary Cultural Heritage Impact Assessment for the Proposed Mombasa Gate Bridge Project, NMK

NMK will prepare and submit a final report including detailed mitigation measures. Based on the mitigation policy of NMK, feasible and tangible mitigation measures are continuously discussed among KeNHA, NMK and a design team of detail design phase.

(19) Landscape

1) Current Conditions and Expected Impacts

Since the project is a huge bridge structure, it could give rise to negative impacts on the immediate landscape. Although the location of the bridge is not a designated scenery protection area, the location is regarded as the sea gate of Kenya and it is close to Mama Ngina Park which is a place of recreation for citizens. Therefore, appropriate considerations should be taken into account in the design of the bridge to be in concert with the surrounding landscape including Mama Ngina Park. As part of the ESIA study, KeNHA held a number of stakeholder meetings where the design that the Survey Team proposed was presented to stakeholders. To date, there have been no public comments about the bridge design.

Figure 14.6-27 Bridge Design as of Basic Design Stage

2) Mitigation Measures

As of feasibility study phase, there is no tangible design of the bridge structure. After moving a detail design stage, more detailed design has to be studied based on stakeholders and public opinions under information disclosure.

(20) Gender

1) Current Conditions

Gender inequality in Mombasa County is manifested in all spheres of life and poses a serious development challenge. The enrolment rate in schools indicates that 49 percent, 51 percent and 48 percent of those enrolled in pre-primary, primary and secondary schools are girls respectively. The dropout rate for girls is lower than for boys but their performance is poorer.

Statistics from the Kenya National Chamber of Commerce and Industry shows that 70 percent of its business members are men, whereas women and the youth account for 30 percent. The majority of women depend on petty trade and low-income jobs. Low representation of women in decision making organs (civic and development committees) is also a major gender issue. Gender disparities are also found in government institutions where more than 80 percent of all the departmental heads and their deputies are men. The same trend is evident in all major private sector institutions such as tourist hotels[19].

2) Expected Impacts due to Construction Activities

Since the project is a big project, a lot of employment for women will be generated on construction activities. It is expected that a lot of women could get jobs and thereby livelihoods.

Construction activities may impact on community roads and affect women's daily activities. To mitigate this, temporary detour roads will be prepared. During the detail design phase, this will be studied.

3) Expected Impacts during Operation Stage

Around the Likoni Ferry jetties, a lot of women are vending and using the ferry service. (see Figure 14.6-28) If the ferry service is terminated, the women would be seriously affected.

Figure 14.6-28 Vendors around Likoni Jetty

Kenya Ferry Service who operates the ferry service is addressing the continuation of the ferry for pedestrians and light vehicles.[20] Therefore, it is expected that there would be no significant negative impacts on the ferry users including challenged persons.

On the other hand, it is expected that ferry users themselves will decrease. Although the current number of ferry users (pedestrian) are 226,000 a day, it is expected that the number on 2040 are 124,000 a day. Although decrease of the ferry users may affect the income of the women vendors around the ferry jetties, it is not clear which the income of the women vendors depends on, and which areas will be affected. Also, there is an opinion that since the area is the economic center of Likoni area, decrease of ferry users will not almost affect the income of the vendors. Regarding local economy of Mombasa area, CGM has a responsibility, and handles mitigation measures. However, as project proponents, KeNHA needs to monitor the situation and harmonize with CGM to carry out the mitigation measures. If negative impacts such as decrease of income or loss of job are foreseen, mitigation measures such as job training should be taken. KeNHA is carrying out a job training program implementation on the other project[21]. Such experience should be utilized in the project

[19] Mombasa county Government: First County Integrated Development Plan 2013-2017
[20] On a meeting which was held by KFS and the Survey Team at 9th October 2017
[21] Regional Mombasa Port Access Road - Resettlement Action Plan for the proposed dualling of Mombasa - Mariakani Road

(21) Children's Rights

1) Current Conditions (Child Labour)

According to a report on Kenya's child labour[22], Kenya had 1.9 million working children (1998/99 surveys) who were thus deprived of a worthwhile childhood as well as access to quality education. Some of these children were heads of households mainly due to the effects of HIV/AIDS among other factors. The majority of these children lived in poverty.

On the other hand, Kenya's parliament passed the National Policy on the Elimination of Child Labour, and Kenya made a moderate advancement in efforts to eliminate the worst forms of child labour. In addition, the Kenyan police established a new Child Protection Unit to investigate cases of child exploitation such as commercial sexual exploitation. However, Kenya has yet to ratify the UN CRC Optional Protocol on the Sale of Children, Child Prostitution and Child Pornography. In addition, the age gap between the compulsory education age and the minimum age for work leaves children vulnerable to child labour, as they are not required to attend school at age 14 but cannot legally work until age 16. The Government has also not committed sufficient resources for enforcement efforts[23].

Table 14.6-39 Statistics on Children's Work and Education

Children	Age	Percent
Working (% and population)	5 to 14	35.6 (3,736,030)
Attending School (%)	5 to 14	85.8
Combining Work and School (%)	7 to 14	23.0
Primary Completion Rate (%)		105.2

Source: Child Labor and Forced Labor Reports, United States Department of Labor
(https://www.dol.gov/agencies/ilab/resources/reports/child-labor/kenya)

2) Mitigation Measures to avoid Child Labour

Children's work sectors in Kenya include construction and quarrying. In this project, to avoid child labour on construction activities, prohibition of child labour is going to be formulated within TOR for contractors.

3) Expected Impacts (Dividing of School-Commuting Roads) and Mitigation Measures

The approach road on the Mainland side would be on an embankment. There are some schools in the vicinity of the project site (Figure 14.6-30) The school-commuting roads may be divided by the embankment road.

To avoid the dividing of the school-commuting roads, culvert boxes would be installed every 100~200m beneath the embankment road (Figure 14.6-29). Total number of the culvert boxes is estimated seven for main roads and ten for community roads. The culvert boxes would keep the school-commuting roads open, and additionally provide connections between communities. In addition to this, temporary fences and barriers, as needed, will be installed for security during construction.

[22] Child Labour Analytical Report, June 2008, Kenya National Bureau of Statistics in collaboration with ILO/IPEC
[23] Child Labor and Forced Labor Reports, United States Department of Labor
(https://www.dol.gov/agencies/ilab/resources/reports/child-labor/kenya)

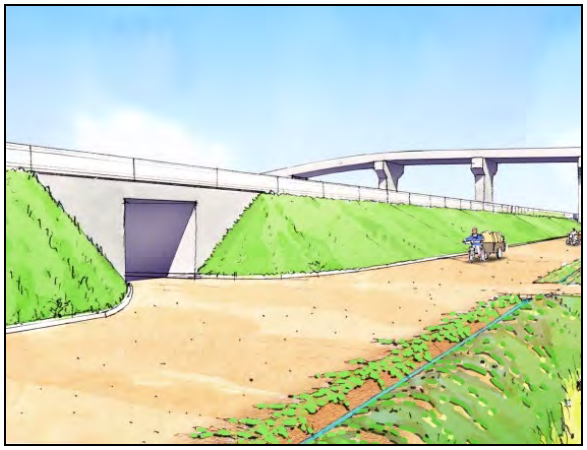


Figure 14.6-29 Culvert Maintaining Community Road

Figure 14.6-30 Educational Facilities around the Project Site

(22) Infectious Diseases such as HIV/AIDS[24]

1) Current Conditions

Kenya is one of the four HIV 'high burden' countries in Africa. About 1.5 million people were living with HIV infection at the end of 2015. The high burden of HIV and AIDS in Kenya accounts for an estimated 29 per cent of annual adult deaths, 20 per cent of maternal mortality, and 15 percent of deaths of children under the age of five. The epidemic has also negatively affected the country's economy by lowering per capita output by 4.1 per cent. Kenya has an estimated 71,034 new HIV infections among adults and about 6,613 new infections among children annually. Stable and married couples are the most affected, as this group accounts for 44 per cent of the new adult infections.

HIV prevalence in Mombasa is 1.3 times higher than the national prevalence at 7.5% (Kenya HIV Estimates 2015). The HIV prevalence among women in the county is higher (10.7%) than that of men (4.6%), indicating women are more vulnerable to HIV infection than men in the county.

Mombasa County contributed to 3.6% of the total number of people living with HIV in Kenya, and is ranked the seventh nationally. By the end of 2015, a total of 54,310 people were living with HIV in the county, with 19% being young people aged 15-24 years and 7% being children under the age of 15 years.

Approximately 253 children and 1,199 adults died of AIDS-related conditions in 2015. There was a decrease of 28% of HIV-related deaths among the children aged below 15 years and a decrease of 40% among adults aged 15 years and above since 2013 in the county.

2) Expected Negative Impacts during Construction Stage and Mitigation Measures

Implementation of the project will generate a lot of construction workers. Considering the

[24] Description of facts is based on "Kenya HIV County Profiles 2016", Ministry of Health

situation of HIV prevalence in Mombasa, enlightenment and education for the construction workers to prevent expanding AIDS/HIV prevalence is required.

(23) Working Conditions (including Occupational Safety)

The project is a huge bridge construction. The construction activities will include high-place work exceeding 200m. Such activities may incur serious accidents such as the falling of workers and materials. To prevent such serious accidents, a safety plan for construction has to be prepared including sufficient and effective safety procedures, providing safety gear, education and enlightenment for workers.

(24) Accidents

1) Expected Negative Impacts due to Construction Activities and Mitigation Measures

Since the project includes structures exceeding a height of 200m, construction work in high places will be required. Construction workers working in high place are exposed to a high risk of falling. The channel of the project site is an active waterway where a lot of vessels come and go. The falling of materials may incur fatal accidents. Considering these situations, a construction plan including stable safety management has to be prepared during the detail design stage.

2) Expected Impacts during Operation Stage

Upon completion of the project, vehicle transportation by Likoni Ferry is to be abolished. In the past, some accidents on ferry operation have been reported such as the wrecking of a ferry and boarding trouble for heavy trucks. The operation of the project would contribute to a decrease in such accidents.

(25) Trans-Boundary Impacts or Climate Change

1) Expected Negative Impacts due to Construction Activities (Greenhouse Gas Emission) and Mitigation Measures

Construction machinery will temporarily increase greenhouse gases. To reduce the emission of greenhouse gases, the machinery needs to be well maintained. And/or the introduction of energy saving machinery is desirable. Rational operation of the construction machinery is important. These should be included in a construction plan which is formulated in the D/D stage.

On the Mainland, 16,713 trees will be felled for the construction of the approach road. The ability of CO_2 absorption by these trees would thereby be lost. Since the annual CO_2 absorption of a tree is estimated to be roughly 80kg[25], the total absorption loss of CO_2 is computed to be roughly 1,340t. To mitigate this, reforestation elsewhere of the same number of the felled trees is proposed.

2) Expected Impacts during Operation Stage (Reduction of Greenhouse Gas Emission)

Under current conditions, there are daily long queues of vehicles at Likoni Ferry ports. Vehicles which are waiting to board are consuming fuels by idling. Because the project resolves vehicle queues at Likoni Ferry, reduction of CO_2 emission is expected. The prediction of CO_2 reduction by the project is shown on *Chapter 13, 13.5 Climate Change Mitigation Effect*.

As a result of the improvement in travel speeds, based on the traffic demand forecast for the

[25] Forestry Agency, Japan, （http://www.rinya.maff.go.jp/j/sin_riyou/ondanka/20141113_topics2_2.html）

whole area, the reduction of CO_2 emissions was estimated to be 46 ton/day in 2030 and 47 ton/day in 2040. In addition to this, by eliminating waiting queues of vehicles at Likoni Ferry jetties, the reduction of CO_2 emission was estimated as 15.7ton/day in 2030 and 21.4ton/day in 2040.

It is expected that the implementation of the project will contribute to reducing the CO_2 emission of Kenya's traffic sector.

14.7 The Assessment of Impacts

Draft scoping and results of the survey are shown on Table 14.7-1.

Table 14.7-1 Draft Scoping and Results of the Survey

No	Items	Evaluation				Reason of Evaluation
		Scoping		After Survey		
		Before/ Under Construction	Operation	Before/ Under Construction	Operation	
Pollution Control						
1	Air pollution	B-	B±	B-	B±	**Construction Phase**: ・ Construction work and the operation of construction machinery will generate air pollutants including dust. To avoid this air pollution, appropriate mitigation measures are required. **Operation Phase:** ・ Reduction of vehicle queues at Likoni Ferry ports will decrease the emission of air pollutants. Negative impacts around the approach roads are insignificant considering the road structure and so on.
2	Water pollution	B-	B-	A-	B-	**Construction Phase:** ・ The project involves installing piers in Kilindini Harbor. The construction work for the piers may cause turbidity of the marine water without appropriate mitigation measures. ・ Construction work of the embankment may cause the turbidity of creeks close to the site without appropriate mitigation measures. **Operation Phase:** ・ Accumulated dust on the approach road (on Mainland side) may cause the turbidity of creeks close to the site without appropriate mitigation measures.

No	Items	Evaluation				Reason of Evaluation
		Scoping		After Survey		
		Before/ Under Construction	Operation	Before/ Under Construction	Operation	
3	Waste	B-	B-	B-	B-	**Construction Phase:** ・ The construction work generates waste including cutting trees, debris of existing structures, excavation soil, general waste of construction site and construction materials. **Operation Phase:** ・ Since the bridge and approach roads are a toll road, a project operator maintains the road facility and manages waste. Although there is no significant concern about waste, monitoring for the operation is required. ・ Disposal of solid waste from road user may occur without appropriate mitigation measures.
4	Soil pollution	D	D	N/A	N/A	-
5	Noise and Vibration	A-	A±	A-	A±	**Construction Phase:** ・ Construction works will cause noise and vibration to neighbourhoods without mitigation measures. **Operation Phase:** ・ Noise and vibration along the approach roads can occur. Appropriate mitigation measures are required. ・ Noise around Likoni Ferry jetties are reduced by the traffic shift.
6	Ground subsidence	D	D	N/A	N/A	-
7	Offensive odours	D	D	N/A	N/A	-
8	Bottom sediment	B-	D	D	N/A	**Construction Phase:** ・ Sediment of Kilindini Harbor around the project site includes an extremely low volume of pollutants such as heavy metals and organic matters. Therefore, construction activities do not cause water pollution derived from bottom sediment.
Natural Environment						
9	Protected areas	C-	D	D	N/A	**Construction Phase:** ・ The Mombasa Marine National Park & Reserve is located roughly 6 km from the project site. It is expected that the construction activities will not affect the national marine park because no significant negative impacts are expected on thewater quality of Kilindini Harbor.

No	Items	Evaluation				Reason of Evaluation
		Scoping		After Survey		
		Before/ Under Construction	Operation	Before/ Under Construction	Operation	
10	Ecosystem	B-	C-	B-	D	**Construction Phase:** ・ There are some endangered species in/around the project site, especially the marshland (Ziwani Lake). With appropriate mitigation measures, a monitoring survey is recommended to minimize negative impacts to the mangrove ecosystem and small fishery activities. In the event that some impacts are found, supplementary mitigation measures should be examined and implemented. For logged trees identified in the detail design phase, replanting should be implemented and monitored.
11	Hydrology	B-	B-	D	D	**Construction / Operation Phase:** ・ A pier will be installed in Kilindini Harbor. However, the profile area of the pier is small compared to the profile area of the channel. The negative impacts on the tidal current of Kilindini Harbor is insignificant.
12	Geographical features	B-	D	B-	N/A	**Construction Phase:** ・ The project needs gravel, sand and filling soil. Geographical features of quarry sites and borrow pits preparing the materials may be affected. Licensed quarry sites and borrow pits shall be selected.
Social Environment						
13	Resettlement/ Land Acquisition	A-	D	A-	N/A	**Before Construction Phase:** ・ 2,523 PAUs will be displaced. **Operation Phase:** ・ Impact will remain if RAP is not carried out appropriately. ・ Additional physical resettlement and land acquisition will not be required for this Project. **Pre-Construction Phase:** ・ A 62.6 ha of large scale land acquisition and 3,156 of PAPs are assumed. **Operation Phase:** ・ Impact will be small when the prepared RAP is applied.

No	Items	Evaluation				Reason of Evaluation
		Scoping		After Survey		
		Before/ Under Construction	Operation	Before/ Under Construction	Operation	
14	Poor people	B-	B-	B-	B-	**Pre-Construction Phase:** ・ Some of the poor people who do not have their own land living within the Right of Way (ROW) will be severely affected by resettlement. Appropriate measures by RAP are required. Vulnerable persons may be affected by conversion of transport measures. **Construction Phase and Operation Phase:** ・ In the event that the Likoni Ferry operation is terminated due to the Bridge, it may affect the mobility of the poor people as the ferry is the sole form of public transportation between the Island and the mainland. **Construction Phase:** ・Poor whose income is less than 20,000 Ksh are living in the project sites are affected. **Operation Phase:** ・Further impact will be mitigated by the prepared RAP.
15	Ethnic minorities and indigenous peoples	C	C	B-	D	**Pre-Construction Phase:** **Construction Phase:** ・The project site does not affect the settlement or activity areas of ethnic minorities and indigenous peoples. However, Muslims who are included in the PAPs are religious minorities in Kenya. On the land acquisition and resettlement, misdistribution and unfairness must be excluded. **Operation Phase:** ・The project does not have an impact on ethnic minorities and indigenous people.
16	Local economies, such as employment, livelihood, etc.	B±	B±	B±	B±	**Construction Phase:** ・ Construction will create job opportunities for local people. ・ Construction activities may have an impact on the local fishery. Monitoring for the water quality at Mweza creek is required. **Operation Phase:** ・ Reduction of travel time will contribute to local economies. ・ As of now, the Kenya Ferry Service will continue the operation of the ferry service even after the opening of the project. The operation of the Kenya Ferry Service should be monitored.

No	Items	Evaluation				Reason of Evaluation
		Scoping		After Survey		
		Before/ Under Construction	Operation	Before/ Under Construction	Operation	
17	Land use and utilization of local resources	C	C	B-	D	**Construction Phase:** ・ Land acquisition for the ROW will require change of land use such as from agricultural land to roads. However, since the project is a linear project, the change of land use would be dispersed. The negative impact is not significant. On the other hand, the change of land use will require the removal of a lot of trees. **Operation Phase:** ・ The project operation does not change land use and utilization of local resources.
18	Water usage	D	D	N/A	N/A	-
19	Existing social infrastructures and services	B-	B±	B-	B±	**Pre-Construction/Construction Phase:** ・ Relocation or protection of existing utilities, such as electric poles, water pipes and optical fibre cable will be required. Affected power distribution infrastructure, tele communication ducts and wires, sewer lines and storm water lines will be shifted/transferred. Therefore, there are no significant impacts. **Operation Phase:** ・ As of now, the Likoni Ferry operation will continue even after the opening of the project. Therefore it may not affect the mobility of the people, particularly poor people, as the ferry is the sole form of public transportation between the Island and the mainland. However, monitoring for the operation of the Likoni ferry operation should be required. ・ Access to social services will be improved. ・ To prevent the splitting of local communities or widening disparity, box culverts will be installed to connect communities on both side of the approach roads. ・ By continuation of the ferry operation, conversion of transport measures may not affect local people.

No	Items	Evaluation				Reason of Evaluation
		Scoping		After Survey		
		Before/ Under Construction	Operation	Before/ Under Construction	Operation	
20	Social structure such as social capital and local decision-making institutions	B-	B-	B-	B-	**Construction Phase:** **Operation Phase:** ・On the Mainland side, the embankment over several kilometer may cause a split of local communities or a widening disparity along the approach roads.
21	Misdistribution of benefits and damages	B-	C	B-	B-	**Pre-Construction Phase:** **Construction Phase:** ・Unfairness among PAPs may occur. Implementation of an appropriate RAP will mitigate the unfairness among the PAPs. **Operation Phase:** ・A decrease in Likoni Ferry users may incur local conflicts. However, as of now, the Likoni Ferry operation will continue even after the opening of the project.
22	Local conflicts of interest	C	C	B-	B-	
23	Cultural heritage	C	D	B-	N/A	**Construction Phase:** ・Because Mombasa is an historical area, construction works may affect cultural properties. Besides the EIA survey, KeNHA conducts CIA survey. According to the result of the CIA survey, KeNHA takes needed procedure.
24	Landscape	B-	B-	B-	B-	**Construction / Operation Phase:** ・There are no landscape preservation areas affected by the Project. However, because an enormous artificial structure will appear in the area, an impact on the landscape is likely to occur. Since there is no tangible design on the F/S stage, negative impacts to landscape is not fixed. On the D/D phase, tangible design should be discussed on stakeholder meetings.
25	Gender	B+	B-	B+	D	**Construction Phase:** ・There are some construction and related works which women can undertake. **Operation Phase:** ・Women account for a considerable portion of the ferry passengers. Termination of the ferry service, thus, will have an impact on the women's activities. However, as of now, the Likoni Ferry operation will continue even after the opening of the project.

No	Items	Evaluation				Reason of Evaluation
		Scoping		After Survey		
		Before/ Under Construction	Operation	Before/ Under Construction	Operation	
26	Children's rights	B-	B-	B-	B-	**Construction / Operation Phase:** ・ Kenya still has a child labour problem. To avoid the problem on the construction work, TOR for contractors should include the prohibition of child labour. ・ The structure of the approach road in the mainland side is an embankment. Since the embankment may divide school-commuting roads ,the installation of culvert boxes will be required to keep them open. .
27	Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	**Construction Phase:** ・ The infection risks of HIV/AIDS may be increased among construction workers and relevant local business. Construction activities generate a lot of workers. To avoid an increase in the prevalence of HIV/AIDS, suitable mitigation measures for the workers are required.
28	Working conditions (including occupational safety)	B-	D	B-	N/A	**Construction Phase:** ・ Works in elevated places may be a risk to worker's safety. Suitable mitigation plans such as a construction safety plan have to be prepared. ・ A worker's camp site will be not required for this project because the project site is in/near an urban area.
29	Accidents	B-	B±	B-	B±	**Construction Phase:** ・ Since the project includes high place activities, there are risks of significant accidents. Suitable mitigation plans such as a construction safety plan have to be prepared. **Operation Phase:** ・ Traffic accidents may happen in and along the approach roads and on the bridge. Proper safety measures should be required. ・ After the operation of the project, vehicle transportation by Likoni Ferry is abolished. The operation of the project contributes to a decrease in the risks of ferry accidents
Others						

No	Items	Evaluation				Reason of Evaluation
		Scoping		After Survey		
		Before/ Under Construction	Operation	Before/ Under Construction	Operation	
30	Trans-boundary impacts or climate change	B-	B±	B-	B+	**Construction Phase:** ・ Operation of construction machinery will temporarily increase greenhouse gases. A construction plan including a rational operation of machinery has to be prepared. ・ By tree cutting, the absorption capacity of CO_2 is lost. Replanting is required as a mitigation measure. **Operation Phase:** ・ The project will solve the queue of vehicles waiting a ferry, and reduce the emission gases including CO_2.

A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)
D: No impact is expected
N/A: Not Applicable
* Impact Items refer to "JICA Guidelines for Environmental and Social Considerations April 2010"

14.8 Mitigation Measures and Costs

Regarding the items which were evaluated as A-, B-, or C on the scoping matrix (Table 14.7-1), mitigation measures are shown on Table 14.8-1 and Table 14.8-2.

Table 14.8-1 Mitigation Plan and Cost on Construction Phase

No	Items	Mitigation Measures	Cost	Responsibilities of Implementation
1	Air Pollution	・ Water spray on construction site to prevent dust generation ・ Suitable and continuous maintenance of construction machinery to control exhaust gases ・ Installation of temporary walls on the construction sites ・ Formulation of rational construction plan to reduce operation hours of construction machinery	To be included in service fee of construction	Contractor (supervised by KeNHA)
2	Water pollution	・ Installation of silt curtain around the main piers to prevent diffusion of marine water turbidity ・ Installation of temporary drainage gathering turbid water and sediment tank. ・ Installation of silt curtain at Mweza creek ・ Monitoring of the water quality	To be included in service fee of construction (Installation of silt curtain: 6.7 million Ksh. Drainage and soil cover: 1.8 million Ksh.) Monitoring cost is shown on Table 14.9-1.	Contractor (supervised by KeNHA)

No	Items	Mitigation Measures	Cost	Responsibilities of Implementation
4	Waste	・ Preparation of a waste management plan including appropriate treatment of construction waste, and implementation of the plan	To be included in service fee of construction	Contractor (supervised by KeNHA)
5	Noise and Vibration	・ Suitable and continuous maintenance of construction machinery to control noise emission ・ Installation of temporary walls around the construction sites to prevent noise propagation, as needed ・ Formulation of rational construction plan to reduce operation hours of construction machinery ・ Monitoring of construction noise	To be included in service fee of construction Monitoring cost is shown on Table 14.9-1.	Contractor (supervised by KeNHA)
10	Ecosystem	・ Monitoring of ecosystem including mangrove forest around Mwetza creek and Ziwani lake ・ Tree planting to mitigate tree cutting	Monitoring cost is shown on Table 14.9-1. Implementation of reforestation: 20 million Ksh	Contractor (supervised by KeNHA)
13	Geographical features	・ On procurement of aggregate and filling soil, licensed quarry sites and borrow pits shall be selected.	To be included in service fee of construction	Contractor (supervised by KeNHA)
14	Resettlement/ Land Acquisition	・ Appropriate implementation of land acquisition and resettlement based on RAP	To be shown on RAP	KeNHA,
15	Poor people	Ditto	Ditto	KeNHA
16	Local economies, such as employment, livelihood, etc.	・ Appropriate implementation of RAP	To be shown on RAP	KeNHA
		・ To confirm whether quite employments are channeled to local persons ・ Monitoring of the marine water quality and fishery at Mweza creek	To be included in service fee of construction Monitoring cost is shown on Table 14.9-1.	Contractor (supervised by KeNHA)
19	Existing social infrastructures and services	・ To confirm whether utilities are relocated appropriately ・ Preparation of traffic management plan in construction stage, and implementation of the plan	To be included in service fee of construction Monitoring cost is shown on Table 14.9-1.	KeNHA
21	Misdistribution of benefits and damages	・ Appropriate implementation of land acquisition and resettlement based on RAP	To be shown on RAP	KeNHA
22	Local conflicts of interest	・ Monitoring for Likoni Ferry operation	To be included in consultant fee	KeNHA, consultant
23	Cultural heritage	(before construction) ・ Implementation of CIA survey ・ Based on the results of the CIA survey, needed procedures are taken.	CIA survey: 12.8 million Ksh Due to the result of the CIA survey	KeNHA

No	Items	Mitigation Measures	Cost	Responsibilities of Implementation
25	Landscape	・ (before construction) Information disclosure and continuous discussion with residents, and adoption of opinions to secure landscape on the D/D stage	To be included in service fee of D/D consultant	KeNHA, D/D Consultant
27	Children's right	・ To confirm that TOR includes a provision of exclusion of child labour on the construction, and the implementation of that requirement. ・ To ensure educational opportunities of children in school to be relocated ・ Preparation of traffic management plan and implementation		KeNHA, Consultant Contractor (supervised by KeNHA)
28	Infectious diseases such as HIV/AIDS	・ Education and enlightenment for construction workers to prevent prevalence of HIV/AIDS	To be included in service fee of construction	Contractor (supervised by KeNHA)
29	Working conditions (including occupational safety)	・ Preparation of work safety plan and implementation	To be included in service fee of construction	Contractor (supervised by KeNHA)
31	Accidents	・ Preparation of work safety plan and traffic management plan and implementation ・ Installation of suitable safety facility on construction site ・ Suitable use of personal safety equipment to secure safety of workers ・ Education and enlightenment for construction workers to prevent accidents	To be included in service fee of construction	Contractor (supervised by KeNHA)
30	Trans-boundary impacts or climate change	・ Suitable and continuous maintenance of construction machinery to reduce fuel consumption ・ Introduction of energy saving construction machinery	To be included in service fee of construction	Contractor (supervised by KeNHA)

Table 14.8-2 Mitigation Plan and Cost on Operation Phase

No	Items	Mitigation Measures	Cost	Institutional Responsibilities
2	Water pollution	・ Maintenance of drainage system along the approach road	To be included in routine operation	KeNHA (Operator)
4	Waste	・ Maintenance of the road facility ・ Protection measures against solid waste disposal from road users	To be included in routine operation	KeNHA (Operator)
13	Resettlement/ Land Acquisition	・ Monitoring of RAP implementation	To be shown on RAP	Third party
15	Poor people	Ditto	Ditto	Ditto
16	Local economies, such as employment, livelihood, etc.	・ Monitoring of RAP implementation ・ Monitoring of the Likoni Ferry operation	To be shown on RAP To be included in routine operation	KeNHA (Operator)
19	Existing social infrastructures and services	・ Monitoring of the Likoni Ferry ・ Monitoring of dividing of the communities	To be included in routine operation	KeNHA (Operator)

No	Items	Mitigation Measures	Cost	Institutional Responsibilities
23	Misdistribution of benefits and damages	・ To confirm APs if displacement is carried out appropriately in accordance with RAP ・ To confirm the paid compensation and LIRP are appropriate or not. ・ Monitoring of the Likoni Ferry operation	KeNHA will hire outsourced monitoring firm.	KeNHA
25	Gender	・ Monitoring of the Likoni Ferry operation	To be included in routine operation	KeNHA (Operator)
26	Children's rights	・ To confirm whether school-commuting route is kept by installation of culvert box	To be included in routine operation	KeNHA (Operator)
31	Accidents	・ Preparation of operation plan to secure occupational safety	To be included in routine operation	KeNHA (Operator)

14.9 Monitoring Plan

14.9.1 Monitoring Plan

To prevent deterioration of the environment and the social situation, monitoring of the environment and social items which were evaluated as possible negative impacts should be monitored, reported upon and inspected. Monitoring plans are shown on Table 14.9-1 and Table 14.9-2.

Table 14.9-1 Monitoring Plan and Cost on Construction Phase

No	Items	Method of Monitoring	Locations	Frequency	Cost	Responsibilities of Implementation
1	Air Pollution	Confirmation of mitigation measures of a construction plan	-	Before commencement of construction work	To be included in consulting cost	Consultant KeNHA)
		Confirmation of implementation of mitigation measures on site	Construction sites	During construction period	To be included in consulting cost	Consultant (KeNHA)
		Sample collection and laboratory analysis PM_{10}, $PM_{2.5}$, NOx, CO, Pb	6 locations	Two times a year 24 hours	3.2 million Ksh/year	Contractor (supervised by KeNHA)
2	Water pollution	Confirmation of mitigation measures in construction plan	-	Before commencement of construction work	To be included in consulting cost	Consultant KeNHA)
		Confirmation of implementation of mitigation measures on site	Construction sites	During construction period	To be included in consulting cost	Consultant KeNHA)
		Sample collection and laboratory analysis pH, DO, COD, TSS, oil grease, and Total Coliform Index.	2 locations	Two times a year	0.3 million Ksh	Contractor (supervised by KeNHA)
4	Waste	Confirmation of waste management plan	-	Before commencement of construction work	To be included in consulting cost	Consultant (KeNHA)

No	Items	Method of Monitoring	Locations	Frequency	Cost	Responsibilities of Implementation
		Confirmation of records of construction activities	Construction sites	During construction period	To be included in consulting cost	Contractor (supervised by KeNHA)
5	Noise and Vibration	Confirmation of mitigation measures in construction plan	-	Before commencement of construction work	To be included in consulting cost	Consultant (KeNHA)
		Confirmation of implementation of mitigation measures on site	Construction sites	During construction period	To be included in consulting cost	Consultant (KeNHA)
		Noise measurements	6 locations	One time a month 24 hours	7.2 million Ksh/year	Contractor (supervised by KeNHA)
10	Ecosystem	Survey of fauna and flora around Mweza creek and Ziwani Lake	Around the project site	Two times a year	1.6 million Ksh/year	Contractor (supervised by KeNHA)
		Record of trees fallen	Construction Site	Before commencement of construction work and during construction work	Included in consulting cost	Contractor (supervised by KeNHA)
		Confirmation of preparation of tree-planting plan and implementation	tree-planting site	During construction work		Consultant (KeNHA)
12	Geographical features	Confirmation for that licensed quarry sites and borrow pits are selected	-	Before commencement of construction work	Included in consulting cost	Consultant (KeNHA)
14	Involuntary resettlement	Implementation record on land acquisition/resettlement	Implemented sites	During land acquisition and resettlement	Included in consulting cost	Consultant [26](KeNHA)
15	Poor people	Yearly income of APs	Implemented sites	Before and after resettlement	Included in consulting cost	Consultant (KeNHA)
16	Local economies, such as employment, livelihood, etc.	Implementation record on land acquisition/resettlement	Implemented sites	During land acquisition and resettlement	Included in consulting cost	Consultant (KeNHA)
		Confirmation of construction record (situation of employment)	-	During construction stage	Included in consulting cost	Consultant (KeNHA)
		Sampling and analysis of marine water Confirmation of fish catch at Mweza creek	Mweza creek	2 times a year	Included in consulting cost	Consultant (KeNHA)
19	Existing social infrastructures and services	Record of utility relocation Site survey and interview	Project site	Before commencement of construction work	Included in consulting cost	Consultant (KeNHA)

[26] Regarding RAP Monitoring, an external monitoring is also carried out in addition to internal monitoring in the table. Generally the external monitoring work is committed to a third party such as university, consultants and NGOs.

No	Items	Method of Monitoring	Locations	Frequency	Cost	Responsibilities of Implementation
22	Misdistributio n of benefits and damages	Yearly income of PAPs	Implemen ted sites	Before and after resettlement	Included in consulting cost	KeNHA (Operator)
22	Local conflicts of interest	Interview on the Kenya Ferry Service about the operation	-	During construction period	Included in consulting cost	Consultant (KeNHA)
23	Cultural heritage	Confirmation of CIA report and that needed procedure is taken	-	Before commencement of construction work	Included in consulting cost	Consultant (KeNHA)
25	Landscape	Confirmation of records of public consultations	-	During detail design	To be included in detail design fee	KeNHA
28	Infectious diseases such as HIV/AIDS	Confirmation of records of construction activities including protection against HIV/AIDS	Construct ion sites	During construction period	To be included in construction cost	Contractor (supervised by KeNHA)
29	Working conditions (including occupational safety)	Confirmation of safety plan of construction work	-	Before commencement of construction work	To be included in consulting cost	Consultant (KeNHA)
		Confirmation of records of construction activities including safety	Construct ion sites	During construction period	To be included in consulting cost	Consultant (KeNHA)
31	Accidents	Confirmation of safety plan of construction work	-	Before commencement of construction work	To be included in consulting cost	Consultant (KeNHA)
		(Implementation of safety plan) Confirmation of records of construction activities	Construct ion sites	During construction period	To be included in consulting cost	Consultant (KeNHA)
30	Trans-boundar y impacts or climate change	(Maintenance of construction machinery) Confirmation of construction records	Construct ion sites	During construction period	To be included in consulting cost	Consultant (KeNHA)
		(Replanting) Confirmation of records of construction activities and field reconnaissance	Subject fields	After completion of replanting	To be included in consulting cost	Consultant (KeNHA)

Table 14.9-2 Monitoring Plan and Cost of Operation Phase

No	Items	Monitoring Methods	Locations	Frequency	Cost	Responsibilities of Implementation
1	Air Pollution	Sample collection and laboratory analysis PM_{10}, $PM_{2.5}$, NOx, CO, Pb	6 locations	Two times a year 24 hours	3.2 million Ksh/year	KeNHA (Operator)

No	Items	Monitoring Methods	Locations	Frequency	Cost	Responsibilities of Implementation
2	Water pollution	Confirmation of operation records about the road maintenance	Project site	Routine work on the operation	To be included in the project cost	KeNHA (Operator)
4	Waste	Confirmation of operation records about the road maintenance	Project site	Routine work on the operation	To be included in the project cost	KeNHA (Operator)
5	Noise and Vibration	Noise measurements	6 locations along the approach roads	One time after the commencement of the project	0.6 million Ksh	KeNHA (Operator)
10	Ecosystem	Confirmation of tree-planting and maintenance implementation	tree-planting site	Routine work on the operation	To be included in the project cost	Consultant (KeNHA)
13	Resettlement /Land Acquisition	Interview for PAPs and others	-	One time after the commencement the project	To be shown on the RAP	KeNHA (Operator)
15	Poor people	Review for RAP monitoring reports and interview on PAPs	-	One time after the commencement of the project	To be shown on the RAP	KeNHA (Operator)
16	Local economies, such as employment, livelihood, etc.	Review for RAP monitoring reports and interview on PAPs	-	One time after the commencement of the project	To be shown on the RAP	KeNHA (Operator)
		Interview on the Kenya Ferry Service about the operation	-	One time after the commencement of the project	To be included in the project cost	KeNHA (Operator)
22	Misdistribution of benefits and damages	Review for RAP monitoring reports and interview on PAPs	-	One time after the commencement the project	To be shown on the RAP	KeNHA (Operator)
25	Gender	Interview on the Kenya Ferry Service about the operation	-	One time after the commencement the project	To be included in the project cost	KeNHA (Operator)
26	Children's rights	Site survey and interview on community's persons	Along the embankment section	One time after the commencement the project	To be included in the project cost	KeNHA (Operator)
31	Accidents	Review for the operation plan	-	One time after the commencement the project	To be included in the project cost	KeNHA (Operator)

14.9.2 Reporting and Inspection

Results of the monitoring survey need to be reported upon and reflected in the Detailed Design and construction of the Project to ensure conservation of the environment and social conditions.

Pre-construction Phase

Before starting construction, land acquisition and resettlement are to be implemented as one of the main events of the environmental and social considerations. On the RAP implementation, monitoring for the RAP implementation is conducted by consultants. The consultant compiles the result of the monitoring as monitoring reports and submits them to KeNHA who then submit the reports to JICA. Regarding other monitoring items such as utility relocation, consultants

carry out monitoring and submit a monitoring report to KeNHA.

Construction Phase

Regarding the construction activities, most of the monitoring would be undertaken by contractors. The contractors conduct the monitoring, compile monitoring reports, and submit the reports to KeNHA. KeNHA then submit the monitoring reports to JICA. Moreover, KeNHA should share the reports with NEMA. Although there is no legal basis for NEMA's involvement in the monitoring, NEMA's involvement is recommended.

Operation Phase

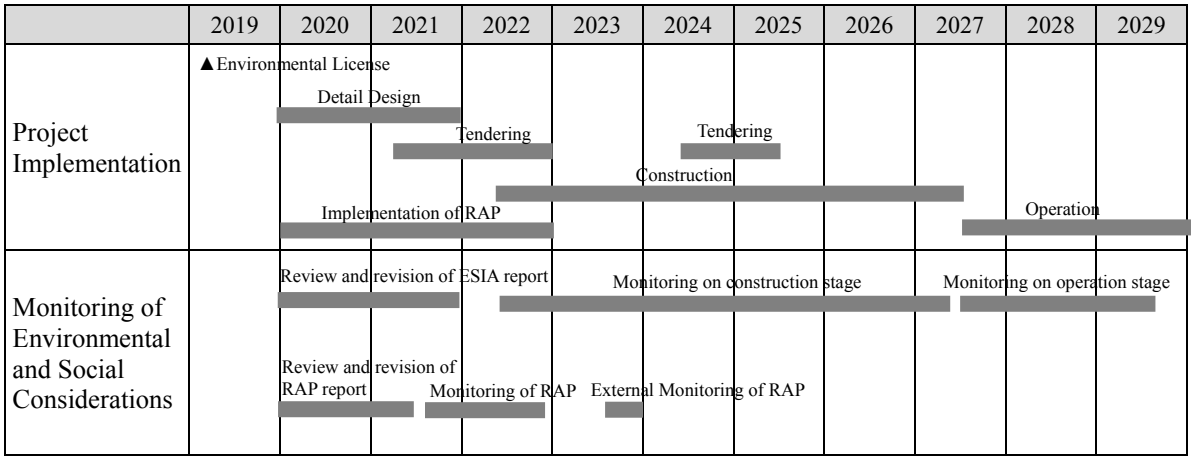
During the operation phase, KeNHA (operator) has a responsibility for the implementation of the monitoring. KeNHA compiles monitoring reports from the results of the monitoring and submits the reports to JICA. As with the construction phase, KeNHA should share the reports with NEMA.

Table 14.9-3 Monitoring Report

Phase	Preparation	Contents of report	Frequency	Submission
Pre-Construction	By Consultants	Progress of implementation of the task of the pre-construction phase such as RAP and utility relocation Results of monitoring Implementation status of mitigation measures Issues to be solved, etc.	Every month during implementation	To KeNHA KeNHA submits to JICA
Construction	By Contractors (and Consultants)	Progress of construction works Results of monitoring Implementation status of mitigation measures Issues to be solved, etc.	quarterly during the construction period	To KeNHA KeNHA submits to JICA, and shares with NEMA
Operation	By KeNHA (operator)	Progress of operation works Results of monitoring Implementation status of mitigation measures Issues to be solved, etc.	Half-yearly	To JICA and related donors KeNHA shares with NEMA

Monitoring schedule is shown on Table 14.9-4.

Table 14.9-4 Monitoring Schedule



14.9.3 Implementation Structure

After the detailed design phase, environmental monitoring starts. KeNHA which is a project proponent has the Environmental & Social Safeguards Department (ESSD) under the Directorate of Highway Planning & Design.

The ESSD is a department that handles environmental and social considerations of KeNHA's projects. KeNHA states "Environmental stewardship" in their Customer Service Charter. Through the ESSD, KeNHA develops, manages, rehabilitates and maintains national trunk roads taking into account environmental and social considerations.

The ESSD implements environmental and social considerations in three ways, namely Environmental Safeguards, Land Valuation and Social Safeguards each under a Deputy Director. As of now, some positions are vacant. The filling of these positions may be needed to manage major projects.

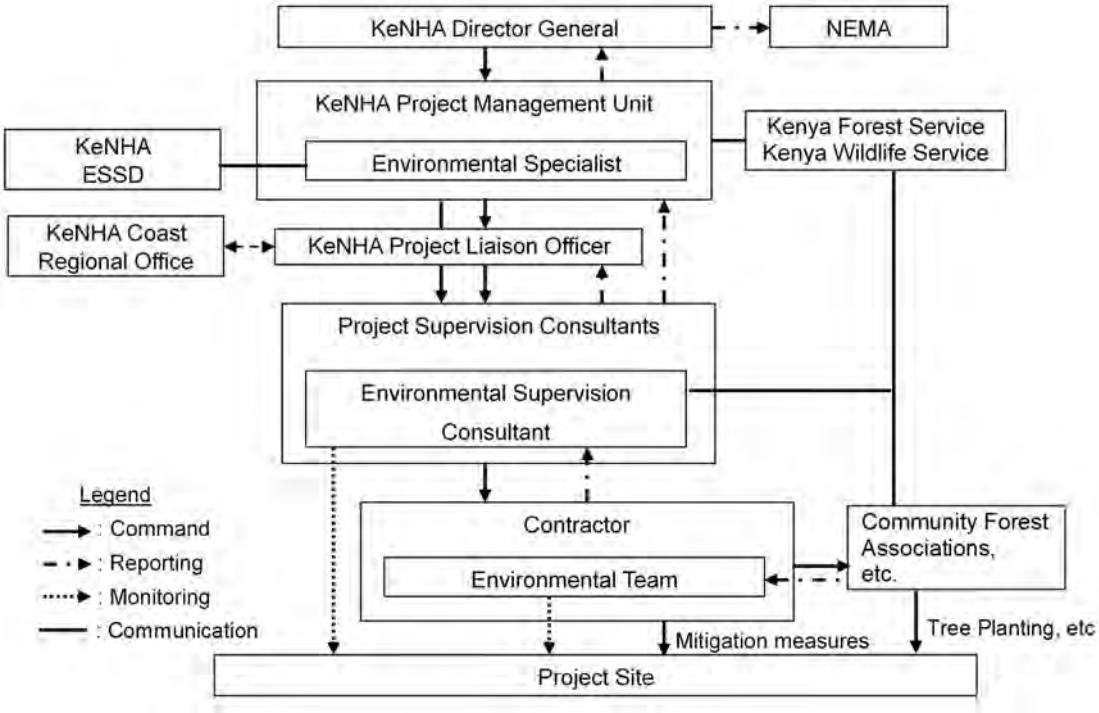
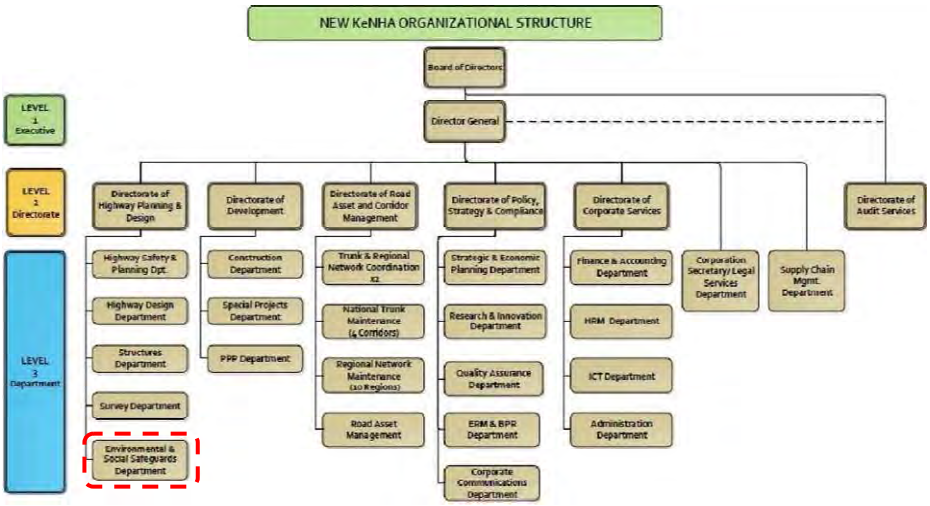
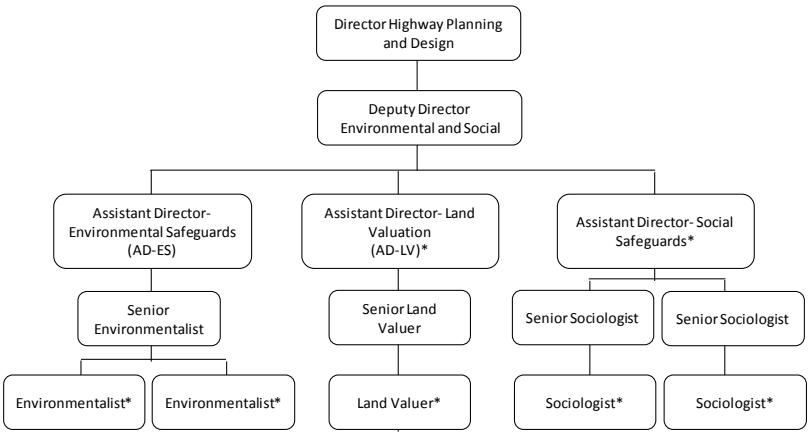


Figure 14.9-1 Organization Chart during Detail Design and construction Stage





*: No person assigned as of now

Figure 14.9-2 Organization Chart of KeNHA (upper) and ESSD (lower)

During the construction stage, contractors conduct monitoring of their activities, and report results of the monitoring to KeNHA. KeNHA reviews the monitoring report submitted by the contractors, and reports it to JICA.

During the operation phase, KeNHA has a responsibility for monitoring. They will conduct the monitoring with the assistance of consultants as necessary. Results of the monitoring are reported to JICA.

Regarding implementation of mitigation measures, KeNHA should be supported by special authorities. For example, for the implementation of the reforestation program it is essential that they have the support of KFS (Kenya Forest Service) and CFAs (Community Forest Associations). Throughout the project, NEMA's support is required on monitoring and mitigation measures.

14.10 Stakeholder Meetings

At each stage during this survey, some stakeholder meetings including public consultation meetings were held.

The purpose of the meetings at the early stages (Route Selection Phase) were to gather opinions about route selections. The latter meetings (EIA Study Phase) were part of Kenya's EIA process to disclose information. These meetings included disclosure of project outlines and results of the EIA survey.

Notice of the meetings was informed to stakeholders as followings:

Leaders who are representative of various fields were informed by Deputy County Commissioners (DCCs). The leaders include Political, Administration, County Government, GOK agencies, and special interest groups.

Residents were informed through respective area chiefs such as Village Elders, Churches, Mosques and others.

Meetings for special interest groups including fishermen and kaya communities were summoned through their leaders. These meetings are positioned as Focus Group Meetings

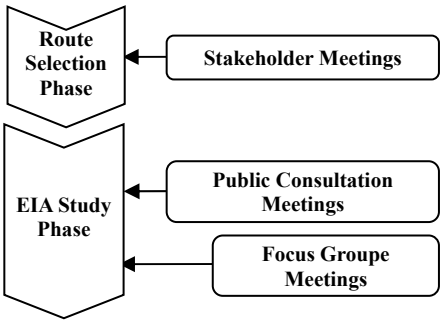


Figure 14.10-1 Flow of Stakeholder Meetings

Some vulnerable persons who could not attend meetings were given the opportunity to explain their views at their homes.

(1) Stakeholder Consultation Meetings before the EIA Survey

Before the EIA survey, as part of the process of route comparison, two stakeholder consultation meetings were held to disseminate the information on the project and obtain the beneficial opinions and suggestions. The meetings were held at Mombasa Island and Likoni District inviting representatives of the Project areas.

Figure 14.10-2 First Stakeholder Consultation Meeting

1) First Stakeholder Consultation Meeting
   - ✓ Date and time: 15:00-17:00, 28th April 2016
   - ✓ Venue: Royal Court Hotel (Mombasa Island)
   - ✓ Agenda: opening speeches, presentations, questions and answers
   - ✓ Attendance: 23 persons including residents, representatives of enterprises and residents, assembly members and local governments (Mombasa County and DCC office).

<u>Outlines of questions and answers</u>

1) **There is a plan for a cable car by Kenya Ferry. Will it have a remarkable effect on the proposed bridge construction?** (Residence)

   A cable car will not affect the project in any way. We are in touch with Kenya Ferry and more information will be provided once the design details are available. (KeNHA)

2) **It is clear that no decision has been made on the final alignment. We will be willing to sensitize people but we don't know the final route.**

   This is a preliminary stage of the study. As a result of consultation with the Kenya Navy, Ports Authority and the Museums of Kenya, Route D is the most appropriate route. These findings will be taken to the Government for final approval. (Survey Team)

3) **Initial idea holds that it was to connect at Port-reize; it has today shifted to this side. Kindly be clear on the final alignment and when will it be officially communicated to us?**

   The Port-reize project is on process but for this study, the survey team has settled and recommended Route D as its final alignment. (KeNHA)

4) **You are saying that Route D is the favourable. Did you consult stakeholders in Route D?** (Enterprise)

   This is the reason why we are here today. To disclose the best route possible for the Mombasa Gate Bridge; to collect your views and concerns and to integrate them in the design process. (Survey Team)

5) **What is the impact of the overhead bridge to our factory?** (Enterprise)

   The bridge height will be 60 m high from the sea level and approach viaducts will be between 20 to 30 m high from the factory ground level. (Survey Team)

6) **Our investments which comprise of warehouses, offices and other structural developments will be affected. We are asking you to shift the road.** (Enterprise)

   Upon consultations, a map of the proposed bridge was given to your representatives and they deduced that their activities will not be affected. The consultant further assured them that extra care has been taken to ensure minimal impact of all the affected places. (Survey Team)

7) **What is the expected duration of the bridge construction?** (Area chief)

It will take four to five years. (Survey Team)

8) During construction of the bridge, what will happen to our houses and land underneath the overhead bridge?

The land underneath will be acquired even though the bridge will be overhead. (Survey Team)

2) Second Stakeholder Consultation Meeting

- ✓ Date and time: 9:30-11:30, 29th April 2016
- ✓ Venue: ACK Guest House (Likoni)
- ✓ Agenda: opening speeches, presentations, questions and answers
- ✓ Attendance: 30 persons including residents, representatives of enterprises and residents, assembly members, Kenya Ferry Service and local governments (Mombasa County and DCC office)

Figure 14.10-3 Second Stakeholder Consultation Meeting

Outlines of questions and answers

1) I fully support the project and I further agree with the comparison methods that identified Route D. But I am afraid the fishermen and fishing activities will be disrupted. Will the fishermen be compensated?

After this, there will be an Environmental Social Management Plan study. The ESMP will incorporate all the concerns of the PAPs and possible cause of action or mitigation and possible benefits. (KeNHA)

2) 30m width of the bridge is a raw deal. The bridge should be made wider. I welcome the idea of retaining the Kenya ferry services but wondering of its sustainability when the bridge toll is phased out.

Road reserve at 60m will displace a large population hence requires time for resettlements. It is complicated because we are traversing already developed plots and also cutting costs on compensation. On the bridge toll, a sustainable system will be put in place to ensure sustainability of the Kenya ferry services. (KeNHA)

3) I have great confidence that the displaced individuals will be given a better future. My concern is that your developments are focused on one side shadowing other areas.

On development, there are a lot of projects including the northern and southern bypass. No area will be left behind in development. (KeNHA)

4) How is disability covered in these developments? (Disability group)

Regarding disability, the issue will be discussed in the design phase. (KeNHA)

5) In Mombasa Island the bridge will start at Lumumba road. Where exactly is it starting from our side? (Area Member of County Assembly)

The bridge connects to Likoni Ukunda road near the mosque with a green roof. The road commences at Kitaruni and goes for 5 km. (Survey Team)

6) Navy rejected a proposed alignment that passes near their naval base. They have nothing to do with our bridge?

Security is a national issue and we should not take the matter lightly. Kenya Navy had proposed to patrol the bridge full time and provide its security against terror attacks that you all know. Employing security (civil) may not be a convenient approach. What we can agree on is that the community be given free access without restrictions. (District Office)

8) Whether people with disability have the capacity to walk and approach the bridge. Most people with disability are currently using the ferry services. What will happen when the ferry is phased out? Kenya ferry gets a lot of money from vehicles levy. In case that the vehicles are using the bridge, will we be asked to pay the lost cost? (Disability group)

There will be a toll station for collection of revenue that will be used to maintain the ferry and the road. (Survey Team)

9) **Will the payment at the toll station be continued or withdrawn after the recovery period is attained?**

There is no other way to run and maintain both the ferry and bridge. The KeNHA's intention is to maintain the toll throughout but this will be confirmed and communicated. (KeNHA)

10) **What measure are you taking to control the earthquake effects of the bridge?** (Women reps' office)

The bridge designs meet international recognition and the bridge cannot be affected by earthquake. (KeNHA)

11) **How many lanes will the bridge have?** (Sub County Peace and Cohesion)

The bridge will have 4 lanes based on future demand projection. (Survey Team)

(2) Public Consultation Meetings during EIA Survey (First Round)

After the start of the EIA survey, public consultation meetings were held as one of the procedures on Kenya's ESIA system. Attendants are mainly residents and local government. The outlines of the meetings are followings:

Table 14.10-1 Public Consultation Meetings during EIA Survey

Date	Venue		Attendance		
			Male	Female	Total
07th Dec 2017	Mombasa Island side	Royal castle Hotel	59	27	86
08th Dec 2017	Mainland side	A.C.K guest house	40	8	48
09th Dec 2017		Peleleza primary school	76	18	94
13th Dec 2017		Kibaki estate	53	19	72
19th Dec 2017		Mtongwe polytechnic	45	24	69
05th Jan 2017		Meeting with Fishermen at Bofu Maskani	39	0	39
14th Feb 2018		Meeting with Kaya Elders at Bofu Maskani	5	0	5
Total			**311**	**96**	**410**
Percentage			**77.8%**	**22.2%**	

Main concerns from the attendance are followings:

- Time frame: When the project is likely to start and when it is likely to be completed.
- Compensation.
  The procedure of payments; whether it will be before or after the project has started.
  Whether the land compensation will be land for land or cash.
  How people living in untenured land and in government reserves will be compensated.
- Ferry services: Whether the ferry services will continue and if yes, who will be served by the ferry services?
- Security
  Measures to take to ensure security on the bridge.
  Are the members of the society allowed to use the bridge?

Table 14.10-2 Outlines of Questions and Answers

Key Issues	Answers
Mombasa Island side	

Key Issues	Answers
	Royal Castle hotel, Mombasa
• Can the government abandon the project if it proves to be very costly?	• The funds put aside for the project is 81 billion and the government has not raised any alarm that the funds are not enough.
• What is the future of the ferry services, will it be abolished or who will be using it? Where will the ferry services get it maintenance costs from?	• The ferry will still be operational and will be used by people, motorbikes and also tuktuks. • The bridge will also have a toll station in which amounts collected will be used to service and maintain the ferry services.
• What is the construction time frame?	• The currently on going asset inventory will continue until end of January, The detailed design stage will take two years and as such there should be no panic.
Mainland side	
	A.C.K Guest House. Likoni
• With the bridge starting from Ziwani and Jela Baridi, how will one be able to access the road from in between or will they have to go to the starting point?	• The bridge has several approaching bridges or lanes. Jela Baridi, Mombasa sports club, and corner mpya In Mtongwe. Also 2 KM from Puma secondary. But there is a proposal to connect through a conveyor belt at bridge academy to create an equidistant point of access.
• In 30 years to come, the population will be massive and the ferry might not be in a position to handle that, can there be an electric train over the bridge or what will happen once the carrying capacity of the bridge is over stretched?	• Unfortunately the weight of the train cannot be supported by the bridge and also a train cannot climb beyond a 2 % elevation gradient. • Human traffic at the ferry will reduce with the construction of the bridge as most commuters will prefer to go to town through the bridge.
• Culverts and weighbridges are ideal crime zones, what measures will be put in place to ensure security at this point.	• Security in such areas is a major concern for the government and even to all of us; as such areas under the bridge will be under surveillance and with constant monitoring on the entrance and exits. Kenya Navy has already requested for prior engagement.
• The huge support pillars might affect the activities of the fishermen and thus denying them access to their livelihood.	• Impact on such is eminent but their interest will be addressed in another forum involving the Beach Management Unit (BMU) members only. A proposal has been made to get them a boat for deep sea fishing however the impact on ecology and biodiversity is ongoing.
• Ferry services are maintained by the toll charged on cars, with the diversion of traffic to the bridge, how will it be sustained? Fears are there that they might start charging pedestrians.	• The ferry services are subsidized by the government as the amounts collected cannot be enough for the daily running of such and it is a government policy that no one should be charged when crossing the channel as a pedestrian.
• If the wind at the highest point of the bridge can blow off a tuk-tuk, how about human traffic using the bridge?	• The pedestrian lane will have glass to protect against the wind strength and any suicide missions among the public. The wheelchair ramp will also be closed with glass.
	Peleleza primary school
• What is the time line of the project?	• Research period to take 2 years and the construction will take 4 years.
• When will the affected be compensated?	• Compensation will take place before implementation of the project begins after which a notice of three months to relocate will be issued.
• What is the way forward for community owned land?	• There would be a need for the community to prove ownership with statutory documents.
• What considerations will be put in place for people living with disabilities?	• The pedestrian lane will be constructed in a spiral way allowing for wheel chair use.
	Kibaki estate
• Will there be a custodian on the amounts of compensation paid to the PAPs?	• The government will pay the affected persons directly
• What measures have been put in place to ensure that the project benefits the locals?	• The requirement is that 40% of participation should go to the local community. Committees should be formed to

Key Issues	Answers
	front suitable persons for considerations
• How will the mosques and schools that will be affected be compensated?	• Such amenities are avoided as far as possible but where it is not
	Mtongwe polytechnic
• Can development continue on affected plots	• Development can only be stopped by the National Lands commission after compensation
• How will the PAPs be prepared psychologically before compensation and displacement?	• NLC prepares people and also guides them during the resettlement process/period
• How will pollution be dealt with during the implementation period	• Studies are being undertaken to come up with mitigation measures on the various forms of pollution likely to be experienced.

(3) Public Consultation Meetings during EIA Survey (Second Round)

After the end of the EIA survey, public consultation meetings were held as one of the procedures on Kenya's ESIA system. The purpose of the meetings is to disclose findings of the EIA survey and gather opinions of stakeholders. Attendants are mainly residents and local government. The outlines of the meetings are followings:

Table 14.10-3 Public Consultation Meetings during EIA Survey

Target of Meeting	Site	Date	Attendance
Mombasa Mainland South Leaders	ACK Guest Hse	28th May 2018	72
Mombasa Island Leaders and PAPs	Castle Royal Hotel	29th May 2018	174
Shika Adabu and Ngombeni Location PAPs/ Villagers	Kibaki Estate	22nd May 2018	265
Likoni and Mtongwe PAPs /Villagers	Bofu Maskani	20th May 2018	221
Likoni/Mweza Creek Fishermen	Bofu Maskani	30th May 2018	118
	Total		**850**

Main concerns from the attendance are followings:

- Time frame: When the project is likely to start and when it is likely to be completed.
- Compensation.
- Impact of bridge on the cultural landscape:
- noise pollution
- Impact on mangroves and biodiversity
- traffic congestion in Mombasa Town

Table 14.10-4 Outlines of Main Concerns of Stakeholders

	Major Concerns	Answers
Mombasa Island Side	Do you have an online presence where one can get all this presented information in more detail?	For now we don't have an online presence. However, KeNHA and NEMA will post the reports on their websites after they have been approvaled.
	What was the outcome of the EIA study on Mangrove biodiversity?	During our flora and fauna studies we documented some mangrove located at the far end of the Mweza Creek. However the entire traverse sits on rock substrata that does not favour growth of the Mangroves.
	How is the cultural diversity of Mombasa reflected in the architectural design of the Bridge?	A lot of cultural assessment has been done since the beginning of preparatory studies for the bridge. The custodians of cultural heritage and cultural research are the National Museums of Kenya. They have

	Major Concerns	Answers
	Mombasa has a Swahili Cultural Center, consider consultation with the organization	already conduct preliminary cultural assessment. Through their interventions, the alignment had to be moved from MamaNgina to allow for the preservation of the rich archeological wealth of the area. Consultations are currently underway with NMK for a full cultural assessment study when need arises.
	The bridge will attract more traffic creating even more noise Noise levels are already escalated based on the findings of your study; Liwatoni residents do not want further noise. This will cause people to relocate far from the area	Yes. The bridge will attract more traffic meaning more noise to an already saturated area. Noted.
	When is the construction/or ground breaking likely to start?	This issue had been mismanaged by the media in our earlier presentations. What I can comfortably tell you is that the feasibility study will take 2 years and the detailed study will also take 2 years from January 2018.
Mainland South Side	Besides plants that are near extinction (Vipingo), did you document any marine fish that are highly likely to be extinct as well?	Noted.
	During implementation, will first employment considerations be given to the locals.	It's a requirement that at least 40% of both skilled and unskilled labour in every project is to be sourced from the local communities.

14.11 Necessity of Land Acquisition and Resettlement

(1) Project Component which Requires Resettlement

This project is for the construction of a new bridge which will supplement the existing car ferry service connecting Mombasa Island and the Mainland South. The project will improve traffic conditions and will contribute to the development of the local economy. However, negative impacts will arise both during the construction and operational stages of the project due to large scale land acquisition and involuntary resettlement.

Outlines of the Project components are presented in Table 14.11-1.

Table 14.11-1 Outline of the Project Components

Items	Description
Project length	Main bridge: 1.4km Approach road on Mombasa Island: 2.8km Approach road in Likoni: 4.7km Widening of existing road (Likoni): 1.6km
Others	Interchange: Two (2) at Moi Intersectioni and Makarrios Intersection and; Three (3) at Mtongwe Intersection, A7 Intersection and the Junction with the Mombasa Southern Bypass Weigh Bridge: One (1) at Mtongwe Construction yard (will be fixed in Detailed Design stage) Quarry and borrow pit (will be fixed in Detailed Design stage)

(2) Alternatives Which were Considered to Avoid or Minimize Resettlement

A number of alternative routes were considered with Alternative "D" being selected, the reasons for this being shown in Table 14.4-1: Comparisons of the Alternatives on the Environmental and Social Considerations.

(3) The Mechanism Established to Minimize Resettlement, to the Extent Possible, during Project Implementation

As far as possible the use of existing streets and land acquisition in areas of low population was adopted to minimize displacement and involuntary resettlement.

(4) Typical Cross Section of the Project

The Right of Way (ROW) for the Project is proposed as follows:

Table 14.11-2 ROW of the Project

Along Existing Roads	ROW would be 30m in width
For new Roads (new road construction)	Bridge section: 2m from the edge of structures Road section: As illustrated in Figure 14.11-2 and Figure 14.11-4

Note: Cross Section (CS)

Figure 14.11-1 Alignment in Mombasa Island

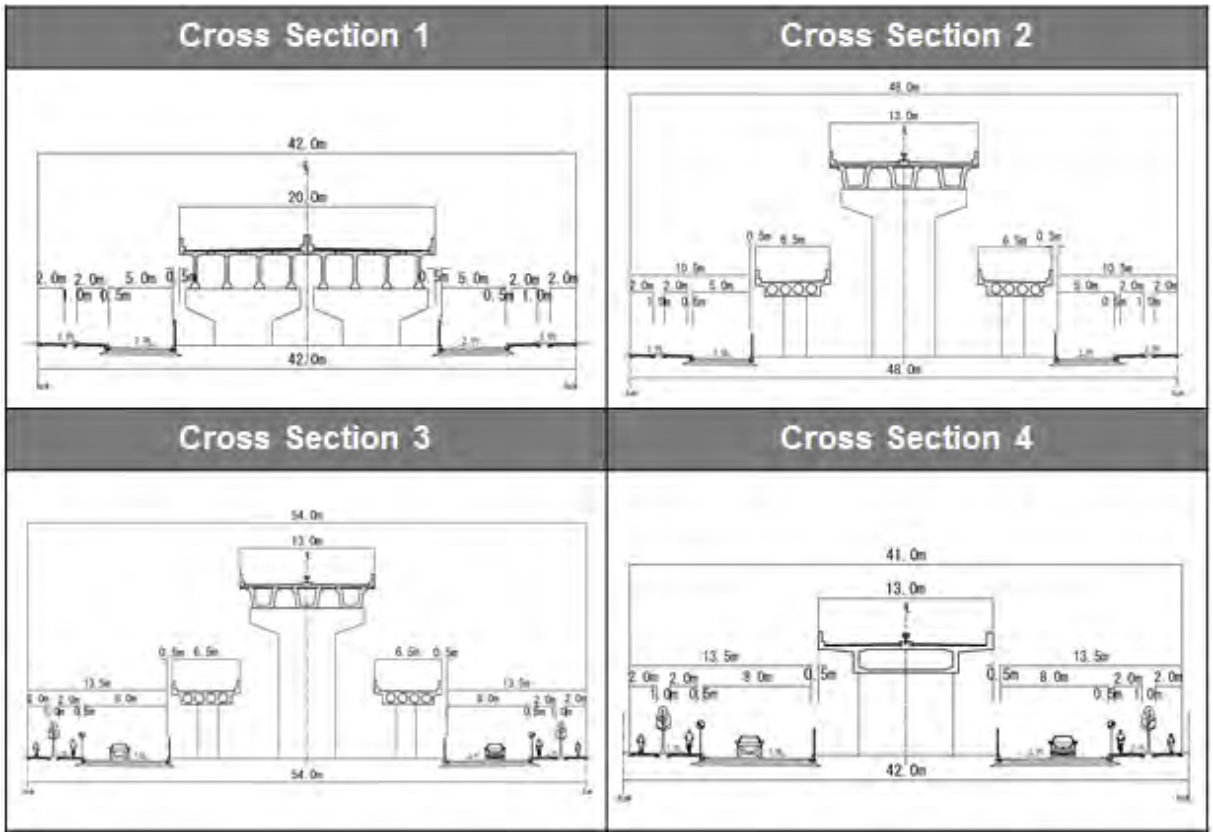


Figure 14.11-2 Typical Cross Section at Mombasa Island Street

Figure 14.11-3 Alignment on Mainland South

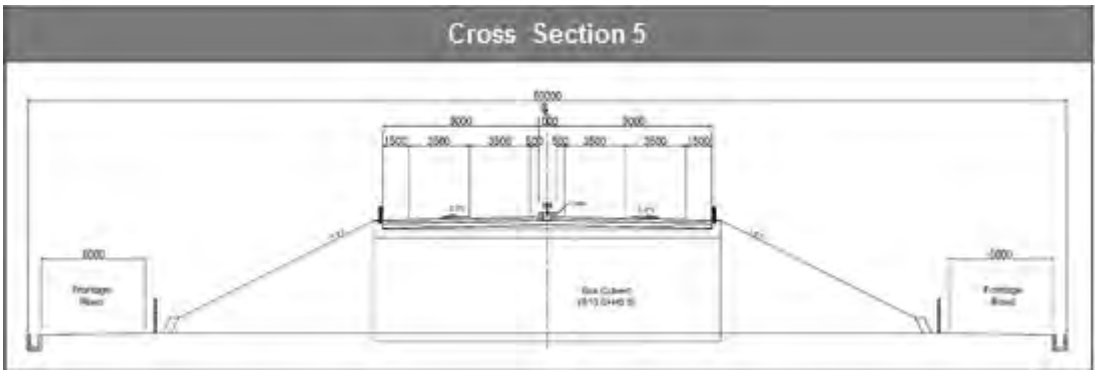


Figure 14.11-4 Typical Cross Section on Mainland South

14.12 Legal and Institutional Framework Related to Land Acquisition and Resettlement in Kenya

This section presents the legal and institutional framework related to public and private property in Kenya for the land acquisition and resettlement required for the implementation of the Project.

14.12.1 Land Ownership System of Kenya

There were two forms of land ownership in Kenya. One is the customary land based system that is based on traditional rules (customary laws), the other is a statutory land based system that is based on land ownership stemming from the British colonial period, which was legalised after independence. However, there is a high level of complexity between land ownership and land use rights because of the historical background and interference by other groups, for example both political and ethnic. The land- related laws and regulations were subdivided into numerous laws. There were over 70 pieces of legislation, acts and subsidiary laws governing land and land matters with the result that they were overlaping and occasionally conficting with each other. That led to the registration and management of land becoming unclear and ineffective, resulting in many land disputes. Confusion over land ownership leads either to under-development or over-development of the land, and deterioration of the environment in the end.

Having acknowledged this situation, GoK drafted the National Land Policy (NLP) in 2004, which was the first land- related law of the country. The National Assembly finally approved the NLP in 2009 after years of discussion. Thereafter GoK adopted a new Constitution in 2010. Under the new Constitution, laws and acts relating to land are being consolidated and rationalized.

GoK has also established several laws on land ownership. Procedures relating to land ownership (land tenure), land property rights (property rights), and registration and transaction of land have been consolidated in the new laws with the old laws being abolished. In 2013, the National Land Commission (NLC) was set up to manage public land on behalf of the national and county governments.

14.12.2 Relevant Laws on Land Acquisition and Resettlement

(1) Overview of Land Acquisition and Resettlement

According to a number of sources, there is no Resettlement Policy in Kenya. EMCA and EIA/EA 2003 do not stipulate a requirement for the preparation of a document to facilitate land acquisition, resettlement, and compensation. However, in response to calls from donors for a Resettlement Action Plan (RAP), NEMA has requested the submission of a RAP along with an EIA based on existing regulations such as Clause 16 of EIA/EA 2003. Moreover, compliance with a RAP has become a requirement for acquiring an EIA license. Nevertheless, criteria to

prepare a RAP, such as the number of the PAPs, and the review standards of NEMA are not established.

The following laws and regulations provide the legal framework for compensation and resettlement in Kenya in the absence of resettlement policies.

- National Land Policy 2009
- The Constitution of Kenya 2010
- Landlord and Tenant (Shops, Hotels, and Catering Establishments) Act (Cap 301) Revised Edition 2015
- The Urban Areas and Cities Act 2011
- Land Act, 2012
- National Land Commission Act, 2012
- The Land Registration Act 2012
- The Environmental and Land Court Act 2011 Revised Edition 2015
- Five-year National Strategic Plan 2013 – 2018, the National Land Commission
- The Land Laws (Amendment) Act, 2016
- Legal Notice related to Land Act and The Land Registration Act

(2) National Land Policy (NLP), 2009

Until the National Land Policy (NLP) which was adopted in 2009, Kenya did not have a single clearly defined or codified national land policy. NLP provides an overall framework for land legislation and defines key measures required to deal with critical issues such as land administration, access to land, land use, compulsory acquisition and development control. The NLP also secures the rights over land and provides for sustainable growth, investment and the reduction of poverty in line with the Government's overall development objectives.

Article 45 of the NLP defines compulsory acquisition as "the power of the State to extinguish or acquire any title or other interest in land for a public purpose, subject to prompt payment of compensation."

In "3.3 LAND TENURE ISSUES", the NLP regulates the classification of land as follows:

Table 14.12-1 Land Category since 2009

Previous Category	New Category in NLP
Government Land	Public Land
Trust Land	Community Land
Collective land ownership*	
Private Land	Private Land

*Traditionally owned and managed land, not an official land category

Source: National Land Policy (NLP), 2009

Article 175 states on resettlement that:

The resettlement principle seeks to procure adequate land for the reorganization of both rural and urban settlements in light of expanding populations, conflicts, historical injustices and disasters. The Government shall: (i) establish criteria for the determination of who qualifies to benefit from resettlement programmes; (ii) ensure that it is carried out in a transparent and accountable manner; and (iii) provide them with infrastructure and basic services.

The NLP also refers to land issues peculiar to the Coast Region wherein Mombasa is included. Article 184 states that: The land question within the Coast region is complex due to its peculiar historical and legal origins. The application of the Land Title Act (Cap 2828) of 1908 deprived many members of the indigenous Coastal Communities of their land. This led to the area having the largest single concentration of landless indigenous people living as squatters. It also gave rise to the problem of absentee land owners. Therefore, in Article 193, GoK established suitable

legal and administrative mechanisms to address the Coastal land problems.

(3) Constitution of Kenya 2010

The Constitution of Kenya 2010 sets out principles governing the land. "Chapter Four of the Bill of Rights" recognizes the Bill of Rights as an integral part of the Kenyan democratic system and is the framework for social, economic and cultural policies. "Chapter Five Land and Environment" further elaborates these rights. These two chapters provide a constitutional basis for land ownership, expropriation and protection of rights to land.

The Constitution protects the sanctity of private property rights and states that the Government can compulsorily acquire no property except by law. Article 40(3) states:

"The State shall not deprive a person of property of any description, or of any interest in, or right over, property of any description, unless the deprivation results from an acquisition of land or an interest in land or a conversion of an interest in land, or title to land, in accordance with Chapter Five; or is for a public purpose or in the public interest and is carried out in accordance with this Constitution and any Act of Parliament that –

(i) Requires prompt payment in full, of just compensation to the person; and
(ii) Allows any person who has an interest in or right over, that property a right of access to a court of law

The right to property is protected by Article 40 (1) Subject to Article 65; "every person has the right, either individually or in association with others, to acquire and own property of any description; and in any part of Kenya".

"Chapter Five Land and Environment" also concerns compulsory land acquisition. Article 60 under this chapter states that land in Kenya shall be held, used and managed in a manner that is equitable, efficient, productive and sustainable, and in accordance with the following principles: a) Equitable access to land; b) Security of land rights; c) Sustainable and productive management of land resources; d) transparent and cost effective administration of land; e) Sound conservation and protection of ecologically sensitive areas; f) Elimination of gender discrimination in law, customs and practices related to land and property in land; and g) Encouragement of communities to settle land disputes through the recognized local community initiatives consistent with this Constitution.

(4) Landlord and Tenant (Shops, Hotels, and Catering Establishments) Act (Cap 301) Revised Edition 2010;

This Act makes provision on certain premises for the protection of tenants of such premises from eviction or from exploitation and for matters connected in addition to that and incidental to it. This act also defines several terms which are relevant to the Project as follows:

Table 14.12-2 Definition of Terms Regarding Landlord and Tenant Act

Term	Definition
Shop	Premises occupied wholly or mainly for a retail or wholesale trade or business or for the purpose of rendering services for money or money's worth
Tenancy	Tenancy created by a lease or underlease, by an agreement for a lease or underlease by a tenancy agreement or by operation of law, and includes a sub-tenancy but does not include any relationship between a mortgagor and mortgagee
Tenant	In relation to a tenancy, the person for the time being entitled to the tenancy whether or not he is in occupation of the holding, and includes a sub-tenant
Landlord	In relation to a tenancy, the person for the time being entitled, as between himself and the tenant, to the rents and profits of the premises payable under the terms of the tenancy

Source: Landlord and Tenant (Shops, Hotels and Catering Establishments) Act (Chapter 301), Revised Edition 2012

(5) The Urban Areas and Cities Act, 2011

Article 36 requires each City and Municipality to formulate an Integrated Development Plan as the central pillar of public administration of the city or municipality. This forms the basis for: (a) the preparation of environmental management; (b) the preparation of valuation rolls for property taxation plans; (c) the provision of physical and social infrastructure and transportation; (d) the preparation of annual strategic plans for a city or municipality; and (e) disaster preparedness and response:

(6) Land Act, 2012

This law was adopted to enable Article 68 of the Constitution to be put into practice by revising land laws in a consolidated and rationalized way, and to provide the sustainable administration and management of land and land-based structures, and for connected purposes.

Section 107 identifies the NLC as the lead agency in land acquisitions. The Same section provides the framework for land acquisition.

Articles in "Chapter 4: Institutional Framework" state that the NLC is a constitutional body whose members shall be vetted by parliament and appointed by the President. The NLC should be accorded sufficient autonomy and independence to perform its function effectively and fairly while being accountable to the people of Kenya.

(7) National Land Commission Act, 2012

This Act creates the NLC with jurisdiction over the compulsory land acquisition in Kenya deifying role and responsibility and budget of the NLC. Article 67 provides for the establishment of the National Land Commission whose functions include managing public land on behalf of the national government and the county government. The Commission under the Land Act has the mandate to notify the county government of any land that has been compulsorily acquired by government and land where the public right of way has been affected. Again it is paramount for NLC to encourage alternative and traditional dispute resolution mechanisms in resolving land conflicts.

(8) The Land Registration Act, 2012

This Act regulates the system and procedures of land registration and land transaction, which shall be applied to the new land classifications: "Public Land", "Private Land" and "Community Land".

(9) The Environment and Land Court Act (Cap12A), Revised in 2015

This prescribes procedures to solve land disputes in courts higher than the High Court. The Environmental and Land Court has the power to hear and determine disputes relating to the environment and land, including disputes: (a) relating to environmental planning and protection, trade, climate issues, land use planning, title, tenure, boundaries, rates, rents, valuations, mining, minerals and other natural resources; (b) relating to compulsory acquisition of land; and (c) relating to land administration and management:

(10) Five-year National Strategic Plan 2013-2018, the National Land Committee, 2013

This plan is like a 5-year guideline for implementation of the National Land Policy. The following issues shall be addressed: i) Public land administration and management, ii) National land information management system, iii) Land dispute and conflict resolution, iv) sustainable

management and use of land and natural resources, (v) Institutional development and management.

(11) The Land Laws (Amendment) Act, 2016

The Act brings about amendments to the Land Act, 2012, Land Registration Act, 2012 and the National Land Commission Act, 2012 and also introduced some fundamental changes to land law and conveyancing in Kenya. Some of the more salient amendments are as follows;

- Clarification of functions of both the Cabinet Secretary for Lands and the NLC
- Introduction of a "Controlled Land Category"
  The Act has introduced the new concept of "Controlled Land". The Act requires that "transactions" in controlled land can only proceed with the prior written approval of the Cabinet Secretary.
  The entire MGB falls within the land designated as controlled land. For purposes of these regulations, it is implying that consent of Cabinet Secretary for Lands is mandatory in implementation of this RAP.
- On Compulsory Acquisition
  Compensation for compulsory acquisition is to be made by the NLC only after final survey and determination of the acreage, boundaries, ownership and value of the land.
- On Eviction of Unlawful Occupiers
  Unlawful occupation of any land, whether public, community or private is prohibited. The Act now provides for elaborate procedures for the giving of notice to unlawful occupiers and the carrying out of evictions upon expiry of such notice. This is highly relevant to the MGB where numerous cases of illegal occupation were registered.

(12) Legal Notice related to The Land Act and The Land Registration Act

Following the enactment of the new Land law regime post-2010, several rules have been published through the Kenya Gazette. Some are deemed relevant to land acquisition as proposed for the MGB as follows;

- The Land Registration (General) Regulations, 2017 (No. 278 of 2017)
  This is to regulate the registration of various instruments relating to land. They include ninety-four (94) prescribed forms that range from the form of Power of Attorney, Application for Registration, Application for replacement of lost Title and Application for Official Search etc.
- The Land Regulations, 2017 (No. 280 of 2017)
  This is to provide guidelines and regulate various procedures to transactions in land. It includes forty (40) prescribed forms that range from Application for Consent to transfer, Application for Land Rent Clearance Certificate and Notice of intention to compulsorily acquire etc.
- The Land (Extension and Renewal of Leases) Rules, 2017 (No. 281 of 2017)
  This is meant to guide officers of the Ministry of Lands and Physical planning, County Governments, the NLC, Lessees, Professionals and any other persons dealing with matters relating to the extension and renewal of Leases and contains various prescribed forms that range from Application of extension of Lease and Application for renewal of lease etc.
- The Land (Assessment of Just Compensation) Rules, 2017 (No. 283 of 2017)
  In exercise of the powers conferred under section 111 (2) of the Land Act, NLC makes the following rules in respect of the amount of compensation to be awarded for land acquired

under the Act. It sets out factors to be taken into consideration when assessing compensation. Factors to considered in assessment of compensation shall include;

a) the market value of the land;
b) damage sustained or likely to be sustained by persons interested at the time of the NLC's taking possession of the land by reason of severing the land from his or her other land;
c) damage sustained or likely to be sustained by persons interested at the time of the NLC's taking possession of the land by reason of the acquisition injuriously affecting his or her other property, whether moveable or immovable, in any other manner or his or her actual earnings;
d) reasonable expenses incidental to the relocation of any of the persons interested or who will be compelled to change residence or place of business as a consequence of the acquisition; and
e) damage genuinely resulting from diminution of the profits of the land between the date of publication in the Gazette of the notice of intention to acquire the land and the date the Commission takes possession of the land.

14.12.3 Institutional Framework of Land Management

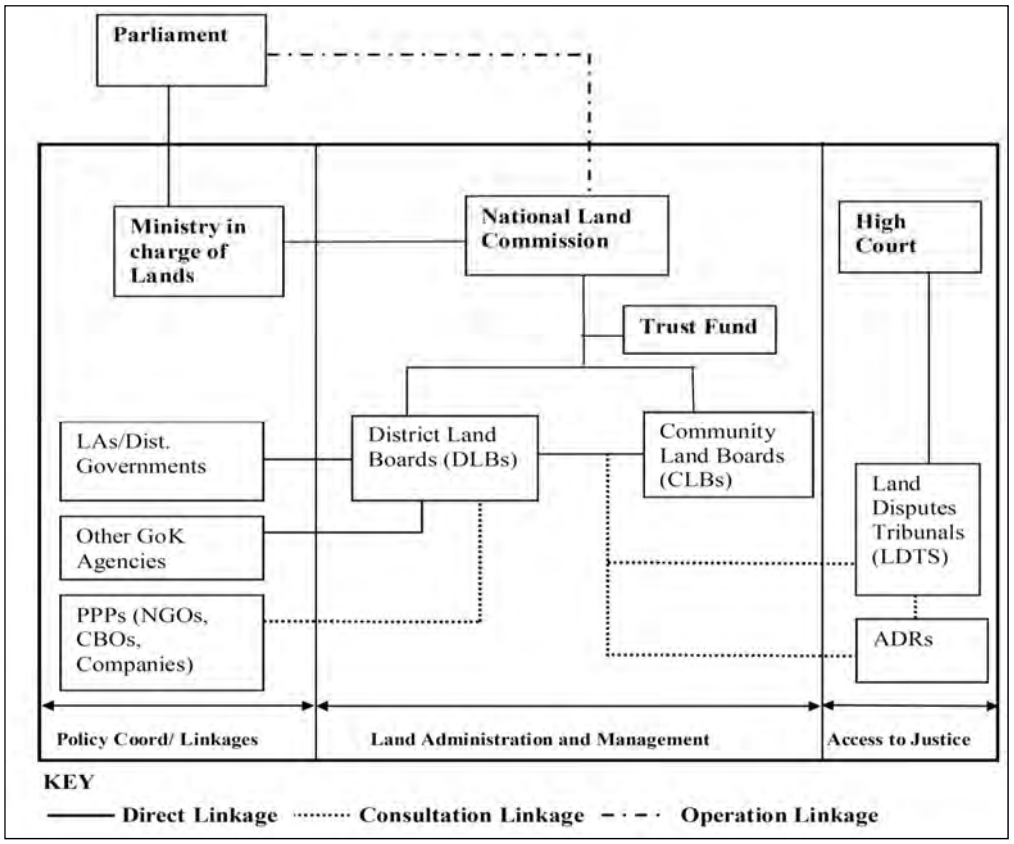
Article 231 of the NLP stipulates three key land management institutions in Kenya: National Land Commission (NLC), the District Land Boards (DLBs) and Community Land Boards (CLBs). The NLC is required to work in close cooperation with the county government in the management of natural resources that fall within their jurisdiction and in efforts for environmental conservation. The Commissioner of Lands manages land belonging to the Government of Kenya while the Ministry of Lands delegates the management of land in the districts to DLBs and Land Committees. CLBs constitute the third tier of devolved land administration and management, especially in regards to community land.

The roles of the District Land Board are as follows:

- Keep and allocate land which is not owned by anyone in the district;
- Assist in the recording, registering and transferring of rights or claims on land
- Make and keep up to date a list of compensation rates for the loss or damage to crops, houses, and other property;
- Revisit the list of rates of compensation every year

Accordingly, Mombasa District Land Board will be instrumental in the allocation of land for resettlement for this Project.

Other important institutions in the land sector will be the Ministry of Lands, local authorities, land property tribunals, district land tribunals, Land Courts, and a Land Reform Transformation Unit. Figure 14.12-1 shows the institutional framework of land management presented in the NLP. The institutional framework will be further studied when the Resettlement Acton Plan (RAP) for the Project is prepared.



Source: Sessional Paper No.3 of 2009 on the National Land Policy, the Ministry of Lands, Housing and Urban Development, (2009)

Figure 14.12-1 Institutional Framework of Land Management

14.12.4 Related Organizational Framework Associated to the Project

(1) Mombasa County Government (MCG)

Mombasa County Government (MCG) includes the Department of Water, Environment and Natural Resource Management (DoWENR), which has been formulating environmental laws under the County Government Act, 2012 in consultation with NEMA. The county environmental laws may have articles governing land acquisition and resettlement to which the Project will have to adhere once the regulations are stipulated.

The Project will coordinate with the Department of Land, Housing and Physical Planning (DoLHP) since this department covers land rates, rents, levies, and housing development plans which are indispensable information and data when preparing a Resettlement Action Plan (RAP). Furthermore, the Project will seek their cooperation when securing land for the relocation and physical resettlement of temporary marketplaces to accommodate shops and vendors in the case of economic resettlement. In addition, the Department of Transport and Infrastructure (DoT&I) is another wing of the MCG that the Project would need to consult with closely.

Table 14.12-3 Functions of the Departments, MCG

Department of Land, Housing and Physical Planning (DoLHP)	Department of Transport and Infrastructure (DoT&I)
・ Mombasa City County Architecture ・ County housing and settlement policies and legislations ・ Integrated development planning. ・ County Physical Planning ・ Land survey and mapping. ・ Boundaries and fencing ・ Land rates, rents and levies. ・ County Housing Development	・ County Public Works ・ Construction and maintenance of county roads ・ Coordination and licensing of public road transport. ・ Development and Management of Marine transport ・ Management and construction of metropolitan rail infrastructure ・ Policy and Implementation ・ Infrastructure development levy. ・ Traffic Management Infrastructure: Marshalling yard, Bus parks, Parking, and Traffic lights

Source: for DoLPH, https://www.mombasa.GoKe/department-of-land-housing-and-physical-planning/for DoT&I, https://www.mombasa.GoKe/department-of-transport-and-infrastructure/, both accessed in April 2016

* Underlining added by the Survey Team to the functions means that they are likely to relate to land acquisition and resettlement under the Project.

14.12.5 Resettlement Policy of JICA

The key principles of JICA policies on involuntary resettlement are summarized below.

I. Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives.

II. When population displacement is unavoidable, effective measures to minimize the impact and to compensate for losses should be taken.

III. People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported, so that they can improve or at least restore their standard of living, income opportunities and production levels to pre-project levels.

IV. Compensation must be based on the full replacement cost* as much as possible.

V. Compensation and other kinds of assistance must be provided prior to displacement.

VI. For projects that entail large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. It is desirable that the resettlement action plan include elements laid out in the World Bank Safeguard Policy, OP 4.12, Annex A.

VII. In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people.

VIII. Appropriate participation of affected people must be promoted in planning, implementation, and monitoring of resettlement action plans.

IX. Appropriate and accessible grievance mechanisms must be established for the affected people and their communities.

The above principles are complemented by World Bank OP 4.12, since it is stated in JICA Guideline that "JICA confirms that projects do not deviate significantly from the World Bank's Safeguard Policies". Additional key principles based on World Bank OP 4.12 are as follows.

X. Affected people are to be identified and recorded as early as possible in order to establish their eligibility through an initial baseline survey (including a population census that serves as an eligibility cut-off date, asset inventory, and socioeconomic survey), preferably at the project

identification stage, to prevent a subsequent influx of encroachers by others who wish to take advance of such benefits.

XI. Eligibility to Benefits include the PAPs who have formal legal rights to land (including customary and traditional land rights recognized under law), the PAPs who don't have formal legal rights to land at the time of census but have a claim to such land or assets and the PAPs who have no recognizable legal right to the land they are occupying.

XII. Preference should be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based.

XIII. Provide support for the transition period between displacement and livelihood restoration.

XIV. Particular attention must be paid to the needs of the vulnerable groups among those displaced, especially those below the poverty line, landless, elderly, women and children, ethnic minorities etc.

XV. For projects that entail land acquisition or involuntary resettlement of fewer than 200 people, an abbreviated resettlement plan is to be prepared.

In addition to the above core principles of the JICA policy, it also lays emphasis on a detailed resettlement policy inclusive of all the above points; a project specific resettlement plan; an institutional framework for implementation; a monitoring and evaluation mechanism; a time schedule for implementation; and a detailed Financial Plan etc.

*Description of "Replacement Cost" is as follows.

Land	Agricultural Land	The pre-project or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land, plus the cost of preparing the land to levels similar to those of the affected land, plus the cost of any registration and transfer taxes.
	Land in Urban Areas	The pre-displacement market value of land of equal size and use, with similar or improved public infrastructure facilities and services and located in the vicinity of the affected land, plus the cost of any registration and transfer taxes.
Structure	House and Other Structures	The market cost of the materials to build a replacement structure with an area and quality similar or better than those of the affected structure, or to repair a partially affected structure, plus the cost of transporting building materials for the structure to the construction site, plus the cost of any labuor and contractors' fees plus the cost of any registration and transfer taxes.

14.12.6 Policy Gap Analysis

As previously mentioned, a Resettlement Policy is not available in Kenya at the present time. Relevant laws and regulations provide the legal framework for compensation and resettlement in Kenya in the absence of resettlement policies.

Table 14.12-4 presents a policy gap analysis between JICA Guidelines and Kenya's Country System in regard to land acquisition and resettlement, including measures to fill the gaps.

Table 14.12-4 Gap Analysis between JICA Guidelines and Kenya's Local System (Land Acquisition and Resettlement)

	JICA's Guidelines (2010)	Laws of Kenya	Gap Between JICA's Guidelines and Laws in Kenya	Proposed Gap Filling Measures
1	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives.	No specific provisions on preventing involuntary resettlement and loss of means of livelihood.	There are no provisions in this regard, while the JICA's Guidelines require to avoid/minimize resettlement/loss of livelihood	The project shall explore various alternatives and select the most viable option where involuntary resettlement is minimized, while optimizing the alignment of the bridge.
2	When population displacement is unavoidable, effective measures to minimize impact and to compensate for losses should be taken.	The Land Act Section 111. (1) requires just and full compensation to be paid promptly to the land owner for compulsorily land acquisition for public purpose.	There is no specific provision for compensation for "effective measures" , while JICA's Guidelines acknowledges all affected persons whether legally residing or not, are eligible for compensation.	The RAP will be prepared incorporating the following: (i) evaluation of the impacts of the project to the PAPs, and (ii) formulation of the entitlement and the compensation for the losses incurred in terms of land, structures, improvements and crops and trees.
3	People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported, so that they can improve or at least restore their standard of living, income opportunities and production levels to pre-project levels.	The Land Act Section 134. (1) the National Government shall implement settlement programmes to provide access to land for shelter and livelihood,.	There is no provision for maintaining living standards of affected people at the same or above pre-project levels in Kenyan Laws, while JICA's Guidelines require that no one is worse off as a result of resettlement and would maintain their living level at least at original levels	Livelihood restoration is not clearly set out in Kenyan laws; the RAP will cover "improve or at least restore their standard of living, income opportunities, and production level to pre-project levels".
4	Compensation must be based on the full replacement cost as much as possible.	The Land Act Section 113. (2), an award shall be based on (i) the size of the land; (ii) the value (opinion of the Commission); (iii) the amount of the compensation payable. The Land (Assessment of Just Compensation) Rules, 2017 sets out factors to be taken into consideration when assessing compensation.	The related provisions on regarding replacement cost is not clear in Kenyan Laws, while JICA's Guidelines require that the replacement cost plus tax and remittance charge shall be included in compensation.	The Project Policy on compensation is based on the full replacement cost for land, structures and other improvements in line with JICA's guidelines. The Survey Team will carry out a Replacement Cost Survey (RCS) to figure out the full replacement cost.
5	Compensation and other kinds of assistance must be provided prior to displacement	The Land Act, National Land Policy specifies quick compensation, however, its timing to disburse is not clear.	Compensation and other assistance is made regardless of whether it is before or after construction, while JICA Guidelines requires compensation to be paid prior to relocation.	The resettlement plan addresses all these issues and spells out a mechanism for all the compensation to be paid prior to possession of the acquired land and prior to displacement.
6	For projects that entail large-scale involuntary resettlement, resettlement	There is no legal basis for the preparation of resettlement plans,	There is no gap in principle. Both the EIA and RAP are disclosed to the	Preparation of the RAP is indispensable for EIA clearance. EIA and RAP are subjects for

	JICA's Guidelines (2010)	Laws of Kenya	Gap Between JICA's Guidelines and Laws in Kenya	Proposed Gap Filling Measures
	action plans must be prepared and made available to the public.	however the schedule of EMCA, 1999, identifies projects requiring EIAs including large-scale involuntary resettlement.	public prior to the issue of a License.	public disclosure before granting the license.
7	In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance.	There is no specific law on preparing a resettlement plan.	There is no provision in the law for consulting the stakeholders or communities.	Kenyan Land Law stipulates the contents for meetings with PAPs. Based on the JICA Guidelines, the Survey Team will organize at least three rounds of public consultation: (i) introduction of the project and announcing a cut-off date, (ii) sharing the findings from RPA related survey and draft of RAP, and (iii) presentation of the RAP, to the affected people in their communities by preparing materials written and spoken in a local language used by the PAPs.
8	When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people.			
9	Appropriate participation of affected people must be promoted in planning, implementation, and monitoring of resettlement action plans.	There is no provision for the monitoring related activities with the participation of affected people	There is no provisions in Kenyan Laws, while JICA Guidelines recommend participation of affected people in planning, implementation and monitoring of the RAP	The RAP has been prepared following a consultation process with all stakeholders. The consultation will be a continuous process at all stages of the project development, such as project formulation, feasibility study, design, implementation, and post-implementation, including the monitoring phase.
10	Appropriate and accessible grievance mechanisms must be established for the affected people and their communities.	The Land Act provides a mechanism for dealing with grievances including lodging complaints to the Environment and Land Court (Section 150)	There is no definite gap.	A substantial gap does not exist. The Survey Team will consult with the public to confirm appropriateness and accessibility of a proposed grievance mechanism from the community's viewpoint.
11	Affected people are to be identified and recorded as early as possible in order to establish their eligibility through an initial baseline survey (including population census that serves as an eligibility cut-off date, asset inventory, and socioeconomic survey), preferably at the project identification stage, to prevent a subsequent influx of encroachers by	Based on the Land Act section 134 (1), a resettlement program is required, but there is no description of a census and cut-off-date.	There is neither a census nor cut-off date requirement in Kenyan Laws.	The Survey Team will announce the cut-off date complying with the JICA Guidelines. A population census and asset inventory, and the socio-economic survey will be undertaken as processes to compile an RAP.

	JICA's Guidelines (2010)	Laws of Kenya	Gap Between JICA's Guidelines and Laws in Kenya	Proposed Gap Filling Measures
	others who wish to take advantage of such benefits. (WB OP4.12 Para.6)			
12	Eligibility of benefits includes, the PAPs who have formal legal rights to land (including customary and traditional land rights recognized under law), the PAPs who don't have formal legal rights to land at the time of census but have a claim to such land or assets and the PAPs who have no recognizable legal right to the land they are occupying. (WB OP4.12 Para.15)	Constitution Article 40 (4) states compensation is to be paid to occupants who may not hold title to the land in good faith. On the other hand, Article 40 (6) states that the rights under this Article do not extend to any property that has been found to have been unlawfully acquired.	Although the statements under the same article conflict, it could be interpreted as eligibility of squatters who do not have legal rights are recognized.	Based on the JICA's Guidelines, appropriate entitlements are discussed in a RAP. In principle, both formal and informal settlers are eligible for compensation and other conditions.
13	Preference should be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based. (WB OP4.12 Para.11)	No specific provisions in the Kenyan Law.	Preference to the land-based resettlement strategies is not confirmed in Kenyan laws.	Land-based resettlement policy should be included in the RAP considering the socioeconomic status and needs of the PAPs.
14	Provide support for the transition period (between displacement and livelihood restoration). (WB OP4.12 Para.6)	No specific provisions on The Land Act.	The Kenyan law does not mention the provision of support during the transition.	During the process of RAP discussions, compensation for temporary business disturbance, income restoration at an early stage, or any other allowances are considered.
15	Particular attention must be paid to the needs of vulnerable groups among those displaced, especially those below the poverty line, landless, elderly, women, and children, ethnic minorities, etc. (WB OP4.12 Para.8)	According to The Land Act Section 134. (4), representatives of persons with special needs, women, youth, and elders shall be members of the committee of beneficiaries identification.	The Kenyan Land Act provides particular attention to persons with special needs, women, youth, and elders.	Based on the needs assessment through the stakeholder meetings, socio-economic survey, focus group discussion, etc., Special considerations for vulnerable groups will be discussed and taken into account in the RAP.
16	For a project that entails land acquisition or involuntary resettlement of more than 200 people, a resettlement action plan is to be prepared (WB OP4.12 Para.25)	There is no provision	As shown on the left.	The RAP has been prepared since the displaced people are estimated to be more than 200.

Source: Compiled by the JICA Survey Team

14.12.7 Land Acquisition and Resettlement Policy of the Project

(1) The Project's Resettlement Policy

The RAP has the following specific principles based on the government provisions and JICA's Guidelines for Environmental and Social Considerations:

1). The land acquisition and resettlement impacts on persons affected by the project would be avoided or minimized as much as possible through alternative design options;

2). Where negative impacts are unavoidable, the persons affected by the project and vulnerable groups will be identified and assisted in improving or regaining their standard of living.

3). Information related to the preparation and implementation of a resettlement plan will be disclosed to all stakeholders and people's participation will be ensured in planning and implementation. The resettlement plan will be disclosed to the PAPs in their local language;

4). Land acquisition for the project would be done as per Clause 16 of EIA/EA 2003. Furthermore, compliance with the RAP has become a requirement to acquire an EIA license.

5). Before taking possession of the acquired lands and properties, compensation and Resettlement and Rehabilitation (R&R) assistance will be paid in accordance with the provisions described in this document;

6). An entitlement matrix for different categories of people affected by the project has been prepared. People moving into the project area after the cut-off date will not be entitled to any assistance. For the purposes of land acquisition the date of notification under section 3 for acquisition will be treated as the cut-off date. For non-titleholders such as informal settlers / squatters and encroachers the date of the census survey or a similar designated date declared by the executing agency will be considered as the cut-off date.

7). An appropriate grievance redress mechanism will be established to ensure the speedy resolution of disputes.

8). All activities related to resettlement planning, implementation, and monitoring would ensure the involvement of women and other vulnerable groups.

9). Consultations with the PAPs will continue during the implementation of resettlement and rehabilitation works.

10). There should be a clause in the contract agreement that the construction contractor will compensate for any loss or damage in connection with the collection and transportation of borrow-materials.

In accordance with the resettlement principles suggested for the project, all affected households and persons will be entitled to a combination of compensation packages and resettlement assistance depending on the nature of ownership rights on lost assets, scope of the impacts including socio-economic vulnerability of the affected persons and measures to support livelihood restoration if livelihood impacts are envisaged. The affected persons will be entitled to;

(i) compensation for the loss of land, crops/ trees at their replacement value;

(ii) compensation for structures (residential/ commercial) and other immovable assets at their replacement value;

(iii) assistance for loss of business/ wage income;

(iv) assistance for shifting and reconstruction of affected structures. This will ensure that persons affected by land acquisition; whether titled or non-titled will be eligible for appropriate compensation/resettlement benefit. Persons having no legal title but using the land under acquisition if vacated for the project purpose would be provided with compensation and resettlement benefit for structures and shifting/reconstruction allowance. Households having customary rights to land and physical property like the owners and users of vested and nonresident property, lessees of homesteads, commercial and agricultural land,

sharecroppers, renters of land and structures, etc. are also covered under the resettlement action plan. The RAP also includes opportunities for occupational skill development training for income generation activities for the PAPs, especially for poor households. The people involuntarily displaced from homes, assets, or income sources as well as non-titled people affected by the project will receive priority access to these income restoration measures. The resettlement activities of the project will be carried out in consultation with the PAPs and all efforts will be made to minimize disruption during project implementation. PAPs will be encouraged to self-relocate and their preferences will be taken into account in the selection of alternative relocation sites.

(2) Cut-off Date of Eligibility

The cut-off date for the Project is the date when the census survey started in principle. For the Mombasa Gate Bridge it was declared at the initial stakeholder meetings. Thus, Table 14.12-5 presents the declared cut-off dates as follows.

Table 14.12-5 Declared Cut-off Date

Date	Venue	Covered Areas		
		Sub County	Location	Village
09th Dec 2017	Peleleza primary school	Mombasa Island	Majengo	Majengo, Ganjoni, Liwatooni
13th Dec 2017	Kibaki estate	Likoni	Likoni	Bofu Maskani & Javi la wageni
			Mtongwe	Mtongwe Polytechnic
			Shika Adabu	Kibaki Estate and Mwahima Village
19th Dec 2017	Mtongwe polytechnic	Matuga (Kwale)	Shika Adabu	Non settled farmlands in Ngombeni Location

Source: RAP

(3) Principal of Replacement Cost

Replacement Cost means replacement of assets with the same quality and quantity with an amount sufficient to cover the full cost of lost assets without depreciation and related transaction costs and taxes. The cost is to be based on the Market Rate (Commercial Rate) according to Kenyan law for the sale of land or property. In terms of land, this may be categorized as follows; (a) "Replacement cost for agricultural land" means the pre-project or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land, plus the costs of: (b) preparing the land to levels similar to those of the affected land; and (c) any registration and transfer taxes;

Replacement Cost for Houses and other Structures means the prevailing cost of replacing affected structures, in an area and of the quality similar to or better than that of the affected structures. Such costs shall include: (a) transporting building materials to the construction site; (b) any labuor and contractors' fees; and (c) any registration costs.

14.13 Scope of Resettlement Impact

This section will be described in the Draft Final Report including the results/findings of the following:

(1) Census Survey

The MGB will potentially displace 2,589 PAUs (3,230 PAPs) including 1,706 PAUs (2,347 PAPs) of Households and 883 PAUs (883 PAPs) of CBEs. This number is based on an inventory of those that reside within the traverse exclusive of those working there.

Table 14.13-1 Distribution of PAHs and PAPs by Category

	Type of Loss	Number of PAUs			Number of PAPs		
	Nature of displacement	*Legal*	*Non-legal*	*Total*	*Legal*	*Non-legal*	*Total*
1	HH(Structure Owner on Gov Land)	944	3	947	1,297	13	1,310
2	HH (Structure Owner on Private land	9	-	9	51	-	51
3	HH (Tenants)	750	-	750	986	-	986
4	CBEs (Structure owner on Gov land)	179	91	270	179	91	270
5	CBE (Structure owner on Private land)	324	-	324	324	-	324
6	CBEs (Tenant)	271	18	289	271	18	289
	Total	2,477	112	2,589	3,108	122	3,230

	Type of Loss	Number of PAUs			Number of PAPs		
	Non-displacement	*Legal*	*Non-legal*	*Total*	*Legal*	*Non-legal*	*Total*
1	Fishermen	-	-	-	500	-	500
2	Community owned structures: CPRs	19	-	19	-	-	-
3	Land owners (Agricultural and undeveloped land)	-	-	-	63	-	63
4	Wage earners	-	-	-	439	227	666
	Total	19	-	19	1,002	227	1,229

Table 14.13-1 (a): Breakdown of above Table 14.13-1 (Distribution of PAHs)

Admin Location	PAHs (Structure owners on Gov. land)		PAHs (Structure owners on Private. land)		Tenants		Total
	Legal	Non--legal	Legal	Non--legal	Legal	Non--legal	
Majengo	-	3	7	-	117	-	127
Likoni	386	-	1	-	267	-	654
Mtongwe	32	-	-	-	22	-	54
Shika Adabu	526	-	1	-	344	-	871
Ng'ombeni	-	-	-	-	-	-	-
Total	**944**	**3**	**9**	**-**	**750**	**-**	**1,706**

Table 14.13-1 (b): Breakdown of above Table 14.13-1 (Distribution of PAPs)

Admin Location	PAPs (Structure owners on Gov. land)		PAPs (Structure owners on Private. land)		Tenants		Total
	Legal	Non--legal	Legal	Non--legal	Legal	Non--legal	
Majengo	-	13	51	-	246	-	310
Likoni	459	-	-	-	358	-	817
Mtongwe	54	-	-	-	-	-	54
Shika Adabu	784	-	-	-	382	-	1,166
Ng'ombeni	-	-	-	-	-	-	-
Total	**1,297**	**13**	**51**	**-**	**986**	**-**	**2,347**

Table 14.13-1 (c): Breakdown of above Table 14.13-1 (Distribution of PAHs)

Admin Location	CBEs (Structure owners on Gov. land)		CBEs (Structure owners on Private. land)		Tenants		Total
	Legal	Non--legal	Legal	Non--legal	Legal	Non--legal	
Majengo	-	88	323	-	160	18	589
Likoni	47	-	1	-	44	-	92
Mtongwe	-	3	-	-	-	-	3
Shika Adabu	132	-	-	-	67	-	199
Ng'ombeni	-	-	-	-	-	-	-
Total	**179**	**91**	**324**	**-**	**271**	**18**	**883**

Table 14.13-1 (d): Breakdown of above Table 14.13-1 (Distribution of PAPs)							
Admin Location	CBEs (Structure owners on Gov. land)		CBEs (Structure owners on Private. land)		Tenants		Total
	Legal	Non--legal	Legal	Non--legal	Legal	Non--legal	
Majengo	-	88	323	-	160	18	589
Likoni	47	-	1	-	44	-	92
Mtongwe	-	3	-	-	-	-	3
Shika Adabu	132	-	-	-	67	-	199
Ng'ombeni	-	-	-	-	-	-	-
Total	**179**	**91**	**324**	**-**	**271**	**18**	**883**

Source: The RAP Study

Furthermore, 19 CPRs, 500 Fishermen, 63 land owners (agricultural and undeveloped land) and 666 employees will be affected due to the MBG project, however displacement of these people will not be necessary. Regarding the fishermen, whole fishermen are controlled under the Beach Management Unit (BMU), and no informal fishermen were confirmed.

(2) Assets and Land Survey

1) Land assets

The outcome of the Census Survey/ inventory of potential PAPs for the MGB is provided in Appendix 3.1 and summarized in Table 14.13-2. From the inventory of PAPs undertaken, development of the 13.2 Km Bridge Project inclusive of Approach Roads is likely to affect a total of 725 plots accounting for 62.59 hectares of land. With the exception of the last part of Shika Adabu and Ngombeni Locations in the tail end of project which is essentially rural, the Project essentially passes through urban and semi urban high density settlements which explains the high number of plots affected. Both Likoni and Shika Adabu Locations account for 73.8% of the plots traversed and 76.8% of the total land to be acquired.

Table 14.13-2 Distribution of landed PAPs by Project Section

Project section by sub-county	Admin Location	Land-use category*	Potentially acquired land plots				Potentially acquired land area			
			No. of plots	%	Total plots	%	Area (Ha)	%	Total Area	%
Mombasa Island	Majengo	Commercial	125	17.2	135	18.6	5.11	8.2	5.44	8.7
		Residential	10	1.4			0.33	0.5		
Likoni	Likoni	Commercial	38	5.2	272	37.5	2.07	3.3	26.38	42.1
		Residential	234	32.3			24.31	38.8		
	Mtongwe	Residential	46	6.4	46	6.4	3.57	5.7	3.57	5.7
	Shika Adabu	Commercial	68	9.4	263	36.3	2.1	3.4	21.71	34.7
		Residential	141	19.5			7.57	12.1		
		Agricultural	54	7.4			12.04	19.2		
Matuga / Kwale County	Ng'ombeni	Agricultural	9	1.2	9	1.2	5.49	8.8	5.49	8.8
Total			**725**	**100**	**725**	**100**	**62.59**	**100**	**62.59**	**100**

Source: The RAP Study

*Land use category of Mombasa Island follows classification of Zoning Plan. For other locations land use is classified based on the actual land use because there is no Zoning Plan.

2) Tenure Category of Target Land

An overview of land tenure conditions within the traverse of the MGB Project is presented in

Table 14.13-3 below. All potentially acquired land in Mombasa Island is privately owned under leasehold. Within Mombasa Mainland South, over 95% of traversed land is formerly GOK land under diverse stages of conversion to private land. Most of the land was surveyed and allotment letters issued implying that, though title vests with government, it is under legal occupation. Overall, 88% of all potentially acquired land is government land in transition.

Table 14.13-3 Tenure Category for Potentially acquired Land

Land Use Category	Admin Location	No. of plots	Total plots	Share (%)	Hectarage	Total area (Ha)	Share (%)
Commercial land	Majengo	125	231	31.9	5.11	9.28	14.8
	Likoni	38			2.07		
	Shika Adabu	68			2.1		
Residential land	Majengo	10	431	59.4	0.33	35.78	57.2
	Likoni	234			24.31		
	Mtongwe	46			3.57		
	Shika Adabu	141			7.57		
Agricultural land	Shika Adabu	54	63	8.7	12.04	17.53	28.0
	Ng'ombeni	9			5.49		
Total		725	725	100	62.59	62.59	100

Source: The RAP Study

3) Displacement of Investment of Land

(i) Total buildings: The entire bridge construction project will displace a total of 1,201 housing structures, of which 76.8% are accounted for by Likoni and Shika Adabu Locations in Mainland South. Majengo location on Mombasa Island accounts for 19.2% of all buildings which includes 27 of the 32 single storied buildings, all double storied buildings, 15 of the 16 three storied buildings and all other multi-storied buildings. A total of 691 permanent buildings equivalent to 57.5% of all building structures that are likely to be displaced followed by temporary buildings at 42.5%. Of these, single storied permanent buildings are in the majority at 51.1%.

The 398 temporary structures in MMS, are owned by 250 people (82 land owners and 168 encroachers).

Table 14.13-4 Inventory of Potentially displaced Buildings

Admin Location	Main Structures (masonry)								Temporary Structures (wooden)	Total Structures	
	NS	*1S*	*2S*	*3S*	*4S*	*5S*	*6S*	*7S*		*Tally*	*%*
Majengo	47	27	24	15	0	1	1	3	112	230	19.2
Likoni	298	1	0	1	0	0	0	0	124	424	35.3
Mtongwe	48	0	0	0	0	0	0	0	0	48	4.0
Shika Adabu	221	4	0	0	0	0	0	0	274	499	41.5
Ng'ombeni	0	0	0	0	0	0	0	0	0	0	0
Total	**614**	**32**	**24**	**16**	**0**	**1**	**1**	**3**	**510**	**1,201**	**100**
Allocation (%)	*51.1*	*2.7*	*2.0*	*1.3*	*0.0*	*0.1*	*0.1*	*0.2*	*42.5*	*100.0*	
	(691) *57.5%*								*42.5%*	*100%*	

Source: The RAP Study

Note: NS-Non-storied, 1-7S-Total Storeys

(ii) Other assorted privately owned assets: A total of 1,038 assorted assets, the majority of which being ancillary non affected buildings, are likely to be displaced. Among these, septic tanks and gates are the majority but also included are 68 functional boreholes and 29 wells. Majengo location in Mombasa Sub County accounts for 32.6% of all assorted assets including 41 of the 68 boreholes traversed.

Table 14.13-5 Inventory of Assorted Assets

Admin Location	Assorted Assets							Total	Share (%)
	Fences	*Walls*	*Verandas*	*Gates*	*Wells*	*Boreholes*	*Septic tanks*		
Majengo	22	76	19	152	6	41	22	338	32.6
Likoni	10	0	6	17	11	10	298	352	33.9
Mtongwe	0	1	0	1	0	3	48	53	5.1
Shika Adabu	18	0	26	0	12	14	225	295	28.4
Ng'ombeni	0	0	0	0	0	0	0	0	0
Total	**50**	**77**	**51**	**170**	**29**	**68**	**593**	**1,038**	**100**

Source: The RAP Study

4) Displacement of Commercial Business Enterprises (CBEs)

A total of 833 Commercial Business Enterprises (CBEs) both small and large are likely to be displaced by the bridge construction project (Table 14-13-6 below). Of these, Majengo in Momba County accounts for the bulk at 597 while commercial rentals are dominant at 401 followed by food kiosks at 171. Within the MMS area, CBEs are mainly encountered along both the A14 and Mtongwe roads targeted for expansion.

Table 14.13-6 Tally of CBEs Traversed

Admin Location	CBEs																											Total
	Commercial rentals	*Restaurants*	*Hotels*	*Liquor store*	*Trading*	*Whole sale*	*Retail shops*	*Hardwares*	*MV garages*	*MV sales yards*	*Unisex saloons*	*Hospital*	*Tyres*	*Autor spares*	*C&F*	*Food processor*	*Godowns*	*Furniture*	*Textiles*	*Transporters*	*Pharmaceutical*	*Scrap metals*	*Carwash*	*Advertising*	*Shops*	*Schools*	*Food kiosks*	*Water kiosks*	*Gas stations*	*Total*
Majengo	279	2	2	1	79	13	26	0	4	6	2	1	1	1	2	3	3	1	2	1	1	1	3	1	52	3	106	0	1	**597**
Likoni	52	0	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	5	0	13	2	2	**84**
Mtongwe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	**3**
Shika Adabu	70	0	0	0	0	0	25	2	1	0	0	0	0	0	0	0	0	7	2	0	0	0	0	0	36	3	52	0	1	**199**
Ng'ombeni	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Totals	401	2	2	1	79	13	56	4	5	6	2	1	1	1	2	3	3	10	5	1	1	1	3	1	96	6	171	2	4	**883**

Source: The RAP Study

5) Displacement of Common Property Resources (CPRs)

A summary of other assets likely to be displaced is provided in Table 14.13-7 below. Other CPRs are encountered as follows.

Table 14.13-7 Common Property Resources (CPRs) in the MGB Traverse

Admin. Location	Assorted CPRs					
	Cemeteries	Shrine	Self help groups buildings	Public Schools	Churches	Total
Majengo	1	0	0	3	0	**4**
Likoni	1	1	3	4	2	**11**
Mtongwe	0	0	0	0	1	**1**
Shika Adabu	1	1	0	0	1	**3**

Admin. Location	Assorted CPRs					
Ng'ombeni	0	0	0	0	0	**0**
Totals	**3**	**2**	**3**	**7**	**4**	**19**

Source: The RAP Study

Graves: Graves account for 3 of the 19 CPRs..

Shrines: Great care was taken to align the MGB away from major shrines and kayas in line with the requirements of OP 4.12. However, as currently aligned, the MGB will traverse the grounds of Kaya Makame on the shoreline of Port Reitz Creek at Bofu Maskani and entirely displace a second one owned by the Mwahima family in Shika Adabu. Access to three other minor shrines situated on the cliffs of Mweza Creek could also be blocked during construction and operation stages of the project.

Self help group projects: These number 3 and comprise structures that groups use to further common interests such as sports, table banking among others.

Public Schools: A total of 7 public schools occur within the traverse of the MGB and its access roads and are likely to be affected as follows:

Table 14.13-8 Potentially Impacted Schools

Admin. Location	Name of School	Nature of Impacts
Majengo	Gabra School (Moslem)	3 meters of store clipped
	Sacred Heart Primary and Secondary (Catholic Archdioceses of Mombasa)	Frontage wall, veranda and water reservoir affected by Archbishop Makarios Rd expansion
	Ganjoni Integrated Primary School	Perimeter wall, sewer line and kitchen affected
Likoni	Puma Primary	Bridge passes overhead
	Bridge Primary	Part of classrooms clipped
	Peleleza Primary	Part of the Classroom clipped
	Consolota Primary along A7 Road	Perimeter wall and classrooms clipped 1.8 metres by expansion of A7 road

Source: The RAP Study

6) Displacement of Trees and Crops

A total of 16,713 assorted agro forestry trees are likely to be displaced in the development of the MGB and assorted roads (Table 14.13-9), 63.4% of which occur in Shika Adabu. Timber trees alone account for 51.2% of the trees followed by Fruit trees which account for 46.8%. Reforestation shall be planned for trees to be displaced at detailed design stage in consultation with CFAs.

Table 14.13-9 Distribution of Trees Likely to be Displaced

Admin Location	Type of Trees by Age Category						Total by Location	
	Fruits		Timber		Ornamental		Tally	Share (%)
	M	*J*	*M*	*J*	*M*	*J*		
Majengo	119	36	141	19	248	35	598	3.6
Likoni	1,435	26	3,008	44	16	7	4,536	27.1
Mtongwe	50	0	217	0	0	0	267	1.6
Shika Adabu	4,046	2,032	3,844	666	14	0	10,602	63.4
Ng'ombeni	72	5	613	9	11	0	710	4.2
Total	**5,722**	**2,099**	**7,823**	**738**	**289**	**42**	**16,713**	**100.0**
Total Tree type	7,821		8,561		331			
Share by Tree (%)	46.80		51.22		1.98			

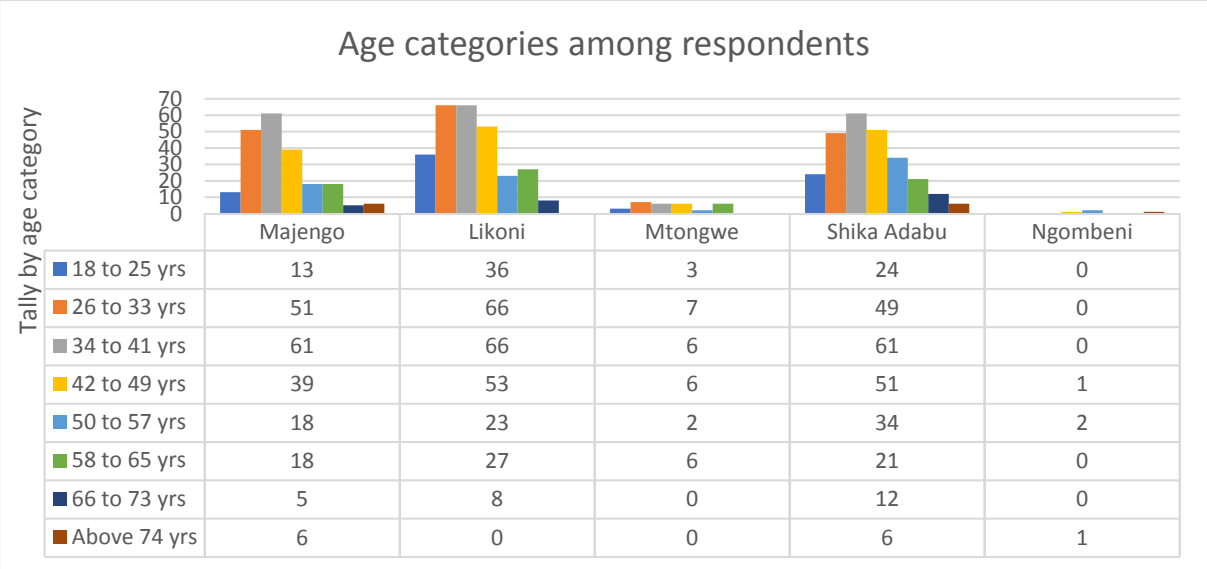
Source: The RAP Study

Note: M-Mature; J-Juvenile

(3) Socio-economic Survey

1) Age of Respondents

Figure 14.13-1 provides age categories for potential PAHs in the MGB project where age categories ranged from 18 to above 74 years. The bulk of potential PAHs (75.8%) are of age 49 years and below implying that most PAHs as still in the economically productive category. Majengo Location in Mombasa Island has a relatively younger population with the age category of 34-41 years approximating to 30% of the respondents. Majengo, Likoni, Shika Adabu and Ngombeni have PAHs who are above 70 years of age and are therefore potentially vulnerable.



	Majengo	Likoni	Mtongwe	Shika Adabu	Ngombeni
18 to 25 yrs	13	36	3	24	0
26 to 33 yrs	51	66	7	49	0
34 to 41 yrs	61	66	6	61	0
42 to 49 yrs	39	53	6	51	1
50 to 57 yrs	18	23	2	34	2
58 to 65 yrs	18	27	6	21	0
66 to 73 yrs	5	8	0	12	0
Above 74 yrs	6	0	0	6	1

Source: The RAP Study

Figure 14.13-1 Age Category for PAPs in the Traverse

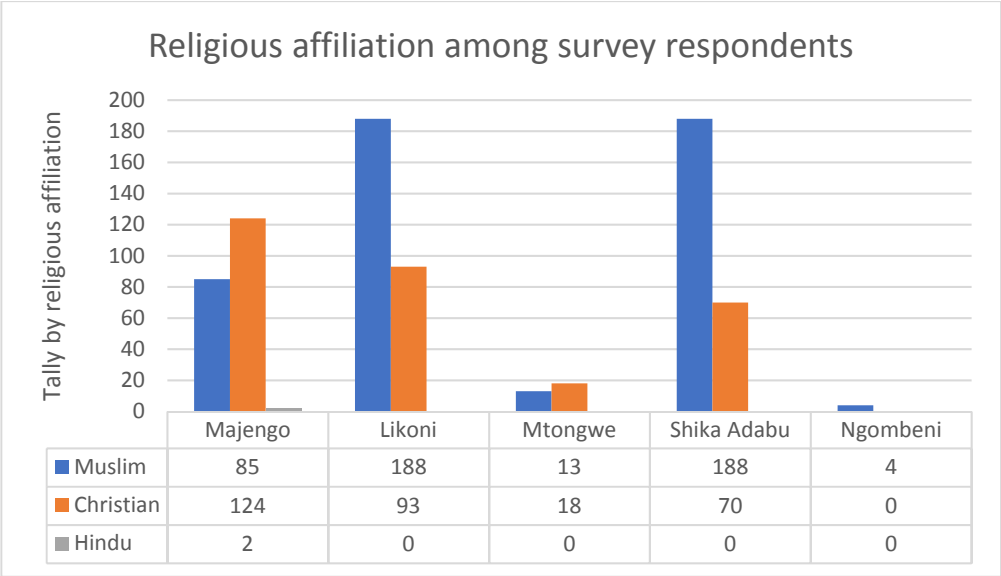
Table 14.13-10 Tally per Age Categories for Respondents

Age Composition	Majengo	Likoni	Mtongwe	Shika Adabu	Ngombeni	Total	Share (%)
18 to 25 yrs	13	36	3	24	0	76	9.7
26 to 33 yrs	51	66	7	49	0	173	22.1
34 to 41 yrs	61	66	6	61	0	194	24.8
42 to 49 yrs	39	53	6	51	1	150	19.2
50 to 57 yrs	18	23	2	34	2	79	10.1
58 to 65 yrs	18	27	6	21	0	72	9.2
66 to 73 yrs	5	8	0	12	0	25	3.2
Above 74 yrs	6	0	0	6	1	13	1.7
Total Reply	211	279	30	258	4	782	100.0
No reply	*0*	*4*	*1*	*4*	*0*	*9*	
Total	**211**	**283**	**31**	**262**	**4**	**791**	

Source: The RAP Study

2) Religion of Potential PAPs

The Islamic faith predominates at 64.4% with Christians accounting for 35.4% of potential PAPs (Figure 14.13-2).



Source: The RAP Study

Figure 14.13-2 Religious Practice within the Traverse

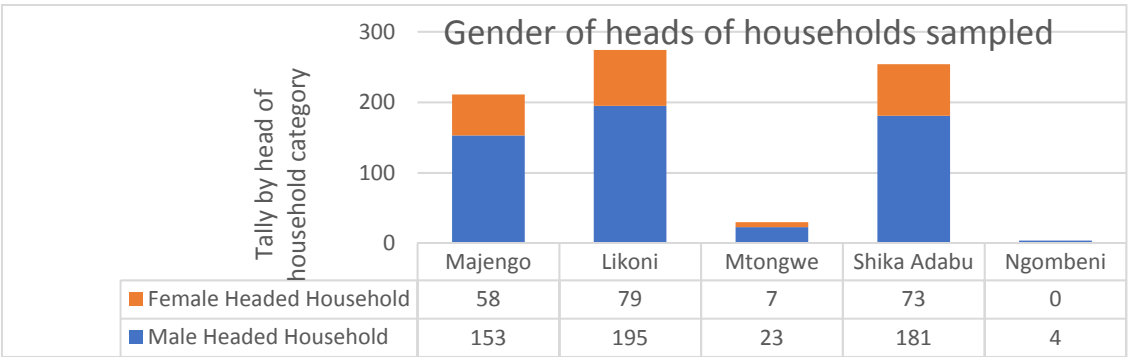
Table 14.13-11 Tally per Religious Categories

Respondent Religion	Majengo	Likoni	Mtongwe	Shika Adabu	Ngombe	Total
Muslim	85	188	13	188	4	478
Christian	124	93	18	70	0	305
Hindu	2	0	0	0	0	2
Total reply	211	281	31	258	4	785
No reply	*0*	*2*	*0*	*4*	*0*	*6*
Total	**211**	**283**	**31**	**262**	**4**	**791**

Source: The RAP Study

3) Composition of Households

The male gender is the dominant head among PAP households at 71.9%.



Source: The RAP Study

Figure 14.13-3 Gender of Head of Households in the MGB Traverse

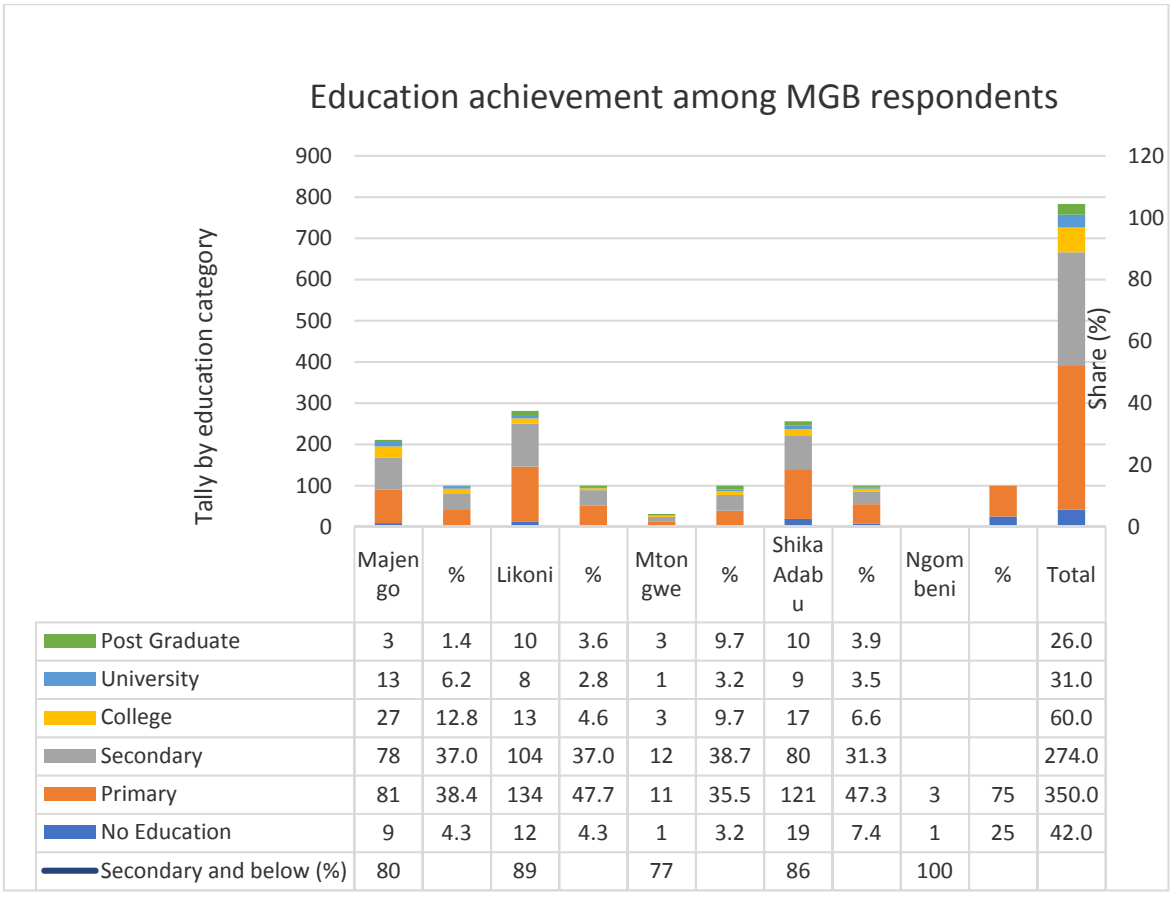
Table 14.13-12 Head of Household by Gender

Head of Household	Majengo	Likoni	Mtongwe	Shika Adabu	Ngombeni	Total	Share (%)
Male Headed Household	153	195	23	181	4	556	71.9
Female Headed Household	58	79	7	73	0	217	28.1
Total respondents	211	274	30	254	4	773	100
No reply	*0*	*9*	*1*	*8*	*0*	*18*	
Total	**211**	**283**	**31**	**262**	**4**	**791**	

Source: The RAP Study

4) Education Achievement

Levels of literacy within the traverse of the MGB is generally low (Figure 14.13-4) with over 80% of respondents being of secondary education and below. The situation is worst at Likoni where 81% of respondents are of secondary level and below with primary level and below accounting for 42.3%.



	Majengo	%	Likoni	%	Mtongwe	%	Shika Adabu	%	Ngombeni	%	Total
Post Graduate	3	1.4	10	3.6	3	9.7	10	3.9			26.0
University	13	6.2	8	2.8	1	3.2	9	3.5			31.0
College	27	12.8	13	4.6	3	9.7	17	6.6			60.0
Secondary	78	37.0	104	37.0	12	38.7	80	31.3			274.0
Primary	81	38.4	134	47.7	11	35.5	121	47.3	3	75	350.0
No Education	9	4.3	12	4.3	1	3.2	19	7.4	1	25	42.0
Secondary and below (%)	80		89		77		86		100		

Source: The RAP Study

Figure 14.13-4 Education Achievement among Heads of Households

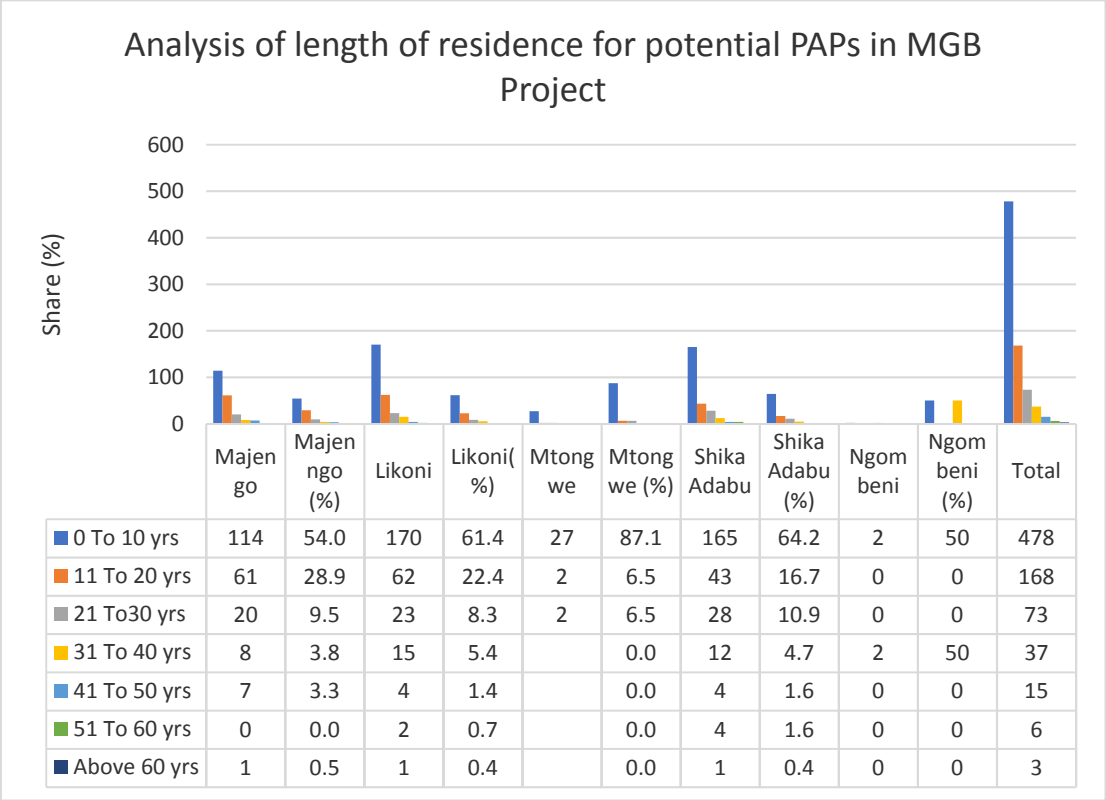
Table 14.13-13 Breakdown of Education Achievement among PAP Representatives

Respondent Education	Majengo	Likoni	Mtongwe	Shika Adabu	Ngombeni	Total	Share (%)
No Education	9	12	1	19	1	42	5.4
Primary	81	134	11	121	3	350	44.7
Secondary	78	104	12	80		274	35.0
College	27	13	3	17		60	7.7
University	13	8	1	9		31	4.0
Post Graduate	3	10	3	10		26	3.3
Total respondents	211	281	31	256	4	783	100
No reply	*0*	*2*	*0*	*6*	*0*	*8*	
Total	**211**	**283**	**31**	**262**	**4**	**791**	

Source: The RAP Study

5) Length of Residence among Respondents

A time line analysis for the MGB traverse based on recorded length of residence for heads of households is presented in Fig 14.13-5 below. At 61.3%, the majority of potential MGB PAPs are newly settled with less than 10 years of residence. Both Mtongwe and Ng'ombeni are newly settled with none of the residents reporting more than 20 years of residence in comparison with Majengo (Mombasa Island), Likoni and Shika Adabu where some respondents reported length of stays more than 60 years.



	Majengo	Majengo (%)	Likoni	Likoni(%)	Mtongwe	Mtongwe (%)	Shika Adabu	Shika Adabu (%)	Ngombeni	Ngombeni (%)	Total
0 To 10 yrs	114	54.0	170	61.4	27	87.1	165	64.2	2	50	478
11 To 20 yrs	61	28.9	62	22.4	2	6.5	43	16.7	0	0	168
21 To30 yrs	20	9.5	23	8.3	2	6.5	28	10.9	0	0	73
31 To 40 yrs	8	3.8	15	5.4		0.0	12	4.7	2	50	37
41 To 50 yrs	7	3.3	4	1.4		0.0	4	1.6	0	0	15
51 To 60 yrs	0	0.0	2	0.7		0.0	4	1.6	0	0	6
Above 60 yrs	1	0.5	1	0.4		0.0	1	0.4	0	0	3

Source: The RAP Study

Figure 14.13-5 Analysis of Length of Residence among PAPs

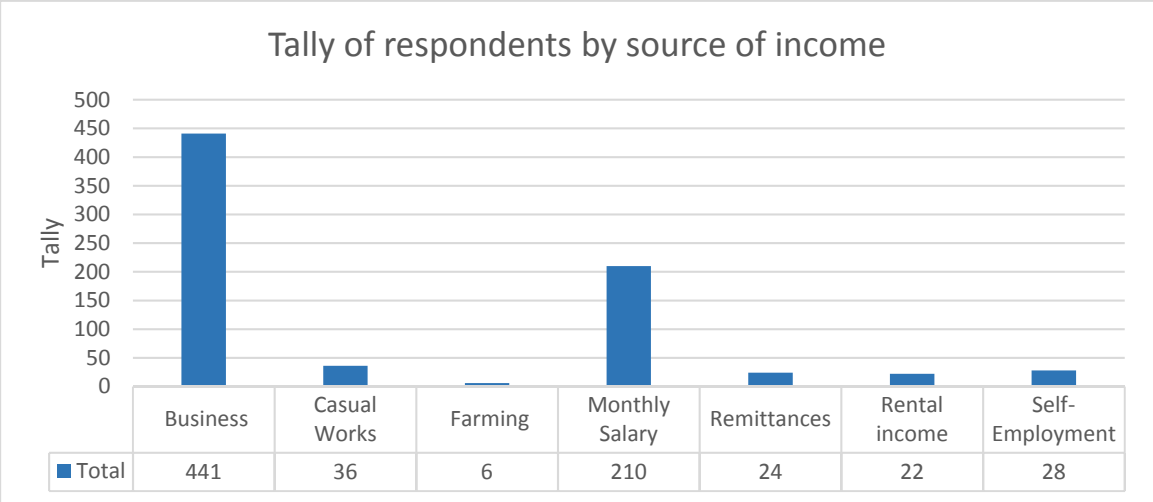
Table 14.13-14 Analysis of Length of Residence for PAPs

Length of Residence	Majengo	Likoni	Mtongwe	Shika Adabu	Ng'ombeni	Total	Share (%)
0 to 10 yrs	114	170	27	165	2	478	61.3
11 to 20 yrs	61	62	2	43	0	168	21.5
21 to 30 yrs	20	23	2	28	0	73	9.4
31 to 40 yrs	8	15		12	2	37	4.7
41 to 50 yrs	7	4		4	0	15	1.9
51 to 60 yrs	0	2		4	0	6	0.8
Above 60 yrs	1	1		1	0	3	0.4
Total respondents	211	277	31	257	4	780	100.0
No reply	*0*	*6*	*0*	*5*	*0*	*11*	
Total	**211**	**283**	**31**	**262**	**4**	**791**	

Source: The RAP Study

6) Analysis of Sources of Incomes

Trading/Business is the most predominant means of livelihood within the MGB traverse followed by salaried employment (Figure 14.13-6 and Table 14.13-15).



Source: The RAP Study

Figure 14.13-6 Analysis of Income Patterns along the MGB Traverse

Table 14.13-15 Income Patterns for Respondents

Sources of Income	Majengo	Likoni	Mtongwe	Shika Adabu	Ngombeni	Total	Share (%)
Business	112	160	13	155	1	441	57.5
Casual Works	11	19	1	4	1	36	4.7
Farming	1	1	1	2	1	6	0.8
Monthly Salary	51	70	9	79	1	210	27.4
Remittances	13	5	3	3	0	24	3.1
Rental income	4	13	0	5	0	22	2.9
Self-Employment	9	11	4	4	0	28	3.7
Total respondents	201	279	31	252	4	767	100.0
No reply	*10*	*4*	*0*	*10*	*0*	*24*	
Total	**211**	**283**	**31**	**262**	**4**	**791**	

Source: The RAP Study
Business: Commercial business enterprises (CBEs) such as real estate, trading, services, manufacturing etc.
Casual Works: Employees on daily wage Farming: Agriculture/cultivation
Monthly Salary: Office worker, civil servant Remittances: Money transfer from other family member or relatives etc.
Rental income: Rental income from property such as structure and land
Self-Employment: Self-employment in small scale trade

7) Income Patterns and Status of Well-being

Income levels for the MGB traverse for the base year 2015 are analyzed below. Outcome of the analysis of the status of wellbeing for PAPs is summarized in Table 14.13-16 below based on a comparison of computed monthly and daily per capita incomes with the national poverty cut-off lines. A monthly income in the range of Ksh 20,000 translates into a per capita monthly income of Ksh 3,333 which is above the official monthly poverty threshold of Ksh 2,913 per adult equivalent in urban areas as published in 2005/6. This further translates into a daily per capita income of Ksh 111 which is above the one dollar (Ksh 100 per day) poverty cut off line. Going by this cut-off, any PAP with a monthly income below Ksh 20,000 is considered below the poverty line and is therefore income poor. By extension, 41.2% of MGB PAPs are considered poor.

Table 14.13-16 Analysis of Income Status for MGB PAPs

Income Profile (per month)	Majengo	Likoni	Mtongwe	Shika Adabu	Ng'ombeni	Tally by category	Share (%) by category	Position on poverty line
Below 10,000	13	59	6	36	3	117	15.70	41.2%
11,000 to 20,000	28	91	9	62		190	25 50	
Poverty Cutoff line: Ksh 15,000 equivalent to Pa capita daily income of One US Dollar								
21,000 to 30,000	40	40	5	57		142	19.06	
31,000 to 40,000	31	22	2	34		89	11.95	58.8%
41,000 to 50,000	23	16	3	21	1	64	8.59	
51,000 to 60,000	12	18	4	14		48	6.44	
61,000 to 70,000	8	8		5		21	2.82	
71,000 to 80,000	8	7		7		22	2.95	
81,000 to 90,000	4	5		5		14	1.88	
Above 90,000	24	5	1	8		38	5.10	
Total Reply	191	271	30	249	4	745	100.00	
No Reply	*20*	*12*	*1*	*13*	*0*	*46*		
Total	**211**	**283**	**31**	**262**	**4**	**791**		

Source: The RAP Study

(4) Socially Vulnerable People

Table 14.13-17 provides an analysis of the scope of vulnerability in the MGB Project. 78.9% of PAPs are considered vulnerable on account of poverty and 10.8% of them are elderly.

Table 14.13-17 Tally of Respondents by Cause of Vulnerability

Category	Majengo	Likoni	Mtongwe	Shika Adabu	Ng'ombeni	Total	Share (%)
Hearing	2	1	0	1	0	4	1.0
Leprosy	0	1	0	1	0	2	0.5
Mentally Challenged	0	5	0	4	0	9	2.3
Old Age	19	11	2	9	1	42	10.8
Paralyzed	0	1	0	1	0	2	0.5
Physical Challenged	1	7	1	13	0	22	5.7
Poverty	41	150	15	98	3	307	78.9
Visually Challenged	0	1	0	0	0	1	0.3
Total	**63**	**177**	**18**	**127**	**4**	**389**	**100**

Source: The RAP Study

(5) Fishery in/around Mweza Creek

1) Fishery Management System in Kenya

On the see area around the project site, fishery is operated. In Kenya, fishery is operated under Kenya's marine fisheries management structure which is stipulated on the Fisheries Management and Development Act of 2016. Kenya's small-scale artisanal fisheries have been managed by a system of Beach Management Units (BMUs) since 2006. BMUs are co-management system which secures communities and livelihoods. Each county has a network of BMUs with fisheries officers. Local management of small-scale fisheries has been successful in Kenya.

2) Beach Management Units (BMUs)

Beach Management Unit (BMU), which is stipulated in the Fisheries Management and Development Act, 2016, is an organization of fishers, fish traders, boat owners, fish processors and other beach stakeholders who traditionally depend on fisheries activities for their livelihoods. Under the Act, Fisheries (Beach Management Unit) Regulations, 2007 clarifies the system, function and responsibilities. A BMU is set up for two or three fish landing stations.

The objectives of a beach management unit are:

- to strengthen the management of fish-landing stations, fishery resources and the aquatic environment;
- to support the sustainable development of the fisheries sector;
- to help alleviate poverty and improve the health, welfare and livelihoods of the members through improved planning and resource management, good governance, democratic participation and self-reliance;
- to recognize the various roles played by different sections of the community, including women, in the fisheries sector;
- to ensure the achievement of high quality standards with regard so fish and fishery products;
- to build capacity of the members for the effective management of fisheries in collaboration with other stakeholders; and
- to prevent or reduce conflicts in the fisheries sector.

In Kenya, whole fishing including sport fishing need license, which restricts fishing methods, gears, vessel type, size and capacity and etc. On the other hand, although landing sites are designated on each BMU, fishing ground is free access.

3) Fishery in/around Mweza Creek

In/around Mweza Creek, traditional and small-scale fishery is carried out by local fishermen who belong to Likoni BMU. The fishing styles of Mweza creek are shown on Table 14.13-18.

Table 14.13-18 Typology of Fishery in/around Mweza Creek

Typology	Details
Nets	1. Catching all types of fish
Malema	1. This type of fish trap is basket like. It is made of a wooden or steel frame and either a net or fibers woven round the frame. 2. It is used for fishing along the shallow edges of the channel and creek. 3. The timber for the traps is made from *Mkone, Mwarobaine* or *Makambe* tree. These trees are available locally.
Uzio (Figure 14.13-8)	1. These are expensive to make and are made from special timber such as mangrove reed / raffia (vito). Nets can also be added to reinforce the trap. 2. A long fence like structure is constructed on the intertidal with a trap chamber. Fish will come in during high tides, but when the tide recedes, the fish is trapped in chamber. 3. This is the best method for commercial fishing as, according to the local

Typology	Details
	fishermen, the trap catches a lot of fish. Averagely in a day, *uzio* can net a ton or more of fish.
Fishing line	1. Used by locals to catch fish for home consumption only. 2. On a small scale, they can attach many hooks and catch more fish for sale using meat as bait.
Spears	1. Used by locals to catch fish for home consumption only. 2. Mostly the users of spears are skin divers and catch lobsters, octopus and squid. 3. It can be metallic or made from *mkone* tree.
Torch	1. Torches are used by the skin divers as well as for night fishing.
Kisoro	1. This is similar to *uzio* but is made from palm fronds (*ukuti*).
Dugout canoes	1. Made from Mango tree, *Msufi* or any other large tree. All these trees are available locally but getting finished. 2. They are used for creek or channel fishing only using nets, lines and spear.

Source: Preliminary Cultural Heritage Impact Assessment for the Proposed Mombasa Gate Bridge Project, Mombasa County, September 6th – October 2nd 2018, National Museums of Kenya

Likoni BMU is allocated five fish landing sites. (see Figure14.13-7) The project will affect one site directly due to pier construction, and one site indirectly due to obstruction of access. The site affected due to the pier construction need to secure alternative sites including other four sites. And another site needs to secure the access route during construction period.

Figure 14.13-7 Locations of Fish Landing Sites of Likoni BMU

Fish species landed at Mweza creek are very various. In addition to the species shown on Table14.6-30, totally 30 species were recorded.

Fishery yields of Likoni BMU depends on fishery types. Daily yield of trap fishing (*Uzio*) is averagely 100 kg: yield of boat fishing is averagely 40 kg per trip. However whole types of fishing depend on conditions including season, tidal and climates. Particularly since impacts of monsoon condition is significant, the fishermen are forced to change their fishing ground due to seasons. And also the fishery is receiving the products of the mangrove forests which is an abundant fishing ground. Since the fishery around Mweza Creek is fragile, environmental change due to the project may affect the fishery. Since the number of fishermen who belong Likoni BMU are 500 persons, maximum 500 fishermen may be affected.

Figure 14.13-8 *Uzio* (Fishing Trap) at Mweza Creek

(6) Affected Vendors around Likoni Ferry Jetties

Around the Likoni Ferry jetties, a lot of vendors are running their vending activities. (See 14.6.1 3)) The number of the vendors is approximately 1,200, including 800 with some stall and 400 with no stall. (as of 20th February, 2019) Due to the operation of the project, the vendors may lose their customers and their livelihoods may be affected.

14.14 Measures of Compensation and Assistance

(1) Income Restoration and Livelihood Development Program

Dominant livelihoods encountered within the MGB traverse are summarized in Table 14.14-1 based on administrative jurisdiction.

Table 14.14-1 Measures for Income Restoration

Sub County	Location	Main Livelihood Systems	Proposed Restoration
Mombasa Island	Majengo	Commercial:- Real Estate, Trading, Services, Manufacturing	Compensation for loss of property and business including relocation costs
		Employment	Cash hand-out for lost opportunities
		Self-employment in small scale trade	Cash compensation for loss of premises and business
Mombasa Mainland South	Likoni /Mtongwe and Shika Adabu	Small Scale Trade	As above
		Employment in Mombasa Town	Design measures to ensure non restricted access to the Kenya Ferry Service and other means to transport
		Rental Income	Compensation for loss of property and one year equivalent for lost rental income
		Crops and Trees	Cash compensation for loss of land, crops and income
			Cash hand-out for loss of employment in farms
		Fishing at Mweza and Port Reitz Creeks	Non-restricted access to fisheries and fish landing sites. Cash compensation for lost income.
		Boda and Tuk tuk based passenger transport	Ensure non-restricted access to transport routes. Provision of alternatives to blocked routes
	Rural Shika Adabu and Ngombeni	Farming	Cash compensation for land and crops lost. Non-restricted access to agricultural land.

Source: The RAP Study

(2) Relocation Site Plan

This RAP Report has made no provision for the selection and preparation of relocation sites. This is because, though some PAPs will lose 100% of their residential and commercial plots, none expressed the wish for land to land compensation. All are in favour of cash compensation provided that adequate compensation is paid promptly and before site handover to contractors. They were advised that this is also the JICA Policy.

(3) Entitlement Matrix.

An entitlement matrix detailing eligibility and entitlement for compensation is provided in Table 14.14-2 below.

Compensation policy of the NLC includes; market value of the land and improvements, expenses incurred due to change of residence or business, expenses incurred due to decreased or loss of business, 15%statutory disturbance allowance, and other expenses incurred as a result of the acquisition e.g. Professional fees, etc. (http://www.landcommission.go.ke/article/faqs) Therefore there is no gap with JICA Guidelines.

Table 14.14-2 Entitlement Matrix

SN	Type of Loss	Entitled Persons	Entitlements	Implementation issue/ Guidelines	Responsible Organization
1	Loss of	Legal owners of	・ Cash compensation at	・ Assessment of market	KeNHA

SN	Type of Loss	Entitled Persons	Entitlements	Implementation issue/ Guidelines	Responsible Organization
	agricultural land, pond, ditches and Orchards etc.	land	market value for land replacement as determined by the NLC ・ Refund for all statutory and transaction charges in acquiring new land ・ 15% cash top-up in compulsory acquisition	value for RAP ・ Submission of application bundles by MOTI to the NLC[27] ・ Follow Chapter VII of Lands Act 2012 ・ NLC to revalidate valuation as per Schedule to Cap. 295	MoTID NLC
2	Loss of access to cultivable land by owner cultivator/ tenant/ sharecropper	Tenants/sharecropper/Legal owner/grower/socially recognized owner/lessee/ unauthorized occupant of land	・ Compensation for standing crops to owner cultivator/ sharecroppers or lessees as determined by NLC ・ Owner/grower to take away the crop	・ All the individuals identified by the NLC as tenants or sharecroppers of land ・ Grant to be paid after taking possession of land and the legal /socially recognized owner is paid for land and on certification of receipt by legal/socially recognized owner ・ Additional cash grant to cover current market value of crop compensation as prescribed in case of private owner himself cultivating crop ・ Crop compensation and the crop will be shared between owner and sharecropper as per terms of sharecropping in case of privately owned land/socially recognized owner ・ In case of dispute over verbal agreement on sharecropping, certification from the elected representative will be considered as legal document	KeNHA MoTID NLC
3	Loss of homestead/ residential/ commercial/ CPR plots by owners/ Authorities	Legal owner(s) of the land	・ Cash compensation at market value for property replacement as determined by the NLC ・ Refund for all statutory and transaction charges ・ Replacement Cost for Immovable structures ・ 15% cash top-up in compulsory acquisition ・ Right to salvage material	・ Assessment of market value for RAP ・ Submission of application bundles by MoTID to the NLC ・ Follow Chapter VII of Lands Act 2012 ・ NLC to revalidate valuation as per Schedule to Cap. 295 ・ PMU to assist community to secure the completion of	KeNHA MoTID NLC

[27] See section 3.3.3 above for NLC Guidelines in compulsory land acquisition

SN	Type of Loss	Entitled Persons	Entitlements	Implementation issue/ Guidelines	Responsible Organization
				CPR's construction on relocation land before transfer of the plot	
4	Loss of Trees/Perennials/ fish stocks	i. Person with Legal Ownership of the land ii. Socially recognized owner/ Unauthorized occupant of the trees/ fishes	・ For commercial trees, Cash compensation at replacement cost equivalent to seven year annual income plus seven year establishment and tending cost ・ For ornamental trees, Cash hand-out computed at gross expected income from timber or firewood ・ For perennials, Right to harvest at maturity ・ Compensation at GMR in case pre-mature removal ・ Cash payment at replacement cost for relocation of pen traps plus additional cash handout for income replacement equivalent to six months declared income ・ At cost replacement of fish landing sites displaced ・ Cash handout for fishermen blocked from accessing fishing grounds calculated at gross daily income for entire length of displacement	・ Cash payment at replacement cost for relocation of pen traps plus additional cash handout for income replacement equivalent to six months declared income ・ At cost replacement of fish landing sites displaced ・ PMU to inform Likoni BMU including the fishermen of information of fishing regulation, construction and results of monitoring of Kilindini Harbour during detail design phase, construction phase and monitoring phase for operation	KeNHA MoTID NLC
5	Loss of residential /commercial structure by owner(s)	Legal Titleholder Owner(s) of structures	・ Cash compensation at market value for property replacement as determined by the NLC ・ Refund for all statutory and transaction charges ・ Replacement Cost for Immovable structures ・ Repair costs at 25% of property value in case of partial loss ・ Right to salvage material	・ Assessment of market value for RAP ・ Submission of application bundles by MoTID to the NLC ・ Follow Chapter VII of Lands Act 2012 ・ NLC to revalidate valuation as per Schedule to Cap. 295	KeNHA MoTID NLC
6	Loss of residential /commercial structure by squatters and unauthorized occupants	Informal settlers/ squatters/non-tilted APs occupying public land without title/or squatting on Governmental land	・ Cash replacement pegged at equivalent to 12 months of gross monthly income as per audited accounts	・ NLC to revalidate valuation as per Schedule to Cap. 295	KeNHA MoTID NLC
7	Loss of access to	Tenants of rented/leased	・ House Transfer Grant (HTG) for shifting of	・ Verification of NLC and records	KeNHA

SN	Type of Loss	Entitled Persons	Entitlements	Implementation issue/ Guidelines	Responsible Organization
	residential houses/ commercial structures (Owners/ rented or leased)	properties	furniture and belongings of residential structure @ ・ Ksh 20,000(twenty thousand) for wooden structures, Ksh 60,000 (sixty thousand) for masonry structures to each shifting tenant	・ Transfer grants will be paid on relocation from project site	MoTID NLC
8	Loss of business by CBEs due to dislocation	Owner/ operator of the business as recorded by NLC	・ Cash replacement pegged at equivalent to 12 months of gross monthly income	・ NLC to revalidate valuation as per Schedule to Cap. 295	KeNHA MoTID NLC
9	Loss of Income and work days due to displacement	Household head/ Employees identified by NLC	・ Cash grant to the affected employees/wage earners equivalent to 45 days wage @ Ksh 400/per day for unskilled labuorers and @ Ksh 600/per day for skilled labuorers ・ Preferential employment in the project construction work, if available	・ All persons recorded by the NLC ・ Cash grant to be paid while taking possession ・ Involvement of the incumbents in project civil works ・ Training on income generating activities.	KeNHA MoTID NLC
10	Poor and vulnerable households	Poor and vulnerable households including informal settlers, squatters /women headed households without adult son/ non-titled APs identified by NLC	・ Additional cash grant of Ksh 10,000 (ten thousand) for affected poor women headed households and other vulnerable households ・ Training on IGA for AP, nominated by AP	・ Identification of Vulnerable households ・ Income restoration schemes for vulnerable households ・ Arrange training on income generating activities	KeNHA MoTID Restoration of Livelihood Implementation Agency
11	Displacement of community structure (CPR)	Community structure representative as identified by the CRL	・ CCL by NLC to legal owners, plus the difference between CCL and RC of structure as determined by NLC. ・ Cash compensation for CPRs on land without titles to be determined by CRL to match RV for the structure ・ Dismantling and reconstruction cash assistance as per assessed price by NLC. ・ Owners will be allowed to take all salvageable materials (within KeNHA declared deadline) free of cost	・ PMU to conduct community consultations to ensure CPRs are relocated taking into account community concerns ・ PMU to inform the community of relocation schedule in advance ・ PMU to assist community to secure the completion of CPR's construction on relocation land before transfer of the plot	KeNHA MoTID PMU
12	Temporary impact during construction	Community / Individual	・ The contractor shall bear the cost of any impact on structures or land due to the movement of machinery and in	・ Community people should be consulted before starting construction regarding air pollution, noise	KeNHA MoTID

SN	Type of Loss	Entitled Persons	Entitlements	Implementation issue/ Guidelines	Responsible Organization
			connection with collection and transportation of borrow materials. ・ All temporary use of lands outside proposed RoW to be through written approval between the landowner and contractor. ・ Land will be returned to owner rehabilitated to original, preferably better, standard.	pollution and other environmental impacts ・ The labuorers in the camp would be trained on safety measures during construction, awareness of health safety, STDs, safe sex etc. The contractor shall ensure first aid boxes and other safety measures like condoms are provided at construction site.	PMU
13	Loss of income due to decrease of customers	Vendors around Likoni Ferry jetties, who might be affected due to the project	・Provision of vocational training program for vendors who wish their means of livelihood ・Provision of fund for start-up after finishing the vocational training program	・Expected impacts should be studied on a detail design study, and affected vendors should be consulted about necessity of the vocational training.	KeNHA MoTID PMU

Source: The RAP Study

1) Compensation and Mitigation Policy for Affected Fishery

As mentioned on article 14.13 (5), small and sensitive fishery is operated in/around the Mweza creek. Compensation and mitigation policies for the fishery are the followings in addition to the description of the entitlement matrix:

- To secure alternative landing site for displaced sites as needed,
- To secure land access routes to landing site during construction period,
- To secure sea access routes to Mweza creek from Kilindini harbor because bridge construction activities hamper the access,
- To consider convenience for fishermen to find alternative landing sites during bridge construction activities,
- To communicate to fishermen and the BMU sufficiently and continuously to find the best mitigation measures for each fisherman,
- To plan and conduct mitigation measures such as livelihood restoration program as needed, and
- To share with the fishermen and the BMU about information of construction, restriction for fishing and monitoring results of the bay during the phases of detail design, construction and operation. Disclosure will be carried out by regular meetings between the BMU and the project proponents including KeNHA, consultants and contractors, and a notice board.

2) Compensation and Mitigation Policy for Common Property Resources

As Table14.13-7 shows, the project affects some CPRs including cemetery, shrine, school and church. The basic of compensation policy is cash compensation. However, since CPRs are one of social functions, break of operation and relocation to far place without alternatives will affect seriously. Therefore, considering the position of the CPRs in the communities, the project proponents should inform a relocation schedule in advance, talk to the communities about the

best mitigation measures, and assist their relocation.

3) Assistance for affected vendors around Likoni Ferry Jetties

For the affected vendors around the Likoni Ferry Jetties, vocational training programs are provided. Some educational institutions in Mombasa area are providing a lot of vocational programs. (Table14.14-3) Using these program, the livelihood of the vendors will be restored.

The rough costs of the assistance for vendors are calculated as follows:

- The number of vendors: 800 vendors with stalls, and 400 vendors with no stalls
- On the assumption that 20% of vendors with stalls and 50% of vendors with no stalls wish the vocational training program, 360 vendors are object for the assistance.
- The cost of livelihood restoration per capita is 130,000~200,000Ksh (including 30,000~100,000Ksh of vocational training program and 100,000Ksh of fund of start-up)
- Total amount of the costs is roughly expected as 47million ~72million Ksh.

Table 14.14-3 Example of Vocational Program in Mombasa Area

Institution	Course	Costs (Ksh)
Technical University of Mombasa	Craft Certificate in Secretarial Studies	21,115
	Craft in Electrical Installation	-
Christian Industrial Training Centre	Electrical Installation Grade III, II, I	36,000
	Welding and Fabrication Grade III, II, I	36,000
	Site Carpentry	36,000
	Domestic Plumbing Grade III, II, I	36,000
	Motor Vehicle Technology Grade III, II, I	36,000
	Driving	-
Kenya Coast National Polytechnic	Welding &Fabrication	21,200
	Air Conditioning & Refrigeration	21,200
	Carpentry & Joinery	21,200
	Artisan in Dressmaking and Tailoring	31,250
	Wireman	21,200
	Masonry Grade III, II, I	21,200
	Artisan in Dressmaking Grade III, II, I	32,200
	Artisan in Hairdressing	38,165
	Artisan in Beauty Therapy	38,165
	Event Decoration and Interior Decor	26,250
	Artisan Proficiency in Leisure and Recreation	29,200
	Bread Making Technique	26,200
	Plumbing Grade III, II, I	24,265
	Welding & Fabrication Grade III, II, I	24,265
	Refrigeration and Air Condition Grade III, II, I	24,265
	Motor vehicle electric Grade III, II, I	24,265
Bandari College Mombasa	Electrical installation	75,000
	Welding and metal fabrication	75,000

Source: The RAP Study

14.15 Grievance Redress Mechanism

A Grievance Redress Committee will be established as an Organ of the PMU to provide leadership on the grievance process and resolution. The GRC will register all grievances forwarded by the PAPs representative committee endeavouring to find a compromise on all matters either through a series of conciliations, mediations and negotiations conducted with the PAPs. If PAPs accept the recommendations made by the committee, the committee along with PAPs who are willing to take part in these proceedings may hold mediations at the appointed places.

The PAPs can declare a grievance free of charge and without papers which are required at places such as the High Court.

This GRC will provide anchorage and support to all conflict resolutions in the RAP implementation and is thus quite pivotal to the successful implementation of the entire project. This is also the organ that will link the grievance resolution mechanism directly to other organs of government to secure the requisite synergy while safeguarding sectorial interests in project implementation. It is the organ that will procure and administer funding to facilitate the resettlement process including:-

- ✓ Providing secretariat services,
- ✓ Capacity building for lower organs,
- ✓ Expeditiously arbitrating on all grievances
- ✓ Providing feedback on grievances resolved, and
- ✓ Liaising with and advising GoK organs through KeNHA on the status of resettlement implementation.

14.15.1 Grievance Redress Committee (GRC)

The GRC will comprise of 3 representatives who are not direct stakeholders to the resettlement process and this should include;

1) One Deputy County Commissioner serving in the area,
2) One former Chairman of the County Council and
3) One who is well versed with land matters in the area.

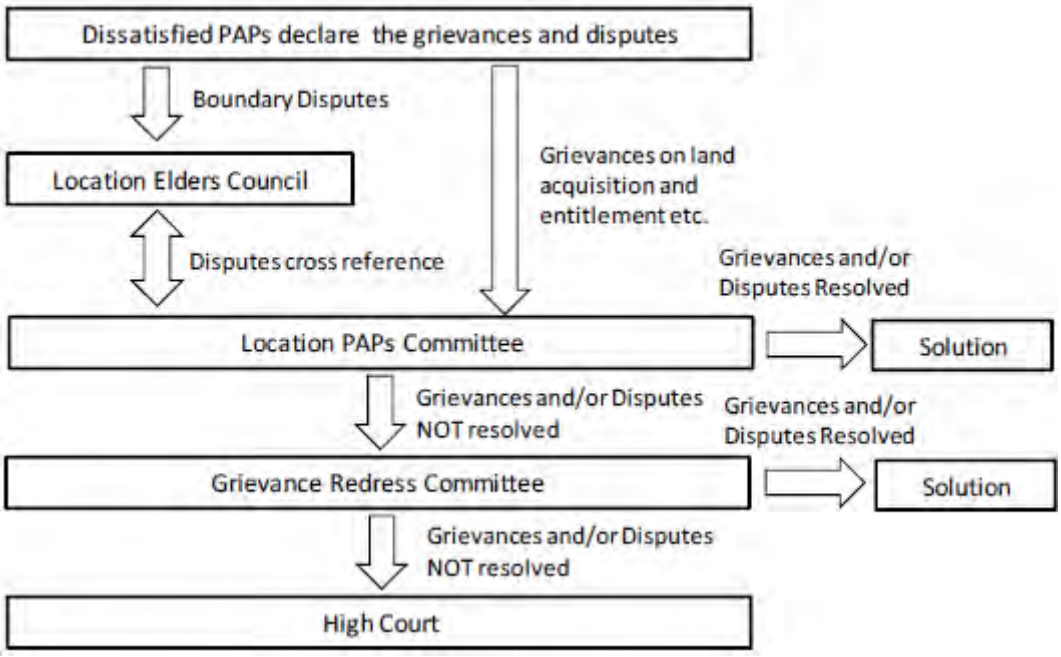
The Resettlement Specialist of the PMU will provide secretariat services and serve as the Secretary to the GRC.

The GRC will meet for 3 consecutive days every month on a pre-fixed schedule and will deliver their decisions within a month from the registration of the case. In the event of the grievance not being resolved by the GRC, the aggrieved party is free to seek legal redress.

14.15.2 Grievance Redress Procedure

Figure 14.15-1 presents the overall grievance procedure recommended in implementing the RAP. Grievance redress is anticipated at 5 levels namely:-

1) Declare the grievance and dispute
2) Elders Council: responsible for filtering for complaints emerging from the land acquisition and resettlement at village level
3) PAPs Committee: responsible for dealing with cases relating the entitlement and compensation
4) Grievance Redress Committee: an organ of the PMU to provide leadership on the grievance process and resolution
5) High Court



Source: RAP

Figure 14.15-1 Grievance Redress Procedure for the Mombasa Gate Bridge Project

14.16 Institutional Mechanism for the Implementation of RAP

This RAP will be implemented as part of the Mombasa Gate Bridge Project which is a project of the Government of the Republic of Kenya with the financial support of the Government of Japan. Project Implementation will therefore take place within the management structures, policy and coordination mechanisms set by the Government of Kenya and the polices and conditions agreed upon with participating strategic partners. Under this arrangement, implementation of the Mombasa Gate Bridge Project inclusive of the RAP will be spearheaded by the Ministry of Roads (Sector Ministry) through the Kenya National Highways Authority-KeNHA as the designated Implementing Agency of the GoK. As a project within KeNHA, the development of the Mombasa Southern Bypass and Kipevu Link

Roads will be mainstreamed into the administrative and management infrastructure of this Authority with the Coast Regional Office assuming the project management role. In sections below, roles and responsibilities within this framework including requisite capacity building are analyzed.

1) The Ministry of Transport and Infrastructure Development (MoTID)

The MBG project is a project of the Kenya government through the Ministry of Transport and Infrastructure Development. In this capacity, the MoTID will provide oversight supervision and technical direction to the Implementing Agency. The MoTID will also interface with other ministries such as Ministry of Finance on issues pertaining to project funding to ensure the smooth flow of both internal and external funding. MoTID will communicate directly with JICA on technical issues related to project implementation including financial, procurement and physical progress and all such communication will take place under the signature of the Permanent Secretary (or his designated representative) as the overall accounting officer for the Ministry.

2) The National Land Commission (NLC)

The National Land Commission of Kenya is an independent government commission whose

establishment was provided for by the Constitution of Kenya to, amongst other things, manage public land on behalf of the national and county governments, initiate investigations into present or historical land injustices and recommend appropriate redress, and monitor and have oversight responsibilities over land use planning throughout the country. It was officially established under The National Land Commission Act, 2012.

3) The Kenya National Highways Authority (KeNHA)

KeNHA is the State Corporation established under the Roads Act 2007 and charged with the responsibility for the management, development, rehabilitation and maintenance of the national trunk road system in Kenya. In the capacity of Executing Agency, KeNHA will be tasked with managing the development and implementation of all aspects of the Mombasa Gate Bridge Project including environmental and social mitigation.

4) Mombasa County Government

The Project shall coordinate with the Department of Land, Housing and Physical Planning since the department covers land rates, levies and the housing development plan which are indispensable information and data when preparing a RAP.

In terms of administrative jurisdiction, the Project starts in Mombasa County and terminates in Kwale County whilst traversing 3 Sub Counties and Five (5) Administrative Locations as presented in Table 14.16-1.

Table 14.16-1 Administrative Jurisdiction of MGB

County	Subcounty	Location	Components
Mombasa	Mombasa Island	Majengo	KM00-King'orani Prison
			Moi Avenue junction
			Liwatoni Interchange
			Archbishop Mackarrios interchange at Mnazi Moja road
			Main Pier
	Likoni	Likoni	Likoni Pier
			Touchdown point
		Mtongwe	Mtongwe Rd Interchange
		Shika Adabu	Mtongwe Road widening
			A14 Road interchange
Kwale	Matuga	Ngonmbeni	Ziwani interchange with MSBR

Source: RAP

5) KeNHA Special Project Department

In order to implement the Project, a KeNHA Special Project Department will be set up under KeNHA Director General. It will consist of a Project Manager, a Financial Specialist, a Procurement Specialist, a Construction Specialist, a Materials / Pavement Specialist, an Environmental Specialist, and a Social Safeguard Specialist, as well as Engineers and Support staff.

6) KeNHA Coast Regional Office

This office already exists and is headed by a Regional Manager (RM) overseeing diverse interests pertaining to the development and maintenance of the rural trunk road network in the coastal province. The Coast Regional Office of KeNHA will provide the physical and Institutional housing for the Mombasa Gate Bridge Project and will thus constitute the PMU. The CRO will in particular provide administrative leverage to the project through liaison with GoK Agencies relevant to the project implementation.

7) RAP Implementation Committee / Project Management Unit (PMU)

The RAP Implementation Committee / Project Management Unit will serve the following roles and responsibilities:

i) Oversee and coordinate the land acquisition process which will require the PMU to recruit a Resettlement Specialist at inception.
ii) Facilitate site handover to the Contractor and introduce the latter to the local administrative set-up.
iii) Provide liaison between the Project and other arms of government including the local political leadership through the county governments, provincial administration, etc.
iv) Facilitate compensation for all displacement occasioned by the Project,
v) Facilitate resolution of all disputes arising from project implementation-particularly land acquisition. To achieve this, the PMU will require to create a semi-autonomous Grievance Redress Committee (GRC) and oversee the creation of grass-root groups to protect PAP interests.
vi) To supervise project development including activities of the Project Contractor. This will require the PMU to employ a Highway Engineer to serve in the role of Supervisor of Works (SoW).
vii) Supervise implementation of the Environmental Management Plan of the Project,
viii) Facilitate activities of all consultants and other Technical Service Providers (TSP) on the project.
ix) Report on matters of Project development to KeNHA HQ

8) The Location PAPs Committee (LPCs)

Implementation of the RAP will be tied up to the national administrative setup starting from the Village, through sub-location, location, and Division and Sub-County level whereby PAPs will be organized at Location Level. PAPs in each of the five administrative locations traversed by the MGB and access roads will be mobilized to elect their own PAP Committee to draw membership as follows:-

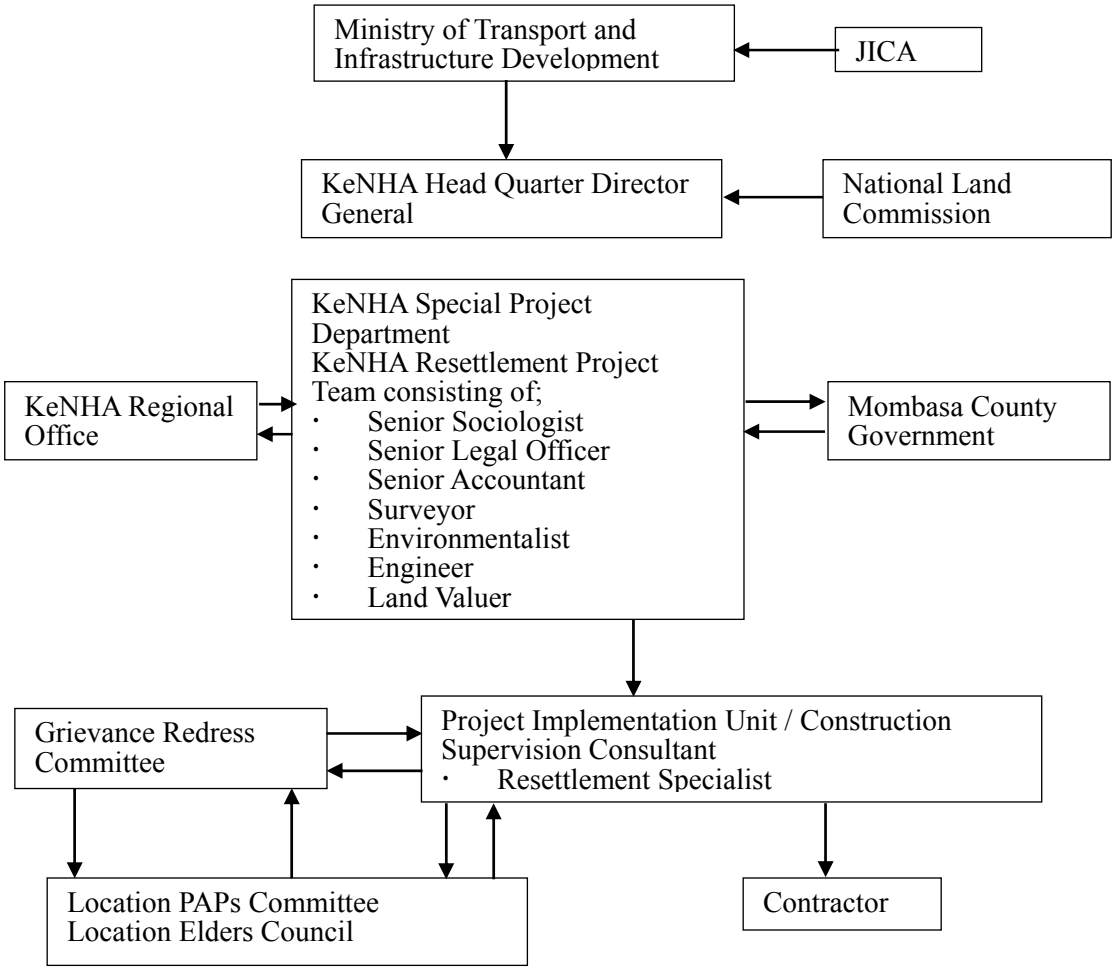
✓ A representative of affected persons in each village of traverse (max three),
✓ A representative of fishermen if there is a BMU in the respective location,
✓ A representative of Kaya Elders where shrines fall within the traverse
✓ Chairmen of any community projects affected

The Committee will appoint their own officials whose names will be submitted to the Local Chief vide minutes signed by all members. This committee will henceforth provide linkage between the PAPS and the PMU/GRC on all aspects of resettlement. This is the committee that will also play a role in resolving basic conflicts between members.

9) The Location Elders Committee (LECs)

The Inventory of Assets undertaken for this RAP came across many silent land disputes relating to inheritance, boundaries, etc. which is likely to intensify once the compensation process gets underway. As such, the Location Elders Forums which already exist within the traverse area will require re-mobilizing and energizing to resolve all non-RAP land disputes whose escalation has the potential to delay or derail project implementation. The LECs will also spearhead compensation for communally owned assets such as water projects, communal graveyards, etc.

The mechanism of implementation and organization/position involved in the organizational structure for RAP implementation is presented in Figure 14.16-1.



Source: RAP

Figure 14.16-1 Organizational Structure of RAP Implementation

The Institutional Responsibilities in the Resettlement Process is presented in Table 14.16-2.

Table 14.16-2 Institutions Responsibilities in Resettlement Process

Activities	Responsibility
A. Preparation of Updated RAP	
Preparation of land acquisition plans	CRO of KeNHA/PMU
LA process and land acquisition	CRO of KeNHA/PMU
Recruitment of Resettlement Specialist	CRO of KeNHA /PMU
Design and reproduction of RAP Information Brochures	CRO of KeNHA /PMU
Disclosure and public consultations	CRO of KeNHA /PMU
Selection of members for resettlement advisory bodies	CRO of KeNHA /NLC
Carry out joint verification survey	CRO of KeNHA /NLC
Market survey on prices of lands, structure, crops and trees.	CRO of KeNHA /NLC
Establishment of unit prices	CRO of KeNHA /NLC
Assessing AHs to be relocated and any vulnerable APs	CRO of KeNHA /NLC
Determination of entitlements and consultations with individual APs	CRO of KeNHA /NLC
Consultation of RAP to EA, APs and stakeholders	CRO of KeNHA /PMU
Concurrence on RAP	DONOR
Approval of RAP	KeNHA
B. RAP Implementation	
Mobilization of GRC	PMU

Activities	Responsibility
Establishment of internal monitoring	KeNHA
Budget approval for compensation and resettlement	KeNHA
Release of funds for compensation	KeNHA
Filing and resolution of complaints of APs,	CRO of KeNHA/PMU
Assess needs,	NLC/ /APs
Consultation with APs on schedule of clearing the lands	CRO of KeNHA/PMU
Clearing of lands	APs
Related Activities and Responsibilities	
Confirmation of "No Objection" for the award of civil works contract	DONOR
Relocation and livelihood restoration assistance	Restoration of Livelihood Implementation Agency
C. Monitoring and Evaluation	
Internal monitoring	KeNHA
Independent external monitoring and evaluation	KeNHA/ External Monitoring Agency

14.17 RAP Implementation Schedule

A time-bound implementation schedule for the RAP has been prepared in accordance with the project construction schedule. The overall schedule of implementation is based on the principle that people affected by the project are paid their due resettlement benefits prior to displacement. The Project Management Unit (PMU) will assist the APs in the process of relocation and resettlement. Individual entitlements on a household basis will be processed by the IA.

Implementation of the RAP will be started before starting the construction works and will continue for up to one year after completion of the construction work for entertaining claims /grievances of the entitled persons regarding additional payment of compensation and other resettlement grants. However, some of the activities for RAP implementation may extend further.

The implementation schedule will be finalized considering possible changes to events during the project implementation period of the project. The APs will be paid their resettlement cash payments independent of legal compensation before their relocation and payments related to the award of compensation by KeNHA.

The preliminary time bound implementation schedule from January 2020 (start of Detailed Design) is presented in Figure 14.17-1.

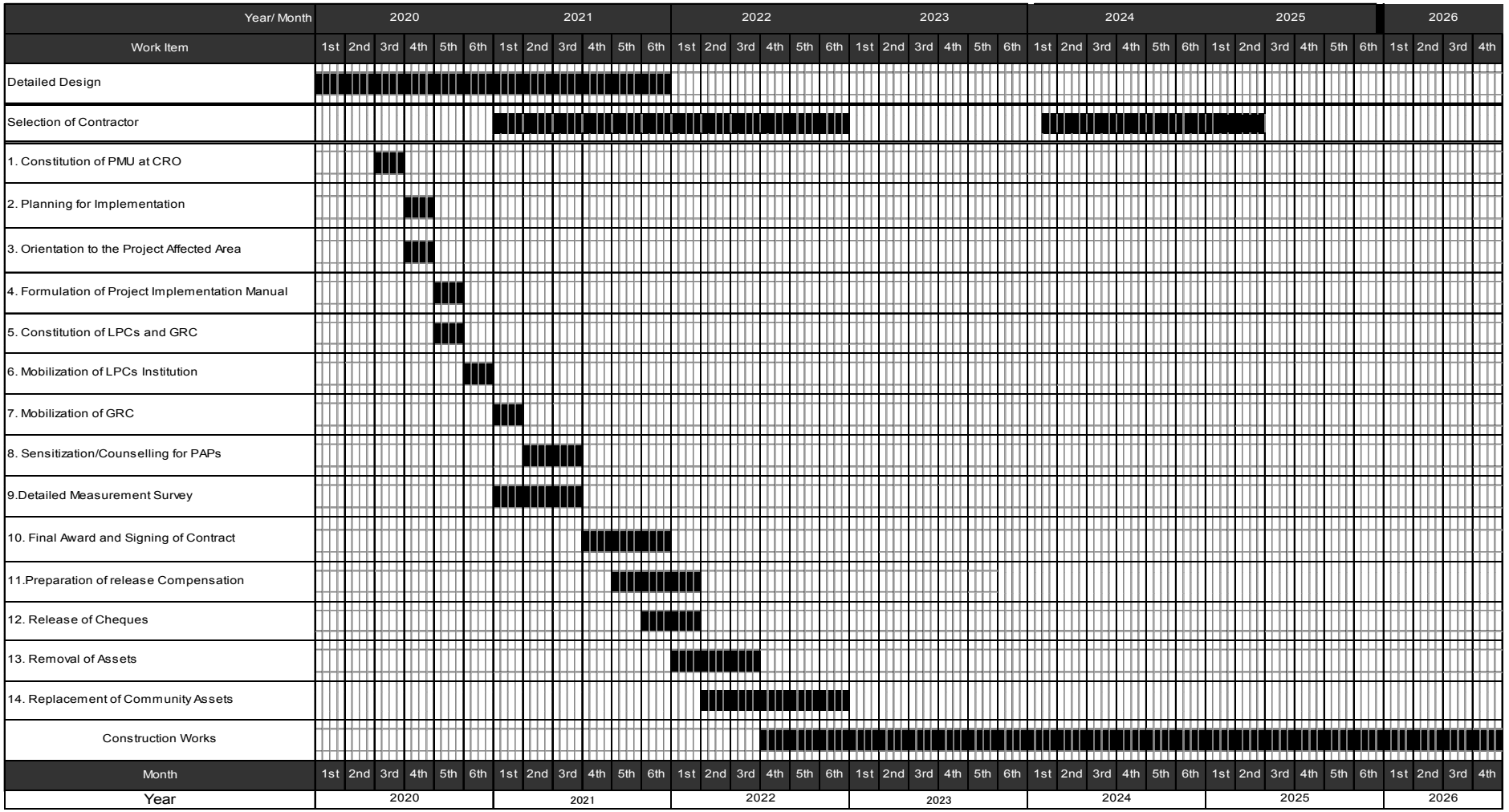


Figure 14.17-1 Implementation of RAP Schedule

14.18 Costs and Budgets

Costs of lands were studied based on such as quoted prices, review of recent sale agreements, data from other independent valuation. Costs of structures were referred from construction costs which Architectural Association of Kenya provides. These costs exclude depreciation.

The estimated compensation costs have been computed based on entitlement as applied to the Assets Register to yield to the Costed Assets Register issued as Appendix 8.1 to this RAP. A summary of the costed assets register is provided in Table 14.18-1 below.

Table 14.18-1 Summary of RAP Implementation Costs

Item	Component	Cost	Share
Direct Costs	Land	3,054,505,740	33.2%
	Structure Demolition	418,919,100	4.5%
	Structure	2,671,989,100	29.0%
	Other Assets	565,497,340	6.1%
	CBEs & Loss of Income	2,366,711,600	25.7%
	CPRs	9,916,500	0.1%
	Trees	30,167,500	0.3%
	Assistance	80,000,000	0.9%
	External Monitoring	20,000,000	0.2%
Sub Total (a)		9,217,706,880	100%
Operation Cost (b) (1% of (a))		92,177,069	
Sub Total RAP Cost (c) ((a)+(b))		9,309,883,949	
Contingency (d) (1% of (c))		93,098,839	
Gross RAP Cost ((c)+(d))		9,402,982,788	

14.19 Monitoring and Evaluation

(1) Internal Monitoring

Internal monitoring will be undertaken by the PMU with assistance from the KeNHA. The PMU will gather information on RAP implementation covering relevant activities as per schedule. All activities listed will be illustrated in Gan Charts showing the target dates for completing resettlement activities. Internal monitoring reports on RAP implementation will be included in the quarterly Project Progress Report to be prepared by PMU. The report will contain: (i) accomplishment to-date, (ii) objectives attained and not attained during the period, (iii) challenges encountered, and (iv) targets for the next quarter. The internal monitoring report will then be integrated by the KeNHA and submitted to JICA. Table 14.19-1 shows the potential monitoring indicators that will be reported.

Table 14.19-1 Internal Monitoring Indicator

Criteria for Internal Monitoring	Indicators for Monitoring	Specifics	Quarter No. Review (%)	Cumulative (%)	Recommended Action	Responsibility
On land acquisition and resettlement	Are resettlement implementation activities being achieved against agreed implementation plan?					
	Percentage of scheduled funds received by the NLC?					
	Number of PAPs signing consent papers	Majengo				
		Likoni				
		Mtongwe				
		Shika Adabu/ Ngombeni				
	Percentage of land acquired for Project	Majengo				
		Likoni				
		Mtongwe				
		Shika dabu/Ngombeni				
	Percentage of PAPs that have received entitlements according to numbers and categories of loss set out in the Entitlement Matrix?	Majengo				
		Likoni				
		Mtongwe				
		Shika Adabu/Ngombeni				
		Fishermen				
		Bodaboda Operators				
		Kaya				
	Progress in restoration of social infrastructure and services?	Specify by component				
On livelihood restoration	Are PAPs able to access schools, health services, public transport, cultural sites and activities?	Specify concerns per location				
	Percentage of PAPs receiving income and livelihood restoration activities	loss of jobs				
		rental income				
		loss of fisheries				
		loss of trade				
	Percentage of businesses that have received entitlements including transfer and payments for net losses resulting from lost business and stoppage of production?					

Criteria for Internal Monitoring	Indicators for Monitoring	Specifics	Quarter No. Review (%)	Cumulative (%)	Recommended Action	Responsibility
Disclosure	Number of consultations that have taken place as scheduled including meetings, groups, community activities?					
Grievance Redress System	Number of complaints by Non PAPs	Majengo				
		Likoni				
		Mtongwe				
		Shika Adabu/Ngombeni				
	Number of disclosure meetings that have taken place?					
	Have LPC and LECs been constituted for Majengo, Likoni, Mtongwe, Shika Adabu/Ngombeni?					
	Number of grievances handled by LPCs	Majengo				
		Likoni				
		Mtongwe				
		Shika Adabu/Ngombeni				
	Has a GRC been set up within KENHA ?					
Assistance to Vulnerable Groups	Number of Vulnerable Groups identified	Majengo				
		Likoni				
		Mtongwe				
		Shika Adabu/Ngombeni				
	Action taken to cushion vulnerable Groups by location					
	Number of complaints received from Vulnerable Groups					
Effectiveness of the GRC	Number of conflicts resolved by GRC					
	Number of grievances referred to the Environment and Land Court					
Effects Monitoring	What changes have occurred in patterns of occupation, production and resource use compared to the pre-project situation?					
	What changes have occurred in income and expenditure patterns compared to pre-project situation? What have been the					

Criteria for Internal Monitoring	Indicators for Monitoring	Specifics	Quarter No. Review (%)	Cumulative (%)	Recommended Action	Responsibility
	changes in cost of living compared to pre-project situation? Have PAP incomes kept pace with these changes?					
	What changes have taken place in key social and cultural parameters relating to living standards?					
	What changes have occurred for vulnerable groups?					
Assessment	Over-all assessment of success in implementation of the EM					

(2) External Monitoring

KeNHA will engage an individual/firm to conduct a social impact evaluation, at least six months after the completion of resettlement. It will use appropriate investigative and analytical techniques in assessing the post-project socio-economic conditions of the PAPs in relation to the baseline socio-economic data generated before undertaking the resettlement implementation.

The evaluation will describe any outstanding future actions that are required to bring the resettlement into compliance with JICA's Guidelines for Environmental and Social Considerations and Government policies, and further mitigation measures needed to meet the needs of any PAPs or families perceiving themselves to be worse off as the result of resettlement. It will include lessons learned from the evaluation that may be useful in developing future policies on involuntary resettlement of PAPs in Kenya.

The Resettlement Specialist within the PMU will conduct periodic reviews and supervision missions during the implementation stage. In addition to regular review missions, KeNHA will undertake a comprehensive mid-term review of the RAP implementation. A post-evaluation of RAP activities will be carried out by KeNHA to assess the resettlement impact in terms of adequacy and deficiencies in planning and R&R operations following the social impact evaluation.

(3) Reporting Requirements

During the implementation phase, the PMU will prepare a quarterly report on the progress of resettlement activities and forward copies to the GoK and the Donor. A format for resettlement implementation monitoring will be devised for quarterly monitoring and data collection by the field officials. The Resettlement Specialist of the PMU will conduct a review every four months during the implementation stage and report to KeNHA and JICA on the progress of all aspects of land acquisition and resettlement activities.

Table 14.19-2 External Monitoring Indicator

Component	Unit Total	Completed (%)	Cumulative Achievement Total (%)	Completed (%)	Progress During Reporting Month			Status & Remarks
					Target	Achievement	%	
Resettlement Preparation								
Distribution of Brochures								
Identification of PAPs								
Consultation Meetings								
Formation of CRO/GRC								
Payment of Compensation								
Compensation for land								
Compensation for tree/crop/fish								
Res/Commercial structure								
Payment for rent/leaseholder								
Shifting/relocation costs								
Social								

Component	Unit Total	Completed (%)	Cumulative Achievement Total (%)	Completed (%)	Progress During Reporting Month			Status & Remarks
					Target	Achievement	%	
Development Activities								
Grant for loss of wages								
Loss of business grant								
Business restoration grant								
Payment for indirect impact								
LIRP activities								

14.20 Public Consultations

(1) The Process

The stakeholders are a key issue in the RAP process. Consultations have taken place to identify key issues that need in-depth analysis during the Environmental and social impact analysis process.

This was achieved by conducting two stakeholder meetings and also public participation meetings (barazas) along the traverse.

The main objectives of these meetings were:

1) To disclose the Mombasa gate bridge construction project, its dimension and scope to the public.
2) To highlight potential impacts, both positive and negative, anticipated in the project.
3) To identify the stakeholders concerns with respect to the project.

The meetings were also a way to establish a means of communication between the general public and the consulting team.

(2) Record of the Meetings

A total of five meetings were held with a total number of two hundred and seventy nine (279) stakeholders and members of the community being reached. Of these meetings, three were public consultation meetings and two were focus group discussions.

Table 14.20-1 presents a summary of meetings held and the number of people who attended them with a comparative attendance on a gender basis.

Table 14.20-1 Record of Meeting

Date	Venue	Male	Female	Total
09th Dec 2017	Peleleza primary school	76	18	94
13th Dec 2017	Kibaki estate	53	19	72
19th Dec 2017	Mtongwe polytechnic	45	24	69
05th Jan 2017	Meeting with Fishermen at Bofu Maskani	39	0	39
14th Feb 2018	Meeting with Kaya Elders at Bofu Maskani	5	0	5
	Total	**218**	**61**	**279**
	Percentage	**78.1%**	**21.9%**	**100%**

Source: RAP

(3) Stakeholder Meeting (First Round)

Stakeholders meetings were conducted in two stages. At the initial stage, the consultant outlined the goal, objective, and different components of the project as a whole, and described the tentative design of the proposed Mombasa Gate Bridge and its Approach Roads with particular reference to the location where stakeholders meetings were conducted. The Consultant also described the potential land acquisition status in that specific area. Feedback from the consultation meetings was taken into account in finalizing the RAP. After finalization of the tentative RAP and other components, a second stage of consultation took place in selected locations of the ROW. The Consultants oulined the entitlements of the affected households and other stakeholders as designed in the RAP based on GoK policy and JICA guidelines.

The consultants also stated the cut-off date for eligibility of receiving resettlement benefits for the non-titled affected peoples as the commencement date of initial stage of Stakeholder Meeting. The consultants also disclosed the procedure for receiving the compensation payments, mechanism of participation of the stakeholders in the process of compensation assessment and payments as well as the grievance redress processes. An outline of the intial stakeholder meetings is presented in Table 14.20-2.

Table 14.20-2 Record of Initial Stakeholder Meeting

	Major Concerns	Answers
Peleleza Primary School	• What is the time line of the project?	• Research period to take 2 years and the construction will take 4 years.
	• when the affected will be compensated?	• Compensation will take place before the implementation the project begins, after which a notice of three months to relocate will be issued.
	• What is the way forward for community owned land?	• There would be a need for the community to prove ownership with statutory documents.
	• What considerations will be put in place for people living with disabilities?	• The pedestrian lane will be constructed in a spiral way allowing for wheel chair use.
Kibaki Estate	• Will there be a custodian on the amounts of compensation paid to the PAPs?	• The government will pay the affected persons directly
	• What measures have been put in place to ensure that the project benefits the locals?	• The requirement is that 40% of participation should go to the local community. Committees should be formed to front suitable persons for considerations
	• How will the mosques and schools that will be affected be compensated?	• Such amenities are avoided in most but where it is not
Mtongwe Polytechnic	• Can development continue on affected plots	• Development can only be stopped by the National Land Commission after compensation
	• How will the PAPs be prepared psychologically before compensation and displacement?	• NLC prepares people and also guides them during the resettlement process/period
	• How will pollution be dealt with during the implementation period	• Studies are being undertaken to come up with mitigation measures for the various forms of pollution likely to be experienced.

Source: RAP

Source: RAP

Figure 14.20-1 Initial Stakeholder Meeting

(4) Stakeholder Meeting (Second round)

To disclose findings of the RAP survey and entitlement matrix and collect opinions of stakeholders including PAPs, second round stakeholder meetings were held. Outlines and opinions are shown on Table 14.20-3 and Table 14.20-4.

Table 14.20-3 Record of Second Round Stakeholder Meeting

SN	Target of Meeting	Site	Date	Attendance
1	Mombasa Mainland South Leaders	ACK Guest Hse	28th May 2018	72
2	Mombasa Island Leaders and PAPs	Castle Royal Hotel	29th May 2018	174
3	Shika Adabu and Ngombeni Location PAPs/ Villagers	Kibaki Estate	22nd May 2018	265
4	Likoni and Mtongwe PAPs /Villagers	Bofu Maskani	20th May 2018	221
5	Likoni/Mweza Creek Fishermen	Bofu Maskani	30th May 2018	118
		Total		850

Table 14.20-4 Record of Second Round Stakeholder Meeting

	Major Concerns	Answers
Mombasa Island Side	Can the asset/PAPs register be shared on email?	The asset register is a public document and contains personal information about the PAPs. It cannot be shared by emails.
	Valuation process. Who is going to do the valuation? Is it NLC, Government valuer, property owners or KeNHA	The NLC will further conduct their own valuation on land and negotiate with land owners on the best price or offer for their land.
	When is the construction/or ground breaking likely to start?	This issue had been mismanaged by the media in our earlier presentations. What I can comfortably tell you is that the feasibility study will take 2 years and the detailed study will also take 2 years from January 2018.
	What is the fate of those that were not inventoried due to their absence during the study period?	We have one week to close the register. We are going to move once again to collect and validate the register to make sure that all affected persons are included in the list. Beyond the one week window period no one will be eligible for inclusion.
	How are you going to approach compensation on impacted graves?	Graves and other cultural assets will be fully compensated. However it is proposed that in areas where the bridge will be elevated the graves and cemeteries are to remain underneath the bridge. In Mombasa Island only a gate and a wall of a cemetery located in Archbishop Makarios are affected.

	Major Concerns	Answers
Mainland South Side	I am doing intensive agriculture, what am I entitled to? I cannot receive the same compensation as those that just have land. My land has value.	You are entitled to Cash Compensation at market rate for your land and additional cash compensation for crops equivalent to 7 years of cultivation.
	Tenants will be compensated. The challenge is that most of them are migratory/they are temporary residents. What will happen at the time of compensation if the listed tenant has moved outside project area?	Before compensation, an update of the entire register will be undertaken. This list of PAPs is only effective or valid for 24 months upon which it must be revalidated.
	What was the criterion used to arrive at the 115% as amount for compensation as it is a small figure? The three months' rent to be offered to landlords is a very small amount considering the time it takes to construct new rentals and start collecting rent from them.	The 15% offered as a disturbance is a provision in the Kenyan constitution under involuntary resettlement, it was seen that the 15% was too small hence the additional 10% as good will on land. The monthly allowance is derivedfrom the world bank provisions in OP 4.12, which the implementing body, JICA, has adopted and is therefore not a government provision.
	During implementation, will first employment considerations be given to the locals?	It's a requirement that at least 40% of both skilled and unskilled labour in every project is to be sourced from the local communities.
	Will the compensation be done in cash, cheque or through accounts?	It is required that couples should open a joint account with their respective spouses and during compensation; they will be paid through those accounts.
	Who will pay the tenants the one time shift allowance, is it the land lord or the government?	The government will pay the one time shift allowance to the tenants.
	What will be the fate of the teachers teaching at the Bridge school?	The school is not being impacted in I way that they will have to move the school.
	Compensation of mosques or churches?	The project has tried to avoid all the mosques. As for churches, a special compensation will be paid to relocate the church to another location.
	Some people are the land owners but do not have the papers, title deeds to show ownership. What is to stop other people from claiming ownership of such lands for compensation purposes?	Once the RAP report is completely compiled, it is submitted to the National land commission for verification of land ownership and as such it would be difficult for someone to claim ownership for land they do not own.
Likoni Beach Management Unit	It is true that the construction is going to affect us and our operations at the sea. My suggestion is that all fishermen to be compensated and given a boat for fishing. Also the names of beneficiaries to include a fishermen's wife and children because they are going to be affected too.	Noted
	The people to be documented as actual beneficiaries should be the fishermen not their wife. I have never seen any fisherman accompanied by his wife and children in the ocean.	That is true; the list will only contain registered BMU members for Likoni BMU.
	Also compensation must not be the same or equal across categories of fishermen. It must be ranked by category.	Several compensation packages have been proposed. The most important issue is that the compensation must be adequate, fair and able to restore lost livelihoods to pre project levels.

	Major Concerns	Answers
	Fishermen to be compensated following their categories, landing sites to be improved and if possible let the affected fishermen to be given employment during construction of the bridge as an alternative means of raising livelihood.	That is a valid suggestion that is worth consideration. I am sure that during construction of the bridge, priority is going to be given to the local community because this is their constitutional right. 40% local participation in any project is enshrined in the constitution.
	If you give a fisherman a onetime compensation you are most likely to fail. Let us not concentrate on the monetary aspect of the project because this is not sustainable.	Noted
	Will we be given a pension as part of the fair compensation package?	No. Pensions are normally given to retirees and they are regulated by the Government. It is advisable that an individual makes a monthly commitment of his own money during his active working years. This will then be paid back at old age. Even I contribute part of my little income to this scheme.
	The fishermen need to be trained and have capacity building. Provide compensation for 6 years advance payments before the start of construction.	Noted