The United Republic of Tanzania

President's Office Regional Administration and Local Government (PO-RALG)

TENDER NO. ME/022/2022/2023/HQ/C/05

FEASIBILITY STUDY AND PREPARATION OF PRELIMINARY AND DETAILED ENGINEERING DESIGNS, ENVIRONMENTAL AND SOCIAL DUE DILIGENCE, COST ESTIMATES AND BIDDING DOCUMENTS FOR INITIAL URBAN INFRASTRUCTURE INVESTMENTS IN KINONDONI MUNICIPALITY, DAR ES SALAAM REGION

Environmental and Social Impact Assessment (ESIA) Report

February 2025

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E1.1 Project Title

Feasibility Study, Preparation of Preliminary and Detailed Engineering Designs, Environmental and Social Due Diligence, Cost Estimates and Bidding Documents for Initial Urban Infrastructure Investment in Kinondoni Municipality, Dar Es Salaam Region.

E1.2 Name of the Project Proponent and Contact Address

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E2.0 PROJECT DESCRIPTION

The Component 1 of the DMDP II Project involves construction of road sections into bitumen standard, roadside storm water drainages, landscaping /greening of open areas/parks and community infrastructure. The justification for the project has been prompted by the need to improve quality of life, enhance economic opportunities, and increase resilience to climate shocks and stresses in the Dar Es Salaam City.

Thus, Component 1 responds to ongoing demands for basic transport, drainage, parks and open space, and community infrastructure. It integrates climate adaptation measures into all infrastructure investments and will address the city's high flood risk by combining conventional engineering technologies (grey infrastructure) with nature-based solutions (green and blue infrastructure), creating additional benefits of urban cooling and increased green spaces for public use. Component 1 also encourages a shift towards low carbon transport modes and urban infill, through the clustering and co-location of multispectral investments around the BRT in the city center and in underserved and marginalized urban neighborhoods. Spatial targeting of investments around public transit will promote densification and improve accessibility of underserved and marginalized people to mass transportation, economic hubs, and open spaces[1].

The indicative construction cost estimates is about US D 16,180,000[2], which is equivalent of TZS 37,586,787,200, based on the Bank of Tanzania (BoT) Exchange Rate of 1 US D = TZS 2323.04 on 3rd April 2023[3]. The project will be funded by the World Bank (WB) and the

[1] This will be complemented by Component 3 which will support planning reform and capacity building to support densification and transit-oriented development.

[2] Refer Annex 1 of the Terms of Reference.

[3] Concept Note Disclosure Date.

Government of the United Republic of Tanzania (GoURT). However, the construction costs will be financed by the World Bank, and the GoURT will be responsible mainly for compensation of affected people due to land acquisition if any.

E3.0 DESCRIPTION OF THE PROJECT ENVIRONMENT

The road sections traverse through built up environment with public infrastructure and utilities such as water supply pipelines, sewerage pipelines, electricity power lines (underground or overhead), and telephone cables (underground nor overhead). These infrastructure / utilities can be found to be either running parallel or crossing the road sections and are likely to be affected during construction, hence the need for relocation before commencement of construction works.

There is no significant natural vegetation cover along the road sections apart from short grass, planted trees and few remaining indigenous trees. Most of the planted trees are mainly for ornamental purpose or for providing shade to the local people.

The road sections are congested by numerous small business operations, parking of Bajaj and Bodaboda[4]. It is also common to find small business operators close to the road and some of them doing business over storm water drainages and within the road reserve. All these small business operations and parking of Bodaboda and Bajaj will have to be removed before commencement of construction works.

E4.0 STAKEHOLDER CONSULTATION AND THEIR INVOLVEMENT

E4.1 Identified Stakeholders

The following are the identified stakeholders for this project and their categorization:

S/n	Stakeholder	Categorization
1.	The World Bank	Financier
2.	President's Office Regional Administration and Local Government (PO-RALG)	Developer
3.	Tanzania Rural and Urban Roads Agency (TARURA)	Developer
4.	Division of Environment in the VPO (DoE-VPO)	Decision Makers
5.	National Environment Management Council (NEMC)	Decision Makers
6.	Dar Es Salaam Rapid Transit (DART) Agency	Interested Parties
7.	Kinondoni Municipal Council (KMC)	Interested Parties
8.	Ward Development Committee (WDC)	Interested Parties
9.	Street (" Mtaa") Development Committee (MDC)	Interested Parties
10.	Tanzania Electricity Supply Company Limited (TANESCO)	Affected Parties
11.	Tanzania Telecommunication Company Limited (TTCL)	Affected Parties
12.	Dar Es Salaam Water and Sewerage Authority (DAWASA)	Affected Parties
13.	Local Community Members/Vulnerable groups.	Affected Parties
14.	CSOs (NGOs/ CBOs)	Interested Parties

E4.2 Results of Stakeholder Consultations

In general, the stakeholders appreciate that the project will be economically beneficial and will stimulate economic development and investment opportunities in the project area. Notwithstanding the mentioned benefits, the stakeholders raised some issues / concerns regarding the project.

[4] Motorcycle Drivers.

E4.2.1 Consultation with Stakeholder Representatives

The consultation with stakeholder representatives indicates the stakeholders were more concerned on that the project will have more effect on public health & safety, public service infrastructure/utilities, labour and economy, severance of community access to the road sections, and flooding effects from roadside storm water drainages.

E4.2.2 Consultation with Local Community Leaders

The consultation with local community leaders indicates the stakeholders were more concerned about the effect of the project on the adjacent lands and properties, public infrastructure/utilities, noise and dust pollution, transportation and employment of local people during construction.

E5.0 POTENTIAL ENVIRONMENTAL AND SOCIAL RISKS/IMPACTS

In general, the project has been found to have both beneficial (positive) impacts, but will also have some environmental and social risks/impacts. The enhancement and mitigation measures for the identified positive and negative impacts have been proposed in the ESIA Report to maximise the project benefits and avoid or minimize the adverse impacts.

The following are the identified beneficial (positive) impacts and potential environmental and social risks/impacts during various phases of the project cycle (i.e. mobilization, construction, demobilization, and operations phase):

Environmental Impacts	Positive	Negative
• ***Mobilization Phase***		
- Loss of ecological functions and landscape quality due to vegetation and tree removal		✓
• ***Construction Phase***		
- Creation of dust emissions along unpaved access roads to the road construction site.	✓	
- Creation of dust emissions along unpaved access roads to the borrow pits/quarry sites	✓	
- Creation of noise nuisance and vibration effects along construction roads.	✓	
- Creation of noise nuisance and vibration effects along access roads to borrow pits/quarry sites.	✓	
- Creation of soil erosion and sedimentation of adjacent lands due to water flow from road	✓	
- Creation of landscape degradation due to excavation and accumulation of soil matearials	✓	
- Risk of environmental pollution due to lack of sanitary facilities at the construction site.	✓	
- Creation of soil erosion and sedimentation of stream/riverbed due to vegetation removal.	✓	
- Creation of occupational health and safety risks due to exposure to hazardous working conditions	✓	
- Creation of construction related risk of accidents due to people trespassing into the construction site.	✓	
- Creation of safety hazards due to deep excavations on the construction road.	✓	

- Increased risk of traffic accidents due to frequent movement of heavy trucks to and from the road construction site.	✓	
- Increased risk of fire outbreak due to accidental ignition of inflammable substances	✓	
- Increased risk of Covid-19 transmission due to influx of people into the project site	✓	
• ***Operation Phase***		
- Reduced dust emission due to improvement of road conditions		✓
- Increased risk of traffic accidents due to improved road conditions.		✓
- Improved road safety for pedestrians due to presence of dedicated walkways.		✓
- Reduced traffic congestion due to linkage between feeder roads and local roads.		✓
- Reduced risks of flood events due to improved storm water drainages.		✓
- Improved ecological functions and landscape quality due to planting of grass and trees.		✓
Social Impacts	**Positive**	**Negative**
• ***Mobilization Phase***		
- Loss of land ownership and other properties due to land acquisition		✓
- Disruption of social services and economic activities due to relocation of infrastructure/utilities		✓
- Creation of temporary employment due to recruitment of construction workers	✓	
• ***Construction Phase***		
- Increased prevalence of HIV/AIDS and STIs due to social interactions		✓
- Severance of community access to the road due to deep excavations on the construction road		✓
- Increased income generation for food vendors due to demand from construction workers	✓	
- Risk of emergence of GBV, SEA, and SH due to working relationships and social interactions		✓
• ***Demobilization Phase***		
- Loss of temporary employment by local people due to retrenchment after project completion		✓
- Loss of self-employment and income generation opportunities by small business operators		✓
• ***Operation Phase***		

- Reduced travel time for low-income communities due to improved access to BRT stations.	✓	
- Increased access to social services for low-income communities along the road sections.	✓	
- Reduced vehicle operation and maintenance costs and transportation costs.	✓	

E6.0 CONSIDERED ALTERNATIVES

The three alternatives have been considered in this study based on technical, economic, environmental, and social point of view. The following are the considered project alternatives:

- **No Project Alternative VS Project Alternative:** The No Project Alternative was found to have less environmental effects/impacts than the Project Alternative during construction phase. However, on the long-term the Project Alternative was found to have more socio-economic and environmental benefits than the "No Project Alternative". Therefore, the "Project Alternative" should be selected and "No Project Alternative should be rejected.
- **Labour-Intensive Construction Method VS Machine-Intensive Methods:** The "Labour-Intensive Construction Method" was found to be favourable than "Machine-Intensive Construction Method". However, due to the nature of the project the labour-intensive method has been found to have some limitations, and therefore the combination of the two methods should be considered. However, during construction more emphasis will be given on the labour-intensive method in order to promote employment of the local people. For example, excavation of storm water drainages, relocation of utilities, etc.
- **Asphalt Pavement VS Concrete Pavement Alternatives:** The comparison was made between the asphalt pavement and concrete pavement based on their disadvantages and disadvantages. It was not easy to derive a conclusion on which pavement type is the most preferable. However, based on the type of the project the concrete pavement alternative was found to be preferable.

E7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The purpose of ESMP is to ensure that the project is being implemented with minimum adverse environmental and social impacts. The ESMP focuses on avoidance or mitigation of potential impacts associated with the project related activities and enhancement of project benefits. It specifies mitigation and institutional measures to be taken during construction and operation phases, to eliminate any adverse environmental and social impacts, offset them or reduce them to acceptable levels.

In order to be effective, the ESMP has specified roles and responsibilities of various stakeholders during implementation. The successful implementation of ESMP also requires financial commitment. In this regard, cost estimates for implementation of mitigation measures have been taken into consideration. Therefore, the cost of implementation of mitigation measures has been estimated to be TZS 2,651,416,900.00 (Tanzania Shillings Two billion Six hundred fifty-one million, Four hundred sixteen thousand nine hundred Only). These costs will be included in the Bill of Quantities during preparation of Bidding Document.

E8.0 RESOURCE EVALUATION OR COST BENEFIT ANALYSIS

The project has been found to have short and long-term benefits which outweigh the project costs, estimated to be TZS 225,019,713,710.00. The following are the short-term and long-term benefits:

- **Short-term Benefits**
  - Creation of temporary employment due to recruitment of construction workers.
  - Increased income generation opportunities to the local people due to increased demand for food and other items from construction workers.

- **Long-term**
  - Benefits Increased productivity and stimulation of economic growth
  - Employment creation and economic improvement of households.
  - Increased Revenue Collection by Local and Central Government.
  - Creation of employment and income generation opportunities
  - Reduced Transportation Costs and Improved Access to Social Services.
  - Reduced risk of traffic accidents and improved environmental quality.
  - Increased comfortability of passengers.

E9.0 DEMOBILIZATION PLAN

The demobilization plan will involve site rehabilitation and restoration of disturbed areas due to construction activities. It is the responsibility of the Contractor to undertake rehabilitation and restoration works to ensure that the environmental value of the project site is maintained for the present and future generations.

The purpose of site rehabilitation is to ensure that all disturbed areas caused by construction activities are restored, leaving a stable environment that is conducive to the establishment of landscapes characteristic to the area.

The rehabilitation and restoration works will be done in accordance with the approved Contractor's Environmental and Social Management Plan (C-ESMP). Those areas that require rehabilitation and restoration works include the borrow pits; quarry pits; materials storage yard; workshop area, cement/asphalt batch plant area; soil/spoil materials dumping site; and camp site.
During demobilization phase all work areas, campsite/offices, workshops /garages, and other temporary installations will be cleaned up and the site will be restored. These includes removal of temporary buildings, equipment, surplus materials, pieces of wood, pieces of bricks or any other material that was not in the area before construction works.

The site will be cleared of overburden resulting from construction works. Natural drainages will be restored and damaged areas will be rehabilitated to make them compatible with the surrounding landscape. Permanent installations will be restored / repaired to their initial state. The compacted soils will be scarified to at least 15 cm deep to loosen it in order to facilitate vegetation growth.

Monitoring will be carried out by the Supervision Consultant's Environmental Expert to ensure the activities specified in the contract are being adhered to by the Contractor. During monitoring the Supervision Consultant's Environmental Expert will undertake assessment of the site conditions and recommend the restoration / rehabilitation requirements for implementation by the Contractor. Emphasis will be placed on the continuity between site characteristics and the adjacent landscapes.

E10.0 CONCLUSION AND RECOMMENDATIONS

E10.1 Conclusion

In general, the stakeholders do support the project because they know it will contribute to improved transportation in the Dar Es Salaam City. The ESIA study indicates the project will

have significant and long-term socio-economic benefits to the local residents, especially the low-income group. The identified benefits include:

- Reduced travel time, increased productivity and stimulation of local economic growth
- Creation of temporary employment for local people and income generation opportunities for food vendors.
- Reduced vehicle operation and maintenance costs.
- Reduced dust emission due to improvement of the road sections into bitumen standard.
- Increased comfortability of passengers travelling along the road sections.

However, the project is expected to have some adverse effects/impacts on the livelihood of the local residents in terms of displacement from the road reserves. However, the problem will be mitigated through payment of compensation to affected persons (PAPs). Another adverse impact will be on the disruption of public infrastructure / utilities services. However, these effects/impacts will be short-term and temporary.

Moreover, the mitigation measures for the identified negative impacts could be easily implemented through good engineering practice with minimum costs to the project. The planned mitigation measures in the ESMP will be incorporated into the Bidding Document and Contract Specifications.

The sustainability of this project has been ensured through institutional capacity building, by establishment of Environmental and Social Unit (ESU); provision of on-the-job training for ESU personnel during construction phase. The ESU personnel will be responsible for overseeing implementation of outlined enhancement/mitigation measures in the ESMP and compliance with EH&S and GBV/SEA issues during Operation Phase.

Finally, the cost-benefit analysis indicates the project benefits outweighs the project costs, whereby the Benefit/Cost Ratio (B/C) was found to be 2.1 before incorporating environmental costs and 2.0 after incorporating environmental costs. Therefore, the environmental costs were found to have no any significant effect on the B/C Ratio. This indicates the environmental costs are negligible and can be tolerated for this project; and since the B/C ratio were more than 1 indicates the project is economically viable and should be implemented without delay.

E10.2 Recommendations

The project has been found to have long-term environmental and socio-economic benefits and its adverse (negative impacts), are temporary and short-term as they occur mainly during construction phase. In addition, the cost/benefit analysis and economic analysis have already found the project to be highly beneficial and economically viable, respectively. It is therefore, recommended that the project should be implemented immediately to avoid increased construction costs due to increasing inflation rate.

In order to for TARURA to ensure successful implementation and sustainability of the project, the following recommendations are made:

- Consider the climate change factor during the design and construction phase to ensure the long-term durability of the road pavement and associated bridge structures. In this case, TARURA in collaboration with TMA should carry out monitoring of climate change indicators such as temperature, precipitation, pressure, wind speed and direction. This will enable the design and construction of road infrastructure to take climate change indicators into consideration.

- Collaborate with Local Government Authorities (LGAs) to relocate small business operators before commencement of the construction works. The smooth way is for

TARURA and Kinondoni MC to make consultation with representatives of the likely affected small business operators to identify the relocation sites.

- Promote awareness and education campaign among the road users on the importance of using pedestrian walkways to minimize risk of traffic accidents due to interaction between pedestrians and vehicles. This can be reinforced by installation of written signboard in Kiswahili, English and Sign Language at strategic locations. The use of pedestrian walkways must be emphasized in the road safety campaigns and TARURA must allocate budget for road safety campaigns. This can be done during the national road safety campaigns ("wiki ya nenda kwa Usalama barabarani").

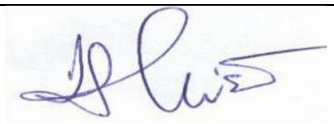
- Promote awareness and education campaign among the small business operators to avoid encroachment into the road pavements. This should also be integrated into the national road safety campaigns.

- Ensure that the design incorporates the provision of parking areas for Bodaboda and Bajaj Operators. The design team must make consultations with Bodaboda/Bajaj Operators to identify suitable locations for construction of parking areas.

ABBREVIATIONS AND ACRONYMS

AADT : Annual Average Daily Traffic
AASHTO : American Association of State Highway and Transportation Officials
ADT : Average Daily Traffic
AIDS : Acquired Immunodeficiency Syndrome
AP : Aggrieved Person
ARVs : Anti-Retro Virus Drugs
BAU : Business-As-Usual
BoT : Bank of Tanzania
BRT : Bus Rapid Transport
BS : British Standards
CBOs : Community Based Organisations
C-ESMP: Contractor's ESMP
CRPs : Compensation and Resettlement Plans
DART: Dar Es Salaam Rapid Transit Agency
DAWASA : Dar Es Salaam Water and Sewerage Authority
DC : Design Class
DCC : Dar Es Salaam City Council
DMDP II : Dar Es Salaam Metropolitan Development Project Phase 2
DoE-VPO: Division of Environment in the Vice President's Office
E&S : Environmental and Social
EA : Environmental Assessment
EHSO : Environmental, Health and Safety Officer
EIA : Environmental Impact Assessment
EMA Cap 181 : Environmental Management Act Cap 191
ESF : Environmental and Social Framework
ESH&S : Environmental, Social, Health, and Safety
ESIA : Environmental and Social Impact Assessment
ESMF : Environmental and Social Management Framework
ESMP : Environmental and Social Management Plan
ESS : Environmental and Social Standard
ESU : Environmental and Social Unit
ESU : Environmental and Social Unit
FBOs : Faith Based Organisations
GBV : Gender-Based Violence
GDP : Gross Domestic Product
GHG : Greenhouse Gases
GN : Government Notice
GoURT : Government of the United Republic of Tanzania
GRC : Grievances Redress Committee
GRM : Grievances Redress Mechanism
HBC : Home Based Care
HIV : Human Immunodeficiency Virus
HQ : Headquarters
HSMP : Health and Safety Management Plan
IBRD : International Bank for Reconstruction and Development
IDA : International Development Association
IFC : International Finance Corporation
ILO : International Labour Organisation
IP/SSAHUTLC : Indigenous People/Sub-Saharan African Historically Underserved Traditional Local Communities
KMC : Kinondoni Municipal Council
kN : kilo Newton
LA : Local Authority
LAA : Local Assessment Area
LCLs : Local Community Leaders
LDV : Light Duty Vehicles
LGAs : Local Government Authorities
LHS : Left-Hand Side
LRP : Livelihood Restoration Plan
LTD : Limited
m.a.s.l. : mean above sea level
MCDO : Municipal Community Development Officer
MDC : Mtaa Development Committee
MEMO : Municipal Environmental Management Officer
MoW : Ministry of Works
MtCO2e : metric tons of carbon dioxide equivalent
NDC : Nationally Determined Contribution
NEMC : National Environment Management Council
NEP : National Environmental Policy
NGOs : Non-Governmental Organisations
NPA-VAWC : National Plan of Action to End Violence Against Women and Children
OHS : Occupational Health and Safety
OSHA : Occupational Safety and Health Authority
PAPs : Project Affected Persons
PAPs : Project Affected Persons
PCT : Project Coordination Unit
PDA : Project Development Area
PDO : Project Development Objective
P-ESMP : Project ESMP
PITC : Providers Initiating Testing and Counselling
PIU : Project Implementation Unit
PM_{10} : Particulate Matter with diameters that are generally 10 micrometres and smaller.
$PM_{2.5}$: Particulate Matter with diameters that are generally 2.5 micrometres and small
PMDM : Tanzania Pavement and Materials Design Manual
PMTCT : Prevention from Mother to Child Transmission
PO-RALG : President's Office Regional Administration and Local Government
PPE : Personal Protection Equipment
PWDs : People with Disabilities
RAA : Regional Assessment Area
RAP : Resettlement Action Plan
RAS : Regional Administrative Secretary
RGDM : Road Geometric Design Manual
RHS : Right-Hand Side
RPF : Resettlement Policy Framework
SATCC-TU : Southern Africa Transport and Communications Commission-Technical Unit
SEA : Sexual Exploitation and Abuse
SEF : Stakeholders Engagement Framework
SGO : Social / Gender Officer
SH : Sexual Harassment
SIA : Social Impact Assessment
SQM : Square Metres
STIs : Sexually Transmitted Infections
SUDS : Sustainable Drainage Systems
TAC : Technical Advisory Committee
TACAIDS : Tanzania Commission for AIDS
TANESCO : Tanzania Electric Supply Company Limited
TANROADS: Tanzania National Roads Agency
TARURA : Tanzania Urban and Rural Roads Agency
TB : Tuberculosis
TFV : Ten Per cent Fines Value
TMA : Tanzania Meteorological Authority
ToR : Terms of Reference
TPDC : Tanzania Petroleum Development Corporation
TSCP : Tanzania Strategic Cities Project
TTCL : Tanzania Telecommunications Limited
TZS : Tanzania Shillings
ULGSP : Urban Local Government Support Program
URT : United Republic of Tanzania
US D : United States Dollars
UTM : Universal Transverse Mercator
VCT : Voluntary Counselling and Testing
VECs : Valued Environmental Components
WB : World Bank
WDC : Ward Development Committee
WEO : Ward Executive Officer
WHO : World Health Organisation
WHO : World Health Organisation

THE STUDY TEAM

NAME[5]	SIGNATURES
Mr. Akonaay M.L. Ako (Environmental Expert / Team Leader)	
Eng. Samwel Maguya (Assistant Environmental Expert)	
Mr. Huruma Kisaka (Sociologist / Resettlement Expert)	

In this study the Environmental Expert (Mr. Akonaay M.L. Ako) was a Team Leader responsible for conducting biophysical survey, preparation of EIA report and integration of Social Impact Assessment (SIA) report with EIA report to produce consolidated ESIA report.

The Team Leader was also assisted by Eng. Samwel Maguya as an assistant environmental Expert and Mr Huruma Kisaka as a Sociologist-responsible for conducting Socio-economic baseline survey, stakeholder consultations and preparation of SIA report.

[5] All the listed Experts are Registered as EIA Expert by the National Environment Management Council (NEMC) of Tanzania

ACKNOWLEDGEMENT

The Project Proponent would like to acknowledge the contribution made by various stakeholders during the ESIA study and finally during preparation of this ESIA report. The assistance provided by the local authorities during the field work is highly appreciated. Apart from providing access to useful documents they were able to assist the Consultant during the field work. The support and cooperation provided by the President's Office – Regional Administration and Local Government (PO-RALG), Kinondoni Municipal Council (KMC), and Local Community Leaders at Ward and Street ("Mtaa") Levels is also highly appreciated as they allowed the Consultant to access relevant documents and project sites.

The cooperation from the infrastructure/utility authorities is also highly appreciated. The utility authorities helped the Consultant in identifying location of infrastructure/utilities that are likely to be affected during construction. Finally, but not least the Project Proponent appreciates the opinions / concerns from various stakeholders. All relevant issues /concerns raised during stakeholder consultations have been considered and incorporated into the ESIA Report and ultimately have been reflected in the Design Report.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Project Background

The Dar Es Salaam Metropolitan Development Project Phase 2) DMDP II) is the result of the technical discussions between the World Bank, PO-RALG and other key stakeholders, which got underway in 2018 to shape the future urban program in Tanzania. During the last twenty years the PO-RALG has successfully implemented several projects. These include Tanzania Strategic Cities Project (TSCP), which closed and Urban Local Government Support Program (ULGSP), which closed on December 31, 2020; and the Dar Es Salaam Metropolitan Development Project (DMDP), which closed recently on January 2, 2023. Altogether, these projects aimed to improve management, planning and service delivery in 29 urban Local Government Authorities (LGAs).

The Project Development Objective (PDO) of DMDP II is to improve urban services and institutional capacity, and strengthen climate resilient development in the Dar Es Salaam Region. DMDP II is comprised of four (4) major components. These include Component 1: Climate-Smart Priority Infrastructure; Component 2: Integrated Metropolitan Solid Waste Management Infrastructure and Services; Component 3: Strengthening Urban Institutions and Component 4: Project Management.

This assignment involves Component 1, which responds to on-going demands for basic transport, drainages, parks and open space, and community infrastructure. It integrates climate adaptation measures into all infrastructure investments and will address the city's high flood risk by combining conventional engineering technologies (grey infrastructure) with nature-based solutions (green and blue infrastructure), creating additional benefits of urban cooling and increased green spaces for public use. Component 1 also encourages a shift towards low carbon transport modes and urban infill, through the clustering and co-location of multi-sectoral investments around the BRT in the city centre and in underserved and marginalized urban neighbourhoods. Spatial targeting of investments around public transit will promote densification and improve accessibility of underserved and marginalized people to mass transportation, economic hubs, and open spaces[6].

However, before commencement of DMDP II it has been necessary to carry out Feasibility Study, Preliminary and Detailed Engineering Designs, Environmental and Social Due Diligence, Cost Estimates and Bidding Documents. Thus, in order to undertake the assignment, the Government of the United Republic of Tanzania (GoURT), through PORALG (Hereinafter referred to as the Employer) has engaged NIMETA Consult (T) Limited (Hereinafter referred to as the Consultant) to undertake preparation of feasibility studies, urban design, detailed engineering designs, environmental and social instruments, and bidding documents for the first batch of a pipeline of investments in Kinondoni Municipality.

One of the tasks under this assignment is to undertake preparation of Environmental and Social Impact Assessment (ESIA) Report and Environmental and Social Management Plan (ESMP) in accordance with the World Bank Environmental and Social Framework and the Environmental Impact Assessment (EIA) and Audit Regulations (2005) and its Amendment Regulations (2018).

[6] This will be complemented by Component 3 which will support planning reform and capacity building to support densification and transit-oriented development.

1.2 The Justification for the Project

The justification for the project has been prompted by the need to improve quality of life, enhance economic opportunities, and increase resilience to climate shocks and stresses in the Dar Es Salaam City. The project is focused on reducing the current problems of traffic congestion and major bottlenecks by completing critical gaps in the local and feeder road network. The expected benefits include reduced travel time, improved road safety by providing dedicated pedestrian walkways; and improved access to low-income communities. Other benefits include reduced occurrence of flood events; improved security due to installation of street lights; reduced land degradation through soil erosion control; and improved landscape quality by utilizing mix of grey and green infrastructure.

1.3 Project Costs and Source of Funding

The Component 1: (Climate-Smart Priority Infrastructure) involves construction of road sections into bitumen standard, roadside storm water drainages, landscaping /greening of open areas/parks and community infrastructure. The indicative construction cost estimates is about US D 12,398,856.89[7] as per the breakdown below:

Nakalekwa – Bwawani Road (7.40 km)	4,810,827.21
Tegeta Police - Silver (2.00 km)	1,389,080.50
Umoja Road (3.86 km)	2,802,676.42
Binti Matola Road (0.77 km)	5 83,208.36
Amiri/Leni Tatu (Dawasa) (0.68 km)	500,146.65
Togo 1 Road (0.36 km)	3 04,263.35
Togo 2 Road (0.36 km)	3 04,443.29
Togo 2 Road (0.20 km)	1 90,022.49
Mivumoni Road (4.80 km)	3,396,272.76
Total:	**12,398,856.89**

The project will be funded by the World Bank (WB) and the Government of the United Republic of Tanzania (GoURT). However, the construction costs will be financed by the WB, and the o will be responsible mainly for compensation of affected people due to land acquisition if any.

1.4 Project Life Span

The construction period is estimated to be about 20 months, whereby 1 month is mobilization period, 6 months will be for construction period, 1 month will be demobilization period, and 12 months will be for defect liability period. After construction period, the infrastructures will be operated for an estimated period of 50 years. Thereafter, the infrastructure will have to undergo new construction and expansion depending on the future requirements.

1.5 The Objective and Scope of the Assignment

According to the Terms of Reference (TOR) the objective of the assignment is to prepare high-quality engineering and urban designs for the investments selected by Kinondoni Council. The specific tasks include Feasibility study; Developing urban and landscape design concepts; Environmental and social due diligence and enhancement; Detailed engineering designs, cost estimates, bidding documents and operations and maintenance plans. The detailed scope of the assignment and tasks are outlined in the Terms of Reference.

1.6 Nature and Categorization of the Project

The Component 1 of the DMDP II involves construction of road sections into bitumen standard, roadside storm water drainages, landscaping /greening of open areas/parks and community

[7] According to Volume IV: Bill of Quantities.

infrastructure. According to the World Bank Concept Note[8], the DMDP II has been rated to be in a **High** Environmental and Social Risk Classification. Also, according to the Concept Note the project applicable standards include ESS1; ESS2; ESS3; ESS4; ESS5; ESS6; ESS8; and ESS10.

According to the FIRST SCHEDULE of the Environment Management (Environmental Impact Assessment and Audit) (Amendment) Regulations (2018), those projects with **High** impacts/risks are considered to be Category A (Type A). Therefore, the project requires preparation of Environmental Scoping Report with Terms of Reference and submission to NEMC for review and approval in accordance with Regulation 10(1).

1.7 EIA Requirements

According to Regulation 10(1), an application for environmental impact assessment certificate shall be made by submitting to the Council a Scoping Report in the format set out in the Third Schedule to the Environmental Management (Environmental Impact Assessment and Audit Regulations) (Amendment) Regulations (2018).

The FOURTH SCHEDULE (Made under Regulation 15) to the Environmental Impact Assessment and Audit Regulations GN No. 349 of 2005 outlines the EIA stages. The first stage is project registration by submitting the EIA Application Form No. 1. The next stage is preparation and submission of Scoping Report and Terms of Reference to the National Environment Management Council (NEMC) for review and approval. So far, the Scoping Report and Terms of Reference have been submitted to NEMC for review and approval through online system.

According to the TOR the Consultant is required to ensure high-quality due diligence on environmental and social impacts, and compliance with GoURT and the World Bank's Environmental and Social Framework (ESF). This will include preparing new and updating existing Environmental and Social Impact Assessments (ESIAs), Environmental and Social Management Plans (ESMPs), and Resettlement Action Plans (RAPs).

Specifically, the Consultant is required to (i) prepare ESIAs/ESMPs in accordance with the World Bank Environmental and Social Framework, EIA and Audit Regulations 2005 and its Amendment Regulations of 2018, (ii) revise/update the existing ESIA reports as per the recommendations of the due diligence reports; (iii) produce mitigation measures to inform the design, and bidding documents for civil work contracts.

1.8 The Study Approach and Methodology

1.8.1 The Study Approach

1.8.1.1 Scoping of the Assessment

The study approach involved scoping of the environmental assessment by selecting relevant Valued Environmental Components (VECs). Valued Environmental Components (VECs are defined as broad components of the biophysical and human environments that, if altered by the Project, would be of concern to regulatory agencies, indigenous persons, resource managers, scientists, stakeholders, and/or the general public.

The approach also involved defining the assessment boundaries in terms of spatial, temporal, administrative and technical boundaries; and establishing the baselines conditions. This was followed by assessment of project related environmental effects/impacts and assessment of cumulative effects/impacts based on the determined significance criteria.

[8] Concept Note on a Proposed Credit in the Amount of US $ 350 Million to the United Republic of Tanzania for Dar Es Salaam Metropolitan Development Project, Phase II. The World Bank, October 24, 2022

1.8.1.2 Definition of Assessment Boundaries

The assessment boundaries include spatial, temporal, administrative, and technical boundaries. These are defined as follows:

Spatial boundaries are referred to as the Project Development Area (PDA), the Local Assessment Area (LAA), and the Regional Assessment Area (RAA).

Temporal boundaries include the various phases of a Project, which can be identified as: Mobilization Phase, Construction; Demobilization Phase, Operation Phase, and Decommissioning Phase. However, the Decommissioning Phase is not considered because the road sections are not expected to be decommissioned, instead the road sections will be undergoing regular maintenance and improvement depending on the future requirements.

Administrative boundaries include specific aspects of national legislative or regulatory requirements; standards, objectives, or guidelines, policy objectives; as well as regional planning initiatives that are relevant to the assessment of the Project's environmental effects on the VECs.

Technical boundaries are the technical limitations or considerations for the evaluation of potential environmental effects of the Project, and may include limitations in scientific and social information, data analyses, and data interpretation, or uncertainties in the assessment.

1.8.1.3 Establishment of the Baseline Conditions

Existing (baseline) environmental conditions were established for each VEC. These include those environmental effects that may have been or may be caused by other past or present projects or activities that have been or are being carried out. The description of existing baseline conditions for each VEC includes:

- The status and characteristics of the VEC within its defined spatial and temporal boundaries for the assessment;
- Information from past research conducted in the region;
- Traditional and ecological knowledge (if applicable or available); and
- Knowledge gained from the collection of baseline data through literature review, qualitative and quantitative analyses, and field work carried out as part of the EIA.

1.8.1.4 Assessment of Project-Related Environmental Effects

The assessment covered descriptions of how an environmental effect will occur or how the Project will interact with the environment, the mitigation and environmental protection measures proposed to reduce or eliminate the environmental effect, and the characterization of the residual environmental effects of the Project. The focus was on residual environmental effects, *i.e.,* the environmental effects that remain after planned mitigation has been applied. All mandatory factors were assessed for all phases of the Project (i.e., Mobilization, Construction, Demobilization, and Operation Phase), as well as, for Accidents, Malfunctions and Unplanned Events. The assessment also considered the effects of the environment on the Project.

1.8.1.5 Assessment of Cumulative Environmental Effects

Cumulative environmental effects of the Project were identified in consideration of other past, present, or reasonably foreseeable future projects or activities that have been or will be carried out, for all phases of the Project (*i.e.,* Construction, Demobilization, and Operation Phase). A screening of potential interactions was done to determine if an assessment of cumulative environmental effects is required (*i.e.,* there is potential for substantive interaction between the project-related environmental effect or overlap with those of other projects or activities that have been carried out or will be carried out in the project area).

The residual cumulative environmental effects of the project in combination with other projects or activities that have been or will be carried out were then evaluated, including the contribution of the Project to those cumulative environmental effects (as applicable).

1.8.1.6 Determination of Significance

The significance of project-related and cumulative environmental effects was determined, in consideration of the significance criteria. The significance determination for project-related environmental effects is based on significance criteria that reflect a variety of considerations based on direction, magnitude, geographic extent, duration, frequency, reversibility, and ecological/socioeconomic context) and other relevant considerations.

Where the environmental effects are determined to be significant, there is further consideration of the likelihood of occurrence of that significant environmental effect, based on past experience and the professional judgment of the Study Team.

1.8.2 Methodology

1.8.2.1 Baseline Data Collection

The baseline data collection involved conducting biophysical and socio-economic baseline surveys by Environmental Expert and Sociologist, respectively. The baseline surveys involved collection of both primary data through field work and secondary data through reviews of relevant documents from various sources, including internet websites.

Biophysical surveys involved recording of any significant features and land use 100 m flanking the project area. Socio-economic survey involved interviews with relevant stakeholders. Whenever necessary, during the survey some photographs were also being taken for illustrations.

1.8.2.2 Stakeholder Consultation

The term 'stakeholder consultation', in this study means 'consultations with interested parties' or with 'affected parties', whether directly or indirectly, positively, or negatively. The purpose of stakeholder consultation is to obtain their concerns and feedback to improve the project design and help the project proponent to identify and mitigate any potential adverse impacts.

The consultation process involved face to face interviews with Ward and Mtaa Government Officials and conducting stakeholder consultation meetings with local community members of the wards traversed by the road sections. Before commencement of the consultation meeting the Sociologist appointed two persons among the local community members to take minutes of the consultation meetings. In addition, the interviewed officials and local community members were asked to write their names, signatures, and phone numbers on a special stakeholder consultation form.

1.8.2.3 Identification and Assessment of Impacts

The identification of impacts was based on the interaction between the project related activities and Valued Environmental Component (VECs) for each project phase (i.e., mobilization or pre-construction phase, construction phase, operation phase and demobilization phase).

The identified impacts were then assessed by using Environmental Impact Assessment Matrix. The assessment of impacts helped to determine the significance of impacts by considering the following factors:

- ***Importance*** of Effects/Impacts – whether important to national/International interest, national/regional interest, areas immediately outside local conditions, or important only to local conditions (site specific).

- ***Magnitude*** of Effects/Impacts – whether Positive/Negative (Major, Moderate, Minor) or No change.
- ***Duration*** of Effects/Impacts –whether Permanent or Temporary.
- ***Reversibility*** of Effects/Impacts – whether Reversible or Irreversible.
- ***Cumulative*** Effects/Impacts – whether Cumulative or Not Cumulative.

The assessment of impacts also took into consideration existing by-laws, national and international environmental standards, legislation, treaties, and conventions that may affect the significance of identified impacts.

These techniques were used in order to have a logical and systematic way of identifying, analysing, and assessing environmental impacts. The techniques also allowed qualitative assessment to be quantitatively recorded and therefore make the assessment of impacts become more objective.

1.8.2.4 Analysis of Alternatives

The analysis of alternatives took into consideration the "No Action" or "No Project" Alternative to demonstrate environmental and social conditions without the project. The analysis of alternatives also considered the following:

- Construction Method Alternatives
- Alternative Site

The Multi-Criteria Analysis Method was used for comparison of alternatives, based on technical, economic (techno-economic), environmental and social criteria. The focus was on environmental and social impacts, technical feasibility, and economic viability.

The intention was to select those alternatives with less adverse environmental and social impacts; technically suitable under the local conditions; and with less investment and operational costs.

1.8.2.5 Formulation of Mitigation Measures

This involved formulation of general and specific mitigation, contingency and compensation measures that are technically and economically feasible to avoid or minimize potentially significant adverse environmental effects. In formulating mitigation measures, emphasis has been on how the mitigation measures will help to reduce the environmental impacts. In most case emphasis has been on avoidance and amelioration[9] rather than compensation or resettlement of people.

1.8.2.6 Preparation of ESMP and Monitoring Plan

The Environmental and Social Management Plans (ESMP) has been prepared to describe how project activities might impact on the environment in which it occurs and set out clear commitments on how those impacts will be avoided, minimised, and managed so that they are environmentally acceptable. The ESMP specifies institutional roles and responsibilities for implementation at each project phase and provides cost estimates for implementation of mitigation measures.

The monitoring plan has been prepared to verify the predictions of the EIA and/or the effectiveness of mitigation. The monitoring plan has been described in sufficient detail to allow

[9]According to dictionary definition, "A**meliorate"** means to make it better or become better, more tolerable (bearable), or more satisfactory.

Independent judgment as to the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted environmental effects (or absence of them), and to confirm both the EIA predictions and/or the effectiveness of mitigation measures.

1.9 The Study Duration and Limitations

The overall duration of the ESIA study is estimated to be about 120 days, as shown in the following tabulation:

1.	Project Registration to NEMC by Filling Online Registration Form No.1	
2.	Reviewing of Project Documents, including the Client's Terms of Reference (ToR).	5 Days
3.	Collection of Biophysical and Socio-economic Baseline Information and Stakeholder Consultations.	14 Days
4.	Scoping Study and Preparation of Scoping Report and ToR	14 days
5.	Review of Scoping Report and Terms of Reference by PO-RALG	7 days
6.	Incorporation of the comments from the PO-RALG on the submitted Scoping Report and ToR	5 days
7.	Submission of Scoping Report and ToR to NEMC for Review and Approval.	14 days
8.	Incorporation of Comments from NMEC on Scoping Report and ToR.	21 Days
9.	Conducting detailed ESIA Study and Preparation of Draft ESIA Report.	
10.	Submission of Draft ESIA report to PO-RALG and WB for review	7 Days
11.	Incorporation of Comments from PO-RALG and WB on the submitted Draft ESIA Report and Preparation of Final Draft ESIA Report	7 Days
12.	Submission of Final Draft ESIA report to NEMC for review and site verification by TAC.	21 days
13.	Incorporation of comments from NEMC on the Final Draft ESIA Report and Submission of Final ESIA Report to NEMC and PO-RALG.	5 days

The major limitation to the study is the lack of baseline information from the project area. As such most of the baseline data was obtained from secondary sources. For example, it became necessary to rely on Socio-economic Profile and National Population Census Report of 2022.

1.10 The Report Format

The preparation of this ESIA report has been carried out in accordance with the requirements of World Bank Environmental and Social Framework and GoURT Environmental Impact Assessment (EIA) and Audit Regulations 2005 and its Amendment Regulations of 2018. Specifically, the report has been prepared in accordance with the requirements of Sub-regulation 18(1), 18(2) and 18(3) of the EIA and Audit Regulations (2005). The table of concordance indicating the sections of the ESIA report where the requirements of Sub-regulation 18(1) have been addressed is provided in **APPENDIX 1.**

The report is divided into two main parts, whereby Part I is Executive Summary and Part II is the Main Text. The main text is comprised of 13 Chapters, whereby Chapter One is Introduction, followed by Project Background and Description in Chapter 2. Chapter 3 deals with Policy, Legal and Institutional Framework, followed by Description of Environmental Baseline Conditions in Chapter 4.

The Stakeholder Consultations and Public Participation are provided in Chapter 5, which is followed by Assessment of Impacts and Analysis of Alternatives in Chapter 6. In Chapter 7, the report outlines Environmental Mitigation Measures, followed by Chapter 8 which outlines the Environmental and Social Management Plan (ESMP); which is immediately followed by Environmental Monitoring Plan in Chapter 9.

Chapter 10 deals with Resources Evaluation and Cost Benefit Analysis, which is followed by Demobilization Plan in Chapter 11. Finally, the report ends up with Summary and Conclusion in Chapter 12, which is followed by list of References and Appendices.

CHAPTER TWO

2.0 PROJECT DESCRIPTION

2.1 Location

The DMDP II Component 1 will be implemented within Kinondoni Municipality in the Dar Es Salaam Region. Specifically, the project will be implemented in 10 wards. These include Makongo Ward; Wazo; Mbezi Juu; Kunduchi; Mikocheni; Kinondoni; Kawe; Msasani; Kijitonyama; and Ndugumbi Wards.

The Dar Es Salaam Region forms boundaries with Pwani Region to the west and Indian Ocean to the north, east and south. The map showing the location of Dar Es Salaam Region is provided in **Figure 2.2-1.** The Kinondoni Municipal Council forms boundaries with Pwani Region to the west, Indian Ocean to the south, and east; Dar Es Salaam City Council to south-east; and Ubungo Municipal Council to the south. The map illustrating the location and boundaries of Kinondoni Municipal Council is provided in **Figure 2.2-2.** Finally, the map showing the location of 10 Wards to be affected by the project is provided in **Figure 2.2-3.**

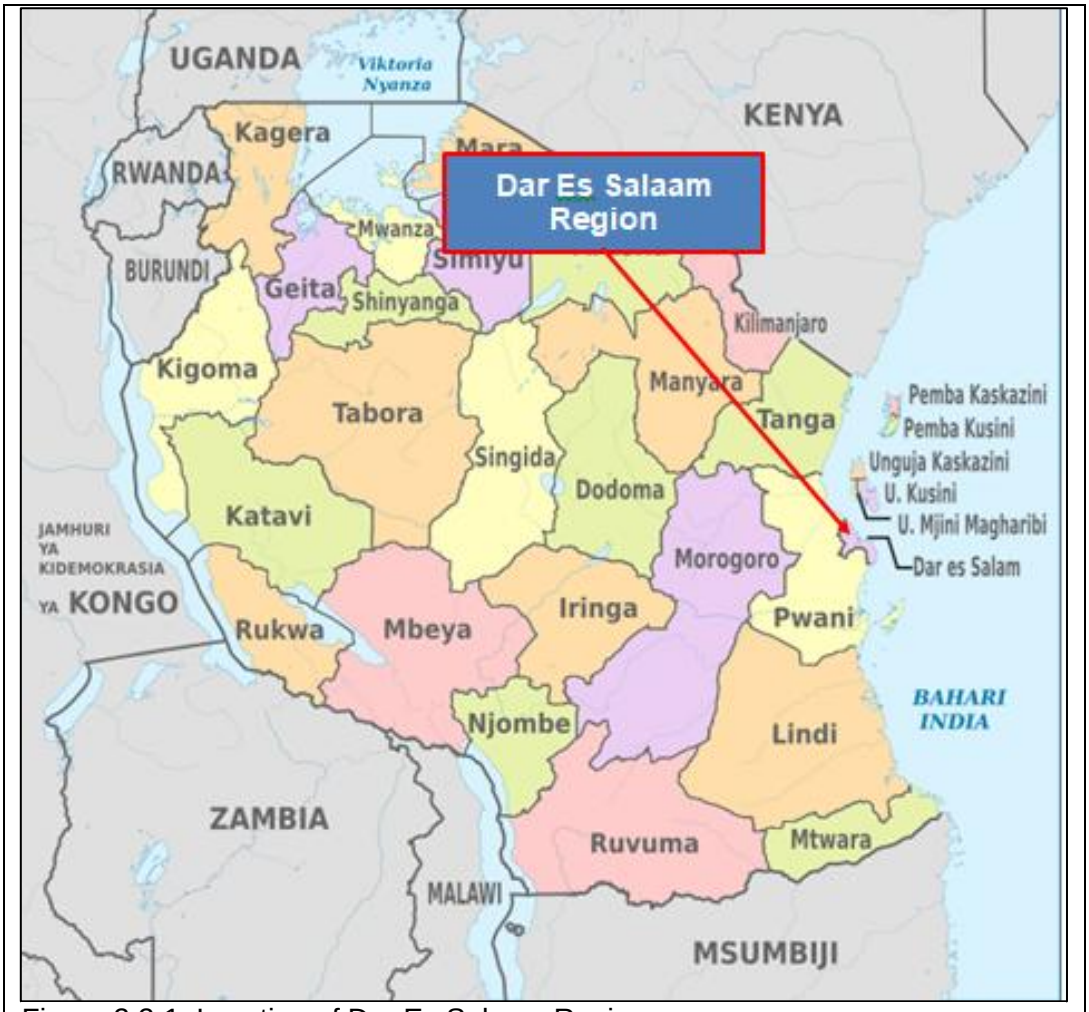


Figure 2.2-1: Location of Dar Es Salaam Region.

Source: https://sw.wikipedia.org/wiki/Picha:Tanzania,_administrative_divisions_-_sw_-_colored.svg

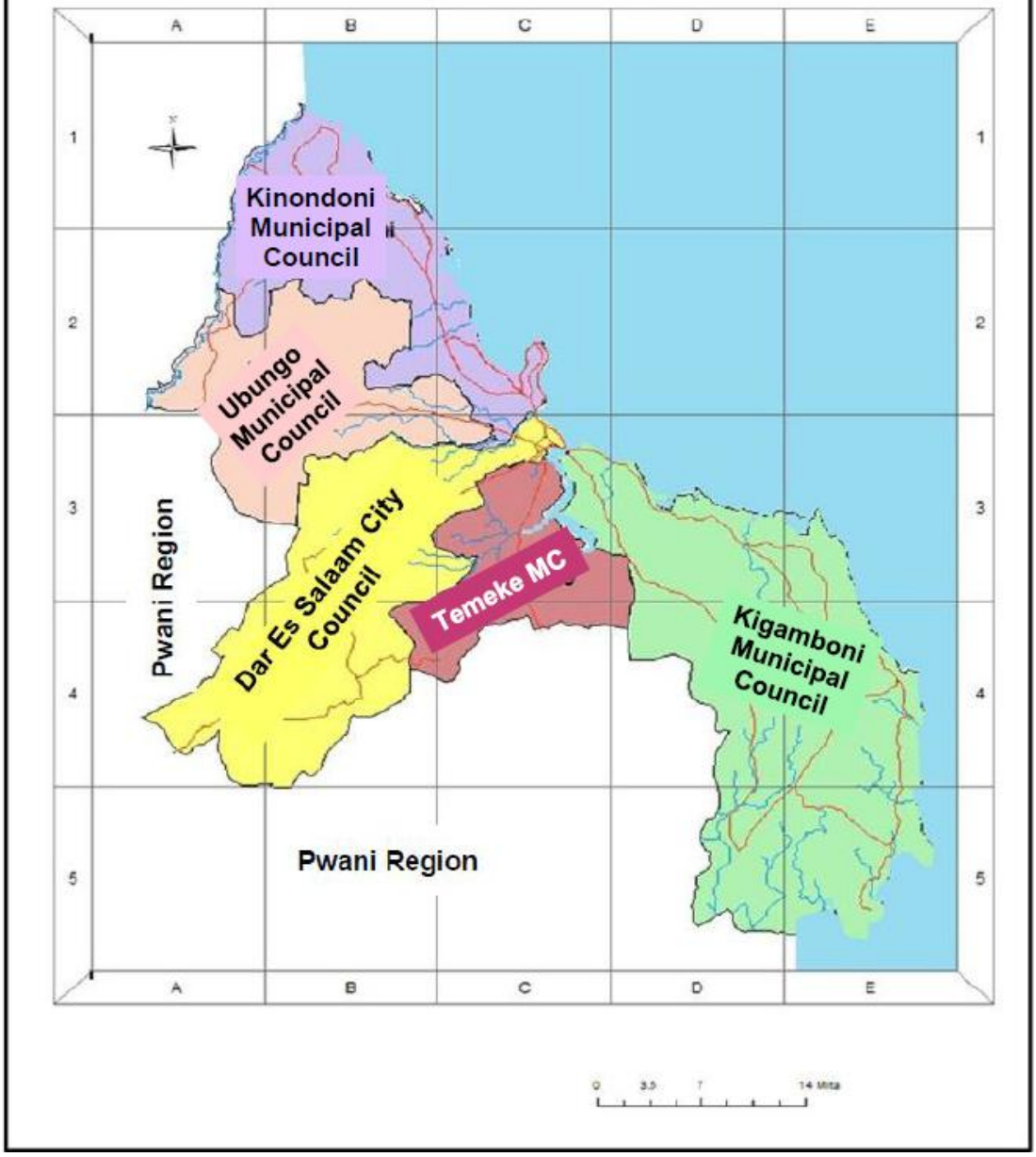


Figure 2.2-2: Location of Kinondoni Municipality.

Source: http://www.dcc.go.tz/city-profile

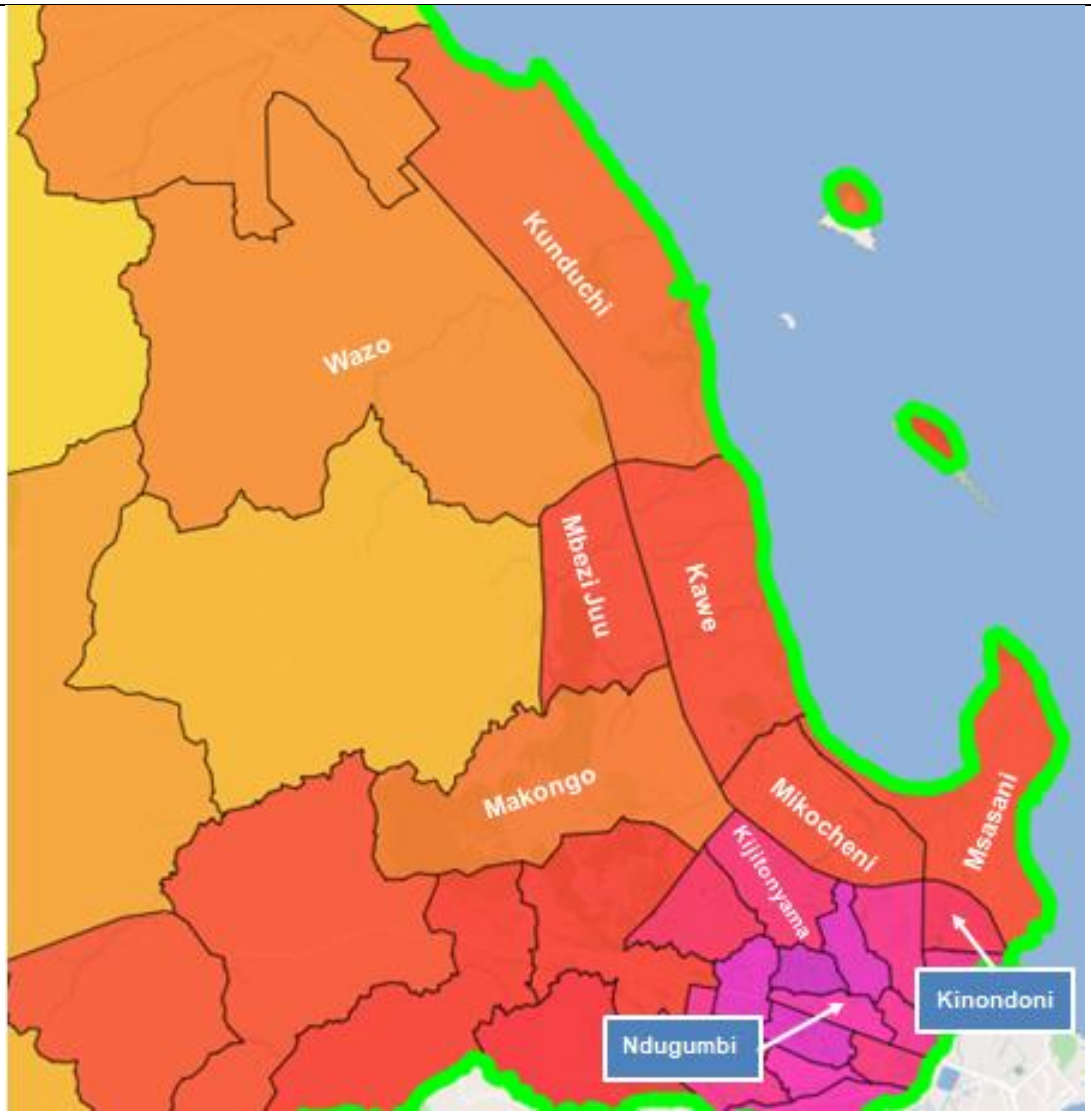


Figure 2.2-3: Location of 10 Wards affected by the Project.
Source: https://www.citypopulation.de/en/tanzania/coastal/admin/0701__kinondoni_municipal/

2.2 Project Boundaries

2.2.1 Spatial Boundaries

The spatial boundaries of the project environment have been divided into Project Development Area (PDA), Local Assessment Area (LAA), and Regional Assessment Area (RAA). The spatial boundaries of the project environment are illustrated in **Figure 2.2-1.**

(a) Project Development Area (PDA)

The Project Development Area (PDA) is the most basic and immediate are of the Project. The PDA is limited to the anticipated area of the physical disturbance associated with the Construction and Operation of the Project. For this Project, the PDA consists of the areas occupied by road corridors. The total area to be occupied by the road corridors is estimated to be about 305,100 Square Metres (SQM)[10]

[1010] This is calculated by multiplying the design width (15 m) by total length of the road sections (20.3 km).

(b) Local Assessment Area (LAA)

The Local Assessment Area (LAA) is the maximum area within which Project-related environmental effects can be predicted or measured with a reasonable degree of accuracy and confidence. The LAA is commonly referred to as the "Zone of Influence" of the Project and may include areas that could experience Project environmental effects that arise beyond the area of physical disturbance by the Project.

The LAA includes the PDA and any adjacent areas to the road section, where Project-related environmental effects may reasonably be expected to occur. The definition of LAA varies from one VEC to another, depending on the local conditions, biological characteristics, socio-economic factors, cultural values, and other factors.

(c) Regional Assessment Area

The Regional Assessment Area (RAA) is the area within which the Project's environmental effects may overlap or accumulate with the environmental effects of other projects or activities that have been or will be carried out such that cumulative environmental effects may potentially occur. The RAA are defined for each VEC depending on the physical and biological conditions and the type of and location of other past, present, or reasonably foreseeable projects or activities that have been or will be carried out

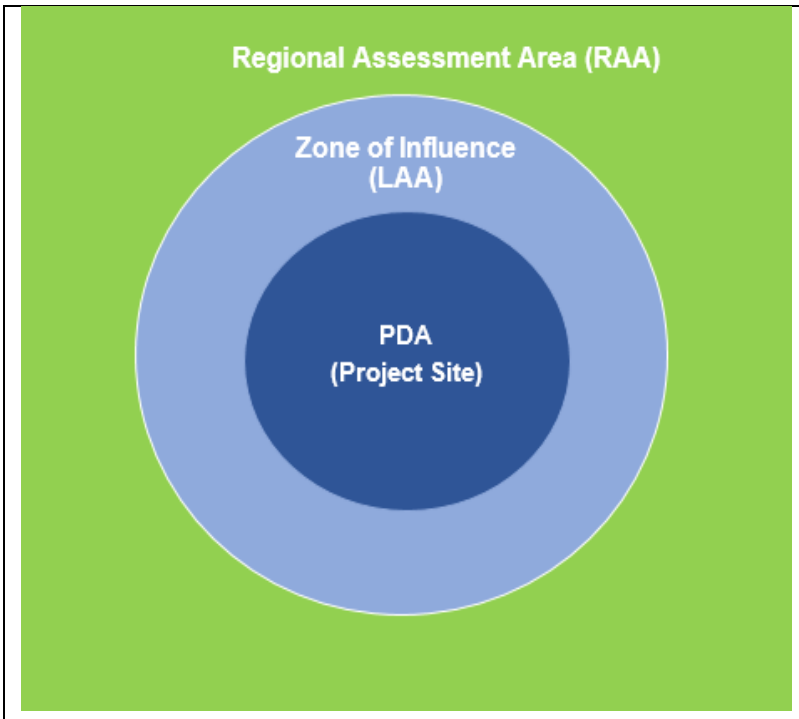


Figure 2.2-1: Spatial boundaries of the Project Environment.

2.2.2 Temporal Boundaries

The temporal boundaries of the project refer to timing and duration of Project. The temporal boundaries of the project consist of the durations for mobilization, construction, and demobilisation phases of the project. In addition, the temporal boundaries are the design periods of the road pavement and its associated bridges and other drainages structures.

The following are the temporal boundaries of the project during mobilization, construction, and demobilisation phases:

Activities	Duration
Mobilization phase:	1 month
Construction phase:	3 Years[11]
Demobilization phase:	1 month
Operation phase:	40 years for Concrete Pavement[12]

The Decommissioning Phase of the project is not expected to occur so long as the need for road infrastructure continues. Instead, the road sections will continue to be undergoing regular maintenance and improvement depending on the future requirements.

2.2.3 Institutional Boundaries

The institutional boundaries refer to those administrative and institutional boundaries in which the project lies or interacts. These can be determined from the legislations, ministries/departmental mandates. The identification of institutional boundaries helps to reduce institutional conflicts and enhance collaboration among various institutions or sectors. The institutional boundaries for conducting environmental and social impact of DMDP 2 subprojects is comprised of World Bank (WB), President's Office, Regional Administration and Local Government (PO-RALG), Division of Environment in the Vice President's Office (DoE-VPO), and National Environmental Management Council (NEMC).

2.3 Description of the Road Sections

2.3.1 Nakalekwa -Bwawani Road (7.32 km)

2.3.1.1 Location

The road is located in Wazo ward at Nyakasangwe Mtaa. The road starts at UTM (Zone 37M) Coordinates 515313.44 m E, 9260905.72 m S along the Madale Bitumen Road **(Photo No. 2.3.1-1)** and ends at UTM Coordinates 517862.07 m E, 9262779.58 m S along the Madale Bitumen Road **(Photo No. 2.3.1-2).** The map showing the location of Nakalekwa-Bwawani Road is provided in **Figure 2.3.1-1.**

The right of way (RoW) for the road section is estimated to range from 20 to 30 m, with a road reserve (RR) ranging from 10 to 15 m on both sides. The road is categorized as urban street roads and typical cross section has been designed to fit into the available road corridor.

[11] The World Bank Report No: PAD1464. http://documents1.worldbank.org/curated/en/794251489201242940/pdf/TZ-PAD-02162017.pdf

[12] THE IMPLICATIONS OF CLIMATE CHANGE ON ROAD INFRASTRUCTURE PLANNING, DESIGN AND MANAGEMENT By Paul Youman, GHD. https://www.coastalconference.com/2007/papers2007/Paul%20Youman.pdf

Photo No. 2.3.1-1: Beginning of the road section at km 0+000.

Photo No. 2.3.1-2: End of the road section at km 7+320.

Figure 2.3.1-1: Location of Nakalekwa-Bwawani Road Section.

2.3.1.2 Topography

The road traverse through undulating topography, whereby it gradually descends from km 0+000 at an altitude of about 104 m mean above sea level (m.a.s.l.) to an altitude of about 55m (m.a.s.l.) at km 3+070, whereby it crosses the Nakalekwa stream at km 3+080 **(Photo No. 2.3.1-3).** Thereafter, the road ascends from 55m to 109m at km 7+320. The maximum ascending slope is 11.4% and maximum descending slope is -11.5% with average ascending slope of 3.0% and average descending slope of -2.1%. The elevation profile along the road section is provided in **Figure 2.3.1-2.**

Photo No. 2.3.1-3: Box culvert across Nakalekwa Stream at km 3+080.

2.3.1.3 On-going Activities and Important Features

The ongoing activities along the road section include hardware selling and block making at km 4 + 331 **(Photo No. 2.3.1-4);** These activities were found to be close to the road, hence likely to be affected during construction. According to the RAP Report, the number of Project Affected Persons (PAPs) is estimated to be 11 and 5 building structures found to be within the road reserve.

Photo No. 2.3.1-4: Hardware selling and block making at km 4+331 on the LHS.

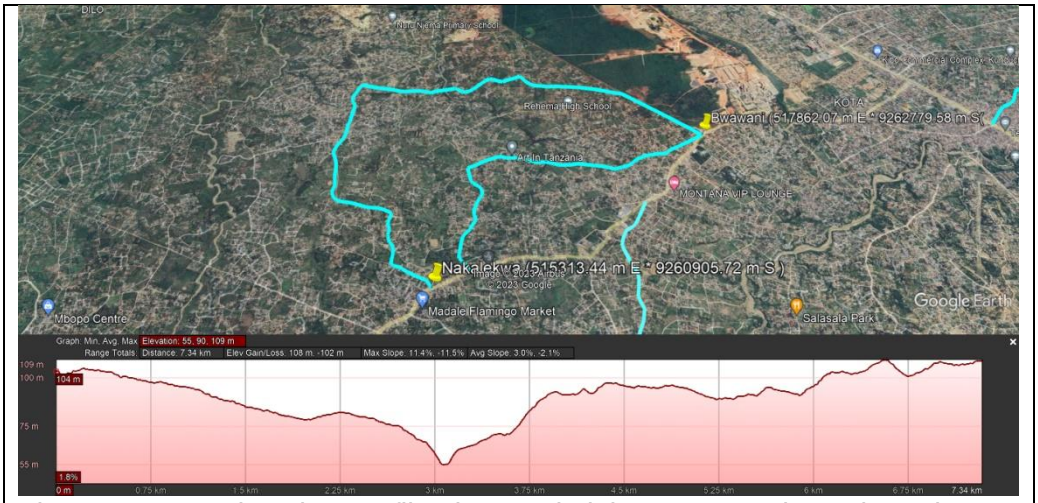


Figure 2.3.1-2: Elevation Profile along Nakalekwa-Bwawani Road Section.

2.3.1.4 Adjacent Land Use and Land Cover

The adjacent land use is mainly cultivation, residential with residential/ commercial/ institutional. This is evidenced by presence of several retails and whole sale shops, primary school at km 1+313 on the LHS **(Photo No. 2.3.1-5)** and km 2+409 on the RHS **(Photo No. 2.3.1-6).** The cultivated farms will benefit from improvement of the road section into bitumen standards due to increased access to the available market in the CBD for agriculture produce. However, the presence of school buildings will have some implications to the safety of school children during construction and operation phase.

The adjacent vegetation cover is comprised of scrubland, short grass and some planted trees like Tick **(Photo No. 2.3.1-7).** The stream/river banks vegetation cover is comprised of tall grass, short trees / shrubs **(Photo No. 2.3.1-8).**

The right of way (RoW) for the road section is estimated to be 30 m, with a road reserve (RR) of 15 m on both sides. It can therefore, be noted that the adjacent properties are likely to be affected as most of them are within the RR and within the RoW (Figure). For example, at km _____ the nearest adjacent buildings are about 10 m from he road centreline (RCL) as illustrated in Figure 2.3.1-3.

Photo No. 2.3.1-5: Uwata Madale primary school at km 1 + 313 on the LHS.

Photo No. 2.3.1-6: Nyakasangwa Primary School at km 2+409 on the RHS.

Photo No. 2.3.1-7: Tick and other trees farms located along the road section from 4+802 to 4 + 960.

Photo No. 2.3.1-8: River banks and river bed conditions in the downstream of box culvert.

2.3.1.5 Infrastructure/utilities

The linear infrastructure/utilities include water supply pipelines, telephone cable, electricity power lines / poles. These infrastructure utilities can be found to running parallel or crossing the road section at various locations.

During the field investigation some telephone cables were found to be located close to the road at km 4+331 on the LHS **(Photo No. 2.3.1-9).** In addition, the water supply pipeline was found to be close to the road at km 4+780 on the RHS **(Photo No.2.3.1-10).** These infrastructure/utilities are likely to be affected during construction; hence the need for relocation before commencement of the construction works.

Photo No. 2.3.1-9: Viettel underground fiber optic cables along the road section at km 4 + 331 on the RHS.

Photo No. 2.3.1-10: DAWASA water supply pipeline and inspection chamber along the road at km 4 + 780 on the RHS.

2.3.2 Umoja Road (3.86 km)

2.3.2.1 Location

The road is located in Wazo ward at Nyakasangwe Mtaa. The road links with Madale Road at the start and end. The road starts at UTM Coordinates 517840.02 m E (**Photo No.2.3.2-1)**, 9262762.14 m S and end at UTM Coordinates 515625.51 m E, 9261090.76 m S along Madale

Road (**Photo No.2.3.2-2).** The map showing the location of Umoja Road is provided in **Figure 2.3.2-1.**
The right of way (RoW) for the road section is estimated to range from 20 to 30 m, with a road reserve (RR) ranging from 10 to 15 m on both sides. The road is categorized as urban street roads and typical cross section has been designed to fit into the available road corridor.

Photo No. 2.3.2-1: Beginning of the road section at km 0+000.

Photo No. 2.3.2-2: End of the road section at km 3+900.

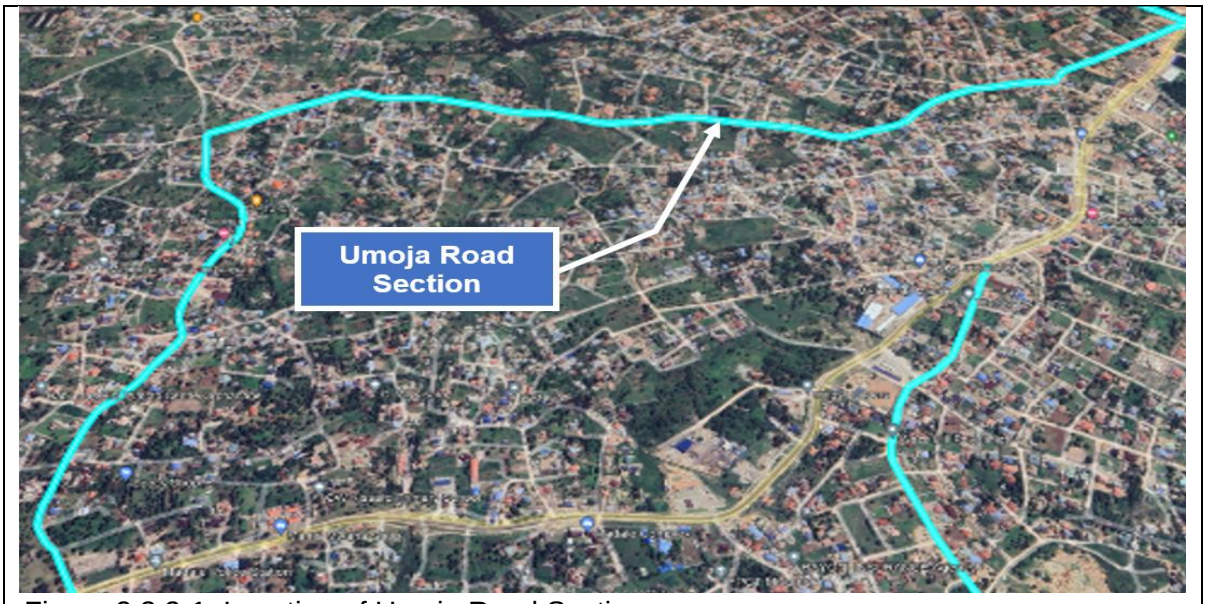


Figure 2.3.2-1: Location of Umoja Road Section.

2.3.2.2 Topography

The road traverse through undulating topography, whereby it starts at km 0+000 at an altitude of about 104 m mean above sea level (m.a.s.l.) and gradually descends to an altitude of about 68m (m.a.s.l.) which is the lowest one at km 1+167, whereby it joins the Nakalekwa-Bwawani Road**.** Thereafter, the road ascends from 1+167 m to 107m at km 3+900. The maximum ascending slope is 11.4% and maximum descending slope is -11.5% with average ascending slope of 3.0% and average descending slope of -2.1%. The elevation profile along the road section is provided in **Figure 2.3.2-2.**

Figure 2.3.2-2: Elevation Profile along Umoja Road Section.

2.3.2.3 On-going Activities and Important Features

The ongoing activities along the road section include operation of apartment buildings **(Photo No. 2.3.2-5)**; residential buildings **(Photo No. 2.3.2-6)**; retails/ whole sale shops; and hardware workshop. According to the RAP Report, the number of Project Affected Persons (PAPs) is estimated to be 3 and 1 building structure found to be within the road reserve.

Photo No. 2.3.2-3: Some of the Apartment Buildings along the road section at km 0+700 on the RHS.

Photo No. 2.3.2-4: Some of the residential buildings on both side of the road section at km 2+019.

2.3.2.4 Adjacent Land Use and Land Cover

The adjacent land use is mainly cultivation, residential with residential/ commercial/ institutional. This is evidenced by presence of several retails and whole sale shops, primary and secondary schools, The adjacent vegetation cover is comprised of scrubland, short grass and some planted trees. The road is provided with road side storm water drainages along the steep slope of the road as shown in **Photo No0. 2.3.2-3** and **Photo No. 2.3.2-4.** The road section has got adequate corridor for construction; therefore, no compensation is expected.

The cultivated farms will benefit from improvement of the road section into bitumen standards due to increased access to the available market in the CBD for agriculture produce.

Photo No. 2.3.2-5: Storm water drainage at km 1+000 on the LHS.

Photo No. 2.3.2-6: Storm water drainage at km 1+070 on the RHS.

2.3.2.5 Infrastructure/utilities

During the site investigation it was not possible to positively identify any linear infrastructure/utilities along the road section However, interview with local people indicated that there are some water supply pipelines and underground telephone cables, which either cross or run parallel to the road section. These infrastructure / utilities will have to be relocated before commencement of construction works. In addition, there will be a need for providing service ducts for passage of crossing infrastructure/utilities.

2.3.3 Mivumoni Road (4.79 km)

2.3.3.1 Location

The road is located at Mivumoni Mtaa in Wazo ward, like Nakalekwa-Bwawani and Umoja Road at Wazo area. The Mivumoni Road also links with Madale Road at km 0+000 **(Photo No. 2.3.3-1)** and at km 4+790 **(Photo No. 2.3.3-2)**. The road starts at UTM Coordinates 515005.12 m E / 9258211.17 m S and end at UTM Coordinates 517202.62 m E / 9261868.27 m S along Madale Road. The elevation profile along the road section is provided in **Figure 2.3.3-1.**

The right of way (RoW) for the road section is estimated to range from 20 to 30 m, with a road reserve (RR) ranging from 10 to 15 m on both sides. The road is categorized as urban street roads and typical cross section has been designed to fit into the available road corridor.

Photo No. 2.3.3-1: Beginning of the road section at km 0+000 along Madale Road.

Photo No. 2.3.3- 2: End of the road section at km 4+800 alng Madale Road.

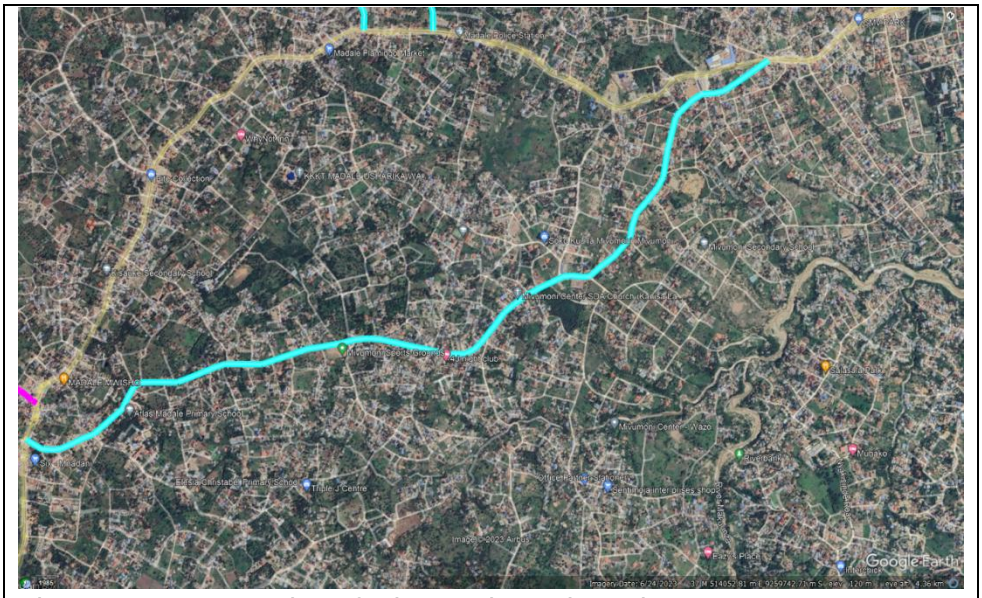


Figure 2.3.3-1: Location of Mivumoni Road Section.

2.3.3.2 Topography

The road traverses through undulating topography, whereby it starts at an altitude of about 106 m (m.a.s.l.). The lowest altitude is 98 m (m.a.s.l.) is at km 0+679 and the highest is 133 m (m.a.s.l.) at km 4+810**.** The maximum ascending slope is 12.3% and maximum descending slope is -8.5% with average ascending slope of 3.0% and average descending slope of -2.3%. The elevation profile along the road section is provided in **Figure 2.3.3-2.**

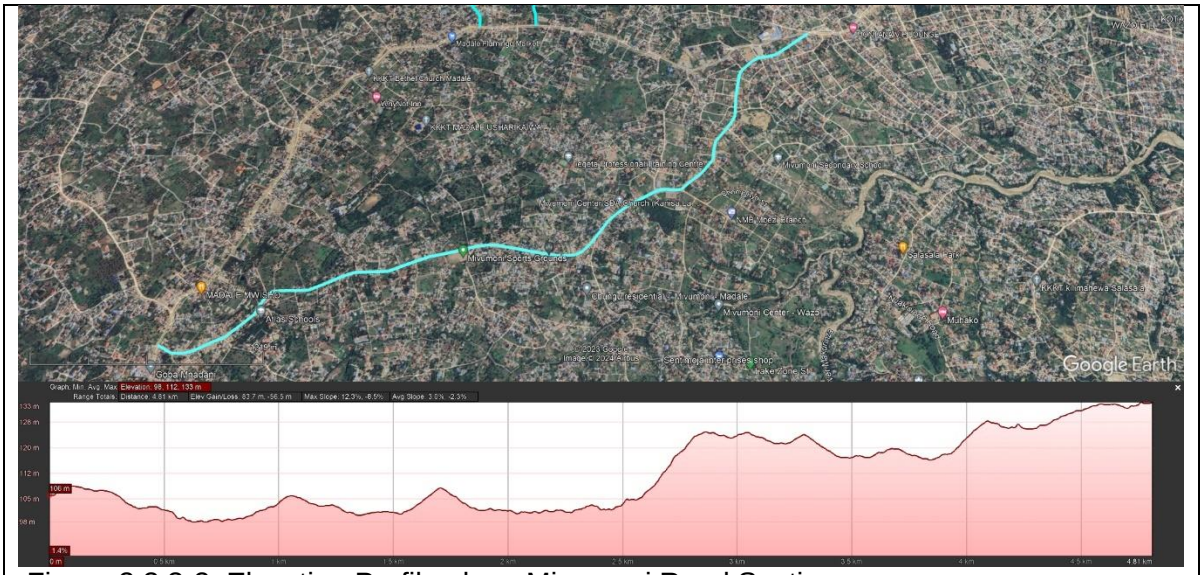


Figure 2.3.3-2: Elevation Profile along Mivumoni Road Section.

2.3.3.3 On-going Activities and Important Features

The ongoing activities include operation of Atlas primary school was found to be on both sides of the road at km 0+591 (Photo No. 2.3.3-3); Hazrat Khadija Complex at km 1+270 on the LHS (Photo No. 2.3.3-4); business centre at km 2+448 (Photo No. 2.3.3-5); fuel filling station at km 4+398 (Photo No. 2.3.3-6). According to the RAP Report, the number of Project Affected Persons (PAPs) is estimated to be 4 and 4 building structures found to be within the road reserve.

Photo No. 2.3.3-3: Atlas Primary School on both sides of the road at km 0+591.

Photo No. 2.3.3-4: Hazrat Khadija Complex at km 1+270 on the LHS.

Photo No. 2.3.3-5: Business Centre at km 2+448 on the Fuel Filling Station at km

Photo No. 2.3.3-6: Fuel Filling Station at km 4+398 on the RHS.

2.3.3.4 Adjacent Land Use and Land Cover

The adjacent land use is mainly cultivation, residential with residential/commercial/institutional with several retails and whole sale shops, primary and secondary schools. The road is also traversing through the sport grounds, business centre, recreations centres, and religion institutions like churches along the road. The cultivated farms will benefit from improvement of the road section into bitumen standards due to increased access to the available market in the CBD for agriculture produce. However, the presence of school buildings on both sides of the road will have some implications to the safety of school children during construction and operation phase.

2.3.3.5 Infrastructure/utilities

The utilities such water supply pipes and manholes, communication cables, electrical poles are located across and along the road, During the site investigation a water supply pipeline and sewer manhole were found to be located on the road median as shown in **(Photo No. 2.3.3-7)** and **(Photo No. 2.3.3-8).** These infrastructure/utilities are likely to be affected during construction; hence the need for relocation before commencement of the construction works. In addition, there will be a need for provision of service ducts for passage of crossing infrastructure/utilities.

Photo No. 2.3.3-7: Water supply pipeline and sewer manhole at km on the road median at km 0 + 829.

Photo No. 2.3.3-8: Close view of the water supply beacon and sewer manhole

2.3.4 Tegeta Police - Silver Road (2.0 km)

2.3.4.1 Location

The road is located at Tegeta and Kondo Mtaa in Kunduchi ward. The road starts at Bagamoyo Road (Kwa Ndevu) at UTM Coordinates 520870.73 m E, 9263032.66 m S) **(Photo No. 2.3.4-1)** and joins a road to Ununio at the Junction of Bahari Road, at UTM Coordinates 522551.01 m E / 9263807.87 **(Photo No. 2.3.4-2)**. The road links with bitumen roads at the start and end. The elevation profile along the road section is provided in **Figure 2.3.4-1.** The road passes through high water table areas, and therefore has been provide with storm water drainages.

The right of way (RoW) for the road section is estimated to range from 16 to 20 m, with a road reserve (RR) ranging from 8 to 10 m on both sides. The road is categorized as urban street roads and typical cross section has been designed to fit into the available road corridor.

Photo No. 2.3.4-1: Beginning of the road section from Bagamoyo Road at km 0+000.

Photo No. 2.3.4-2: End of the road section at Ununio Road at km 2+000.

Figure 2.3.4-1: Location of Tegeta-Police - Silver Road Section.

2.3.4.2 Topography

The road traverse through a flat topography, whereby it starts at altitude 32 m (m.a.s.l.) at km 0+000, which is the highest altitude and keep descends to an altitude of about 14m (m.a.s.l.) at km 2+000. The maximum ascending slope is 4.8% and maximum descending slope is -

12.3% with average ascending slope of 1.1% and average descending slope of -1.9%. The elevation profile along the road section is provided in **Figure 2.3.4-2.**

Figure 2.3.4-2: Elevation Profile along Tegeta-Police - Silver Road Section.

2.3.4.3 On-going Activities/Important features

The ongoing activities include operation of refrigerator maintenance workshop **(Photo No. 2.3.4-3);** These activities are found to be close to the road section, hence likely to be affected during construction. According to the RAP Report, the number of Project Affected Persons (PAPs) is estimated to be 10 and 17 building structures found to be within the road reserve.

Photo No. 2.3.4-3: Refrigerator repair and maintenance workshop at km 0 + 250

2.3.4.4 Adjacent Land Use and Land Cover

The adjacent land use is mainly residential with residential/commercial/institutional. This is evidenced by presence of police station secondary schools; Kunduchi Primary School **(Photo No. 2.3.4-4);** Mzumbe University Campus **(Photo No. 2.3.4-5);** and retail/whole shops **(Photo No. 2.3.4-6).** The road has been provided with lined road side storm water drainage at km 0+567 **(Photo No. 2.3.4-7)** and unlined road side storm water drainage at km 0+600 **(Photo No. 2.3.4-8**) to minimize flooding effects.

The adjacent vegetation cover is mainly comprised of planted exotic ornamental and/or shade trees. These trees are likely to be affected during construction due to construction of road side storm water drainages.

Photo No. 2.3.4-4: Kunduchi Primary School located at km 0+421 on the LHS.

Photo No. 2.3.4-5: Mzumbe University, Tegeta branch at km 0+567 on the LHS.

Photo No. 2.3.4-6: Whole sale and retail shops on both sides from 0 + 000 to 0 + 041

Photo No. 2.3.4-7: Lined roadside storm water drainage at km 0+567 on the LHS.

Photo No. 2.3.4-8: Unlined roadside storm water drainage at km 0+600 on the RHS.

The road has got narrow corridor at some locations **(Photo No. 2.3.4-9,** hence likely to trigger land acquisition issues due to the need of space for installation of roadside storm water drainages and pedestrian walkways.

Photo No. 2.3.4-9: Narrow road corridor from km 0+000 to km 0+041.

2.3.4.5 Infrastructure/utilities

The important infrastructure/utilities include water supply pipelines, telephone cables, and electric power lines al poles are located across and along the road. During the site investigation some water supply pipelines were found to be crossing the road **(Photo No. 2.3.4-1)** and electric power lines were found to be along the road section **(Photo No. 2.3.4-2).** These infrastructure/utilities will have to be relocated before commencement of construction works. In addition, there will be a need to provided service ducts for crossing infrastructure/utilities.

Photo No. 2.3.4-10: Water supply pipes crossing the road at km 0+726

Photo No. 2.3.4-11: Electric Power Lines close to the road at km 0+250

2.3.5 Binti Matola Road (0.77 km)

2.3.5.1 Location

The road is located at Ada Estate Mtaa in Kinondoni Ward. The road starts at Tunisia Road at UTM Coordinates 530370.98 m E / 9250000.14 m S **(Photo No. 2.3.5-1)** and end at Kinondoni Road (Makaburini Area) at UTM Coordinates 530051.54 m E / 9249410.69 m S **(Photo No. 2.3.5-2).** The road crosses the Atlas Road at Governor Sports Bar and Grill at UTM Coordinates 530139.87 m E / 9249725.24 m S. The map showing the location of the road section is provided in **Figure 2.3.5-1.**

The right of way (RoW) for the road section is estimated to range from 16 to 20 m, with a road reserve (RR) ranging from 8 to 10 m on both sides. The road is categorized as urban street roads and typical cross section has been designed to fit into the available road corridor.

Photo No. 2.3.5-1: View along Tunisia road from km 0 + 040.

Photo No. 2.3.5-2: Makaburini Area at km 0 + 770.

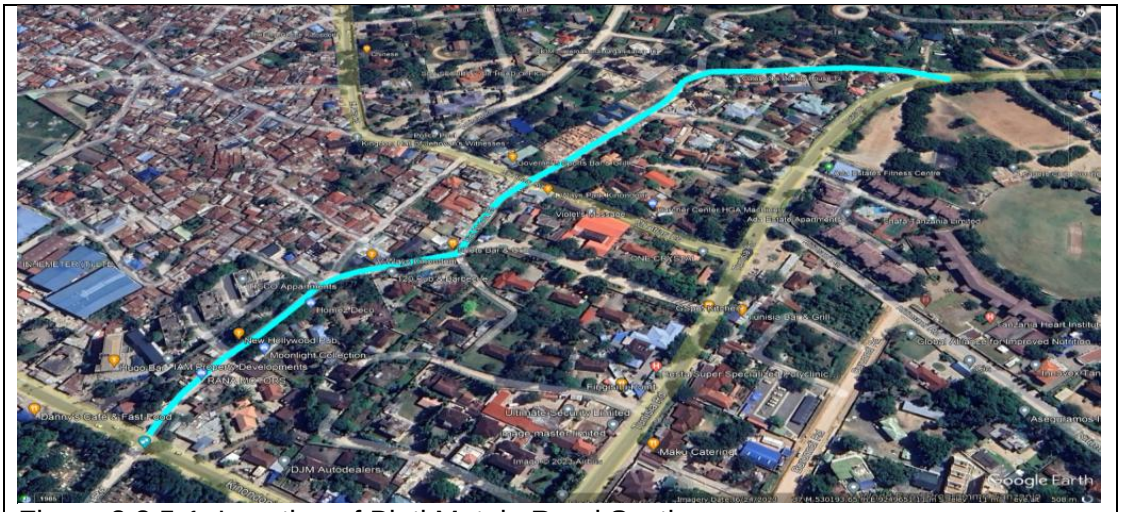


Figure 2.3.5-1: Location of Binti Matola Road Section.

2.3.5.2 Topography

The road traverse through undulating topography, whereby it starts at altitude 7 m (m.a.s.l.) at km 0+000 which is the lowest altitude and ascends to an altitude of about 12 m (m.a.s.l.) at km 0+901 and 0 + 310 and then descends to 11m (m.a.s.l.) at km 0+770. The maximum ascending slope is 4.8% and maximum descending slope is -12.3% with average ascending slope of 1.1% and average descending slope of -1.9%. The elevation profile along the road section is provided in **Figure 2.3.5-2.**

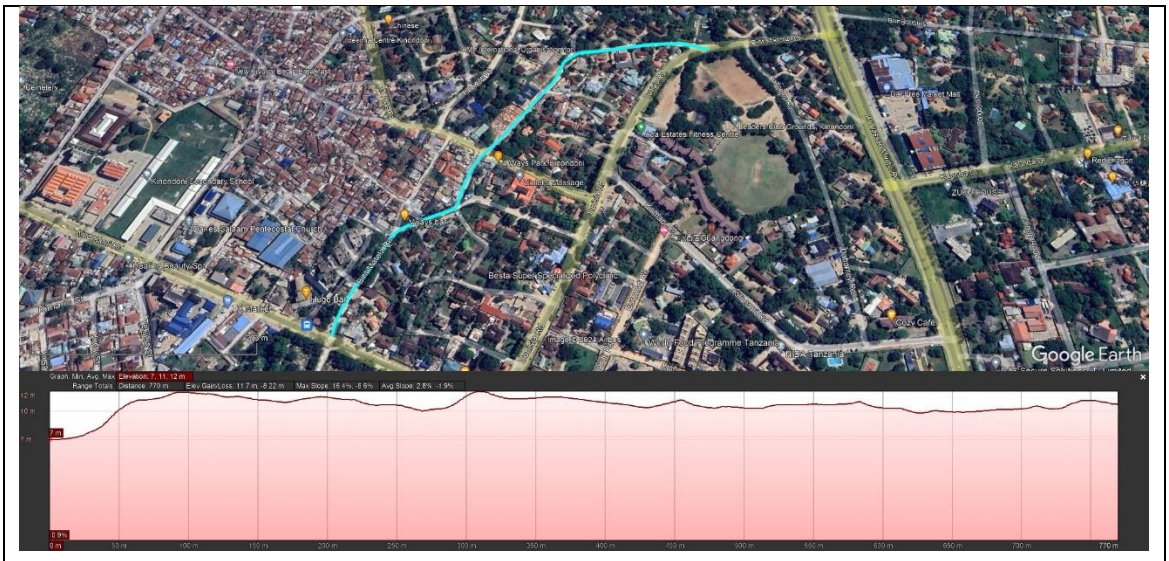


Figure 2.3.5-2: Elevation Profile along Binti Matola Road Section.

2.3.5.3 Ongoing Activities/Important Features

The ongoing activities along the road section include operation of Mtaa Government Office Building at km 0+273 **(Photo No. 2.3.5-3)** and Vehicle Repair Garage at km 0+500 **(Photo No. 2.3.5-4)**; several retails and whole sale shops; metal grill workshop (LHS) and public bar (RHS) at km 0+090 **(Photo No. 2.3.5-5)**, restaurants, and health centre **(Photo No. 2.3.5-6)**.

According to the RAP report the owners of business activities will be required to push back all the identified activities allow the road construction works to proceed without compensation.

Photo No. 2.3.5-3: Mtaaa Government Office Building with planted trees 0+273 on the RHS.

Photo No. 2.3.5- 4: Vehicle Repair Garage at km 0+500 on the RHS.

Photo No. 2.3.5-5: Metal Grill Workshop (LHS) and Public Bar (RHS) at km 0+090.

Photo No. 2.3.5- 6: Health centre at km 0 + 314 on the LHS.

2.3.5.4 Adjacent Land Use and Land Cover

The adjacent land use is mainly residential and commercial and residential/commercial/institutional. This evidenced by presence of residential, commercial and institutional buildings along the road section. The road has got narrow corridor at 0+579 **(Photo No. 2.3.5-7)** and 0+579 **(Photo No. 2.3.5-8**), hence likely to trigger land acquisition and compensation issues.

Photo No. 2.3.5-7: Narrow road corridor near Health Centre at km 0+461.

Photo No. 2.3.5-8: Narrow Road corridor at km 0+579.

2.3.5.5 Infrastructure/utilities

The important infrastructures/utilities include water supply pipelines; telephone cables; electric power lines. During the site investigation underground telephone cable was found to be crossing the road at km 0+010 **(Photo No. 2.3.5-5)** and electric power lines were found to be close to the road at km 0+070 on the RHS **(Photo No. 2.3.5-6).** These infrastructure/utilities will have to be relocated before commencement of construction works. In addition, service ducts will need to be provided for crossing infrastructure/utilities.

Photo No. 2.3.5-9: Airtel underground telephone cable crossing the road at km 0+010.

Photo No. 2.3.5-10: Electric power pole close to the road at km 0+070.

2.3.6 Amiri/Leni Tatu (Dawasa) Road (0.68 km)

2.3.6.1 Location

The road is located at Kumbukumbu Mtaa in Kinondoni ward, at the area well known as Block 41. The road starts at Rashid Kawawa Road near Airtel House at UTM Coordinates 529174.38 m / 9250767.71 m S) at Morocco BRT Station **(Photo No. 2.3.6-1)** and links with Ruhinda Road (near Best Bite) at UTM Coordinates 529809.28 m / 9250663.20 m S **(Photo No. 2.3.6-2)**. The map showing the location of the road section is provided in **Figure 2.3.6-1.**

The right of way (RoW) for the road section is estimated to range from 16 to 20 m, with a road reserve (RR) ranging from 8 to 10 m on both sides. The road is categorized as urban street roads and typical cross section has been designed to fit into the available road corridor.

Photo No. 2.3.6-1: View of Morocco BRT station (See Arrow) at km 0+000.

Photo No. 2.3.6-2: View along Ruhinda Road from km 0+678.

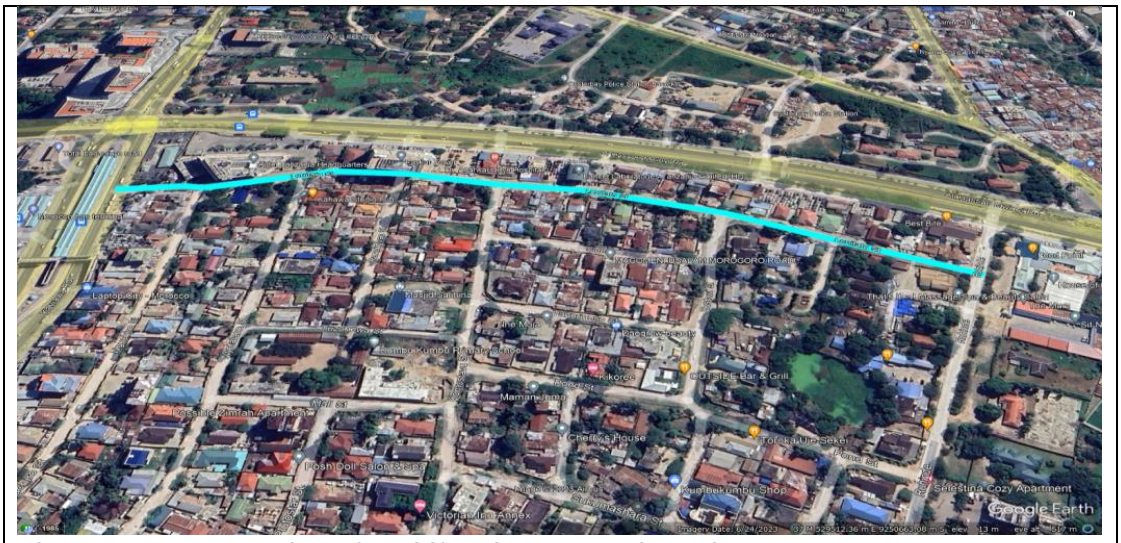


Figure 2.3.6-1: Location of Amiri/Leni Tatu Road Section.

2.3.6.2 Topography

The road traverse through undulating topography, whereby it starts at an altitude of about 17 m (m.a.s.l.) at km 0+000 which is the highest altitude and gradually descends to the lowest altitude of about 10m (m.a.s.l.) at km 0+680.

The maximum ascending slope is 9.9% and maximum descending slope is -13.4% with average ascending slope of 1.1% and average descending slope of -1.9%. The elevation profile along the road section is provided in **Figure 2.3.6-1.**

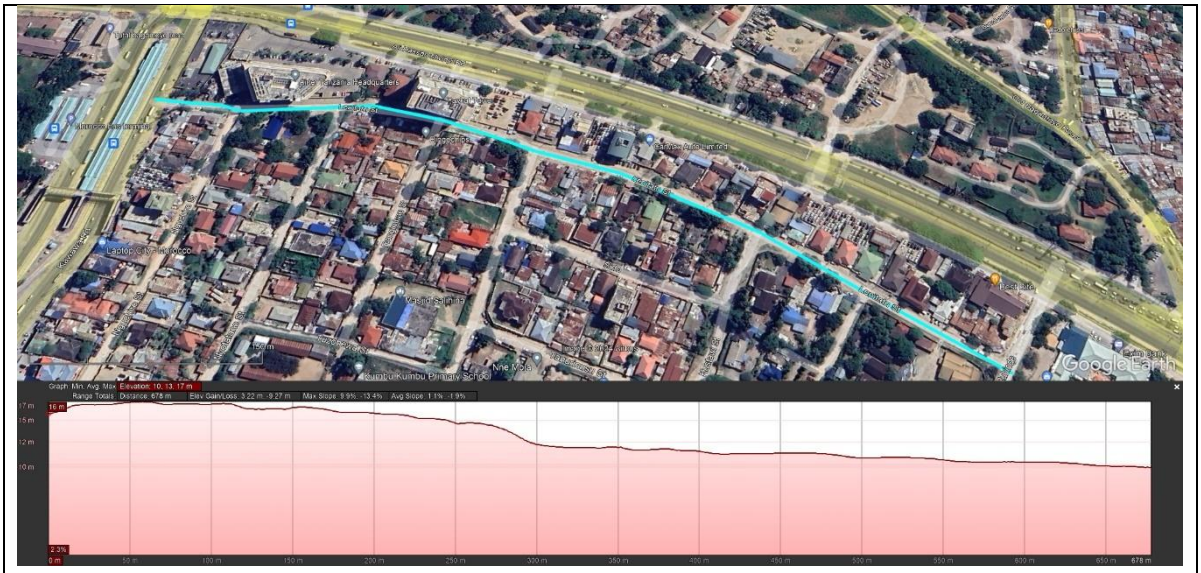


Figure 2.3.6-2: Elevation Profile along Amiri/Leni Tatu Road Section.

2.3.6.3 Ongoing Activities and Important Features

The ongoing activities include operation of commercial and residential buildings **(Photo No. 2.3.6-2)**; retail and whole sale shops; car parking and vehicle shown rooms. According to the RAP report the owners of business activities will be required to push back all the identified activities allow the road construction works to proceed without compensation.

Photo No. 2.3.6-3: High rise Buildings along the road section.

2.3.6.4 Adjacent Land Use and Land Cover

The adjacent land use is mainly residential and commercial and residential / commercial / institutional with several offices, retail and whole sale shops, show rooms for cars, parking, restaurants and DAWASA office. Planted ornamental or shade trees are common along the road section **(Photo No. 2.3.6-4).** The road has no problem with corridor size and therefore is not likely to trigger land acquisition and compensation issues.

Photo No. 2.3.6-4: View along the road section from Kawawa Road showing planted trees.

2.3.6.5 Infrastructure/utilities

The important infrastructure/utilities along the road section include water supply pipelines; electric power lines and underground telephone cables, whereby some of them either cross or run parallel to the road section. These infrastructure//utilities will have to be relocated before commencement of the construction works. In addition, service ducts have to be provided for crossing infrastructure/utilities.

2.3.7 Togo 1 Road (0.36 km)

2.3.7.1 Location

The road is located at Kinondoni Mtaa within Hananasifu Ward. The road links with Kinondoni Road at UTM Coordinates 529325.87 m E/ 9249469.34 m S at the beginning **(Photo No. 2.3.7-1)** and Kawawa Road at UTM Coordinates 529194.70 m E/9249220.18 m S at the end **(Photo No. 2.3.7-2).** The map showing the location of Togo 1 Riad Section is provided in **Figure 2.3.7-1**.

The right of way (RoW) for the road section is estimated to range from 16 to 20 m, with a road reserve (RR) ranging from 8 to 10 m on both sides. The road is categorized as urban street roads and typical cross section has been designed to fit into the available road corridor.

Photo No. 2.3.7-1: View of Kinondoni road at km 0 + 000.

Photo No. 2.3.7-2: View of Kawawa road from km 0 + 359.

Figure 2.3.7-1: Location of Togo 1 Road Section.

2.3.7.2 Topography

The road traverse through undulating topography, whereby it starts at an altitude of about 17 m (m.a.s.l.) at km 0+000 which is the lowest altitude and ascends to the highest altitude of about 18 m (m.a.s.l.) at km 0+119. Thereafter the road descends to an altitude of about 16 m, and then ascends to an altitude of about 17 m, and then descends to an altitude of about 16 m at km 0+358,

The maximum ascending slope is 16.2% and maximum descending slope is -8.4% with average ascending slope of 1.9% and average descending slope of -1.8%. The elevation profile along the road section is provided in **Figure 2.3.7-2.**

Figure 2.3.7-2: Elevation Profile along Togo 1 Road Section.

2.3.7.3 Ongoing Activities and Important Features

The ongoing activities along the road section include operation of retail/whole sale shops; kiosks, restaurants/bars; spare parts shops; garage; fuel filing station, vehicles parking; Bodaboda/Bajaj parking **(Photo No. 2.3.7-3).** According to the RAP report the owners of business activities will be required to push back all the identified activities allow the road construction works to proceed without compensation.

Photo No. 2.3.7-3: Parking area for Bajaj and Motorcycles along the road

2.3.7.4 Adjacent Land Use and Land Cover

The adjacent land use is mainly residential and commercial and residential / commercial The land in the project area is covered with planted trees such as a shocks tress **(Photo No. 2.3.7-4)** and other trees used as shadow trees along the road.

Photo No. 2.3.7-4: View of the road shows a shock and shadow trees.

2.3.7.5 Infrastructure/utilities

The important infrastructure/utilities include water supply pipelines; telephone cables and electricity power lines, whereby some them either cross or run parallel to the road section. These infrastructure/utilities will have to be relocated before commencement of construction works. In addition, service ducts will need to be proved for crossing infrastructure/utilities.

2.3.8 Togo 2 Road (0.36 km)

2.3.8.1 Location

The road is located at Kinondoni Mtaa in Kinondoni Ward. The road starts at Kinondoni Road **(Photo No. 2.3.8-1)** and forms a T-junction with Togo-3 **(Photo No. 2.3.8-2)** at the end. About 100m of the road has been constructed in bitumen standards. The map showing the location of the road sections is provided in **Figure 2.3.8-1.**

The right of way (RoW) for the road section is estimated to range from 16 to 20 m, with a road reserve (RR) ranging from 8 to 10 m on both sides. The road is categorized as urban street roads and typical cross section has been designed to fit into the available road corridor.

Photo No. 2.3.8-1: View along Togo-2 Road from km 0 + 000.

Photo No. 2.3.8-2: End of Togo-2 at km 0 + 400, along Togo-3 Road.

Figure 2.3.8-1: Location of Togo 2 Road Section.

2.3.8.2 Topography

The road traverse through flat or slightly undulating topography, whereby starts at an altitude of about 16 m (m.a.s.l.) at km 0+000 which is the lowest altitude along the road section and ascends to the highest altitude of about 18 m (m.a.s.l.) at and then descends to an altitude of about 17 m at km 0+360.

The maximum ascending slope is 15.5% and maximum descending slope is -14.4% with average ascending slope of 3.2% and average descending slope of -3.5%. The elevation profile along the road section is provided in **Figure 2.3.8-2.**

2.3.8.3 Ongoing Activities and Important Features

The on-going activities include operation of retail/whole sale shops; spare parts shops; garage; vehicle parking; food vending points; restaurants and liquor bars. According to the RAP Report, the number of Project Affected Persons (PAPs) is estimated to be 4 and 12 building structures found to be within the road reserve.

Figure 2.3.8-2: Elevation Profile along Togo 2 Road Section.

2.3.8.4 Adjacent Land Use and Land Cover

The adjacent land use is mainly residential and commercial and residential / commercial with several. The planted ornamental and/or shade trees are common along the road section. These trees are likely to be affected due to widening of the road section.

2.3.8.5 Infrastructure/utilities

The important infrastructure/utilities include water supply pipelines; telephone cables; and electric power lines. During the site investigation some of the electric power lines were found to be close to the road at km 0+000 on the LHS **(Photo No. 2.3.8-3)** and km 0+400 on the LHS **(Photo No. 2.3.8-4),** whereby some of them were found to be crossing the road and/or running parallel to the road section.

Photo No. 2.3.8-3: Electric pole along the road at km o+000 on the LHS.

Photo No. 2.3.8-4: Electric pole along the road at km 0+400 on the LHS.

2.3.9 Togo 3 Road (0.20 km)

2.3.9.1 Location

The road is located at Kinondoni Mtaa in Kinondoni ward. The road links with Rashid Kawawa Road at UTM Coordinates 529480.71 m E/ 9250194.05 m S **(Photo No. 2.3.9-1)** and Open University Road at UTM Coordinates 529307.76 m E / 9250205.46 m S **(Photo No. 2.3.9-2)**. The road forms a T-junction with Togo 2 Road at km 0+098. The map showing the location of the road section is provided in **Figure 2.3.9-1.**

The right of way (RoW) for the road section is estimated to range from 16 to 20 m, with a road reserve (RR) ranging from 8 to 10 m on both sides. The road is categorized as urban street roads and typical cross section has been designed to fit into the available road corridor.

Photo No. 2.3.9-1: T-Junction at km 0+000 between Togo-3 Road and Rashid Kawawa Road.

Photo No. 2.3.9-2: T-Junction at km 0+186 between Togo-3 Road and University Road.

Figure 2.3.9-1: Location of Togo 3 Road Section.

2.3.9.2 Topography

The road traverse through flat topography, whereby it starts at an altitude of about 18 m (m.a.s.l.) at km 0+000 and ascends to an altitude of about 19m (m.a.s.l.) at km 0+0165 to km 0+0256, then the road start to gradually descends to an altitude of about 16 m (m.a.s.l.) at from km 0+186. The maximum ascending slope is 16.7% and maximum descending slope is -15.9% with average ascending slope of 0.1% and average descending slope of -15.2%. The elevation profile along the road section is provided in **Figure 2.3.9-2.**

Figure 2.3.9-2: Elevation Profile along Togo 3 Road Section.

2.3.9.3 Ongoing Activities and Important Features

The ongoing activities along the road section include operation of commercial buildings **(Photo No. 2.3.9-3)**; retail/whole sale shops; spare parts shops; garage; vehicle parking; food vending

points; restaurants; and liquor bars. According to the RAP Report, the number of Project Affected Persons (PAPs) is estimated to be 2 and 1 building structure found to be within the road reserve.

Photo No. 2.3.9-3: Residential and Commercial Buildings on both sides of the road section.

2.3.9.4 Adjacent Land Use and Land Cover

The adjacent land use is mainly residential / commercial /institutional land use. The land in the project area is covered by planted mango and shade trees **(Photo No. 2.3.9-4).**

Photo No. 2.3.9-4: View along the road showing planted mango and shade trees

2.3.9.5 Infrastructure/utilities

The important infrastructure/utilities along the road section include water supply pipelines; telephone cables; and electric power lines, whereby some of them either cross or run parallel to the road section. These infrastructure/utilities will have to be relocated before commencement of construction works. In addition, service ducts have to be provided for the crossing infrastructure/utilities, hence avoiding damage on the road pavement during repair of crossing infrastructure/utilities.

2.4 Project activities

2.4.1 Mobilization Phase

The mobilization phase is the initial stage of the project cycle, during which the Contractor will start to mobilize equipment and workforce for the project. For this project the following are some of the major activities to be carried out by the Contractor:

- Topographical survey and geotechnical investigations.
- Establishment of Contractor's Site Office / Camp Site and Materials Storage Yard.
- Recruitment of construction workers and administrative staff.
- Mobilization and transportation of construction equipment / machinery to the site.
- Transportation of construction materials (e.g., stone aggregates, sand, cement, gravel, etc.) to the site.
- Installation of safety / security fence around the camp site and construction site.
- Removal of existing trees / vegetation cover along the road sections.
- Identification and relocation of public services infrastructure and utilities such as, water supply pipelines, sewer pipelines, and electricity power poles, and telephone cables.
- Relocation of traffic lights and street lights from the road junctions and road medians.
- Installation of temporary road traffic signs and road diversions signs.
- Demolition of existing building structures along the road sections.
- Collection and transportation of construction related solid wastes / spoil materials and demolition wastes to the dumping sites.

2.4.2 Construction Phase

The second stage is construction phase, overlaps with mobilization phase, whereby some of the activities from mobilization phase will continue during the construction phase. During construction the following activities will be performed:

- Earth works including vegetation clearance, removal of top soils, excavation of road bed and storm water drainages ditches.
- Filling of road bed with gravel / base course materials, compaction and laying of concrete materials.
- Transportation of construction materials, machinery, and equipment to new construction sites
- Collection and transportation of soil/spoilt materials and demolition wastes to the dumping site.
- Transportation of construction materials such as gravel, sand, aggregates, cement bags, reinforcement bars to the materials storage yards.
- Fabrication of concrete slabs, curb stones, and concrete lining of storm water drainages,
- Installation of permanent road signs, traffic lights and street lights.

2.4.3 Demobilization Phase

This is the third stage of the project cycle, which involves clearing the construction sites and restoration of the disturbed areas to at least their original conditions. The following are some of the major activities to be carried out by the Contractor during demobilisation phase:

- Handing over of the constructed road sections by the Contractor;
- Removal of temporary infrastructure, installations and equipment from the workshop and campsite;
- Disposal of Contaminated Materials including used oil, sewage, solid wastes (plastics, wood, metal, papers etc.) to the authorized dumping place;
- Closure of temporary diversion roads, pedestrian crossings, and culverts.
- Disassembling and transportation of construction equipment/machinery from the construction sites.

2.4.4 Operation Phase

The operation phase is the fourth stage in the project cycle, which involves operation of the constructed infrastructure. The following are some of the major activities to be carried out during the operation phase:

- Operation of road sections and road side storm water drainages and culverts.
- Periodic maintenance of the road sections and road side storm water drainages.
- Awareness creation and education on proper use and protection of road pavements and associated infrastructure such as roadside storm water drainages and culverts.

2.5 Design of Project Roads

2.5.1 Geometric Design

The geometric design of road sections includes the design of cross sections, horizontal alignment, vertical alignment, intersections, and various design details. The goals of geometric design are to maximise the safety, economy and comfort of facilities whilst minimising the social and environmental impacts. This section of the report focuses on the geometric design criteria and design standards.

The following approved standards by the Ministry of Works has been adopted and adhered to in out carrying the geometric design:

- Road Geometric Design Manual, MoW Tanzania, 2011 (RGDM, 2011)
- MoW Low Volume Roads Manual, 2016
- A policy on Geometric Design of Highways and Streets 2011 (AASHTO, 2011)
- Code of practice for geometric Design (draft) published by SATCC – TU 1998

2.5.2 Road Classification

Any road network is usually grouped into a number of different classifications for planning and design purposes. For design purposes, the existing network is classified in accordance with the Road Act of 2007:

- Class A: Trunk Roads
- Class B: Regional roads
- Class C: Collector roads
- Class D: Feeder roads
- Class E: Community roads

Based on TOR, the sub-projects roads can be specified as Feeder roads in accordance with RGDM (2011).

2.5.3 Design Class

Referring to the standard reconnaissance survey and the availed Traffic Volume from DLA's Kinondoni and Ubungo the AADT (ADT) ranges from 200 - 400vpd (vehicles per day). Considering the traffic volume from DLA's the proposed road classifications can be considered as Design Class 5 (DC 5) in accordance with RGDM (2011). The following is the dimensions of the Design Class 5 Road:

- Road reserve width [m] = 60
- Roadway width [m] = 8.5
- Carriageway width [m] = 6.5
- Lane width [m] = 3.25
- Number of lanes = 2

- Shoulder width [m] = 2 x 1.0
- Median width [m] = 0

2.5.4 Typical Cross-Section

The purpose of the assignment is to upgrade the road section into bitumen standard and according to the RGDM, the road sections are classified as Design Class 5. Thus, in accordance with classification and site condition, the minimum design criteria for the road sections are as follows:

- Surface: Asphalt Concrete
- Normal camber: 2.5%
- Roadway width: 8.5m
- Carriageway width: 6.5m
- Lane width: 3.25m
- Shoulder width: 1.0m
- No of lanes: 2
- Side drain, each side: 1.0m, 0.5 deep with 1:1 slope

The widening of the road sections in curves will be defined during the final design. The proposed typical cross sections are provided in **APPENDIX 2.** This has been defined in accordance with the ToR and based on the site condition and intended purpose of the road and possibilities of inclusion of SUDS.

2.5.5 Design Control and Criteria

In road design, various controls and criteria have been employed to ensure that the facility will safely accommodate the expected traffic requirements and to encourage consistency and uniformity of operation. Primary considerations in the design of roads are the types of terrain traversed, environmental constraints, and the desired road users experience. These considerations have been addressed through the selection and application of appropriate design controls.

The critical consideration in designing the road sections was that the design will follow the existing alignments as much as possible to minimize construction costs and land acquisition costs. Therefore, the existing road alignments have been retained with realignment at few sections where geometry improvement is necessary or where the cost of land acquisition is likely to be high.

2.5.6 Horizontal Alignment

2.5.6.1 Design Criteria

The horizontal alignment of the project road was designed to the standards adopted in the Road Geometric Design Manual Ministry of Works, Tanzania 2011 Edition with the following recommended design criteria for tangents and circular curves shown in the **Table 2.5-1** below:

Table 2.5-1: Recommended design criteria for Tangents.

Element	Criteria
Length of Straight Section	2km Maximum
Minimum Length of Circular curve where deflection Angle is greater than 5	150m
Minimum Length of Circular curve where deflection Angle is less than 5	200m
Desirable maximum length of circular curve	800m
Absolute maximum length of curve	1000m

2.5.6.2 Circular Radii

The adopted minimum radii of curves based on the recommended design speed of 70km/h, 50km/h and 30km/h is provided in **Table 2.5-2.** The horizontal alignment closely follows the existing alignment. Some deviations have been made to comply with the minimum standard recommended for the selected design speeds. All the curves with radius less than 250m have been redesigned and larger radius curves fitted and some realigned completely except in some areas where the alignment changes were constrained by some physical features.

Table 2.5-2: Minimum Radii of Curves.

Design Speed km/h	Minimum Radii of Curves (m)	
	Desirable	Absolute (Calculated), emax=0.06
30	50	31
50	100	90
70	300	252

2.5.6.3 Super Elevation

A maximum super-elevation of 4.0% has been adopted with super-elevations applied to horizontal radii in accordance RGDM, Where transition curves have been introduced, the super-elevation run-off has been applied in such a way that it takes place within the clothoid to ensure that the values of the rate of change of super-elevation fall within the change recommended above. On the circular curves without clothoids, the super-elevation run-off has been applied in such a way that two thirds take place within the straight and the rest within the curve.

2.5.6.4 Hairpin Curves

Hairpin curves have been highly avoided in the design, however in some sections the proposed road passes through highly congested properties. The road section with hairpin curves include;

- Nakalekwa -Bwawani Road (7.32 km)
- Umoja Road (3.86 km)
- Tegeta Police - Silver Road (2.0 km)
- Togo 1 Road (0.36 km

In these sections hairpin curves have been provided with very small radius curves, which will allow design vehicles to be able to pass around the curve safely, a minimum radius of 28m have been adopted to satisfy safety turning of a Single unit truck with the reduced design speed of 30 km/hr in such case the design principle outlined in RGDM have been adopted.

2.5.7 Vertical Alignment

2.5.7.1 Gradients

Vehicle operations on gradients are complex and depend on a number of factors: severity and length of gradient; level and composition of traffic; and the number of overtaking opportunities on the gradient and in its vicinity.

Maximum vertical gradient is therefore an extremely important criterion that greatly affects both the serviceability performance and cost of the road. These performance considerations have formed the basic limiting criteria for gradients used in the design and are shown in table below.

Table 2.5-2: Maximum gradients (%)[13].

Terrain	Design Speed (km/h)								
	40	50	60	70	80	90	100	110	120
Flat			5	5	4	3.5	3	3	3
Rolling	8	7	6	6	5	4.5			
Hilly/ Mountainous	10	9	8	7	7				

From the above guidelines a maximum grade of 5% to 6% has to be adhering too for flat to hilly areas for a design speed of 70 km/h have been achieved throughout the aligned section, for mountainous sections a maximum grade of 10% for a design speed of 40km/h.

2.5.7.2 Minimum Curve Lengths

Recommended minimum lengths of vertical curves are given in the **Table 2.5.-3.** Vertical curves are specified in terms of rate of curvature K and the Algebraic difference between gradient, the vertical curves lengths are related to K by the following formula:

L = KA

Where:
L = Length of vertical curve
K = Rate of vertical Curvature (the required length of crest/ sag curve to a 1% change in gradients)
A = Algebraic difference between the gradients (g2-g1)

The guideline document also recommends that where the length of the curve is longer than 43.5A, special attention should be given to drainage.

Table 2.5.3: Minimum length of Vertical curve

Design Speed km/h	K-Values to Satisfy stopping sight distances (m / % of g)		K-Values to satisfy passing sight distances (m / % of g)
	Crest	Sag	
30	3	4	50
40	5	8	86
50	10	12	126
60	18	18	176
70	22	25	246
80	49	32	310
90	71	41	387
100	105	51	475
110	151	62	561
120	201	74	644

2.5.7.3 Critical Length of Grades

Critical length of grades is the maximum length of the designated up-grade on which a loaded truck can operate without unreasonable reduction in speed. As such, the length of all grades should be limited to the values given in **Table 2.5-4** below for a 20km/h reduction in speed of trucks.

[13] Road Geometric Design Manual. Ministry of Works, Tanzania 2011 Edition.

Table 2.5-4: Critical Length of Grades

Gradient	Length of grade at design speed of 60 km/h	Length of grade at design speed of 80 km/h
3%	NA	>900 m
4%	>1200 m	>550 m
5%	>800 m	>400 m
6%	>600 m	>350 m
7%	>500 m	>300 m
8%	>400 m	>200 m

2.6 Road Furniture and Other Facilities

2.6.1 Junctions, Accesses and Bus Bays

All junctions along the road sections have been designed in accordance with the "Code of Practice for the Geometric Design of Trunk Roads", SATCC. The design of junctions is based on the need to limit potential hazards and to maintain acceptable traffic capacity thereby avoiding vehicle conflicts. Typical layout drawings showing the location and the type of the junctions and access are incorporated in the book of drawings.

Bus bays will be provided in all major and minor urban centres and between social services areas as considered appropriate to provide better access to businesses and social services. Provision of speed calming features will be made in urban centres and social services areas, whereby rumble strips and speed humps will be used to control over-speeding. These details of these traffic calming devises are included in the books of drawings.

2.6.2 Public Utilities

The cost of relocation of infrastructure/utilities such as water supply pipelines crossing the road sections have been considered as provisional sum in Bill No 1000 item 12.02. Diversion of any overhead power lines or telephone cables will be carried out by relevant utility company during the construction phase.

2.6.3 Erosion Control and Measures

Soil erosion is a problem along some road sections as it creates demand for maintenance, and in some severe instances, the carriageway can become undercut. In these cases, the design of erosion preventive measures has been considered as described in respective chapter of Landscaping. Measures adopted to reduce or prevent erosion are discussed in the following sub-sections.

2.6.3.1 Embankment Slopes

The steeper the embankment slope, the faster the speed of rainwater runoff down the slope and the more severe its eroding effect. Furthermore, the natural angle of repose of sand is around 30o (1 in 1.7) so it is considered that 1 in 1.5 slopes as recommended in the Road Geometric Design Manual for embankments higher than 3m to be too steep. It is therefore proposed constructing embankments using the freely available sandy soils with 1 in 2 side slopes, and then placing cohesive side fill material adjacent to flatten the slopes to 1 in 3.

2.6.3.2 Drainage Control Kerbs

We have specified the use of drainage control kerbs on the low side of super-elevated sections of road where the embankment height is greater than 3 m. Water is channelled along the face of the kerb into concrete/masonry chutes taking the water away down the embankment slope.

A small energy dissipater is to be constructed at the bottom of each chute to prevent scour. Details will be given during phase II of the assignment.

2.6.3.3 Embankment Pitching

Pitching of embankment slopes greater than 1m at bus bays has been recommended where there will be a large amount of pedestrian traffic. Gabions benches are proposed in this project where the embankment height exceeds 4 meters. Details will be provided during phase in detailed design phase.

2.6.3.4 Grassing

It is considered most important that grass is established on embankment slopes Suitable grass species will be specified in detailed design phase to add slope stability. The selection of grass species will be carefully done to avoid propagation of invasive plant species. The most effective measures is to emphasize on using the indigenous grass species or grass species found within the project area.

2.6.3.5 Lined Drains

Lined Drains including SUDS have been incorporated in the design.

2.6.4 Ancillary Works

2.6.4.1 Marker Posts

Edge Marker posts shall be specified at 25m spacing as follows:

- On the outside of curves where there is no safety barrier and where the vertical embankment height is greater than 2m.
- On straights where there is no safety barrier and where the vertical embankment height is greater than 3m.

2.6.4.2 Road Reserve Posts

These will be installed at interval of 100m.

2.6.4.3 Safety Barriers

The steel safety barriers have been specified on both sides of the road at major culvert and Bridges sites where the embankment height is greater than 3m.

2.6.4.4 Road signs

Road signs have been specified in accordance with Ministry of Works (MoW) Traffic Sign Guide 2009.

2.6.4.5 Road Markings

Road markings have been specified in accordance with MoW Traffic Sign Guide 2009. Centreline markings will be white, as is normal practice in Tanzania, and not yellow as stated in the MoW Traffic Sign Guide 2009. Thermoplastic road markings have been proposed because they are more durable than road paint.

2.6.4.6 Rumble Strips and Road Humps

Provision has been made for the construction of rumble strips, constructed from asphalt concrete, on the approaches to pedestrian crossings, approaching and sharp curves and village centres.

Road humps have not been provided as they impair safety to the road users especially during night hours, furthermore they aggravate damage of pavement surfacing material in vicinity of the road hump due to repeated breaking and accelerations, instead, rumble strips, road

warning signs and regulatory traffic signs have been provided to warn and regulates speed respectively to the road users.

2.6.4.7 Road Lightning

Road street lights are important as one of ways of improving road safety to the road user. Solar powered road street lights have been proposed and provided.

2.7 Project Requirements

2.7.1.1 Gravel/Fill Materials

The potential sources of gravel materials have been identified as shown in **Table 2.7-1.** The estimated quantity of available materials is also provided. However, the Contractor shall be responsible for confirmation on the suitability of the identified sources for extraction of gravel materials. The Contractor in consultation with the Supervising Consultant shall undertake E&S due diligence of the gravel borrow-sites considered to supply murram to ascertain their E&S operational compliance.

Borrow material will therefore be required to meet the contract requirement for:

- G3 material for fill
- G7 material for the lower improved subgrade layer
- G15 material for the upper improved subgrade layer
- G25 or superior for stabilised pavement layers as appropriate

In order to estimate requirements for natural gravel material, the following has been assumed:

- Carriageway width 6.5 m
- Walkways width 1.5 m
- Base course thickness 150 mm
- Sub-base thickness 200 mm
- Upper Improved subgrade 150 mm (G15)
- Lower improved subgrade 150 mm (G7)
- Fill, average 1.0 m

For this project (assuming a total length of about 20.34 km single lane for all road section, a total of about 1,000,000 m^3 of gravel material is required.

Table 2.7-1: Source and Quantities of Grave Materials.

S/n	Location/ID	Estimated Quantity (m3)	Material Class
1	Boko	425,000	G15
2	Mbutu	500,000	G15
3	Kambodia Borrow Pit	550,000	G25
4	Vigungu Kwa Pazi	359,400	G7, G25
5	Mabwe Vidunda	870,060	G7, G15
6	Ngugu Dalu	132,590	G20

2.7.1.2 Crushed Stone Aggregates

The crushed stone aggregates will be required for production of concrete culverts and production of base course pavement layer, and production of bituminous surfacing pavement layer.

The potential source of crushed stones aggregates is located at Lugoba Village in the Coast Region about 140 km from Dar Es Salaam, along Chalinze –Segera Trunk Road on Left Hand Side (LHS). The source has fine grained weathered granite rock, and has been used to supply crushed aggregates and base course materials for a number of road projects in Dar Es Salaam, Coast, Tanga and Morogoro Regions. There are three licensed crusher sites in the area, owned by ESTIM CONTRACTORS LTD, NOREMCO A/S, and NCC. The source is estimated to yield more than 200,000 m^3 of crushed aggregates. However, the Contractor shall be responsible for confirmation on the suitability of the identified sources for extraction of crushed stone aggregates. The Contractor in consultation with the Supervising Consultant shall undertake E&S due diligence of the stone quarries considered to supply stone aggregates to ascertain their E&S operational compliance.

The aggregates from the source meet the required properties for crushed rock base course and concrete works in accordance with Tanzania Pavement and Materials Design Manual of 1999 (PMDM, 1999). In addition, the source meets requirements for surface dressing and asphalt concrete. The rock type is granite with the following properties:

- TFV dry (kN) = 200
- TFV wet (kN) = 170
- Ratio TFV wet/dry (%) = 85

2.7.1.3 Sand Materials

Two potential sources of sand identified were Kondo Sand Pit, about 30 km from the site, at an offset of about 2.5 km on the RHS along Tegeta -Bagamoyo Road and Buma Sand Pit, about 30 km from the site, at an offset of about km 10+200 LHS along Dar - Bagamoyo Road. The sources contain adequate quantity of material with respect to the project requirements. However, the Contractor shall be responsible for confirmation on the suitability of the identified sources for extraction of crushed stone aggregates. The Contractor in consultation with the Supervising Consultant shall undertake E&S due diligence of the sand-extraction sites considered to supply sand to ascertain their E&S operational compliance.

The materials report has also suggested to use crushed rock sand for concrete works, provided it meets relevant specifications. This needs to be explored during construction. Samples should be taken for laboratory testing to determine suitability for use in the concrete works.

The grading of the samples in comparison with the grading specified in BS 882: 1992 should form the basis for recommending the use of these sources for concrete works.

2.7.1.4 Construction Water

There is limited availability of construction water in the project area. Therefore, the existing portable water from Dar Es Salaam Water and Sewerage Authority (DAWASA) at Boko, Mwenge, Tabata, and other locations around the project area has been recommended.

2.7.1.5 Manufactured Materials

The manufactured materials like cement, lime, bitumen, and steel bars will be required in the construction works. All these materials are available in bulk quantities from various dealers in the country.

2.7.1.6 Equipment

The type of equipment to be required will depend on the prevailing conditions on the site. However, the most common equipment for road works includes lorry tippers, bulldozers, asphalt plant, rollers and plate compactors, wheeled loaders, hydraulic excavators, vibrators,

concrete mixers, fuel, and water tankers (bowsers), graders, pokers, vehicles, trucks, dewatering pumps, site dumper, hydraulic cranes, etc.

2.7.1.7 Labour Force

The total number of labour force to be employed by the project is estimated to be about 58 people as summarized in **Table 2.7-2.** The methodology[14] for manpower estimation for this type of project is provided in **APPENDIX 3.** According to the methodology the required manpower for this project is estimated to be about 68 people, whereby 55% will be causal labourers. It is therefore evident that the subproject will create employment for significant number of people from the project area. The Contractor will be required to give employment priority to the local people from within he projects area to maximize the project benefits,

2.8 Utility Requirements

2.8.1 Energy

The major source power supply in the project area is from TANESCO. Therefore, during construction the power supply from TANESCO will be used by the Contractor. However, due to unreliable power supply from TANESCO, there will be a stand by generator. The amount of power consumption during construction cannot be easily estimated but it will depend on the operational requirements.

2.8.2 Water

The major source of water supply in the project area is from DAWASA source. The water supply from DAWASA will be used for construction activities and for sanitary purposes at the Contractor's Office / Camp Site during construction. The amount of water consumption for sanitary purpose during construction is estimated to be about 2,900 Litres per day, based on consumption rate of 50 Litres Per Capita Per Day (LPCD), and assuming that the project is expected to employ a maximum of 58 people during construction phase.

The bottled drinking water for construction workers will be obtained from local suppliers in the Dar Es Salaam City. Therefore, based on the assumption that each person will require 3 litres of drinking water per day, the amount of drinking water per day is estimated to be 174 Litres per day.

2.9 Waste Management

Wastewater Management

The Contractor's office is expected to generate sanitary wastewater from kitchen, bath rooms, and toilets. The amount of sanitary wastewater to generated during construction is estimated to be 2,320 Litres per day. This is based on 58 people with water consumption date of 50 Litres per day and wastewater discharge factor of 80%. The generated sanitary wastewater will be discharge into central sewerage system.

Solid Waste Management

The most common types of solid wastes to be generated during the mobilization phase will be mainly excavated soil materials and vegetation residues due to widening of road sections. The amount of excavated soil materials and vegetation residues will depend on the depth of excavated area and cleared area of vegetation cover, respectively.

Types of solid wastes to be generated during mobilization and construction phase include food residues, waste papers, plastic bottles, food cans, etc. Office. Other types of wastes will be

[14] Environment, Transport and Works Bureau. Works Branch. Guideline for Estimation of Manpower Requirements arising from Public Works Revision: June 2003. https://www.devb.gov.hk/filemanager/en/content

generated from construction activities and construction machinery/equipment operation. These include cement bags, pieces of bricks/blocks, wood, and metals, oils, grease and paint containers.

Some of the solid wastes like cement bags, paint containers, waste oils, pieces of bricks and wood can be re-used during construction or handed over to local people. Non-re-usable wastes will be disposed into the approved site by the Resident Engine

The type of solid wastes to be generated from camp site will be comprised of food residues, plastic bottles, plastic papers, food cans, broken glass, and waste papers, etc. The construction activities will result into generation of excavated soil materials, cement bags, metals, waste oils, paint containers, pieces of bricks and wood.

Hazardous waste like wate oils, car batteries, scrap metals, used tyres, etc, will be collected and temporarily stored on-site on well covered (roofed with iron sheets or impermeable materials) concrete paved surface with bund walls. The waste oils and other hazardous wastes will be collected by authorized dealers. Non-reusable solid wastes will be disposed of as prescribed by the Resident Engineer. The estimated quantities of various types of wastes likely to be generated during construction phase is provided in **Table 2.8-1.**

Table 2.8-1: Quantity of Solid Wastes to be Generated during Construction Phase.

Category of waste	types	Quantity	Treatment Disposal
Solid Waste (Degradable)	General garbage (food remains, cardboards and papers etc.)	20 kg/day (based on generation rate of 0.25kg/day/person and 80 workers)	To be collected in skip bucket then disposed at the Municipal dumpsite
	Vegetation	13 Nos. mango and Neem Trees will be removed from the site.	Tree logs will be handed over to local people.
	Pieces of timber	Variable	Will be collected for re-use by the Contractor for other projects or handed over to local people.
Solid Waste (Non-Degradable)	Plastics	Variable	Will be collected and handed over to recyclers
	Tins, glasses	Variable	Will be collected and handed over to recyclers
Hazardous Wastes	Scrap metals, materials packaging, paint buckets, corrugated iron sheets, oil filters and etc.)	Variable	To be collected and handed over or sold to the registered hazardous waste dealers by NEMC or VPO
Liquid waste	Sewage	2,320 L/day (Based on 58 people, with water consumption	To be discharged into the central sewerage system.

Category of waste	types	Quantity	Treatment Disposal
		rate of 50L/capita/day and wastewater discharge factor of 80%)	
	Oils and greases	Variable	To be collected and handed over or sold to the registered hazardous waste dealers by NEMC or VPO

2.10 Waste Management

2.10.1.1 Mobilization Phase

The most common types of solid wastes to be generated during mobilization phase will be mainly soil materials from site excavations. The amount and type of solid wastes will depend on the depth of the area to be excavated.

The Contractor's office is expected to generate sanitary wastes, mainly wastewater from kitchen, bath rooms, and toilets. Types of solid wastes to be generated include food residues, waste papers, plastic bottles, food cans, etc. The amount of waste water and solid wastes will depend on the number of people occupying the Contractor's Office. Other type of wastes will be generated from construction activities and operation of construction machinery/equipment. These include cement bags, pieces of bricks, wood, and metals, oils, grease, and paint containers.

Some of the solid wastes like cement bags, pieces of bricks and wood can be re-used during construction or handed over to local people. Non-re-usable wastes will be disposed into approved site by the Resident Engineer.

2.10.1.2 Construction Phase

During construction phase the operation of Contractor's Office is expected to generate wastewater from kitchen, bathrooms, and toilets. The type of solid wastes to be generated from camp site will be comprised of food residues, plastic bottles, plastic papers, food cans, broken glass, and waste papers, etc. The construction activities will result into generation of soil materials from excavations, cement bags, metals, waste oils, paint containers, pieces of bricks and wood. However, the quantity of solid wastes and wastewater to be generated during construction phase is not expected to be significant compared to similar types of wastes being generated in the city.

Hazardous waste like wate oils, car batteries, scrap metals, used tyres, etc, will be collected and temporarily stored on-site on well covered (roofed with iron sheets or impermeable materials) concrete paved surface with bund walls to prevent spilled materials from escaping into the surrounding environment or get and later on handed over to the authorized hazardous waste dealers. Non-reusable solid wastes will be disposed of as prescribed by the Resident Engineer.

2.10.1.3 Demobilization Phase

The most important waste to be generated includes pieces of bricks, concrete rubbles, pieces of wood, scrap metals. All these wastes will be disposed into the approved dump site. However, the re-usable materials can be handed over to the local people.

CHAPTER THREE

3.0 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

Preamble

This Chapter provides the description of relevant National Policies, Legislations and World Bank Environmental and Social Standards, and Institutional Framework for environmental management in the country as well as relevant regulations, strategies, standards, international conventions and/or treaties/agreements. It also considers compliance with relevant National Policies and World Bank Environmental and Social Standards (ESS), legal requirements, and international conventions/agreements/treaties to which the country is a signatory.

3.1 POLICY FRAMEWORK

3.1.1 Cross-cutting Policies

3.1.1.1 National Environmental Policy (2021)

The National Environmental Policy (NEP) of 2021[15] is the result of the review of the NEP of 1997. As it was with NEP (1997) the NEP (2021) is the main policy document governing environmental management in the country. The overall objective of NEP (2021) is to provide a national framework for guiding harmonized and coordinated environmental management for the improvement of the welfare of present and future generations.

The policy provides a broad range of measures and actions responding to key environmental issues and challenges. It provides the framework for an integrated approach to planning and sustainable management of the environment in the country. It also recommends strong institutional and governance measures to support the achievement of the desired objectives and goals.

Therefore, the policy addresses the following key environmental issues and challenges:

- land degradation;
- lack of accessible good quality water for urban and rural inhabitants;
- environmental pollution;
- loss of wildlife habitats and biodiversity;
- deterioration of aquatic ecosystems;
- deforestation;
- environmental pollution;
- climate change; and
- safe use of modern biotechnology.

The policy also identifies the following crosscutting issues as challenges facing environmental management in the country:

- Inadequate environmental Good Governance at all levels;
- Inadequate financial resources for Environmental Management; and
- Inadequate Gender consideration in environmental management.

The policy recognises the role and responsibilities of key players for successful achievement and implementation of policy objectives: These include the Ministry Responsible for Environment, Ministry of Finance, Sector Ministries, Government Departments and Agencies, Regional Secretariats, Local Government Authorities (LGAs), National Environment

[15] The United Republic of Tanzania. Vice President's Office. National Environmental Policy, 2021. October 2021. https://www.vpo.go.tz/uploads/publications/en-1644923087-NATIONAL%20%20ENVIRONMENTAL%20POLICY%202021%20new.pdf

Management Council (NEMC), National Environmental Advisory Committee (NEAC), Environmental Appeals Tribunal, Civil Society Organizations, Academic and Research Institutions, Local Communities, Media, Development Partners, Regional and International Bodies,

Relevance / Compliance
The project is being implemented by KMC under the President's Office Regional Administration and Local Government (PO-RALG), which is recognized by the policy as one of the key players in the implementation of NEP (2021). The project proponent will ensure mainstreaming of the NEP objectives and strategies into the project and will ensure there is collaboration with other stakeholders as required by the policy.

3.1.1.2 National Policy on HIV/AIDS (2001)

The National Policy on HIV/AIDS (2001) was formulated by the Government of Tanzania (GoURT) under technical support from the World Health Organization Global Programme on AIDS (WHO-GPA) led to the establishment of the National HIV/AIDS Control Programme (NACP) under the Ministry of Health.

The overall goal of the National Policy on HIV/AIDS is to provide a framework for leadership and coordination of the National multi-sectoral response to the HIV/AIDS epidemic.

The policy outlines several specific objectives, however, the relevant objectives, which focus on sectoral roles and financing are:

- To strengthen the role of all the sectors, public, private, NGOs, faith groups, PLHAs, CBOs and active participation of all stakeholders in HIV/AIDS prevention and control.
- To provide a framework for coordination and collaboration of HIV/AIDS work.
- To influence sectoral policies so as to address HIV/AIDS.

Relevance / Compliance:
The project is likely to lead into HIV/AIDS transmission due to interaction between construction of workers and local community members. Therefore, the project proponent will ensure the Contractor develops and implements HIV/AIDS prevention and control programme for construction workers and local community members.

3.1.1.3 National Human Settlements Development Policy (2000)

The overall goal of the National Human Settlement Development Policy (2000)[16] is to promote the development of sustainable human settlement and to facilitate the provision of adequate and affordable shelter to all people, including the poor. The policy outlines a number of objectives; however, the relevant objective is to protect the environment within human settlement and natural ecosystems against pollution, degradation, and destruction with the aim of attaining sustainable development.

Relevance / Compliance:
The project is likely to lead into environmental pollution due to dust emission and generation of liquid and solid wastes. The project proponent will ensure dust emission is minimized during transportation and storage of dusty construction materials. The project proponent will also ensure proper disposal of solid wastes and liquid wastes to avoid pollution of the surrounding environment.

[16] National Human Settlements Development Policy (2000). United Republic of Tanzania. Ministry of Lands and Human Settlement Development. Dar Es Salaam, January, 2000.

3.1.1.4 Women and Gender Development Policy (2000)

The objective of the Women and Gender Development Policy (2000)[17] is to provide a directive to ensure the planning, strategies, and various activities in each sector and institution take into consideration gender equality. The policy outlines eleven specific objectives, but the most relevant ones for this project include:

- To ensure development plans take into consideration gender equality
- To identify the role of women and men to ensure their participation in development activities for the benefit of society.

In general, the policy aims at establishing strategies for poverty eradication by ensuring that both women and men get access to existing resources for their development. It values the role played by women in bringing about development in society.

Relevance / Compliance

The project has the potential to create employment for local people during construction. The project proponent will ensure the Contractor provides equal employment opportunities for women and men, and will avoid any kind of discrimination at the workplace.

3.1.1.5 National Employment Policy (2008)

The overall objective of the National Employment Policy (2008)[18] is to stimulate national productivity, to attain full, gainful, and freely chosen productive employment, to reduce unemployment, and underemployment rates, and enhance labour productivity. The policy outlines several specific objectives but the most relevant ones are:

- To promote equal access to employment opportunities and resources endowments for vulnerable groups of women, youth, and People with Disabilities (PWDs).
- To address cross-cutting issues related to the environment, gender, and HIV/AIDS in employment

Relevance / Compliance

The project has the potential to create employment for youth and women and to create adverse environmental impacts as well as the prevalence of HIV/AIDS. The project proponent will ensure the Contractor provides equal employment opportunities for women and men with a focus on vulnerable groups. The project proponent will also ensure the Contractor minimizes HIV/AIDS prevalence through formulation and implementation of HIV/AIDS preventive and control programme.

3.1.1.6 Occupational Health and Safety Policy (2009)

The main objective of the Occupational Health and Safety Policy (2009)[19] is to reduce the number of work-related accidents and diseases in Tanzania. The policy outlines eight specific objectives, but the most relevant ones are:

- To improve occupational health and safety skills and resources in the public and private sectors.
- To enhance education and training on occupational health and safety at all levels.
- To mainstream cross-cutting and cross-sectoral issues at workplaces.

[17] Jamhuri ya Muungano wa Tanzania. Sera ya Maendeleo ya Wanawake na Jinsia. Wizara ya Menedeleo ya Jamii, Wanawake and Watoto. S. L.P. 3448, Dar Es Salaam, TANZANIA. Mwaka 2000.
[18] The United Republic of Tanzania. Ministry of Labour, Employment and Youth Development. National Employment Policy 2008. Dar Es Salaam, Tanzania 2008.
[19] The United Republic of Tanzania. Ministry of Labour, Employment and Youth Development. National Occupational Health and Safety Policy. 2009.

Relevance / Compliance
The project has the potential to create occupational health and safety risks during implementation. The project proponent will ensure the provision of Personal Protection Equipment (PPE) to the construction workers and regular training on OHS issues to the construction workers.

3.1.1.7 National Health Policy (2009)
The National Health Policy (2009)[20] outlines several objectives but the most relevant one is to reduce the burden of disease, maternal and infant mortality and increase life expectancy through the provision of adequate and equitable maternal and child health services, facilitate the promotion of environmental health and sanitation, promotion of adequate nutrition, control of communicable diseases and treatment of common conditions.

Relevance/Compliance
The project has the potential to create a spread of communicable diseases due to interaction between construction workers and local community members. The project proponent will ensure the provision of sanitary facilities for construction workers.

3.1.1.8 National Plan of Action to End Violence against Women and Children
The National Plan of Action to End Violence Against Women and Children (NPA-VAWC, 2017/18-2021/22)[21] emphasizes the actions needed for both preventing and responding to violence and recognizes that investing in violence prevention initiatives has a positive impact on inclusive growth. Thus, the diverse investments being made by the government, development partners, and stakeholders on the lives of women, children, and families and subsequently on communities and Tanzania as a whole, is of paramount importance.

The NPA-VAWC is grounded in the Tanzanian context and envisages improved coordination, delivery of quality services, implementation of viable prevention and response measures and application of innovative solutions to end all forms of violence against women and children.

Relevance / Compliance
The project is likely to result into the risk of emergence of Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH) due to interpersonal and social interactions among the construction workers. The project proponent will ensure the Contractor prevents the emergence of GBV/SEA and SH. This will include awareness creation on GBV/SEA and SH for construction workers.

3.1.2 Sectoral Policies
3.1.2.1 Construction Industry Policy (2003)
The vision of the Construction Industry Policy (2003)[22] is: To have a dynamic, efficient, and competitive local construction industry that is able to undertake construction projects of any magnitude and participate effectively in providing its services in the regional and global market place. The mission is to create an enabling environment for the development of a vibrant, efficient, and sustainable local industry that meets the demand for its services to support sustainable economic and social development objectives.

[20] The United Republic of Tanzania. Ministry of Health, National Health Policy, Ministry of Health, October 2003.
[21] NATIONAL PLAN OF ACTION TO END VIOLENCE AGAINST WOMEN AND CHILDREN IN TANZANIA. December, 2016. file:///E:/DOCS/BRT%20PHASE%204%20PROJECT/LITERATURE/NATIONAL%20PLAN%20OF%20ACTION%20TO%20END%20VIOLENCE.pdf
[22] Construction Industry Policy (2003). The United Republic of Tanzania. Ministry of Works. November, 2003.

The policy outlines several objectives; however, the relevant policy objective is to improve the capacity and competitiveness of the local construction enterprises (contractors, consultants, and informal sector).

Relevance / Compliance:
The project proponent has been involved in the service of local consultants in the design, preparation of bidding documents and supervision. During construction, priority will be given to local contractors or joint ventures/associations between the local and firms from abroad, local people, as well as, the use of locally available materials, as emphasized in the policy.

3.1.2.2 National Land Policy (1995)

The overall aim of a National Land Policy (1995)[23] is to promote and ensure a secure land tenure system, to encourage the optimal use of land resources, and to facilitate broad-based social and economic development without upsetting or endangering the ecological balance of the environment.

The policy outlines several specific objectives; however, the most relevant policy objective to this project is to protect land resources from degradation for sustainable development.

Relevance / Compliance
The project has the potential to create land degradation through soil excavations, and accumulation of construction solid wastes into the surrounding environment. The project proponent will ensure proper disposal of construction solid wastes and restoration of the landscape after construction. The resident engineer will ensure construction activities are confined within the permitted areas in order to minimize land degradation.

3.1.2.3 National Energy Policy (2015)

The Vision of the National Energy Policy (2015)[24] is to have a vibrant Energy Sector that contributes significantly to economic growth and improved quality of life of Tanzanians. The Mission is to provide reliable, affordable, safe, efficient and environmentally friendly modern energy services to all while ensuring the effective participation of Tanzanians in the sector.
The main objective of the policy is to provide guidance for sustainable development and utilization of energy resources to ensure optimal benefits to Tanzanians and contribute towards the transformation of the national economy.

The policy outlines sector specific issues, statements, and objectives. With regard to energy efficiency and conservation, the policy objective is to promote energy efficiency and conservation in all sectors of the economy. The relevant issues to this project are energy efficiency in the transport sector and the residential and commercial sectors.

Relevance / Compliance:
The project falls under the transport sector which is recognized by the policy as one of the energy consuming sectors. The design and construction of the road sections will be carried out in such a way as to optimize energy efficiency.

[23] National Land Policy (1997). The United Republic of Tanzania. Ministry of Lands and Human Settlements Development, Dar Es Salaam, Tanzania. Second Edition 1997.
[24] National Energy Policy (2015). The United Republic of Tanzania. Dar Es Salaam. December, 20015.

3.1.2.4 DMDP 2 Resettlement Policy Framework (2023)

The key objective of the. DMDP 2 Resettlement Policy Framework (DMDP 2-RPF)[25] is to provide a framework through which the project will appropriately identify, address and mitigate adverse socioeconomic impacts that may occur due to the implementation of subprojects that involve the involuntary acquisition of land and the subsequent resettlement of affected families. The DMDP 2- RPF provides guidelines for preparation of Subproject-specific RAPs. The DMDP 2-RPF also recognizes the Environmental and Social Management Framework (ESMF) and Stakeholders Engagement Framework (SEF) as important E&S instruments, although not associated with land acquisition and restrictions.

Relevance / Compliance:

The project is likely to create land acquisition due to widening of the road sections. This will trigger involuntary resettlement of people, hence the need for preparation of Resettlement Action Plan (RAP) in accordance with DMDP 2-RPF.

3.2 LEGAL AND REGULATORY FRAMEWORK

3.2.1 Cross-sectoral Legislation

3.2.1.1 The Environmental Management Act Cap 191

The Environmental Management Act Cap 191 (EMA Cap 191)[26] is an Act to provide for legal and institutional framework for sustainable management of environment; to outline principles for management, impact and risk assessments, prevention and control of pollution, waste management, environmental quality standards, public participation, compliance and enforcement; to provide basis for implementation of international instruments on environment; to provide for implementation of the National Environment Policy; to repeal the National Environment Management Act, 1983 and provide for continued existence of the National Environment Management Council; to provide for establishment of National Environmental Trust Fund and to provide for other related matters.

Sub-section 81(1) requires any developer of a project to undertake Environmental Impact Assessment study at his/her own cost Sub-section 81(2) requires Environmental Impacts Assessment to be carried out prior to the commencement or financing of a project or undertaking.

Relevance / Compliance

The project falls under those projects that require EIA to be carried out prior to the commencement of construction works. This EIA is an indicator of compliance with the requirements of the EMA Cap 191.

3.2.1.2 The Environmental Impact Assessment and Audit Regulations (2005)

The Environmental Impact Assessment and Audit Regulations (2005)[27] are made under Environmental Management Act No. 20 of 2004. The regulations provide basis for undertaking Environmental Impact Assessment (EIA) and Environmental Audit for various development projects with significant environmental impacts in the country. These regulations provide the procedures for carrying out Environmental Impact Assessment, Environmental Monitoring and Environmental Audits.

[25] The United Republic of Tanzania. President's Office Regional Administration and Local Government (PO-RALAG). Dar Es Salaam Metropolitan Development Project (DMDP) Phase 2. Resettlement Policy Framework (RPF). October 2023. https://www.tamisemi.go.tz/announcement/dmdp-documents

[26] The Environmental Management Act No. 20 of 2004. The United Republic of Tanzania. Vice President's Office. 11th November 2004.

[27] The Environmental Impact Assessment and Audit Regulations (2005). The United Republic of Tanzania.

Regulation 4 prohibits any developer or proponent from implementing a project which is likely to have a negative environmental impact without conducting Environmental Impact Assessment study.

Relevance / Compliance
The project falls under those projects that require Environmental Impact Assessment (EIA) study. The Project Proponent will adhere to the procedures for conducting EIA study as prescribed in these regulations.

3.2.1.3 The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations (2018)

The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 is read as one with the Environment Impact Assessment and Audit Regulations (2005)/ These provide some amendments to the EIA and Audit Regulations (2005) and classify projects into Four (4) Categories based on the magnitude of impacts on the environment. These include Category "A"; Category "B1"; Category "B2" and "Special Category". The regulations provide the procedures for registration of each category of project.

Relevance / Compliance
The project falls under Category A in accordance with the classification provided in the amendment regulations. The Project Proponent already complied with project registration procedures as prescribed in these regulations.

3.2.1.4 The Occupational Health and Safety Act (2003)

The Occupational Health and Safety Act No. 5 of 2003[28] is an Act to repeal the Factories Ordinance; to make provisions for the safety, health, and welfare of persons at work in factories and other places of work; to provide for the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with activities of persons at work; and to provide for connected matters

Relevance / Compliance:
The project involves construction activities that are likely to create occupational health and safety risks. The project proponent will follow the provisions given in the Act to safeguard the health and safety of workers. This will include ensuring that the contractor conducts risk assessment including providing Personal Protective Equipment (PPE) to construction workers. The contractor will also develop occupational health and safety management plan.

3.2.1.5 The Public Health Act (2009)

The Public Health Act No. 1 of 2009[29] is an Act to provide for the promotion, preservation, and maintenance of public health with a view to ensuring the provisions of comprehensive, functional, and sustainable public health services to the general public and to provide for other related matters.

Section 32(1) requires the occupier or owner of any premises shall cause any drainage system to be properly protected or inspected to the satisfaction of an authorized officer in order to prevent the ingress of mosquitoes, vermin, and other disease-causing agents. According to Sub-section 32(2), any person who contravenes the provisions of this section commits an offence and on conviction is liable to a fine not exceeding one hundred thousand shillings.

[28] The Occupational Health and Safety Act (2003). The United Republic of Tanzania. Ministry of Labour. 13th February 2003.

[29] The Public Health Act No. 1 of 2009. The United Republic of Tanzania.

Section 101(2) deals with the connection of private drains or sewers with public sewers. It prohibits direct or indirect discharge of any matter from a manufacturing process or factory other than domestic or storm-water into the public sewer without a written agreement with the Authority.

Relevance/Commitment:
The operation of contractor's camp site is expected to generate sanitary wastewater from toilets and washrooms. The wastewater treatment system and sewer pipelines will be designed in such a way that waste water will be directed into a soak pit.

3.2.1.6 The HIV and AIDS (Prevention and Control) Act (2008)

The HIV and AIDS (Prevention and Control) Act No. 28 of 2008[30] is an Act to provide for the prevention, treatment, care, support and control of HIV and AIDS, for the promotion of public health in relation to HIV and AIDS; to provide for appropriate treatment, care and support using available resources to people living with or at risk of HIV and AIDS and to provide for related matters. Section 6(3) requires the project proponent to design and implement HIV/AIDS prevention and control programme and to submit it to TACAIDS before implementation for coordination and advice.

Relevance / Compliance:
The project is likely to create increased transmission of HIV/AIDS due to interaction between construction workers and the local community members. Thus, the project proponent will ensure the contractor formulates and implements HIV/AIDS prevention and control programme.

3.2.1.7 The Employment and Labour Relations Act of 2004

The Employment and Labour Relations Act No. 6 of 2004[31] is an Act to provide for core labour rights to establish basic employment standards; to provide a framework for collective bargaining; to provide for the prevention and settlement of disputes and to provide for related matters.

Relevance / Compliance:
The project involves employment of construction workers and other staff, who are covered by the provisions of the Act. The project proponent will comply with the provisions of the Act by ensuring the contractor avoids child labour, discrimination at work place directly or indirectly, and pays minimum wages to the construction workers as prescribed by the Labour Laws.

3.2.1.8 The Worker's Compensation Act (Cap. 263 RE 2025)

This law established the Workers Compensation Fund to administer and regulate workers' compensation for all matters related to injuries and damage to workers in Tanzania.

The law under Section 34(1) requires an employer to, within seven days after receiving a notice of an accident from the employee or having learned in some other way that an accident has occurred, report the accident to the Director- General in a prescribed form.

Sub-section 34(2) requires an employer; at the request of an employee or the dependant of an employee furnish the employee or dependent with a copy of the notice of the accident

[30] The HIV and AIDS (Prevention and Control) Act (2208). The United Republic of Tanzania. Ministry of Health and Social Welfare. 1st February 2008.
[31] The Employment and Labour Relations Act (2004). The United Republic of Tanzania. Ministry of Labour. 14th April 2004.

furnished by the employer to the Director-General in respect of a claim for compensation by the employee or dependant.

Section 71(1) requires an employer carrying on business in Tanzania shall within the prescribed period and in the prescribed form register himself to the Director-General and furnish the Director-General with-
(a) the prescribed particulars of the employer's business; and
(b) any additional particulars he/she may require.

Section 72(1) requires an employer to keep a register or other record of the earnings and other prescribed particulars of all employees and to produce the register or record or a satisfactory reproduction on demand to an authorized person for inspection.

Relevance/Commitment:
The project proponent will adhere to the objectives of the Act by ensuring that all employees employed under this project are registered with the WCF and appropriate payments are made to the Fund as per the law and regulations. This will include submission employees' records of earnings and payment of monthly contributions.

3.2.1.9 The Contractors Registration Act (1997)
The Contractors Registration Act No. 17 of 1997[32] is an Act to provide for the registration of contractors and to establish a Board to regulate the conduct of contractors and for the related matters.

Section 12(l) prohibits non-citizens of the United Republic from forming a local contracting firm unless the majority of its shares are owned by the citizens of the United Republic of Tanzania. Otherwise, it will be registered as a foreign firm or company.

Section 23(1) prohibits any body of persons, whether corporate or unincorporated, from carrying out the business of contractors, unless at least one of the partners or directors who shall also be a shareholder has, as prescribed by the Board the required technical qualifications, skills, and experience.

Relevance / Compliance
The project will engage the services of contractors during construction. Therefore, the project proponent will ensure only qualified and registered contractor is engaged in the execution of the project.

3.2.1.10 The Contractors Registration (Amendment) Act (2008)
The Contractors Registration (Amendment) Act No. 15 of 2008[33] is an Act to amend the Contractors Registration Act, with a view to providing provisions for effective regulation of activities and maintenance of professional conduct and integrity of contractors and for related matters. The Act shall be read as one with the Contractors Registration Act, hereinafter referred to as the "principal Act."

Sub-section 22(4) prohibits an employer or developer from engaging unregistered firms or persons. If found guilty is liable to a fine of not exceeding ten per cent of the contract sum or project value but not less than one per cent of such contract sum or project value or five million

[32] The Contractors Registration Act No. 17 of 1997. United Republic of Tanzania.
[33] The Contractors Registration (Amendment) Act No. 15 of 2008. United Republic of Tanzania.

shillings whichever amount is greater or to imprisonment for a term of not less than three years or to both.

Relevance /Commitment
The project will require engagement of contractor during construction. The project proponent will comply with the requirement of the Act by employing only a qualified and registered contractor.

3.2.1.11 The Engineers Registration Act (1997)
The Engineers Registration Act No, 15 of 1997[34] is an Act to repeal and re-enact with modifications the Engineers (Registration) Act of 1968, to establish a Board to regulate the conduct of engineers, to provide for their registration and for related matters. Section 12(1) prohibits any person or body of persons who are not citizen of the United Republic from being registered as a local consultant or consulting firms unless:

- in the case of a natural person, he is a citizen of the United Republic;
- in the case of a company, it is incorporated in Tanzania and the firms.

Relevance /Commitment
The project involves consultancy services during contract supervision. In this regard, the project proponent will engage only a qualified and registered engineering consultancy firm.

3.2.1.12 The Engineers Registration (Amendments) Act (2007)
The Engineers Registration (Amendment) Act No. 25 of 2007[35] is an Act to amend the Engineers Registration Act of 1997 and shall be read as one with the Engineers Registration Act, hereinafter referred to as the "principal Act"

Sub-section (1) any person from employing as an engineer any person who is not a professional engineer or consulting engineer, or causing to undertake engineering works or services without employing the services of a professional engineer or consulting engineer.

Sub-section (2) prohibits any person from taking up or continuing in any employment as an engineer, or carrying out engineering works or services, unless he is a professional engineer or consulting engineer.

Relevance /Commitment
The project will require services of engineers during construction. In this regard, the project proponent will ensure only qualified professional engineers are employed.

3.2.1.13 The Valuation and Valuers Registration Act (2016)
The Act provides for the process in which the value of an interest in real property is assessed by a valuer. It also requires a Chief Valuer to be appointed within the Ministry responsible for lands and provides for the registration of valuers.

Relevance /Commitment
The project will require services of valuers during valuation of assets before payment of compensation of affected parties. Therefore, the Consultant will be required to ensure an authorized valuer is engaged to carry out valuation in accordance with the requirements of the legislation.

[34] The Engineers Registration Act No. 15 of 1997. United Republic of Tanzania.
[35] The Engineers Registration (Amendments) Act No. 25 of 2007. United Republic of Tanzania.

3.2.2 Sector Legislations

3.2.2.1 The Road Act (2007)

The Road Act No. 13 of 2007[36] is an Act to make provisions for road financing, development, maintenance, management, and other related matters. The Act outlines several functions of road authority, but the relevant one is to control the use of roads to provide safe and adequate infrastructure for transpnr1ation commensurate with economic development of the country.

Relevance/Compliance

The project involves upgrading road sections into bitumen standards to minimize traffic congestion to facilitate rapid transportation of people and goods within the city. The project proponent will ensure road safety issues are taken into consideration during design, construction, and operation phase.

3.2.2.2 The Road Traffic Act Cap 168

The Road Traffic Act Cap 168[37] is an Act to provide for the control and regulation of road traffic. Section requires Employer to keep a written record of the name and driving license number of such other person and shall on demand by a police officer produce such a record for inspection.

Relevance/Compliance

The project has the potential to create disruption of traffic flow and road traffic accidents during construction. The project proponent will ensure that the Contractor formulates and implements a traffic management plan during constriction. The contractor will erect permanent road signs to guide traffic movement during the operation phase.

3.2.2.3 The Water Resource Management Act (2009)

The objective of this Act is to ensure that water resources are protected, used, developed, conserved, managed, and controlled in ways that take into account fundamental principles. Section 63 deals with discharge permits, whereby it requires any person who wishes to discharge effluents from commercial, industrial or agricultural sources or from any sewerage works or trade waste systems or from any other source into surface water or underground strata to apply to the Basin Water Board.

Relevance/Compliance

The project has potential to pollute ground and surface water sources during the construction and operation phase. The Project Proponent will ensure the Contractor avoids pollution of ground and surface water sources during construction.

3.2.2.4 The Roads Management Regulations (2009)

The Road Management Regulations (2009) is made under Section 61 of the Road Act No. 13 of 2007, The regulations provide for prohibition of certain activities in the road reserve. These include; closure of road for urgent activities; obstruction of road drains or water course; stopping or clogging of water course on roads; construction of drains or watercourse; damage from water collected on land; and construction of roadside facilities. It also provides for prevention of pollution of the road due to disposal of sewage, garbage, rubbish, etc.

Relevance/Compliance

[36] The Road Act (2007). The United Republic of Tanzania. Ministry of Works. 28th August 2007.
[37] The United Republic of Tanzania. The Road Traffic Act Cap 168 (Principal Legislation)..

The project proponent will ensure that there is no encroachment into the road reserve. The project proponent will ensure that the contractor installs beacons to demarcate the boundaries of the road reserve and educate the people on the importance of protecting the road reserve.

3.2.2.5 Road Sector (Environmental Protection) Regulations (2009)

The Road Section (Environmental Protection) Regulations (2009) is made under Section 61(2) of the Road Act No. 13 of 2007. The regulation provides for the prevention of environmental pollution and degradation.

Sub-regulation 11(1) provides for the road authority to preserve and protect trees and shrubs within the road reserve area which does not necessarily require removing for the road works. Sub-regulation 11(2) damaged or injured beyond repair or treatment to be restored early in the following planting season with the same type or species or other approved species suited to the environment.

Relevance/Compliance

The project has the potential to result into destruction trees within the road reserve and beyond the road reserve if precautions are not taken during construction. The construction activities could also lead into r=environmental pollution and degradation. The Contractor will be required to take precaution during constriction to avoid or minimize destruction of vegetation/ trees and environmental pollution.

3.2.2.6 The Land Act (1999)

The Land Act No. 4 of 1999 is an Act to provide for the basic law in relation to land other than the village land, the management of land, settlement of disputes and related matters. Section 156 of the Land Act 1999 requires compensation to be paid to any person for the use of land of which he/she is in lawful or actual occupation as a communal right of way and with respect to a way leave. These include: any damage suffered in respect of trees, crops, and buildings as a result of the creation of way leave; and damage due to surveying or determining the route of that way leave. It is the responsibility of the government department of the Ministry, Local Government authority or corporate body that applied for the right of way to pay compensation.

Relevance / Compliance

The project will involve the construction of road section within the existing way leave, but in some cases widening of the road sections. Therefore, the project proponent will be required to pay compensation due to land acquisition. Also, the contractor will be required to pay compensation for any damage that will be caused by the construction works on the adjacent lands.

3.2.2.7 The Urban Planning Act (2007)

The Urban Planning Act No. 8 of 2007 regulates land use in the country. It requires the occupier to pay land rent in order to get the Certificate of Occupancy. The Act, among others, requires the submission of drawings, elevations, and plans to the urban authority. The Act gives the Commissioner for lands absolute discretion to give or withhold building consent.

Relevance / Compliance

The project proponent is the urban planning authority and therefore it will be obliged to adhere to the land sue master plan.

3.2.2.8 The Land (Compensation Claims) Regulations (2001)

The regulations is made under Section 179 of the Land Act No. 4 of 1999. Sub-regulation 5(1) stipulates that the regulations apply to any applications or claim for compensation by any

person occupying land. According to Sub-regulation 5(2) the compensation to be claimed shall be the value of unexhausted improvements pm the land being occupied and grazing land. According to Sub-regulation 9(2) these regulations all application or compensations shall apply for government or local government authority or any public body or institutions under the Land Act. However, compensation under Section 156 of the Land Act shall apply against non-government corporate body, or group of persons in whose favour a public right of way is created,

Relevance / Compliance:
The project has the potential to create land acquisition due to possible widening of some the road sections. Therefore, in this case the Kinondoni Municipal Council as a local government authority shall be responsible for payment of compensation claims.

3.2.2.9 The Land (Assessment of the Value of Land for Compensation) Regulations (2001)

The regulation is made under Section 179 of the Land Act No. 4 of 1999. According to Regulation 3, the basis for assessment of the value of any land and unexhausted improvement for purposes of compensation, under the Act shall be market value of such land. According to Regulation 4, the market value of any land and unexhausted improvement shall be: arrived at by use of comparative method evidenced by actual recent sales of similar properties or by use of income approach or replacement cost method, where the property is of special nature and not sellable.

Relevance / Compliance:
The project proponent will use the assessment method as prescribed by the regulations.

3.2.2.10 The Local Government (Urban Authorities) Act Cap 288

The Local Government (Urban Authorities) Act Cap 288[38] is an Act to make better provision for the establishment of urban authorities for local government, to provide for the functions of those authorities, and for other matters connected with or incidental to those authorities.

Section 59 provides for the functions and powers of the Urban Authorities. According to the Act the Urban Authorities, among others, shall have power:

- to construct any new and necessary works in connection with any of the functions under this Act;
- to provide for the establishment, management, layout, planting, improvement, maintenance, and regulation of parks, gardens, swimming baths, public libraries, museums and other places of public resort, recreation, or entertainment for the use of the public, and to contribute to the cost of maintenance of any parks, gardens, swimming baths, public libraries, museums and other places of public resort, recreation or entertainment provided by persons for the use of the public;
- to design the layout of streets, building areas, and other areas, and to provide for and authorize the adoption of such measures concerning expropriation or limitation of the user, and concerning the assessment and time of payment of compensation, as the authority may consider necessary or desirable for the convenient design and construction of such layouts; save that before any layout is made, the plan or plans of such layout or alteration shall be submitted for the approval of the Minister.

Relevance/Compliance

[38] The Local Government (Urban Authorities) Act No. 8 of 1982. The United Republic of Tanzania.

The project involves the construction of road sections in an urban area and therefore has the potential to interfere with urban land use planning, such as allocation of areas for gardens, parks, or recreational areas. In this case the project proponent will be required to make a consultation with Kinondoni Municipal Council (KMC), which is the urban authority to ensure the construction of the road sections is compatible with urban land use planning.

3.2.2.11 The Forest Act (2002)

The Forest Act No. 14 of 2002[39] is an Act to provide for the management of forests, to repeal certain laws relating to forests and for related matters. Sub-section 17(1) empowers the an authorized officer, either of his own motion or at the request of an occupier of land and on being satisfied of the facts, to enter on land and cause to be cut down and destroyed or removed any tree, whether a reserved tree or not and whether within a reserve or not which is deceased or which is a result of natural causes or human activity on or near the tree or on land nearby the tree is in condition which is a danger to persons living, working or passing near to the tree or to the property adjacent to it.

Sub-section (2) empowers the authorized officer to charge a reasonable fee from the occupier of that land after removal of tree on land which is occupied as a place of residence or for commercial or industrial purposes, whether the occupation is by a person or organizations in the public or private sector.

Section 65(1) empowers the Minister, after consultation with such persons and organizations within the public and private sectors who may appear to him to be knowledgeable on environmental issues, by order published in the *Gazette,* declare in respect of any general land that any tree, class of tree or group of trees of diverse kinds shall be reserved.

Relevance / Compliance:

The project has the potential to destroy planted trees due to widening of the road sections and construction of roadside storm water drainages. The planted trees have some ecological functions and maintenance of landscape quality of the urban environment, hence needs to be preserved.

In this regard, the project proponent will ensure the Contractor minimizes destruction of natural vegetation by confining construction activities within the road reserve and whenever possible undertake tree planting after construction.

3.2.2.12 Other Relevant Regulations

The following are other relevant legislations to which the project will comply with during implementation:

- The Environmental Management (Air Quality Standards) Regulations 2007 (GN No. 237/2007)
- The Environmental Management (Water Quality Standards) Regulations, 2007 (GN No. 238/2007);
- The Environmental Management (Soil Quality Standards) Regulations 2007 (GN 239/2007)
- The Environmental (Solid Waste Management) Regulations, 2009 (GN No. 263/2009)
- The Environmental Management (Quality Standards for Control of Noise and Vibration Pollution) Regulations, 2015.

3.2.3 Environmental Management Guidelines

[39] The Forest Act (2002). The United Republic of Tanzania. 4th June 2002.

3.2.3.1 Environmental Assessment and Management Guidelines in Road Sector (2004)

The Environmental Assessment (EA) Guidelines for Road Sector (July 2004) has been prepared to address environmental issues in all projects that fall under the road sector. The road sector guideline outlines resettlement plan and compensation procedures. It recognizes the considerable impacts of road infrastructure on human settlement and local community properties, including adjacent land use.

Relevance / Compliance

The project proponent will ensure compensation is paid to affected persons for any affected properties due to land acquisition or any damaged property due to construction activities.

3.2.3.2 Road Sector Compensation and Resettlement Guidelines (2009)

The purpose of these guidelines is to provide a consistent approach in the development and implementation of Compensation and Resettlement Plans (CRPs). The main strategy is to integrate compensation and resettlement process from the planning phase of the road project. The objective, among others, is to create awareness on compensation and resettlement issues among the various road agencies and other stakeholders.

The guidelines have been developed to complement the Environmental Assessment and Management Guidelines (2004) and have drawn from the World Bank's Operational Policy 4.12 on Involuntary Resettlement, the IFC's Handbook for Preparing a Resettlement Action Plan, and the African Development Bank's Involuntary Resettlement Policy.

The guidelines are intended to guide the user in the preparation of a Compensation and Resettlement Plan (CRP) and are to be used on an individual or case by case basis, bearing in mind that the overall objective of a CRP is that the resultant standard of living of the affected persons is equivalent to, if not higher, than before the project.

Relevance / Compliance

The project is likely to involve land acquisition due to widening of the road sections. In this regard, the project proponent will ensure that all the PAPs are compensated in accordance with the requirements of the relevant legislations.

3.2.3.3 Environmental Code of Practice for Road Works (2009)

The Environmental Code of Practice for Road Works has been prepared to guide the intervention of road engineers and technicians during the planning, design, construction, and operation phases, so that direct adverse environmental impacts of the project can be avoided or minimized through appropriate corrective measures. The intention is to ensure that all environmental considerations are well integrated into the road projects and activities.

The overall objective of the Environmental Code of Practice is to provide a tool, which integrates identified environmental aspects for project managers, road engineers, technicians, contractors, and environmental specialists. Specifically, the objectives of the environmental code are:

- To establish specific environmental criteria for road works in Tanzania.
- To provide technical assistance.
- To ensure general understanding of environmental impacts and define environmental criteria to minimise such impacts.
- To ensure that road engineers and technicians can find solutions for any problems arising during road constructions or maintenance activities.

- To facilitate the preparation of environmental assessment for road development projects.

Relevance / Compliance
The project proponent will ensure that the contractor adheres to the environmental code of practice during construction. This includes application of cost-effective mitigation measures to minimize environmental degradation due to construction activities.

3.2.4 International Conventions
3.2.4.1 ILO Conventions
The ILO Conventions cover a wide area of social and labour issues including basic human rights, minimum wages, industrial relations, employment policy, social dialogue, social security, and other issues.

(a) Working Environment (Air Pollution, Noise, and Vibration) Convention, 1977 (No. 148[40])
The Convention got entry into force on 11 Jul 1979, and Tanzania signed the Convention on 30 May 1983 and accepted the obligation of the convention in respect of air pollution only[41]. According to Article 3, the term air pollution covers all air contaminated by substances, whatever their physical state, which is harmful to health or otherwise dangerous; the term noise covers all sound which can result in hearing impairment or be harmful to health or otherwise dangerous; The term vibration covers any vibration which is transmitted to the human body through solid structures and is harmful to health or otherwise dangerous.

Article 4 requires national laws or regulations to prescribe measures to be taken for the prevention and control of, and protection against, occupational hazards in the working environment due to air pollution, noise, and vibration; and to have provisions concerning the practical implementation of the measures so prescribed may be adopted through technical standards, codes of practice and other appropriate methods.

Relevance / Compliance:
The project has the potential to create occupational health and safety risks due to the handling of hazardous construction materials and equipment. The propjet proponent will ensure the Contractor provides relevant PPE to construction workers.

(b) Worst Forms of Child Labour Convention, 1999 (No. 182)[42]
The Convention concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labour, known in short as the Worst Forms of Child Labour Convention, was adopted by the International Labour Organization (ILO) in 1999 as ILO Convention No 182. It is one of eight ILO fundamental conventions. Tanzania signed the Convention on 12 September 2001.

By ratifying this Convention No. 182, a country commits itself to take immediate action to prohibit and eliminate the worst forms of child labour. Article 1 requires member countries to take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labour as a matter of urgency.

Relevance / Compliance:

[40] https://en.wikipedia.org/wiki/Working_Environment_(Air_Pollution,_Noise_and_Vibration)_Convention,_1977
[41] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11300:0::NO::P11300_INSTRUMENT_ID:312293
[42] https://en.wikipedia.org/wiki/Worst_Forms_of_Child_Labour_Convention

The project has the potential to create employment, and there is a possibility of children trying to seek employment during construction. The project proponent will ensure the Contractor does not employ children aged 14 years or below.

(c) Discrimination (Employment and Occupation) Convention, 1958 (No. 111)[43]

The Convention concerning Discrimination in Respect of Employment and Occupation or Discrimination (Employment and Occupation) Convention (ILO Convention No. 111) is an ILO Convention on anti-discrimination. It is one of eight ILO fundamental conventions. The convention requires states to enable legislation that prohibits all discrimination and exclusion on any basis including race or colour, sex, religion, political opinion, national or social origin in employment, and repeal legislation that is not based on equal opportunities.

Article 2 requires each Member Country to declare and pursue a national policy designed to promote, by methods appropriate to national conditions and practice, equality of opportunity and treatment in respect of employment and occupation, to eliminate any discrimination in respect thereof.

Relevance / Compliance:

This project will employ different people of different origins in terms of nationalities, tribes, races religious affiliations, and gender. The Contractor will ensure there is no any kind of discrimination based on nationality, tribe, race, religion, or gender.

3.2.4.2 Workmen's Compensation (Accidents) Convention, 1925 (No. 17) 44

Workmen's Compensation (Accidents) Convention, 1925 is an International Labour Organization (ILO) Convention, which was adopted on June 10, 1925, and came into force on April 1, 1927. Tanzania signed the convention on 30 January 1962.

Article 1 requires each Member Country to ensure that workmen, who suffer personal injury due to an industrial accident, or their dependents, shall be compensated on terms at least equal to those provided by this Convention.

Relevance / Compliance:

This project has the potential to cause accidents or death during construction. The project proponent will ensure that the Contractor is registered by the Workers Compensation Fund, which is responsible for the payment of compensation in case of injury or death of any worker in the course of work.

3.3 World Bank Environmental and Social Framework

The review of the World Bank Environmental and Social Framework (ESF)[45] has been necessary because the project will receive funding from the World Bank. The ESF is used to ensure that all projects financed by the World Bank are developed and implemented in an environmentally and socially responsible manner. The ESF ensures that the environmental and social risks of World Bank-funded projects are properly identified and evaluated, any significant environmental and social risks are reduced, minimized or mitigated, and that key information about the project is disclosed and shared with key stakeholders.

[43] https://en.wikipedia.org/wiki/Discrimination_(Employment_and_Occupation)_Convention
[44] https://en.wikipedia.org/wiki/Workmen%27s_Compensation_(Accidents)_Convention,_1925
[45] The WORLD BANK Environmental and Social Framework. IBRD-IDA WORLD BANK GROUP.

There are ten (10) World Bank Environmental and Social Standards (ESS). The ESS set out the requirements for Borrowers relating to E&S risks and impacts associated with projects. The standards are intended to support Borrowers to reduce poverty and sustainably increase prosperity for the benefit of the environment and their citizens.

The review and screening of WB ESS has been carried out to find out which of those ten standards are applicable/ relevant as shown in **APPENDIX 4.** The results indicate the Sub-projects are expected to trigger the following six (6) WB ESSs:

- ESS 1-Assessment and Management of Environmental and Social Risks and Impacts
- ESS 2-Labor and Working Conditions
- ESS 3-Resource Efficiency and Pollution Prevention and Management
- ESS 4-Community Health and Safety
- ESS 5-Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
- ESS 10-Stakeholder Engagement and Information Disclosure

3.4 World Bank Environmental, Health and Safety Guidelines (EHSGs)

The WBG General EHS Guidelines outlined EHS issues associated with road projects, which occur during the construction and operation phase, along with recommendations for their management. According to the EHS Guidelines, the environmental issues specific to construction and operation of roads include Habitat alteration and fragmentation; Stormwater; Waste; Noise; Air emissions; and Wastewater.

Relevance / Compliance:

The EHS Guidelines are relevant to the project because the project is likely to create some environmental risks/impacts due to stormwater discharge, solid waste generation, wastewater discharge, noise emissions, and air emissions. However, the project is not likely to result into habitat alterations or fragmentations because the project is being implemented within a built-up urban environment. The project will comply with the requirements of the EHS Guidelines regarding stormwater, solid waste, noise and air quality and wastewater management to minimize EHS risks/impacts associated with this project. WBG General EHS Guidelines include recommendations that shall be considered during construction activities and subproject operations in vary fields such as wastewater management, hazardous material and waste management, waste management, occupational health and safety, measures to safeguard community health and safety, traffic safety, disease prevention, and specific measures for construction activities.

The following Industry Specific EHSGs will apply to the proposed subprojects: (i) WB EHSG for Toll roads (given the various road works and even though not toll roads), and (ii) WB EHSG for Construction Materials Extraction (as road and possible other subprojects will need such materials).

3.5 INSTITUTIONAL FRAMEWORK

3.5.1 At National and Local Authority Level

The institutional framework for environmental management in Tanzania is well established from local government level to national level. The organisational structure for implementation of environmental management matters from national to local government authorities' level is provided in in **Figure 3.4-1.** The institutional responsibilities for implementing environmental management matters from national to local authority (LA) level are outlined in **Table 3.4-1.**

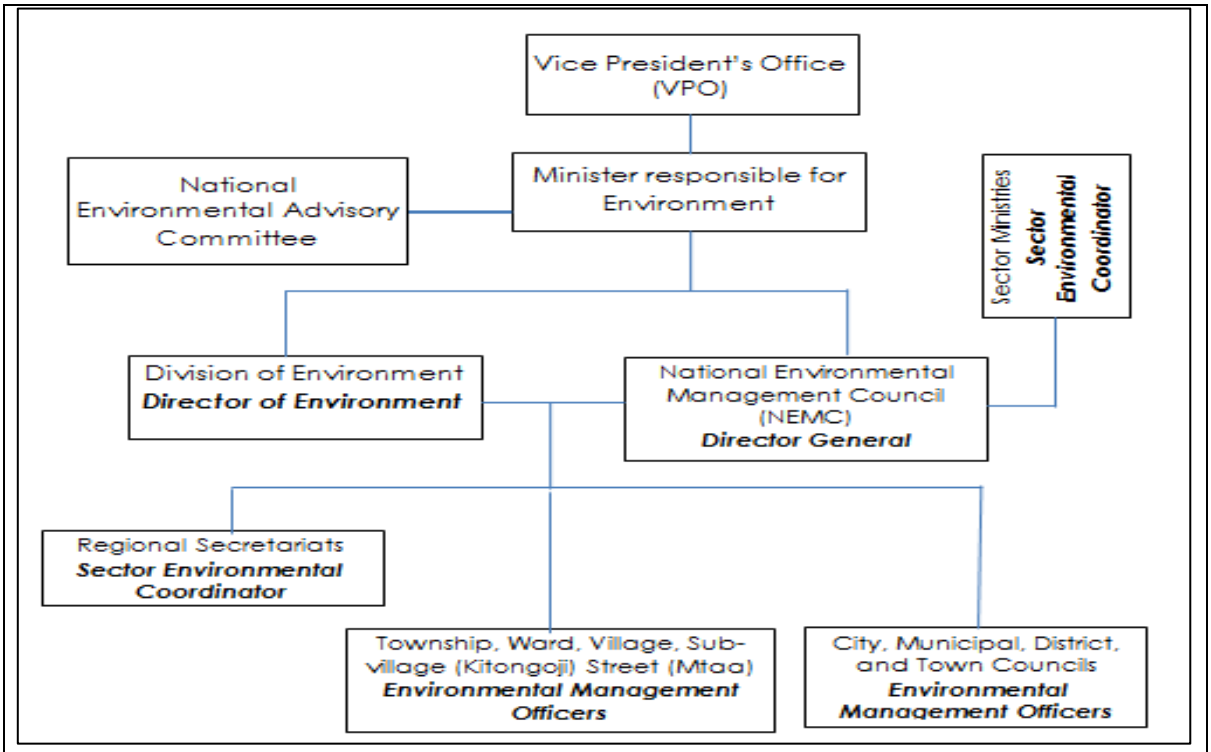


Figure 3.4-1: Organizational Structure for Environmental Management in Tanzania.

3.5.2 At Project Level

The institutional framework for environmental and social management at project level is comprised of World Bank (WB), World Bank Coordination Unit (WBU), President's Office Reginal Administration and Local Government (PO-RALG), Kinondoni Municipal Council (KMC); KMC Project Implementation Unit (PIU), Tanzania Rural and Urban Road Agency (TARURA)), ESIA Consultant, Design Consultant, Supervision Consultant, and Contractor. The organisational structure for implementation of environmental and social management issues in accordance with DMDP 2- ESMF[46] is provided in **Figure 3.4-2.** The institutional roles and responsibilities for implementation of environmental and social management issues at project level is provided in **Table 3.4-2.**

The WB is responsible for financing the project and ensuring that the project is carried out in accordance with the ESMF and that environmental and social impacts are managed in accordance with WB Environmental and Social Framework (ESF) and Environmental and Social Standards (ESS1-10).

[46] President's Office-Regional Administration and Local Government (PO-RALG). Dar Es Salaam Metropolitan Development Project-Phase 2. Environmental and Social Management Framework (ESMF). September 2023 https://www.tamisemi.go.tz/storage/app/data/ESMF-DMDP%20II.docx

The PO-RALG is responsible for overall project implementation and coordination through its Project Coordination Team (PCT). The PCT is responsible for environmental and social monitoring and surveillance of all project components/ investments that will be undertaken by project and reporting the results to the WB.

KMC/TARURA through Project Implementation Unit (PIU) is responsible for coordination of consultant's activities (preparation of ESIA and ESMPs), providing support to the procurement department within the implementing institution and ensuring that the Contractor complies with environmental, social, health and safety requirements, including appointment of a qualified environmental and social experts.

The Supervision Consultant through its Environmental and Social Supervisors is responsible for liaising with Project Implementation Unit (PIU) in ensuring the environmental and social requirements are met by the project. These include conducting EIA studies, preparation of ESIA reports and corresponding ESMPs, and assisting PIU in obtaining relevant permits and certificates for project implementation.

The Contractor through its Environmental and Social Officers is responsible for complying with environmental and social requirements, including allocation of adequate budget for preparation and implementation of HSMP and C-ESMP based on project ESMP provided in the Bidding Documents. The Contractor is also responsible for liaising with PIU and Supervision Consultant and reporting of any accidents or incidents

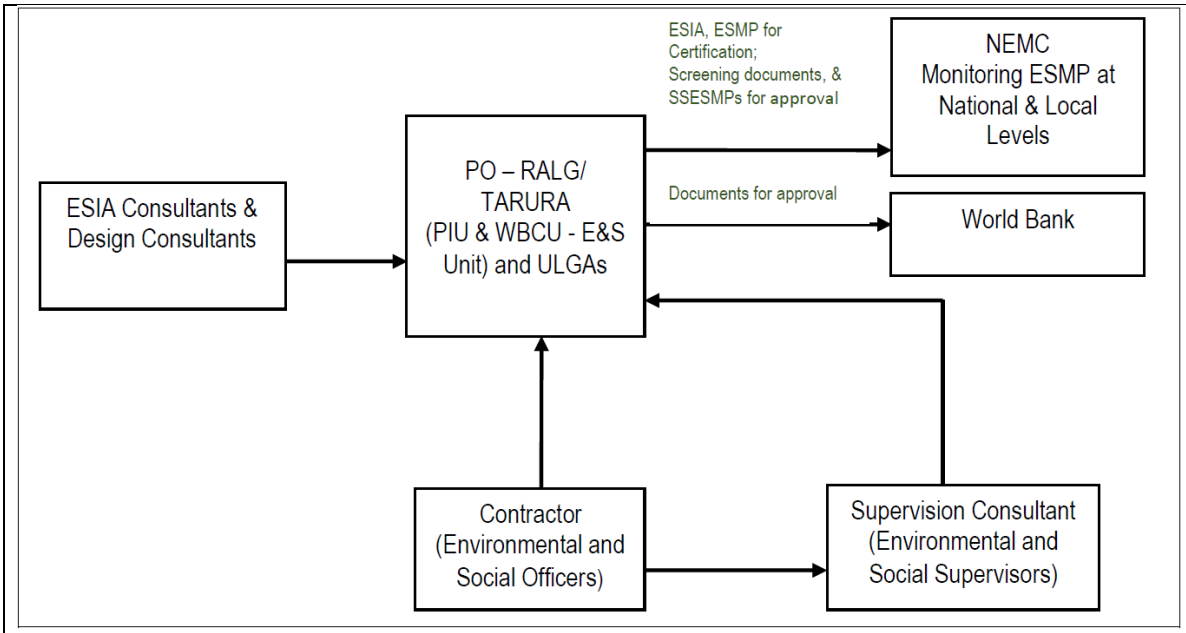


Figure 3.4-2: Organisational Structure for Environmental Management at Project Level.

Table 3.4-1: Institutional Responsibilities from National to LGA Level.

Institution	Roles and responsibilities	Relevant Legislations
A. National level		

Institution	Roles and responsibilities	Relevant Legislations
A1. President's Office, Regional Administration and Local Government (PO-RALG)	• Policy formulation at sectorial level and overseeing implementation of national environment policy within the sector ministry and collaborates with the national environmental agencies. • The ministry through its Sector Environmental Coordinator is responsible for: - Ensuring the line ministry's compliance with Environmental Management Act Cap 191 (EMA Cap. 191); - Ensuring all environmental matters contained in other laws falling under the jurisdiction of the sector ministry are implemented and reported to NEMC; and - Liaising with NEMC on all environmental matters in order to achieve cooperation and shared responsibility for environmental governance.	▪ Section 30 Environmental Management Act Cap. 191 -which establishes Sector Environment Section within Sector Ministry. ▪ Section 31 of the EMA Act Cap 191-which stipulates the functions of the Sector Environment Section.
A2. Tanzania Rural and Urban Roads Agency (TARURA)	Tanzania Rural and Urban Roads Agency (TARURA) is responsibility for managing. the development, rehabilitation, maintenance, axle load control, environment and road management of rural and urban roads network for the socio-economic development of Tanzania'.	▪ Section 3(1) of the Executive Agencies Act (Cap 245) by Order published under Government Notice No. 211, dated May 12,2017.
A3. Division of Environment (VPO-DOE)	The DOE which is headed by Director of Environment is responsible for: • Formulation of environmental policy. • Coordination and monitoring of environmental issues. • Review and approval of ESIA report and issuance of EIA Certificate	▪ Section 14 of the EMA Act Cap 191-which establishes the position of the Director of Environment. ▪ Section 15 of the EMA Cap. 191-which stipulates the functions of the Director of Environment.
A4. National Environmental Management Council (NEMC)	• Undertaking enforcement, compliance, review and monitoring of environmental impact assessment (EIA), including the facilitation of the public participation process in environmental decision making. • Ensuring that the project is being implemented in an environmentally friendly and socially acceptable manner.	▪ Section 16 of the EMA Cap. 191-which establishes NEMC. ▪ Section 17 of the EMA Cap.191-which stipulates the object for establishment of NEMC. ▪ Section 18 of the EMA Cap. 191-which stipulates the function of NEMC.
B. Municipal Council Level		

Institution	Roles and responsibilities	Relevant Legislations
Kinondoni Municipal Council (KMC)l	The Municipal Council through the Environmental Management Officer (EMO) is responsible for: • Coordination of environmental management matters at city level. • Land use planning and issuing of development permits within the city. • Monitoring the implementation of environmental mitigation measures by the Contractor	▪ Section 36 of the EMA Cap. 191-which stipulates the functions of the Environmental Management Officers. ▪ Government Gazette No. GN 211 of 12 May 2017.
C. Ward / Mtaa Level		
D1. Ward and Mtaa Development Committees	The Ward and Mtaa Development Committees are responsible for: • Environmental management issues within their jurisdictional boundaries. • Monitoring the implementation of environmental mitigation measures by the Contractor through their respective Environmental Management Officers (EMOs).	▪ Sub-section 31(1) of the Local Government (District Authorities) Act of 1982-which establishes the Ward Development Committee. ▪ Sub-section 38(1) of the EMA Cap 191-which stipulates the functions of the Ward Development Committee. ▪ Sub-section 38(2) of the EMA Cap 191-which stipulates the functions of the Village Development Committees. ▪ Section 39 of the EMA Cap. 191-which establishes the position of Ward and Village Environment Management Officers. ▪ Section 40 of the EMA Cap 191-which stipulates the Ward and Village Environment Management Officers.

Table 3.4-2: Institutional Responsibilities at Project Level.

Institution	Roles and responsibility
1. World Bank (WB)	The World Bank (WB) through the World Bank Coordination Unit (WBCU) has an overarching responsibility of ensuring that the project is carried out to the highest environmental standards strictly in accordance with the ESMF and ESIA project report and the mitigation measures set out therein. Additionally, the WB has the responsibility of ensuring that environmental and social impacts are managed in accordance with the World Bank ESF and its ESS. The WB is responsible for:

Institution	Roles and responsibility
	▪ Review and sub-project screening including risk level categorization; ▪ Reviewing of ESIAs, ESMPs Health and Safety Management Plan (HSMPs), Grievance Redress Mechanisms (GRMs), Labor Management Plans (LMPs), and Traffic Management Plans (TMPs);. ▪ Reviewing of quarterly reports by the implementing agencies;\ ▪ Monitoring compliance with the ESMF, SEP, LMP, ESCP and RPF; ▪ Providing advice on the required instruments when informed of the presence of IP/SSAHUTLC for the subproject to go ahead; and ▪ Undertaking implementation support Missions..
2. President's Office, Regional Administration and Local Government (PO-RALG)	The PO-RALG is responsible for: • E&S monitoring and surveillance of all project components investments that will be undertaken by project. • Reporting the monitoring results to the World Bank.
3. Kinondoni Municipal Council (KMC) /TARURA	The Kinondoni Municipal Council (KMC) and TARURA are responsible for: ▪ Overseeing and meeting the costs of conducting Environmental Impact Assessment (EIA) and implementation of ESMP/EMP; ▪ Undertake Initial Environmental Audits and Environmental Control Audit, ▪ Undertake self-auditing during implementation of ESMP; ▪ Undertake Baseline Survey before project implementation as basis for undertaking effective monitoring. The KMC as subprojects implementing agency is responsible for preparation of annual work plans incorporating Environmental, Social, Health and Safety (ESHS) aspects and budgets to be submitted to the WBCU for approval by the Project Steering Committee.
4. Project Implementation Unit (PIU)	The Project Implantation Unit (PIU)is responsible for: ▪ Coordinating different activities to ensure that, the project meets the country legal and World Bank requirements in regard to Environment and Social Framework ▪ Coordinating specialist/consultants for any support missions or attend different meetings and provide any guidance in the bid to ascertain that the different challenges identified for each sub-project/activity are duly covered from risk. ▪ Supporting the procurement officer of KMC/TARURA in making sure that the bidding documents clearly cover the environmental, health, and safety and issues with appropriate provisions of the same for the contractors to bid.
5. ESIA Consultant	▪ Coordinating preparation of ESIA and environmental and social management plans (ESMPs) done by consultant and site-specific ESMPs (SSESMP). ▪ Ensuring that contractors have an Environmental Health and Safety Officer (EHS), who are familiar with the compliance requirements, including WB EHS guidelines • Work with the PIU to understand the requirements of the environmental and social assessment;

Institution	Roles and responsibility
	• Conduct initial site visits with the NPIU/APIU/UPIU to understand the sub-project setting and site-specific requirements; • Prepare the ESIAs and ESMPs based on the procedures described in the ESMF including carrying out an alignment walk, alternatives analysis and baselines studies, identifying the E&S risks and impacts, developing mitigation measures and monitoring plans incorporating EHS requirements; • Cost all the mitigation and management measures proposed in the ESMPs and SSEMPs • Propose a capacity building plan for the implementation of the sub-projects for all actors involved with cost estimates and schedule; • Carry out public consultations; • Conduct trainings as needed; • Assist the PIU in preparing documentation to obtain certification from NEMC for the ESIAs and ESMPs.
6. Design Consultant	▪ Understand the sub-project setting and site-specific requirements with discussions with the PIU; ▪ Incorporate the issues identified in the ESIAs, ESMPS into the designs of the subprojects (including necessary budget) and ensure consistency with the design guidelines and specifications as relevant – see Table 18 below; and ▪ Provide cost estimates for implementing the design requirements.
7. Supervision Consultant	▪ The Supervision Consultant through Resident Engineer, Environmental Specialist, Social Specialist, Occupational Health and Safety Specialist is responsible for: ▪ Ensuring at all times there are competent personnel with adequate knowledge, ability, training and experience on protection of environmental and social issues in construction projects and be able to supervise the Contractor's performance. ▪ Monitoring and review of on-site implementation of the E&S measures14
8. Contractor	The Contractor through its ESHS personnel is responsible for: • Compliance with relevant environmental and social legislative requirements (project-specific, district- and national level), including allocating adequate budget for implementation of these requirements; • Work within the scope of contractual requirements and other tender conditions; • Prepare CESMPs based on the ESMP in the bidding documents and contracts; • Train workers about EHS (including relevant WBG EHS Guidelines) and the site specific environmental and social measures to be followed; • Ensure EHS officer is participating in the joint site inspections with the PIU and Supervision Consultant. • Immediate notification of the NPIU and supervision engineer of any significant social or environmental health and safety incident linked with the project, and indication about the measures taken or that are planned to be taken to address the incident as well as propose any measures to prevent its recurrence.

Institution	Roles and responsibility
	• Carrying out any corrective actions instructed by the Supervision Engineer/consultant; • Carrying out investigation in case of non-compliances/discrepancies, and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impact; • Proposing and carrying out corrective actions in order to minimize the environmental impacts; • Sending weekly reports of non-compliance to the Supervision Consultant; • Sending monthly progress reports to the Supervision Engineer Consultant

3.5.3 Project Implementation Unit (PIU)

Each ULGA will establish a full time Project Implementation Unit (PIU) staffed with dedicated team of officers to carry out these responsibilities.

Project Implementation Unit (PIU) is comprised of 12 members. These include 1-Environmental Expert; 1-Social Expert; and 1-Gender Expert, locally known as Environmental and Social Safeguard (ESS) Team. Other PIU members include Coordinator, Deputy Coordinator, Infrastructural Development Officer; Capacity Building Officer; Curriculum Development Officer; Finance Officer; ICT Expert; Procurement Officer; Monitoring and Evaluation Officer; Industrial Linkage Officer; and Communication Officer. Most of the PIU members have been appointed based on their expertise and thus their contribution to this project is based on their expertise.

The ESS Team is involved in providing inputs in preparation of TORs and Contracts Documents for procurement of Contractors and Consultants. In addition, the ESS Team has an ESS Office and has developed an operational Grievances Redress Mechanism (GRM). Also, there is a suggestion box at the ESS Office.

CHAPTER FOUR

4.0 ENVIRONMENTAL BASELINE CONDITIONS

4.1 Physical Environment

4.1.1 Topography

The general topography of the Dar Es Salaam regions is shown in **Figure 4.1-1.** The region is divided into three distinct morphological zones[47] as shown in **Figure 4.1-2.** These include the upland zone comprising of the hilly areas to the west and north of the region; the middle plateau; and the low lands. In general, most of the Kinondoni municipality is within the lowland plateau.

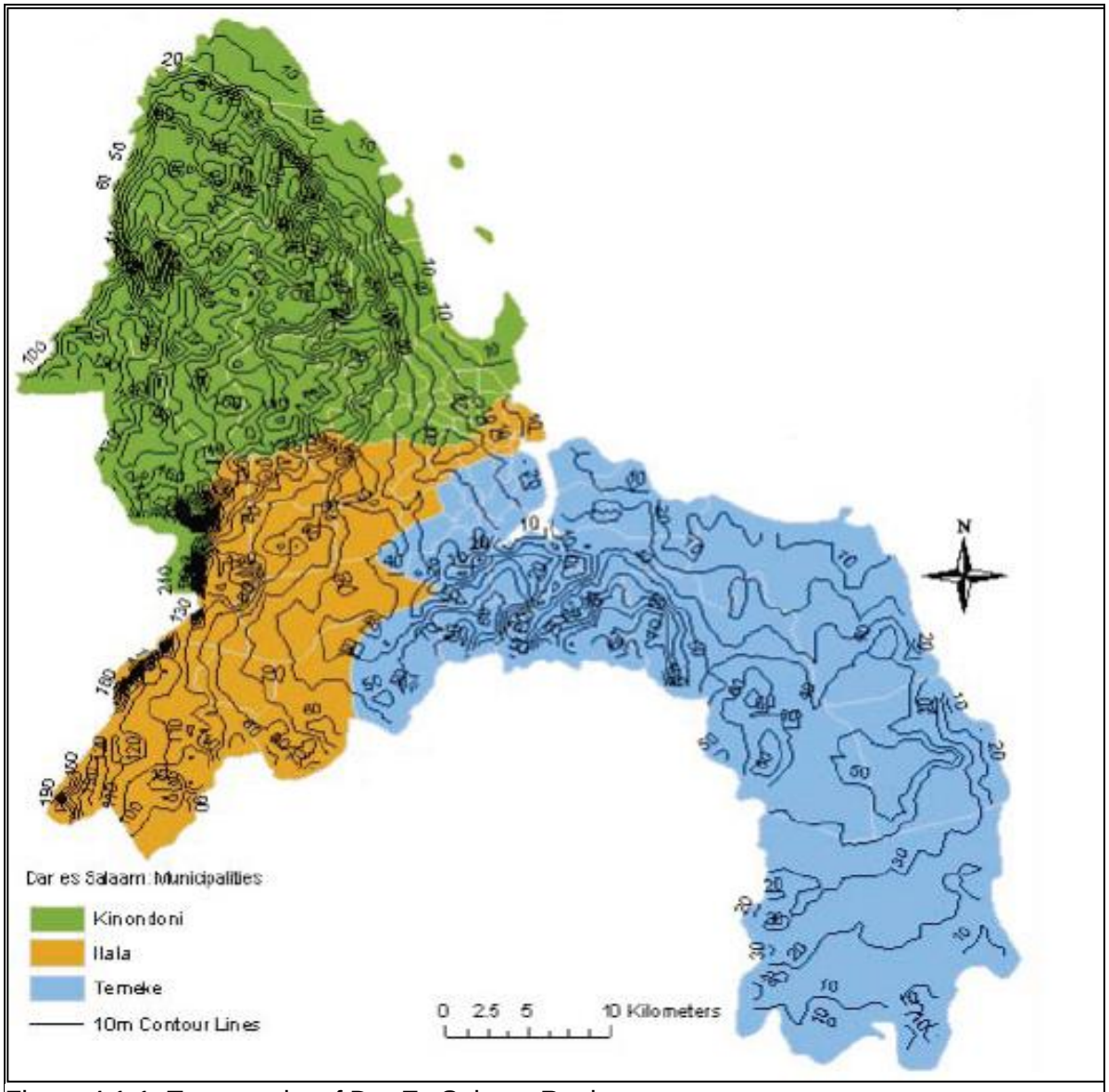


Figure 4.1-1: Topography of Dar Es Salaam Region.

Source: Dar Salaam City Profile (2004). By Dar Es Salaam City Council

[47] Final Report Urban Poverty & Climate Change in Dar es Salaam, Tanzania: A Case Study. *Prepared/contributed to by:* Pan-African START Secretariat International START Secretariat Tanzania Meteorological Agency Ardhi University, Tanzania. March 10, 2011

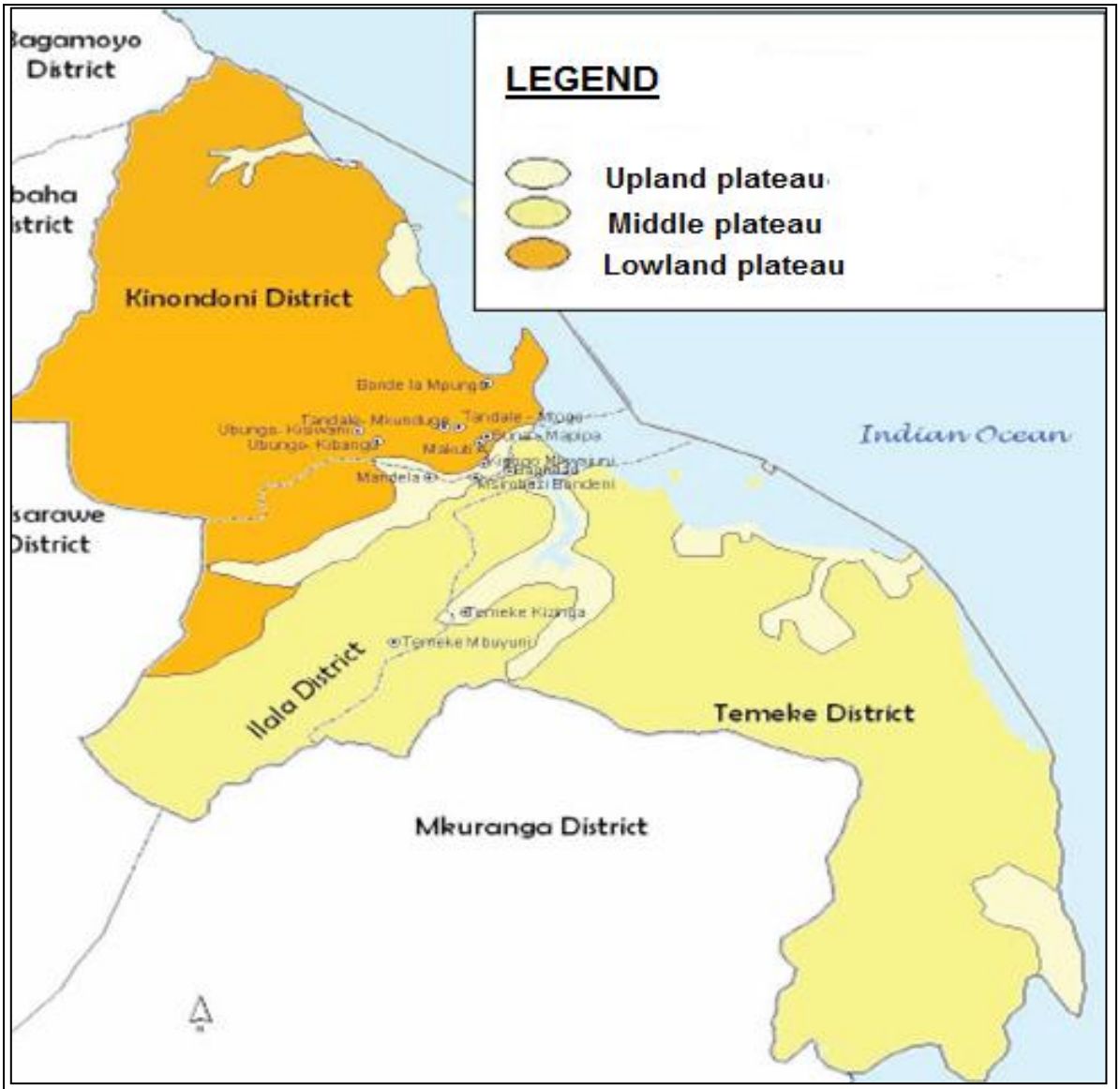


Figure 4.1-2: Morphological zones of Dar Es Salaam Region.
Source: Final Report Urban Poverty & Climate Change in Dar Es Salaam, Tanzania.

4.1.2 Climate

The project area has a tropical climate characterised by hot and humid weather throughout much of the year with an average temperature of 29ºC. In general, the climate is influenced by its proximity to the warm Indian Ocean. The hottest season is from October to March during which temperatures can raise up to 35ºC. It is relatively cool between May and August, with temperature around 25ºC.

The area has a tropical wet and dry climate with two distinct rainy seasons. These include the “long rains” between March and May, and "short rains", from October to December. The average rainfall is 1000mm (lowest 800mm and highest 1300mm). Humidity is around 96% in the mornings and 67% in the afternoons. The project area is relatively cool between May and August, with temperature around 25ºC[48].

[48] African Development Bank Group. Dar Es Salaam Bus Rapid Transit Project, Tanzania. Environmental and Social Impact Assessment Summary. March 2015.

4.1.3 Climate Change

The following tabulation outlines the possible climate change events, risks and proposed mitigation measures to minimize climate change impacts.

Climate event	Risks to the road	Measures
Heavy rain for longer periods	▪ Water overtopping on road crest. ▪ Increased capacity of moistures and decreased cohesion of soil and increased seepage and infiltration across road body. ▪ Drainage system over capacity of and increase drainage erosion. ▪ Embankment instability or loss, road wash away.	▪ Increase road level to at least 0.5 m over the maximum flood level. ▪ Erosion protection ▪ Increase capacity of culverts ▪ Build up weirs and spillways ▪ Increase capacity of compaction (lower moisture percentage) ▪ Decrease hydrodynamic force of water through planting grass ▪ Use resistant materials for building roads.
Storm events (Typhoons, Cyclones) and extreme winds	▪ Destabilisation of bridges ▪ Falling trees blocking the roadway. ▪ Damage to road traffic signs, street lights and traffic lights.	▪ Increase capacity of spillways and culverts ▪ Embankment protection through tree plantings ▪ Increase road inspections ▪ Decrease road traffic during storms

4.1.4 Greenhouse Gas Emissions

Tanzania's total GHG emissions in 2014 were 286.49 million metric tons of carbon dioxide equivalent (MtCO2e), totalling 59% of GHG emissions[49]. In Tanzania, 72.7 percent of GHG emissions come from the land-use change and forestry sector, followed by agriculture, energy, waste, and industrial processes which contribute 17.3 percent, 7.8 percent, 1.6 and 0.5 percent relatively to GHG emissions[50].

According to WRI CAIT, the GHG emissions in Tanzania, increased by 3% between 1990 and 2014 by 9 MtCO2e, while GDP grew 234%, averaging 5.2% annually. Although GDP grew faster than GHG emissions, in 2014, Tanzania's emissions relative to GDP were almost eleven times the world average, indicating significant potential for improvement[51].

In its Intended Nationally Determined Contribution (INDC), Tanzania states its goal to embark on a climate resilient development pathway that will reduce GHG emissions by 10% to 20% by 2030, relative to the projected 2030 business-as-usual emissions of 138-153

[49] Greenhouse Gas Emissions in Tanzania. USAID. https://www.climatelinks.org/resources/greenhouse-gas-emissions-factsheet-tanzania

[50] Food and Agriculture Organization of the United Nations Statistics Division (FAOSTAT). Tanzania, Emissions – Land use total and Emissions – Agriculture total, viewed on August 19, 2018.

[51] Greenhouse Gas Emissions Factsheet: Tanzania. Greenhouse Gas Emissions in Tanzania. Tanzania Numbers at a Glance (2014). USAID. https://www.climatelinks.org/resources/greenhouse-gas-emissions-factsheet-tanzania

MtCO2e[52]. The INDC also identifies intended actions whose implementation would reduce emissions while developing Tanzania's agriculture, livestock, forestry, energy, transport, waste management, coastal / marine / environment / fisheries sector, water resources, tourism, human settlements, and health sectors[53]. However, according to the NDC Report (2021)[54], Tanzania will reduce greenhouse gas emissions economy-wide between 30-35% relative to the Business-As-Usual (BAU) scenario by 2030, whereby about 138-153 Million tons of Carbon dioxide equivalent (MtCO2e)-gross emissions is expected to be reduced, depending on the baseline efficiency improvements, consistent with its sustainable development agenda.

The amount of GHG emission from transportation in the Dar Es Salaam City was estimated[55] to be ktCO2e 490, whereby ktCO2e 440 was from Light Duty Vehicles (LDV), ktCO2e 20 from Daladala, ktCO2e30 from Bajaj or Bodaboda. However, the residential emissions were found to be higher than emissions from transportation at ktCO2e 1,400 with tCO2e/capita of 0.2.

In 2030, the total GHG emission from transportation will be ktCO2e 700, whereby ktCO2e 560 will be from LDV, ktCO2e, ktCO2e 40 from Daladala ktCO2e 50 from Bajaj and Bodaboda Use, and ktCO2e 0.4 from urban transport use[56]. It can therefore, be noted that the amount of GHG is expected to increase in future but GHG emission from DMDP 2 use will be very small compared to other transport modes.

4.1.5 Ambient Noise and Vibration Levels

4.1.5.1 Noise Levels

The results of noise and vibration measurements carried out along the road sections between 17th and 18th August 2023 are shown in **Table 4.1-1.** The methodology and measurement locations for ambient noise levels along the road sections are provided in **APPENDIX 5.** Noise monitoring should be carried out using a Type 1 or 2 sound level meter meeting all appropriate IEC standards. Monitors should be located approximately 1.5 m above the ground and not closer than 3 m to any reflecting surface (e.g., wall).

The results indicate Msasani Roads (1-6) had the highest noise levels, followed by Tingisha Road (63.6 dBA), Binti Matola Road (63.0 dBA), Baraza Road (62.6 dBA), Nakalekwa Bwawani Road (61.3 dBA), Bima-Msikitini–Viwandani (60.2 dBA), Viwandani Extension Road (60.0 dBA). For other road sections the noise levels ranged from 52.8 dBA to 59.9 dBA. The ambient noise levels were higher than Tanzania Standards

4.1.5.2 Ground Vibration

The recorded vibration levels were ranging from 0.35 to 4.60 mm/s PPV, with lowest vibration levels being recorded along Kanisa Road (-.35 mm/s) and highest along Binti Matola Road (4.60 mm/s). as shown in **Table 4.1-4.** This is followed by Amiri/Leni Tatu (Dawasa) Road (4.34 mm/s), Tingisha Road (4.20 mm/s), The high vibration levels along those road section could be attributed to movement of heavy trucks along the road sections. However, all vibration levels were above the prescribed Tanzania Standards (0.25 m/s^2).

[52] The United Republic of Tanzania. Intended Nationally Determined Contributions, 2018.
[53] Ibid.
[54] The United Republic of Tanzania. Vice President's Office. Nationally Determined Contribution. July, 2021. https://unfccc.int/sites/default/files/NDC/2022-06/TANZANIA_NDC_SUBMISSION_30%20JULY%202021.pdf
[55] Modelling future patterns of urbanization, residential energy use and greenhouse gas emissions in Dar Es Salaam with the Shared Socio-Economic Pathways. By Chibulu Luo, I. Daniel Posen, Daniel Hoornweg, Heather L. MacLean. Journal of Cleaner Production 254 (2020) 119998. https://www.researchgate.net/publication/338506682_Modelling_future_patterns_of_urbanization_residential_energy_use_and_greenhouse_gas_emissions_in_Dar_es_Salaam_with_the_Shared_Socio-Economic_Pathways/link/5f7c8ba4458515b7cf6a563b/download
[56] Ibid.

The measured vibration levels along all the road section are considered to be significant as the measured levels exceeded 0.15 mm/sec, which is the criteria established to evaluate the extent that can easily be detected by human being.

Table 4.1-1: Average Noise Levels Along the Road Corridors.

S/n	DMDP 2 Investment Road	Noise Levels (dBA)	Vibration (m/s^2)	Time (24hrs)
1.	Nakalekwa Bwawani Road	61.3	0.85	0630 - 0720
2.	Umoja Road	58.2	1.03	0724 - 0750
3.	Mivumoni Road	59.7	1.85	0805 - 0840
4.	Tegeta Police - Silver Road	59.3	0.67	0500 - 0545
5.	Mongela - Goba Road	58.8	2.62	1500 - 1600
6.	Tingisha Road	63.6	4.20	1210 -1230
7.	Binti Matola Road	63.0	4.60	0900 - 0930
8.	Amiri/Leni Tatu (Dawasa) Road	59.9	4.34	0600 - 0630
9.	Togo Roads	55.7	2.28	0700 - 0725
10.	Baraza Road	62.6	1.15	0900 -0940
11.	Makonde Road	59.0	2.25	1010 - 1025
12.	Mbezi Beach Roads (Hekima, Santiago,Ndafu)	59.9	1.60	1040 - 1150
13.	Kanisa Road	57.3	0.35	0945 - 1005
14.	Msasani Roads (1-6)	66.3	2.37	1700 - 1745
15.	Msikitini Bima Road	59.6	1.70	1310 -1340
16.	Bima - Msikitini - Viwandani	60.2	1.77	1240 -1300
17.	Viwandani Extension	60.0	2.10	1350 - 1420
18.	Mwanamboka Road	57.8	0.60	1500 - 1530
19.	Chama Migombani Road	52.8	1.60	1550 - 1620
TZS 932: 2017[57]		**55**	**0.25**	**-**
WHO/IFC/WB Guidelines[58]		**55**	**-**	**-**

4.1.6 Ambient Air Quality

4.1.6.1 Dust Level Measurements

The results of ambient air quality measurements carried out between 17th and 18th 2023, in terms of particulate matter (PM10 and PM2.5) and gaseous concentrations, along the road section are provided in **Table 4.1-2** and **Table 4.1-3**, respectively. In addition, the methodology and measurement locations fir ambient air quality along the road sections are provided in **APPENDIX 6.**

The results, indicate the Binti Matola Road has the highest concentration of PM2.5 (86µg/m^3) and PM10 (99µg/m^3), followed by Togo Roads, Amiri/Leni Tatu (DAWASA) Road, Nakalekwa Bwawani Road, Tegeta Police - Silver Road. The high values of PM2.5 and PM10 at Binti Matola Road could be attributed to dust emission due to high traffic volume along the road

[57] TANZANIA STANDARD. Acoustic — General tolerance limits for environmental and occupational noise. Acoustic — General tolerance limits for environmental and occupational noise TANZANIA BUREAU OF STANDARDS. © TBS 2017. Second Edition 2017.

[58] **Environmental, Health, and Safety (EHS) Guidelines**
GENERAL EHS GUIDELINES: ENVIRONMENTAL. NOISE MANAGEMENT

section. However, all values for PM2.5 and PM10 were below the prescribed TBS Air Quality Specifications[59] and WHO Guidelines

Table 4.1-2: Recorded PM2.5 and PM10 Concentrations.

S/n	Sub-project Roads	$PM_{2.5}$ (µg/m³) 24 hours	PM_{10} (µg/m³) 24 hours
1.	Nakalekwa Bwawani Road	48.66	55.77
2.	Umoja Road	14.66	16.44
3.	Mivumoni Road	20.8	23.8
4.	Tegeta Police - Silver Road	21.88	25.33
5.	Mongela - Goba Road	7.40	8.00
6.	Tingisha Road	15.50	17.50
7.	Binti Matola Road	86.00	99.20
8.	Amiri/Leni Tatu (Dawasa) Road	50.40	58.10
9.	Togo Roads	76.70	88.30
10.	Baraza Road	17.58	19.91
11.	Makonde Road	14.70	16.60
12.	Mbezi Beach Roads (Hekima, Santiago,Ndafu)	5.10	5.30
13.	Kanisa Road	6.66	7.16
14.	Msasani Roads (1-6)	12.6	16.6
15.	Msikitini Bima Road	7.05	7.60
16.	Bima - Msikitini - Viwandani	7.08	7.75
17.	Viwandani Extension	7.09	7.80
18.	Mwanamboka Road	51.00	58.6
19.	Chama Migombani Road	7.08	7.07
TZS 845: 2019[60].		**0.750**	**0.100**
WHO Guidelines[61]		**0.250**	**0/500**

Source: Field Measurements on August 2023.

4.1.6.2 Gaseous emission

In terms of gaseous emissions, the results indicate Baraza Road has the highest concentration of SO_2 (0.175 mg/m³) and O_3 (0.058 mg/m³), followed by Mbezi Beach Roads (Hekima, Santiago,Ndafu Road for SO_2 (0.007 mg/m³) and O_3 (0.022 mg/m³). The high concentration of gaseous emissions along these roads can be attributed to vehicular emissions along the road sections. However, the values at all locations did not exceed the Tanzania Standards for SO_2 (0.500 mg/m³) and O_3 (0.240 mg/m³).

[59] TANZANIA STANDARD. Air quality — Specification. TANZANIA BUREAU OF STANDARDS. © TBS 2019 Third Edition 2019.

[60] TANZANIA STANDARD. Air quality — Specification. TANZANIA BUREAU OF STANDARDS. © TBS 2019 Third Edition 2019.

[61] Environmental, Health, and Safety Guidelines. GENERAL EHS GUIDELINES.: ENVIRONMENTAL AIR EMISSIONS AND AMBIENT AIR QUALITY. Annex 1.1.5 - Fugitive PM Emissions Controls. International Finance Corporation) IFC) and World Bank Group. April 20, 2007

Table 4.1-3: Average Concentration Values of Gaseous Pollutants.

S/n	Sub-project Roads	CO (mg/m^3) 1 hour	SO_2 (mg/m^3) 1 h/24h	O_3 (mg/m^3) 1 hour	NO_2 /NOx (mg/m^3) 1 hour	H_2S (mg/m^3) 1 hour	VOC (mg/m^3) 1 hour
1.	Nakalekwa Bwawani Road	0	0	0	0	0	0
2.	Umoja Road	0	0	0	0	0	0
3.	Mivumoni Road	0	0	0	0	0	0
4.	Tegeta Police - Silver Road	0	0	0	0	0	0
5.	Mongela - Goba Road	0.33	0.01	0	0	0	0
6.	Tingisha Road	0	0	0	0	0	0
7.	Binti Matola Road	0	0	0	0	0	0
8.	Amiri/Leni Tatu (Dawasa) Road	0	0	0	0	0	0
9.	Togo Roads	0	0	0	0	0	0
10.	Baraza Road	0	0.175	0.058	0	0	0
11.	Makonde Road	0	0	0.022	0.077	0	0
12.	Mbezi Beach Roads (Hekima, Santiago,Ndafu)	0	0.007	0.022	0	0	0
13.	Kanisa Road	0	0	0	0	0	0
14.	Msasani Roads (1-6)	0	0	0.029	0	0	0
15.	Msikitini Bima Road	0	0	0	0	0	0
16.	Bima - Msikitini - Viwandani	0	0	0	0	0	0
17.	Viwandani Extension	0	0	0	0	0	0
18.	Mwanamboka Road	0	0	0	0	0	0
19.	Chama Migombani Road	0	0	0	0	0	0
TZS 845: 2019 [62].		**10**	**0.500**	**0.240**	**0.380/ 0.500**	**NM**	**6(8h)**
WHO Guidelines[63]			**0.020 (24h)**	**0.1 (8h)**	**0.200 (NO2)**		

Source: Field Measurements on August 2023.

[62] TANZANIA STANDARD. Air quality — Specification. TANZANIA BUREAU OF STANDARDS. © TBS 2019 Third Edition 2019.

[63] Environmental, Health, and Safety Guidelines. GENERAL EHS GUIDELINES.: ENVIRONMENTAL AIR EMISSIONS AND AMBIENT AIR QUALITY. Annex 1.1.5 - Fugitive PM Emissions Controls. International Finance Corporation) IFC) and World Bank Group. April 20, 2007

4.1.7 Geology and Soils

The geology of the project area is dominated by continental and lacustrine sedimentary formations[64]. The sub-soil is dominated by marine limestone, mainly comprised of sandy clay and clayey sands. According to the Geological Map of Tanzania[65] the project area is comprised of Mesozoic rocks, limestone, sandstone, shales and mark.

Generally, the soils are categorized as SAND and loamy SAND with good drainage properties. Along the road section the soils vary from SAND, loamy SAND and CLAY, and in some locations the soils to be silt SANDS.

4.1.8 Tectonics/Seismicity

According to the Modified Mercalli (MM) Scale[66], seismic activity around the Dar es Salaam Region can be classified as MM VI. Therefore, according to the scale the intensity of seismic activity is considered to be strong **(Table 4.1-1)** with earthquake magnitude of 5.0 **(Table 4.1-2).** The effect will be felt by all, and many will be frightened, some heavy furniture will be moved, a few instances of fallen plaster will occur, with slight damage.
In Dar-es-salaam earthquake hazard is classified as **medium** according to the currently available information[67]. This means that there is a 10% chance of potentially-damaging earthquake shaking in the project area in the next 50 years. Based on this information, the impact of earthquake should be considered in all phases of the project, during design and construction. Project planning decisions, project design, and construction methods should consider the level of earthquake hazard.

According to the historical data[68] there was no or low historical economic losses and casualties that have been reported in Zanzibar. Therefore, because Zanzibar is close to the Dar Es Salaam Region, the likelihood of earthquake occurring is low.

Table 4.1-1: Modified Mercalli Intensity Scale.

Scale level	Ground conditions
I. Not felt	Not felt except by very few under especially favourable conditions
II. Weak	Felt only by a few people at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III. Weak	Felt quite noticeably by people indoors, especially on upper floors of buildings: Many people do not recognize it as an earthquake. Standing vehicles may rock slightly. Vibrations are similar to the passing of a truck, with duration estimated.
IV. Light	Felt indoors by many, outdoors by few during the day: At night, some are awakened. Dishes, windows, and doors are disturbed; walls make cracking sounds. Sensations are like a heavy truck striking a building. Standing vehicles are rocked noticeably.
V. Moderate	Felt by nearly everyone; many awakened: Some dishes and windows are broken. Unstable objects are overturned. Pendulum clocks may stop.

[64] GEOLOGY AND MINERAL MAP OF TANZANIA. Patrice PINNA, Sospeter MUHONGO, Boniface A. MCHARO, Elizabeth LE GOFF, Yves DES CHAMPS, Francis VINA UGER and Jean Pierre MILESH, December 2004
[65] Source: . http://earthwise.bgs.ac.uk/index.php/Hydrogeology_of_Tanzania
[66] https://en.wikipedia.org/wiki/Modified_Mercalli_intensity_scale
67 ThinkHazard! GFDRR and WORLD BANK GROUP. https://thinkhazard.org/en/report/48358-tanzania-dar-es-salaam/EQ
[68] Southwest Indian Ocean Risk Assessment Financing Initiative (SWIO-RAFI): Component 1 -Hazard. FINAL Report Submitted to the World Bank June 1st 2016 https://www.geonode-gfdrrlab.org/documents/1075

VI. Strong	Felt by all, and many are frightened. Some heavy furniture is moved; a few instances of fallen plaster occur. Damage is slight
VII. Very strong	Damage is negligible in buildings of good design and construction; but slight to moderate in well-built ordinary structures; damage is considerable in poorly built or badly designed structures; some chimneys are broken. Noticed by
VIII. Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water.
IX. Violent	Damage is considerable in specially designed structures; well-designed frame structures are thrown off-kilter. Damage is great in substantial buildings, with partial collapse. Buildings are shifted off foundations. Liquefaction occurs. Underground pipes
X. Extreme	Some well-built wooden structures are destroyed; most masonry and frame structures are destroyed with foundations. Rails are bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed over banks.

Table 3.1-2: Correlation with Magnitude

Magnitude	Typical Maximum MM Intensity
1.0–3.0	I
3.0–3.9	II–III
4.0–4.9	IV–V
5.0–5.9	VI–VII
6.0–6.9	VII–IX
7.0 and higher	VIII or higher

4.1.9 Ground and Surface Water Resource

4.1.9.1 Surface Water Resource

The road sections cross several seasonal steams at various locations. Most of the seasonal streams are highly contaminated due to discharge of raw sewage wastewater from adjacent local residents and dumping of solid wastes. Sand mining activities is common in many stream/river beds, hence affecting the stability of the stream/river banks. As a result most of the natural streams/rivers are characterized by shifting of stream/river banks and flooding events during rainy seasons, hence the need for river training as one of the mitigation measures.

4.1.9.2 Ground Water Resource

The project site is within the Coastal Sedimentary Aquifer, which is typically five to 30 meters thick, with a water depth of 10 to 35 meters below ground. Water quality varies, with periodic nitrate and salinity issues and better productivity from limestone and sandstone, compared with shale and marl.

According to the hydrogeological map of Tanzania[69], the project area is within the Karoo Sandstone Aquifer is unconfined with the inter-granular flow and is also comparatively near-surface—boreholes are seldom drilled more than 80 meters deep. However, the baseline

[69] **Source:** Hydrogeology of Tanzania. http://earthwise.bgs.ac.uk/index.php/Hydrogeology_of_Tanzania

indicates there is not any groundwater source within the road corridor. It is therefore unlikely that ground water sources will be affected during construction.

4.1.10 Biological Environment

4.1.10.1 Flora

The project is located within heavily built-up urban environment with high rise or multi-storey buildings. Most of the existing flora is comprised of planted grass and ornamental or shade trees along the road sections. The most common tree species include Neem trees (*Azadirachta indica*) and Ashoka trees (*Polyalthia longifolia*) and a few African teaks (*Tectona grandis*).

4.1.10.2 Fauna

The existing flora provides a habitat for small mammals (e.g., rats and squirrels), insects, reptiles (e.g., snakes), amphibians (e.g., toads, and frogs), and birds (e.g., Indian house crow). However, the presence of Indian house crow ***(Corvus splendens)*** has resulted into elimination of other avian species.

4.2 Socio-economic and Cultural Environment

4.2.1 Population

According to 2022 National Population and Housing Census Kinondoni had a population of 982,328 **of** whic**h** 474,825 were males and 507,503 were females[70]. The annual growth is 2.1% and households are 299184 with average of 3.3 members per household. The sex ratio is 94 which mean in every 100 women there are 94 men. In Kinondoni MC projected population density estimated to be 3,881 people per square kilometres which is a little bit higher than the density in Dar Es Salaam Region which is 3.865. Population in the project wards is **480,730** male **230,181** female **250,549** with **143,537** households and sex ratio is 92 and household size is 3.3. It is therefore, estimated that the project is expected to benefit 49% of the entire municipal population. The population distribution in the project area is shown in **Table 4.2-1.**

Table 4.2-1:Population Distribution in the Project Area.

S/n	Ward	Male	Female	Total	Sex Ratio	No. HH	HH size
1.	Kinondoni	8,380	8,957	17,337	94	5,823	3.0
2.	Makongo	16,991	18,576	35,567	91	11,196	3.2
3.	Mbezi juu	24,336	27,149	5,485	90	16,146	3.2
4..	Wazo	73,027	79,986	153,013	90	44,155	3.5
5.	Kunduchi	43,232	46,582	89,814	93	26,125	3.4
6.	Kawe	32,154	35,521	67,675	91	20,370	3.3
7.	Mikocheni	12,076	13,357	25,433	90	7,325	3.5
8	Msasani	19,985	20,421	40,406	98	12,397	3.3
	TOTAL	**230,181**	**250,549**	**480,730**	**92**	**143,537**	**3.3**

***Source**: 2022 National Population and Housing Census. Volume 1A December, 2022*

4.2.2 Ethnic Groups and Customs

Local people of Dar Es Salaam are mainly of Bantu origin. The main dominant natives' ethnic groups in the Municipal are Zaramo and Ndengereko, but due to urbanization many people of different ethnicity have immigrated making a heterogeneous tribal composition where no single ethnic group accounts for more than 20 percent of the total Kinondoni population. The project area inherits a long-established Swahili-Arab Culture that predates Arabs Settlers. The

[70] The United Republic of Tanzania. Administrative Units. Population Distribution Report Ministry of Finance and Planning National Bureau of Statistics, Tanzania and Presidents' Office - Finance and Planning Office of the Chief Government Statistician, Zanzibar. December 2022

majority of ethnic groups speak Swahili, as a common language for communication and general trading.

4.2.3 Land Use and Land Tenure

4.2.3.1 Land Use

Kinondoni MC has a total area of about 231 Square Km and the land use planning is comprised of settlements with 106 streets whereby 49 streets (mitaa) are surveyed, 46 streets are un-surveyed and 11 streets are partially surveyed. Other land uses include industrial area (Mikocheni Light Iindustry, and Wazo Hill Cement Factory), Pande Game Reserve, Public and Private Institutions, Military Area (Lugalo and Mbweni) and Agriculture which is mainly conducted at peri-urban areas. **Table 4.2-3** below illustrates the land use distribution in Kinondoni Municipality.

Table 4.2-2: Land use Distribution in KMC.

Land Use Category	% of occupancy	Land Use Category	% of occupancy
Settlement area	82.8	Institutional and army area	6.3
Industrial area	5.4	Agricultural area	3.2
Game Reserve	0.7	Others	1.6

Source: Estimated report from KMC Land use Planning Department, 2021

4.2.3.2 Land Tenure

Land tenure is the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land. The Municipal Council is responsible for land use planning and land allocation. There is no discrimination between male and female regarding land ownership.

4.2.4 Community Structure

The main organization of Mtaa government in the study area is the Mtaa Assembly and Council. The Mtaa Assembly is made up of the adult members of the community and the Mtaa council is composed of 5 members comprised of men and women representatives. The Mtaa council is responsible for overseeing day to day activities in the Mtaa (sub-ward) as well as to make decisions on matter concerning the whole community. Functions of the Mtaa Assembly are the maintenance of peace and order the promotion of social welfare and economic development. The Council manages the mtaa and implements decisions made by the assembly.

Like the Municipal council, the mtaa government is arranged into a series of committee's and overseen by the Mtaa Chairperson, Mtaa Executive Officer (MEO), and mtaa leader members of the council). The main committees include Finance and Planning, safety and security, construction and finally Education, and social services. The sub-committee of the latter includes the water and sanitation committee, health committee, Environment committee and the school committee.

4.2.5 Employment

Employment pattern in the project area reflect urban characteristics whereby formal and non-formal employment is dominant. Employment in the Municipality reflects that private sector occupies 61%, self-employment 35% and public sector covers only 4%. Apart from non and informal employment, salaried employment found in the project area are in the sectors of education, health and administrative at ward and mtaa offices.

4.2.6 Distribution of Income

The socio-economic survey obtained from Dar es Salaam master plan carried out between 2016 to 2018 and information from local leaders as shown in **Figure 4.2-1**, indicated that, in the project area majority of residents earn income between TZS 50,000 and 1,500,000 about 71% of which 28% earns monthly income ranging from TZS 50,000 to 100,000, 21% earn income between TZS 100,000 and 200,000 and 22% ranging between TZS 200,000 and 1,500,000. Only 17% of the residents earn income above TZS 2,000,000 and 12% earn income above TZS 5,000,000. The figure below illustrates the income distribution.

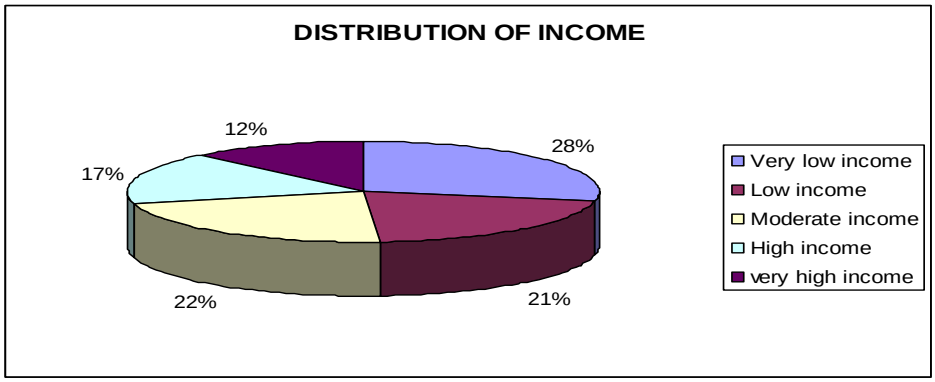


Figure 4.2-1:Income distribution in the project area.

Source: Field data August, 2023

4.3 Income Generating Activities (IGA)

The analysis of social economic activities determining income and expenditure patterns of people living along and adjacent DMDP2 selected Roads sections is discussed in relation to this project. In access to, and utilization of production resources, both genders are involved. Although men are still regarded as the family breadwinner gender relationships reflect the importance of both men and women in the present socio-economic set-up and activities in the area. Both men and women are engaged in whole sale business, retail business, operating food-vending, industrial sector, horticulture and agriculture.

4.3.1 Medium, small-scale (micro) enterprises and retail shops

This is important sector, a first main occupation of the interviewed stakeholders (DMDP2 road sections) followed by formal and non-formal employment and urban agriculture. The activities include retail shops, small restaurants and petty trade.

4.3.1.1 Retail shops

Currently the residents along the project roads have retail shops particularly in all business centres in all 8wards. The shops and kiosks stock a wide range of goods including foodstuffs, household utensils, school supplies, textiles, cosmetics and minor spare parts for motorbikes, bicycles. The photograph below shows different commodities found in one street in the project area.

However, some of the goods are slow moving commodities because of many shops selling the same items. Construction materials such as corrugated iron sheets and cement are mainly found in some shops in Mwenge, Kunduchi Mtongani and Tegeta while other small centres are mostly equipped with other consumable goods. The shop operations adopt various techniques to keep the operation costs low. For example, some shops are often located in one of the rooms within the homestead which are along the project roads and usually attended and managed by members of the household. Other shops are located in hired frames and most of them possess a single room.

4.3.1.2 Restaurants and food vending

There are medium and small restaurants and numerous food vendors in business centres in the project area especially at Mtongani, Mwenge, Tangibovu, Tegeta and Makonde. The restaurants serve soft drinks, tea snacks and meals basically to industrial workers, visitors and limited number of students. It was noted that restaurants and food vending employ a good number of girls in a daily basis and wages range from TZS 5,000 to TZS 10,000. These girls apart from preparing food they also supply to the customers in their respective offices of working places. This technique is to reduce the walking distance of customers and increase income to the owners. In rare cases girls are paid according to the plate of food they sell daily.

4.3.1.3 Flower Vendors and Furniture dealers

Furniture dealers are one of emerging petty business groups in the project area. In estimate the sector employs more than 80 youth along the project roads. Furniture dealers are often displayed the furniture along the project road (as a show room) or customers to view them and buy. Furniture workshops are located away from the project road so during construction workshops will not be affected. Furniture is displayed during the day and in the evening is collected back to the stores. During discussion with dealers revealed that a set of table and six chairs is sold at TZS 700,000 to TZS 1,000,000 depending on the type of wood (timber) used to make them.

4.3.1.4 Bodaboda and Bajaj Operators

This is the recently emerged business which employs many youths. The business deals with transportation of passengers from and to the trunk roads to/from remote areas with transport difficulties. Due to transport congestions in Dar es Salaam Bodaboda are used as means of transport which penetrates during traffic jams and reach the intended destination within a reasonable time. So many workers and people who want to reach early at their respective destinations opt Bodaboda than other commuters. Most of the Bodaboda operators do not own the bike but they work for wage in daily basis. However, few of them engage in contract with owners and after servicing the agreeable amount, the operator owns the bike. Bodaboda business makes more than TZS. 30,000/= and pays the owner TZS 10,000 daily. It means the operator can accumulate TZS. 20,000/= daily as a daily wage.

4.3.1.5 Small Business Operators

Petty trade includes selling a range of products in small and medium quantities in stalls/shelves along the project roads and, in other areas, at the local market or along the streets especially in business centres like Mwenge, Tegeta and at the market square in Msasani Bonde la Mpunga. The products sold include rice, maize and cassava flour, vegetables, and dry cassava, and dried fish, and fruits. Other products dealt by petty traders include household utensils and textiles, mainly second-hand clothes.

4.3.1.6 Agriculture

As far as agriculture is concerned, there has been a significant variation in the production capacity of vegetables, fruits, coconut, cashew nuts and food crop in all wards under project and Kinondoni MC in general. For example, Kinondoni MC, agriculture provides 466.74 tons of food crops, which is only 0.18% of the total annual food requirement and actual food consumption is 255,064.38.

The major food crop grown includes cassava, sweet potatoes, paddy, maize andcowpeas. Cassava is the main food crop in the peri – urban areas. The main cash crops grown include a variety of vegetables such as amaranths (*mchicha),* and leek (*matembele*), fruits like citrus, passions, pawpaw (papaya), pineapples, mangoes, and cucumbers. The peri-urban agriculture is carried out in areas traversed by some of the road sections. These include Nakalekwa-Bwawani Road (7.32 k,); Umoja Road (3.86 km); and Mivumoni Road (4.79 km). The owners of cultivated farms along the road sections will benefit from improved road conditions due to increased access to the available market in the CBD for agricultural products.

4.3.1.7 Fisheries Activities

Fisheries activities are mainly done along Indian Ocean. Kinondoni MC possesses a coastline of about 143 km long along the Indian Ocean and there are about 2,978 fishermen and the total number of fishing vessels is about 501. The estimated quantity of fish catch per year is about 3,995.86 tones. There are about six (6) landing sites, among these only three landing sites are sheltered and those include Msasani, Kunduchi, and Ununio. There are about six (6) Beach Management Units (BMU's). These are Msasani, Kawe, Mbweni, Maputo, Kunduchi and Ununio. The Municipal also possess about 7 fishers associations found at Msasani, Kunduchi, Kawe Ununio and Mbweni (*Kinondoni MC, 2018)*.

4.3.1.8 Social Services

Provision of basic amenities is essential to the livelihood and human development. In the study area the core interest was the extent of provision, access among the residents and their impact in the community development. Some of the visited were education, health, transportation, water supply, energy and others.

4.3.1.9 Education

In this section education is divided into three areas of pre-primary, primary and secondary education. All wards in the project have pre, primary and secondary schools and specifically almost every Mtaa has one or two pre and primary schools. Kinondoni MC has 161 Pre - Primary Schools out of which 78 belong to Government and 83 are owned by private sectors.

Also, Municipal has 163 Primary schools, whereby 79 are owned by Government and 84 Primary Schools are owned by Private Sectors. All 77 Government Primary Schools have a total number of 86,672 pupils from Pre-Primary level to Primary level and 1975 teachers and Private Schools has total of 34,170 pupils.

Since some schools are along DMDP proposed roads in both sides, the Contractor must take stern measures on road safety to avoid road accidents which may involve school children particularly during school sessions when going to school, during break hours and in the afternoon when lessons end.

4.3.1.10 Health

Health is one of the key sectors of which people depend on it when seeking their health status. The DMDP2 project will also require the services from health sector as construction workers will have to seek health services when get injuries or for the sake of knowing their health status. The KMC currently has a total of 188 health facilities of which 27 are government owned, while the remaining 161 are privately owned, as shown in the **Table 4.2-2.** The most common diseases in the project area are shown in **Figure 4.2-4**, whereby the leading ones are birth asphyxia, anaemia, and prematurity.

The availability of health facilities in the project area implies that the project will not have significant pressure on medical services and the construction workers will benefit from the existing medical services.

Table 4.2-3: Number of Health Facilities in KMC.

Health Facility	Ownership		Total
	Government	Private	
Hospitals	1	23	24
Health Centres	2	7	9
Dispensaries	23	74	97
Clinics	1	56	57
Maternity Homes	0	1	1
TOTAL	**27**	**161**	**188**

Source: KMC Socio-economic profile, 2018.

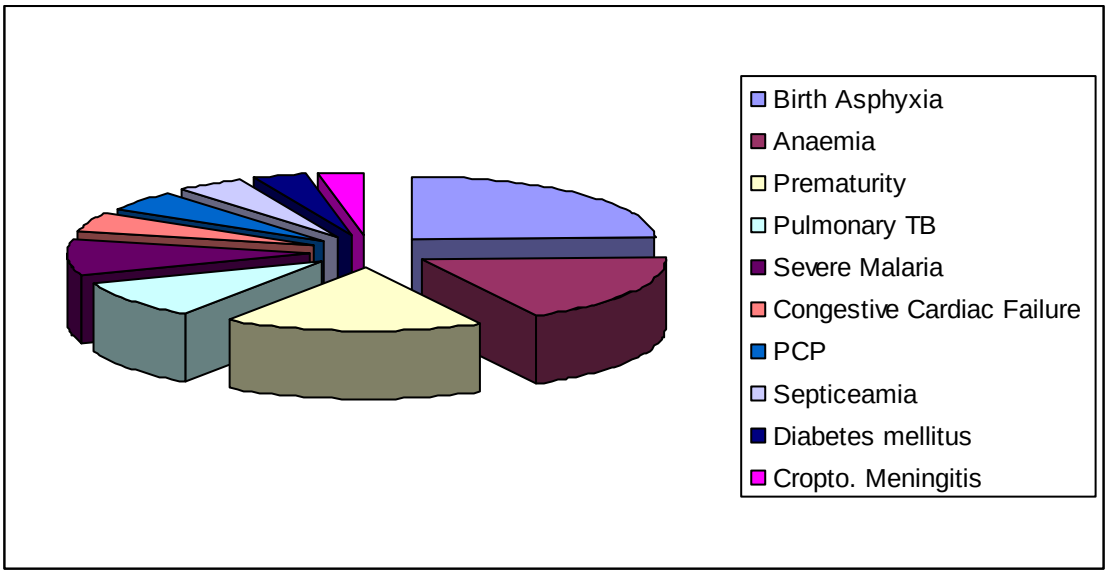


Figure 4.2-2: Ten Common Diseases in the Project Area in 2018.

Source: KMC Socio-economic profile, 2018

4.3.2 Transport

Transportation plays a major role in urban development enabling movement of both people and goods between points. For Dar Es Salaam, transportation is dominated by public transit and walking between its primary roads and arterial roads. Traveling for Dar Es Salaam residents is influenced by behaviour, proximity, and a mix of land use, density, and design. The city's residents travel short distances but with much difficulty, leading to low levels of mobility and therefore, difficulty in meeting transportation demands. The poor level of mobility is caused by overpopulation, poverty, and uncontrolled urban growth, factors that directly affect the provision of transport services and transportation infrastructure construction. Thus, DMDP2 project will solve transport difficulties by connecting people from their destination to Rapid Transit Buses and to other social services.

4.3.3 Water Supply

The main source of water for Kinondoni residents is from Lower and Upper Ruvu which is managed by Dar-Es-salaam Water and Sewerage Authority (DAWASA). In Kinondoni MC The

water from DAWASA systems contributes 81% of water being consumed daily and the rest is contributed by deep wells which owned by both private and community.

4.3.4 Sanitation

In regard to solid waste collection and transportation, there has been an increase in rates of solid waste collected and transported to the disposal site since 2000, when Councils opted to work in partnerships with the private sector as contractors of solid waste collection and transportation, the collection rate decreased from 650 tons in 2015 to 550 tons per day 2018 and disposed of. The decrease was due to decrease of skip buckets, decrease in number of skip loaders, and decrease in number of refuse trucks The main factors contributing to low level of solid waste collection include: -

- fast population growth resulting in daily waste generation levels that exceed the handling capacities of the council
- limited financial resources which constrain the ability of the council to secure the necessary infrastructures and appropriate equipment in adequate numbers to provide the services

4.3.5 Energy

Electricity is the power source for domestic, commercial premises, institutions and industries. All Municipalities are connected to the National grid. The power supply line connects almost all wards except few wards in per-urban.

Another major source of energy is Fossil fuels. Petroleum products are the most important source of lighting energy in rural areas and even in urban areas. Fossil fuels also do energize transport, industries and various commercial establishments. The Municipalities and project area in general are supplied with petroleum products from private companies. Gas is another energy used in households mainly for cooking and few industries also use it as source of running machines.

Low and medium income earners in both rural and urban use fuel wood. Charcoal is the most important form of energy used for domestic purposes such as cooking. Solar energy is also available to few individuals with the financial ability to install.

4.3.6 Gender Issues

Gender empowerment ensures that, all sexes particularly women are fully participating in policy and decision-making processes and in all aspects of economic, socio-cultural, participation in managerial, political, professional, and technical personnel. It is within this context women are encouraged to participate fully in this project from the planning stage, construction, and operation stages as one of the most beneficiaries of employment in the project. In the project area women are significantly involved in implementing activities especially in economic activities besides horticulture, 60% of the interviewed women were engaged in business activities such as selling of food crops, local brewing, food vending and alike.

For example, in Ilala Women groups have been assisted in different projects. In 2015, data available shows that there were 298 women groups with 1,489 members among them 92 groups were loaned 774,652,652.00. In 2018, there were 2322 women economic groups, with members being 11,624 who were loaned Tsh 1,021,200,000.00 who were engaged in a variety of economic activities such as petty business, agriculture and animal husbandry, Batik, tie and die and food/beverages processing.

The unequal access to economic opportunities such as sharing of household income and other family/clan wealth existing between men and women leaves women with minimal options of earning their lives decently. It is reported that sometimes some of the women resort to promiscuity in order to meet their needs. With the prevalence situation of HIV/AIDS, they place themselves in a high-risk. Furthermore, women and girls are more vulnerable as they face early pregnancies, school dropout, early marriages, raping, unequal gender roles and prevalence of STDs among women and girls.

4.3.7 Gender Based Violence (GBV)

Gender Based Violence has been defined as "any harmful act that is perpetrated against a person's will and that is socially ascribed (gender) differences between males and females. GBV has a greater impact on women and girls, as they are most of often the survivors and suffer of great physical damage than men. At this juncture, GBV data is collected at Municipal level from which the project area is part of the Municipal. However, through anecdotal information from the Mtaa leaders indicate that physical violence do happen in the families but they are not recorded. When violence becomes tense is reported either at Municipal or Police station under Gender Desk. Data showing magnitude of GBV at Municipal and Police Commander- Police Region Kinondoni are presented hereunder.

Kinondoni Municipal Council like other councils in Tanzania is not exceptional on prevalence of GBV. It was reported that in 2022 there were 248 cases reported at Gender Desk Department (under Municipal Medical Officer – Social Welfare). Out of all cases reported 184 cases were physical violence against women and 21 cases physical violence against men, 29 cases raping (women) and 14 cases were psychological violence against women. From January to March 2023 GBV cases were 75 and all fall under physical and psychological violence as shown in the **Table 4.2-5.**

Table 4.2-4: GBV status in Kinondoni MC from January to March, 2023

S/n	Month	Status of GBV from January to March, 2023 KMC			Total
		Male	Female	Type of Violence	
1.	January	17	14	Physical and Psychological/Emotional	31
2.	February	7	6	Physical and Psychological/Emotional	13
3.	March	18	13	Physical and Psychological/Emotional	31
	Total:	**42**	**33**	**Total:**	**75**

Source: Field data May, 2023

The GBV records obtained from the Police Commander (RPC) Kinondoni in recent years shows that a total number of 258 people were victims of GBV at different levels as shown in the **Table 4.2-6** below.

Table 4.2-5: GBV data obtained from RPC office Kinondoni Police region, 2021/22

S/n	Type of GBV	Number of Victims		
		Male	Female	Total
1.	Physical Violence *including beating, punching, pushing, grabbing, maiming, and killing with or without weapon, FGM etc.*	27 (using objects/soft weapons)	108 (using objects/soft weapons)	135
		1 (No weapon)	1(No weapon)	2
2.	Psychological Violence *include verbal abuse, scolding, isolating and verbal humiliation*	5	18	23

3.	Sexual Abuse include *rape, dishonesty in relationship, forced unprotected sex, touching of private parts of a person without her/his consent etc.*	12	71	83
		0	15 (Assault/attack of shame)	15
4.	Economic abuse *includes lack of voice in economic rights affecting one, working for less pay*	0	0	0
	:		**Total:**	**258**

Source RPC office Kinondoni, 2021

The main challenge of such violence in the project area is basically on economic constraints, attitudes, norms and behaviours that are deep-rooted in the families, homes and communities and institutionalized at all levels and consequently producing a culture of social acceptance of gender violence, especially violence against women. It is within this context that the project at hand, must apply GBV protective mechanism to reduce the violence against women particularly during construction. Regarding the GBV status in the project area the proposed best mitigation measures should be the following: -

1. Awareness education on the rights of workers and community surrounding the project area in this case all 8 wards and specifically the sub-wards (Mitaa) which are traversed by the project roads. The Contractor will be responsible of hiring a Service Provider who will carry out GBV and HIV/AIDS, STDs and TB awareness campaign. KMC on the other hand will supervise the campaign throughout the construction phase.
2. In line with awareness campaign, the Contractor must develop different policies to curb GBV impacts to his workers and nearby communities. These policies include (i) Gender Based Violence and Sexual Harassment Policy (ii) Child Labour Policy (iii) Workers Code of Ethical Conduct (iv) Grievances Redress Mechanism Plan (v) Crime Management Plan (vi) Labour Influx Plan. These policies and Plans will be used as yardstick in controlling GBV at work places and in communities around the project area.

4.3.8 HIV / AIDS Prevalence

According to Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS, 2017/18), Tanzania is experiencing some recent decline in national HIV prevalence. Between 2004 and 2012, the overall adult prevalence rate fell from 7% to 5.0 (from 6% to3.8% % for men and from 8%to 6.5% % for women). Declines in HIV prevalence were also observed among pregnant women attending antenatal clinics and among blood donors.

The downward trend in levels of HIV infection correlates with the reduction in behaviours known to have a high risk of transmitting HIV. For example, in the 15-49 age group, casual sex with non-marital, non-cohabiting partners declined from 46% to 29% among men, and from 23% to 16% among women.

The HIV/AIDS pandemic is still considered a killer disease in all the regions including Dar es Salaam. It was revealed from the reported cases that in 4 years from 2015 to 2018 people were tested as follows: In 2015, a total of 208 persons were tested, 314 in 2016, 2,445 in 2017 and 9,397 in 2018. The same report reveals that expectant mothers 49,823 were also tested for HIV/AIDS status as well as their new born in 2018 which indicated that 2.7% were HIV/AIDS positive. The number of children born with negative status ware 40312 and 1521 children was HIV positive.

Regarding the life style of the people and socio-cultural and traditional practices, the project area is not different from other communities with similar traditions which in one way or another early marriage, raping cases and early pregnancies are indicators of activities fuelling the prevalence of HIV.

In the project area, KMC has HIV prevalence of about 2%. With the coming project stern measures should be taken to prevent the spread of it through HIV awareness campaigns including safe sexual relations and fidelity to couples. The Contractor must develop HIV/AIDS Prevention Policy to control the spread among workers and communities nearby the project.

Since the project is implemented in KMC then the Municipal has a role to prevent the spread and prevalence of HIV/AIDS in the entire municipal through collaboration of public and private partners in the following services:

- Voluntary Counselling and Testing (VCT).
- Treatment for AIDS patient with Anti-Retro Virus Drugs (ARVs).
- Providers Initiating Testing and Counselling (PITC).
- Prevention from Mother to Child Transmission (PMTCT).
- TB and HIV services.
- Treatment of Sexually Transmitted Infection (STIs)
- Home Based Care (HBC) Services (HBC).

So, during project implementation the Contractor will collaborate with KMC in HIV/AIDS awareness campaign to both Contractor's workers and the Communities adjacent the project area.

4.3.9 Prevention of Corona Virus Diseases- 2019 (COVID-19)

In general, COVID 19 cases in the region and Municipal are not significant but for the coming project, COVID 19 prevention measures must be taken care of. A number of measures must be taken by the Contractor including designation of special person's Risk Monitoring at campsite and working sites. The other control measures will include the use of sanitizers, the mobilization of temperature detecting machines to record body temperature of each employee and visitors in the project. Therefore, it will be mandatory for every employee and visitors to undergo body temperature testing at least twice a day in the morning during reporting time and afternoon after lunch and before work closing time.

4.3.10 Historical and Cultural Resources

The only important cultural property in the project area is the existing grave yard along Baraza Road Section. Otherwise, there are no any other important historical and cultural resources along the road sections.

4.3.11 People's Aspirations and Attitude to the Project

Transport in Dar Es Salaam is a major problem faced by almost every resident in the City despite his/her age. Workers and school children face constant transport hurdles in the morning and in the evening. The proposed DMDP2 project seemed to be the best solution of ferrying magnitude of passengers in peak hours to and from city centre.

4.3.12 On-going and Planned Projects

The BRT Phase 3 and BRT Phase 4 Projects are currently on-going projects in the Kinondoni Municipality. The BRT Phase 5 and BRT Phase 6 are the planned projects located in Kinondoni Municipality. These BRT projects are likely to overlap with the DMDP 2 Subprojects and therefore are likely to create some cumulative impacts during construction and operation phase. The location of the ongoing and planned BRT projects is provided In **APPENDIX 7,**

(a) BRT Phase 3

The BRT Phase 3 corridor, which covers about 23.6 km is being implemented along Nyerere and Bibi Titi Mohamed Roads (17.4 km), Nelson Mandela Road, Uhuru, Shaurimoyo and Lindi Streets (3.85 Km) and Maktaba/Azikiwe Street (0.9 Km).

(b) BRT Phase 4

The BRT Phase 4 corridor, which is comprised of about 30.12 km, covers:

- Bibi Titi Mohamed road from Maktaba Street junction to Ohio Street junction (0.23km);
- Ali Hassan Mwinyi road, from the junction of Ohio Street to Morocco (5.92 km);
- New Bagamoyo Road from Morocco junction to Tegeta (DAWASA Daladala Bus Station) (20 km); and
- A spur on Sam Nujoma Road from its junction with New Bagamoyo Road to Ubungo junction (4 km).

(c) BRT Phase 5

The BRT Phase 5 corridor comprising of about 22.8 km covers:

- Mandela Road from its junction with Uhuru Street at Buguruni to Ubungo (~7.56 km);
- New/proposed route linking Upanga area and Sam Nujoma Road via Msimbazi valley, Kinondoni Hanan Asif area, Mwananyamala and Sinza areas (15.24km).

(d) BRT Phase 6

The BRT Phase 6 corridor comprising of about 27.6 km covers:

- Mwai Kibaki Road from Morocco Junction and Old Bagamoyo Road ending at Kawe/TPDF Range Junction (7.78km); and
- Nyerere Roads via Buguruni, Kigogo, Kijitonyama and Mikocheni areas (19.82km).

CHAPTER FIVE

5.0 STAKEHOLDER CONSUTATION AND PUBLIC PARTICIPATION

5.1 Stakeholder Identification

The stakeholder engagement process is focused on identifying key stakeholders and informants who can further identify the full range of affected parties in the project area of influence. Identification of key stakeholders was based on the role, relevance and influence of an organization, group or individual to the proposed project. The stakeholders that can influence or affect the project and those who can be influenced and affected by the project were predetermined based on their roles and pertinence to the project, nature of the proposed project activities, discussions with the Client and the Consultant's experience within Tanzania in relation to DMDP Phase 2.

The identification of stakeholders is based on how they are related to the project, how the project is going to affect them and why should they be consulted. The identified stakeholders with a rating of importance to the project are presented in **Table 5.1-1.** The list will be periodically updated and expanded, particularly during the RAP implementation phase of the project.

Table 5.1-1: Identified Stakeholders for DMDP II Project.

Stakeholder Group	Key stakeholder	Connection to the Project	Level of Impact	Level of Influence	Level of Interest
Ministries, Departments and Agencies (MDAs)	President's Office-Regional Administration and Local Governments Authorities (PO-RALG)	Oversee the project infrastructure development in Dar Es Salaam through the Regional secretariat and municipal councils	High	High	High
	Ministry of Lands, Housing and Human Settlements Development	Facilitating land acquisition, approval of the valuation reports (Chief Government Valuer) and land use planning	Low	High	High
	Division of Environment in the Vice President's Office (DoE-VPO)	Assessment of environmental issues and submission of certificate for construction	Medium	High	High
	TANESCO	Custodian of National Grid Power required for road construction and responsible for relocation of electric poles along the roads under construction	Medium	Medium	Medium

Stakeholder Group	Key stakeholder	Connection to the Project	Level of Impact	Level of Influence	Level of Interest
	DAWASA	Custodian of Water supply along the constructed roads and responsible for relocation of water pipes crossing or within RoW in the roads under construction	Medium	Medium	Medium
	TPDC	Managing Natural Gas Pipes and responsible for relocation of gas pipes within RoW in project roads	Low	Medium	Medium
	TTCL	Custodian of National fibre/cables distribution and responsible for relocation of fibre cables within RoW in project roads	Low	Medium	Medium
Project Proponent	TARURA	Custodian of Rural and Urban Roads where this project belongs. Responsible for supervision, technical assistance and owner of the project.	High	High	High
Municipalities	Ubungo and Kinondoni municipal councils (Directors and Technical Departments)	Oversee and facilitate implementation of DMDP2 project including monitoring, facilitating land acquisition, compensations, access to ward and mtaa levels	High	High	High
Ward	10 wards traversed by the project roads	Directly affected communities/project beneficiaries as well as making decisions on matters related to the project including	High	High	High

Stakeholder Group	Key stakeholder	Connection to the Project	Level of Impact	Level of Influence	Level of Interest
		resettlement and compensation.			
Community	Community members in the respective Streets (“*Mitaa”)* traversed by the project	Directly affected communities/project beneficiaries as well as implementers at mtaa levels providing causal labour.	High	High	High
Private sector/	NGOs/ CBOs/ FBOs	Advocacy groups, Human rights supporting project implementation, monitoring issues	Medium	Medium	Medium
Interested and Affected Parties (I&AP)	Project Affected Persons (PAPs) along the project corridor	Directly affected individuals (resettlement), compensations and relocation to pave way for the project	High	High	High
Vulnerable groups	Vulnerable groups identified along the core project area included people with disabilities and the association of disabled, women groups, single-parents /children/elderly-headed households and orphans.	Likely to suffer more from the project resettlement. Expectation of Livelihood Restoration Plan (LRP) to assist them.	High	High	High
	Informal sector traders and hawkers (static and active)	Livelihood activities along the route. Provision of alternative area for business.	Medium	Medium	Medium

5.2 Stakeholder Analysis

According to ESS10 stakeholders can be categorized into individuals or groups who are affected or likely to be affected by the project (project-affected parties); and those who may have an interest in the project (interested parties)[71]. The affected parties can be affected positively or negatively and directly or indirectly, depending on their relationship with the project. However, for this project, stakeholders can also be categorized into “Developers” and “Decision Makers” as illustrated in **Table 5.2-1.**

[71] Para 5 of the ESS10.

5.2.1 Financiers and Developers

(b) Financiers

This project is being financed by the Government of the United Republic of Tanzania (GoT) and the World Bank (WB). The GoT and the WB are also responsible for ensuring the project is implemented in compliance with the relevant national policies, legislations and the World Bank's Environmental and Social Framework (ESF).

(b) Developers

The developers in this project are the President's Office, Regional Administration and Local Government (PO-RALG)[72] and Tanzania Rural and Urban Roads Agency (TARURA). he TARURA is responsible for overseeing proper design and construction of the proposed road infrastructure.

5.2.2 Decision Makers

The decision-making authorities are those institutions dealing with environmental management in the country and therefore they can decide on whether a project should be implemented or should not be implemented. These include the Division of Environment in the Vice President's Office (VPO-DOE) and National Environment Management Council (NEMC).

The VPO-DOE is responsible for approval of Environmental Impact Assessment report and issuance of Environmental Impact Assessment (EIA) Certificate. The National Environmental Management Council (NEMC) is responsible for screening and registration of the project, review and approval of scoping report and review of environmental impact assessment report and submission to the VPO-DOE for approval.

5.2.3 Interested Parties

The interested parties are those stakeholders who are not directly or indirectly affected by the project but they can influence the success or failure of the project or can provide advice to the project. For this project, the interested parties are Kinondoni Municipal Council (KMC), Ward Development Committees (WDCs), "Mtaa" Development Committees (MDCs), and Dar Es Salaam Rapid Transit Agency (DART) Agency). The Kinondoni Municipal Council is responsible for overseeing environmental management, land use planning and issuing building permits within its jurisdictional boundaries. The DART Agency is responsible for the establishment and operation of the Bus Rapid Transit (BRT) system for Dar Es Salaam., which is linked to the project roads.

5.2.4 Affected Parties

These are those stakeholders who can be directly or indirectly affected by the project, whether positively or negatively. The infrastructure / utility companies or authorities namely, Dar Es Salaam Water and Sewerage Authority (DAWASA), Tanzania Electric Supply Company Limited (TANESCO), Tanzania Telecommunications Limited (TTCL), are considered to be indirectly and negatively affected by the project. They can be negatively affected if the project results into relocation of infrastructure/utilities. For example, relocation of electricity power poles, telephone cables and water supply pipelines.

The local community members from the adjacent villages can be positively or negatively affected. It is expected that during construction some of the local community members will get temporary employment opportunity, hence considered to be directly and positively affected parties. Also, during construction, some small business operators like food vendors will get opportunity to increase their income by selling food items to the construction workers, hence considered to be indirectly and positively affected parties.

[72] In Kiswahili it is known as "Ofisi ya Rais, Tawala za Mikoa na Serikali za Mitaa (TAMISEMI)"

The local community members and vulnerable groups are also indirectly and negatively affected due to environmental, health and safety effects associated with the project activities. It is anticipated that during construction the project is likely to create some air pollution, noise nuisance, and health & safety risks to the local community members. Therefore, they are considered to be indirectly and negatively affected parties.

Table 5.2-1: Stakeholder Identification and Analysis Matrix

S/n	Stakeholder	Categorization
1.	The World Bank	
2.	The Government of the United Republic of Tanzania (GoT)	
3..	President's Office Regional Administration and Local Government (PO-RALG)	
4.	Tanzania Rural and Urban Roads Agency (TARURA)	
5.	Division of Environment in the VPO (DOE-VPO)	
6.	National Environment Management Council (NEMC)	
7.	Dar Es Salaam Rapid Transit (DART) Agency	
8.	Kinondoni Municipal Council (KMC)	
9.	Ward Development Committee (WDC)	
10.	Street ("Mtaa") Development Committee (MDC)	
11.	Tanzania Electricity Supply Company Limited (TANESCO)	
12.	Tanzania Telecommunication Company Limited (TTCL)	
13.	Dar Es Salaam Water and Sewerage Authority (DAWASA)	
14.	Local Community Members/Vulnerable groups.	

KEY	
	Financiers
	Developers/Financing Agencies
	Decision Makers
	Interested Parties
	Affected Parties (Directly and Positively)
	Affected Parties (Indirectly and Positively)
	Affected Parties (Directly and Negatively)
	Affected Parties (Indirectly and Negatively)

5.3 Stakeholder Consultation

The consultation with stakeholder representatives involved face to face interviews with representatives of relevant government institutions, agencies, and local government authorities. These include Regional Administration Secretary (RAS); Tanzania Telecommunication Company Limited (TTCL); Occupational Safety and Health Authority (OSHA).

5.4 Results of Stakeholder Consultations

5.4.1 Consultation with Stakeholder Representatives

The consultation with stakeholder representatives was carried out 28TH August 2023 In general, the stakeholders have raised some issues/concerns and have provided recommendations or mitigation measures. The record of issues / concerns raised during consultation with stakeholder representatives is provided in **APPENDIX 8.**

The raised issues/concerns were then analysed to determine the most affected Valued Environmental Components (VECs) based on the number of issues/concerns raised by the stakeholders. The analysis of issues / concerns raised by stakeholder representatives is provided in **APPENDIX 9.**

The analysis indicates issues / concerns raised by the consulted stakeholder representatives were more on Public Health, Safety and Security (9 Issues), followed by Pubic Services Infrastructure/Utilities (2 Issues), and lastly Labour and Economy, Transportation, and Terrestrial Environment (1 Issue@).
It can therefore be concluded that the stakeholder representatives were more concerned that the project will have more effect on public health & safety, public service infrastructure/utilities, labour and economy, severance of community access to the road sections, and flooding effects from roadside storm water drainages.

5.4.1.1 Recommendations

The following are some of the recommendations provided by the consulted stakeholder representatives:

- The project design must consider prevention of floods by construction of concrete or cement lined storm water drainages.
- The project should ensure continuous supply of water either by relocating, replacement or protecting water supply pipes
- Detailed design report should be submitted to OSHA explaining the potential hazards, risks and the use of PPE at the work area/place.
- During the design stage, all drawings should be submitted to OSHA for review before project implementation.

5.4.2 Consultation with Local Community Leaders

The consultation meeting was carried out with local community leaders of the project affected Mtaa and Wards. In general, the stakeholders have raised some issues/concerns have provided recommendations or mitigation measures. The record of issues / concerns raised by the local community leaders during stakeholder consultation meeting is provided in **APPENDIX 10.**

The raised issues/concerns were then analysed to determine the most affected Valued Environmental Components (VECs) based on the number of issues/concerns raised by the stakeholders. The analysis of issues / concerns raised by Ward and Mtaa leaders is provided in **APPENDIX 11.**

The analysis indicates the consulted local community leaders were more concerned on Current Land and Resources Use (6 Issues), followed by Transportation (3 Issues), Public Health, Safety and Security (2 Issues), Pubic Services Infrastructure/Utilities (2 Issues), and lastly Atmospheric Environment, Acoustic Environment, Transportation, and Labour and Economy (1 Issue@). It can therefore by concluded that the consulted stakeholders were more concerned about the effect of the project on the adjacent lands and properties, public infrastructure/utilities, noise and dust pollution, transportation and employment of local people during construction.

5.4.2.1 Recommendations

The following are some of the recommendations provided by the consulted local community leaders:

- Compensation of affected people (PAPs) should be fair and timely to avoid inflation.
- Companies with utilities along and across the road like DAWASA should relocate their infrastructure/utilities before construction to avoid inconveniences,
- Pedestrian walkways should be included in the design.
- The contractor should give the priority of employment to the people living adjacent to the project sites during construction.

- Contractors should cooperate with community in case of any damages caused by project activities to the properties.
- During construction phase; drainage system should be well constructed for handling floods during rain seasons.
- Construction should take into account historical background of a place before preparation of design drawings.
- People should be educated about possible social interactions which may lead to HIV/AIDS provenances and unwanted pregnancies and infidelity.
- During construction cracks on nearby houses mighty happen due to vibration, therefore compensation must be paid to the affected persons.

CHAPTER SIX

6.0 POTENTIAL ENVIRONMENTAL AND SOCIAL RISKS/IMPACTS

Preamble

In this Chapter, the assessment of effects/impacts has been carried out in two steps, whereby the first step is identification of impacts and the second one is determination of significance of impacts. The identification of impacts considers both positive and negative impacts which result from interaction between the Project related activities and Valued Environmental Components (VECs)[73]. The assessment also considers cumulative effects/impacts; impacts of the potential environmental effects arising from credible accidents, malfunctions, and unplanned events; and effects of the environment on the projects. For the purpose of this report, the term "environmental effects" will be taken to be synonymous to the term "environmental impacts" as referred to in the EIA and Audit Regulations (2005). As such, the EIA study considers environmental effects and impacts as defined by the national legislation. However, for convenience the term "impact(s)" shall be used throughout this report, unless otherwise specified.

6.1 Identification of Impacts

The identification of potential environmental effects/impacts is based on the interaction between the Project Related Activities and Selected Valued Environmental Components (VECs). The selection of VECs was based on existing project environment (environmental baseline conditions), opinions/views obtained from stakeholder consultations, and consultant's professional judgement. For this project the selected VECs include Atmospheric Environment; Acoustic Environment; Water Resources; Aquatic Environment; Wetland Environment; Terrestrial Environment; Public Health and Safety; Labour and Economy; Public Services Infrastructure / Utilities; Transportation; Current Land and Resource Use; and Cultural Heritage Resources. The potential interactions between the Project Related Activities and the Selected VECs for each phase of the project implementation are illustrated in **Table 6.1-1.**

Table 6.1-1: Potential Interactions of the Project with VECs.

Valued Environmental Components	Project Phase		
	Construction	Demobilization	Operation
Atmospheric Environment	✓	✓	✓
Acoustic Environment	✓	✓	✓
Water Resources	-	-	-
Aquatic Environment	-	-	-
Wetland Environment	-	-	-
Terrestrial Environment	✓	✓	-
Public Health and Safety	✓	-	✓
Labour and Economy	✓	✓	✓
Community and Public Services Infrastructure / Utilities	✓	-	-
Transportation	✓	-	✓
Land and Resource Use	✓	-	✓
Current Use of Land and Resources by Indigenous Peoples[74]	-	-	-
Cultural Heritage Resources	✓	-	-
Legend:			

[73] Valued Environmental Components can be physical, biological, social, economic or cultural

[74] Defined as members of those cultures which have historic, ancestral, spiritual and functional connection to the land on which and from which they live. Distinguished from members of those cultures whose connection to the land on which they live is limited to the historical period.

Valued Environmental Components	Project Phase		
	Construction	Demobilization	Operation
- No Substantial Interaction			
✓ Possible Interaction			

The potential risks/impacts can be categorized into generic and site-specific risks/impacts and can be positive or negative. Generic risks/impacts are those risks/impacts that are not site specific and not directly associated with construction activities along the road sections. The identified potential generic risks/impacts that are likely to occur are provided in **Table 6.1-2.**

Table 6.1-2: Identified Potential Generic Risks/Impacts

S/n	Potential Generic Riaks/ Impacts	Affected Component	Positive	Negative
1.	Creation of temporary employment due to recruitment of construction workers	Labour and Economy	✓	
2.	Loss of self-employment and income generation opportunity by small business operators	Labour and Economy	✓	
3.	Loss of employment due to retrenchment of construction workers after closure or completion of the project.	Labour and Economy		✓
4.	Increased prevalence of HIV/AIDS, STIs due to social interactions between construction workers and local community members.	Public Health and Safety		✓
5.	Creation of occupational health and safety risks to due to handling of hazardous materials or operation of construction equipment.	Public Health and Safety		✓
6.	Emergence of GBV/SEA and SH at due to gender inequalities among the project staff and workers.	Labour and Economy		✓
7.	Creation of income generation opportunities for local food vendors due to presence of construction workers along the road sections.	Labor and Economy	✓	
8.	Risk of environmental pollution due to lack of sanitary facilities at the construction sites.	Public Health and Safety		✓
9.	Increased risk of traffic accidents due to overseeding on the improved road sections.	Public Health and Safety		✓
10.	Reduced travel time, increased comfortability and productivity for local people due to improved road conditions.	Labour and Economy	✓	
11.	Reduced vehicle maintenance and operation costs due to improved road conditions.	Labour and Economy	✓	
12.	Reduced air pollution due to improved road conditions into bitumen or concrete standard.	Atmospheric Environment	✓	

The site-specific risks/impacts are those risks/impacts that are associated with construction activities along the road sections. The detailed description of potential site-specific risks/impacts associated with construction activities along the road sections and possible mitigation measures are provided in **APPENDIX 12.** In addition, the summary of identified site-specific potential risk/impacts associated with construction activities along the road sections is provided in **Table 6.1-3.**

Table 6.1-3: Identified Site-Specific Risks/impacts.

S/n	Site-Specific Risks/Impacts	Affected Component	Sub-project roads
1.	Loss of land ownership and other properties due to land acquisition.	Current Land and Resources Use	Tegeta Police - Silver Road (2.0 km) Binti Matola Road (0.77 km) Togo 2 Road (0.36 km) Togo 3 Road (0.20 km)
2.	Soil erosion and sedimentation of stream/riverbed due to destruction of stream/river banks vegetation cover.	Aquatic Environment	Nakalekwa-Bwawani Road.
3.	Loss of ecological functions and landscape quality due to removal of vegetation cover/trees.	Terrestrial Environment	Tegeta Police - Silver Road (2.0 km) Binti Matola Road (0.77 km) Togo 2 Road (0.36 km) Togo 3 Road (0.20 km)
4.	Creation of air pollution due to dust emission along the construction road sections.	Atmospheric Environment	All road sections
5.	Creation of noise nuisance and vibration effects on the adjacent buildings due to operation of mobile equipment/heavy trucks along the road section.	Acoustic Environment	All road sections
6.	Severance of community access to and from their residences/business premises due to deep excavations.	Transportation	All road sections
7.	Creation of landscape degradation and loss of aesthetic value of the surrounding environment due to accumulation of construction solid wastes.	Terrestrial Environment	All road sections
8.	Creation of construction related risk of accidents due to trespassing by unauthorized persons into the construction site.	Public Health and Safety	All road sections
9.	Disruption of socio-economic activities due to relocation of public service infrastructure/ utilities from the road section.	Community and Public Services Infrastructure / Utilities	All road sections
10.	Risk of traffic and construction related accidents to school children and sick persons.	Public Health and Safety	- Nakalekwa-Bwawani Road (7.32 km).

S/n	Site-Specific Risks/Impacts	Affected Component	Sub-project roads
			- Mivumoni Road (5.79 km) . - Tegeta Police-Silver Road (2.0 km) - Binti Matola Road (0.77 km) (Refer Section 6.3..2.10 for more details).

6.2 Assessment of Impacts

The purpose of impact assessment is to identify and evaluate the likely significance of the potential impacts on identified receptors and resources according to defined assessment criteria, to develop and describe measures that will be taken to avoid, minimize, reduce or compensate for any potential adverse environmental effects, and to report the significance of the residual impacts that remain following mitigation.

Therefore, the identified potential risks/impacts have been assessed by using Environmental Impact Assessment Matrix provided in **APPENDIX 13**, based on the Rapid Impact Assessment Matrix (RIAM) Methods[75]. The assessment of impacts helped to determine the significance of impacts based on the following criteria:

- ***Importance*** – whether important to national, regional or international interest or site specific.
- ***Magnitude of Change*** – whether Positive or Negative
- ***Permanence*** – whether condition is permanent or temporary.
- ***Reversibility***- reversible or irreversible.
- Whether ***Cumulative / Synergistic*** for positive and negative impacts, respectively.

The significance of impacts also took into consideration existing by-laws, national and international environmental standards, legislation, treaties, and conventions that may affect the significance of identified impacts. These techniques have been used in order to have a logical and systematic way of identifying, assessing, and analysing environmental impacts. The techniques also allowed subjective judgments to be quantitatively recorded and therefore make the assessment of impacts become more objective.

6.3 Environmental Impacts

6.3.1 Mobilization Phase

6.3.1.1 Loss of ecological benefits and landscape quality

The project will involve construction of roadside storm water drainages and pedestrian walkways. However, due to narrow corridor for some road section, there will be a need for removal of the adjacent vegetation cover/trees. The adjacent vegetation cover/trees apart from safeguarding the landscape quality also provide a natural habitat for variety of living organism like insects, birds, reptiles, etc. The adjacent trees provide shade for local people. Therefore, the removal of existing vegetation cover/trees is likely to result into loss of ecological benefits and landscape quality of the surrounding environment. The impact will occur along Tegeta Police-Silver Road (2.0 km), Binti Matola Road (0.77 km), Togo 2 Road (0.36 km), and Togo 3 Road (0.20 km)

The impact has been assessed to be ***indirect*** and ***negative*** with ***Medium Significance***; and is expected to be ***long-term*** and ***permanent*** as it will continue to occur even after the construction phase. However, its effects on the surrounding environment are ***Reversible***

[75]Environmental Impact Assessment Using the Rapid Impact Assessment Matrix (RIAM). Ed. Kurt Jensen. Published by Olsen & Olsen, 1998.

because the surrounding environment can be restored through planting of grass/trees along the road sections. The impact is considered to be ***non-Cumulative*** as it will occur only within the boundaries of the construction site.

6.3.2 Construction Phase

6.3.2.1 Dust emissions along unpaved access roads to construction site.

The construction activities will involve mvement of heavy trucks along the unpaved access roads to the road construction site. The movment of heavy trucks along unpaved acess roads is likely to result into increased dust emission during dry seasons, hence affecting the the adjacent local residents and nearby road users.

The impact has been assesed to be ***direct*** and ***negative*** with ***Medium Significance***; and is expected to be ***short-term*** and ***temporary*** as it will occur only during construction phase. The impact is ***Reversible*** because after stopping the source of emission, the air will return back to its normal status. The impact is considered to be ***Cumulative*** due to interaction with dust emissions from other sources.

6.3.2.2 Dust emissions along unpaved access roads to borrow pits/quarry sites

The project will involve transportation of construction materials from borrow pits and quarry sites. The movement of heavy trucks hauling construction materials along unpaved access roads to borrow pits / quarry pits will result into due dust emission during dry seasons, hence likely to affect the adjacent local residents, cultivated crops and natural vegetation.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it will occur only during construction phase. The impact is considered to be ***Reversible*** because it will cease to occur completion of the transportation activities along the access roads to borrow pits / quarry site. The impact is considered to be Cumulative because it is likely to interact with impacts from other sources.

6.3.2.3 Noise nuisance and vibration effects along construction roads.

The project will involve operation of mobile equipment/machinery during the construction. This is likely to result into creation of noise nuisance and vibration effects on the adjacent buildings. The vibration effects on adjacent buildings will be more significant during compaction of soil/gravel materials along the construction roads.

The impact has been assessed to be ***Direct*** and ***Negative*** with ***Low Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. The impact can be ***Reversible*** after stopping the source of noise emission and vibrations. The impact is considered to be non-***Cumulative*** because it is not likely to interact with impacts from other sources.

6.3.2.4 Noise nuisance and vibration effects along access roads to borrow pits/quarry sites.

The project will involve transportation of construction materials from borrow pits and quarry pits. The movement of heavy trucks along the access roads will creation of noise nuisance and vibration effects on the adjacent buildings. The noise nuisance and vibration effects will be more significant if the access road passes through densely populated areas.

The impact has been assessed to ***Indirect*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. The impact can be ***Reversible*** after stopping the source of vibration emission. The impact is considered to be ***Cumulative*** due to interaction with noise and vibrations from other sources.

6.3.2.5 Soil erosion and sedimentation of adjacent lands and properties.

The project will involve construction of roadside storm water drainages and installation of culverts. If not properly designed the water flow from roadside storm water drainages and culveerts may result into creation of soil ersoin and sedimentation of adjacent lands.

The impact has been assessed to be ***Direct*** and ***Negative*** with ***Low Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it persists even after construction phase. However, the impact is considered to be ***Reversible*** after prevention of water flow into the adjacent lands. The impact is considered to be non-***Cumulative*** because it is not likely to interact with impacts from other sources.

6.3.2.6 Landscape degradation and loss of aesthetic value.

The project will involve excavation and accumulation of soil materials into the surrodunign environment. The accummulation of excavated soil materials is likely to result into landscape degradation and loss of aesthetic value of the surrounding environment.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Very Low Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during the construction phase. Its effects on the surrounding environment are ***Reversible*** because the surrounding environment can be restored to its original by removing stockpiled soil materials and construction related solid wastes after completion of the project. The impact is considered to be *non-**Cumulative*** because he impacts will occur only within the boundaries of the construction site.

6.3.2.7 Risk of environmental pollution around the construction site.

The project will involve deployment of construction workers along sub-project roads. This will result into the need for provision of sanitary facilities along the road sections. The absence of sanitary facilities is likely to create risk of environmental pollution.

The impact has been assessed to be ***Direct*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during the construction phase. The impact is considered to be ***Reversible*** because the impact will cease to occur after provision of sanitary facilities. The impact is considered to be non-***Cumulative*** because the impacts is not likely to interact with impact from other sources.

6.3.2.8 Soil erosion and sedimentation of stream/riverbeds.

The project will involve construction of bridge crossing over natural stream during construction of Nakalekwa -Bwawani Road. This is likely to result into stream/river banks erosion and sedimentation of the stream/river bed due to removal of stream banks vegetation cover.

The impact has been assessed to be ***Direct*** and ***Negative*** with ***Low Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during the construction phase. The impact is considered to be ***Reversible*** because the impact will cease to occur after completion of construction works. The impact is considered to be ***Cumulative*** because it is likely to interact with impacts created by other land use activities on the downstream of the stream/river.

6.3.2.9 Risk of occupational health and safety for construction workers.

The construction workers are likely to be exposed to hazardous conditions during construction. These include handling of hazardous construction materials; operation of construction equipment; working at heights, handling of high voltage electrical conductors, etc. This is likely result into physical injury or death if precautions are not taken during construction.

The impact has been assessed to be ***Direct*** and ***Negative*** with ***a Substantial Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it is present only during construction phase. The impact is considered to be ***Reversible*** because the risk can be eliminated by providing Personal Protective Equipment (PPE) to the construction workers. The impact is considered to be *non-**Cumulative*** it is not likely to interact with impacts from other sources.

6.3.2.10 Risk of construction related accidents for local communities.

Trespassing by unauthorized people into the construction site is likely to result into risk of construction related accidents due to movement of mobile construction equipment like bulldozers, graders, and heavy dumper trucks, around the construction site. For example, a person may be overrun by backward moving mobile construction equipment / machinery, especially if it is not fitted with sounding alarm device.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. The impact is considered to be Reversible because the impacts will cease to occur after application of appropriate mitigation measures like installation of fence around the construction site and prohibiting unauthorized people from entering the construction site. The impact is considered to be non-***Cumulative*** because it will occur only within the boundaries of the construction site.

6.3.2.11 Risk of traffic and construction related accidents for school children and sick people

The baseline indicates three school buildings and one health centre v building are close to the road sections. This situation triggers the risk of traffic and construction related accidents becomes higher due to presence of school and health centre buildings along the following road sections:

- Nakalekwa-Bwawani Road (7.32 km) – school building at km 1+313 on the LHS and at km 1+313 on the LHS.
- Mivumoni Road (5.79 km) -school buildings on both sides of the road at km 0+491.
- Tegeta Police-Silver Road (2.0 km) – school building at km 0+421 on the LHs.
- Binti Matola Road (0.77 km)-health centre building at km 0+314 on the LHS.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Substantial Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. The impact is considered to be ***Reversible*** through appropriate mitigation measures such as barricading and formulation of traffic management plan along the road sections. The impact is considered to be non-***Cumulative*** because it will occur only within the boundaries of the construction site.

6.3.2.12 Risk of accidents to pedestrians and other road users.

The project will involve excavation of road bed and roadside storm water drainages. The presence of deep excavation on the construction roads is a safety hazard with a potential to cause risk of injury or death to pedestrians and other road users.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. The impact is ***Reversible*** because it will cease to occur after backfilling of excavated areas or covering with concrete slabs. The impact is non-***Cumulative*** because it is not likely to interact with impacts from other sources.

6.3.2.13 Increased risk of traffic accidents during construction.

The project will involve frequent movement of heavy trucks vehicles to and from the construction road during transportation of construction materials into the construction site and spoil materials from the construction site to the dumping site. This is likely to result into risk of traffic accidents at the junction between the access roads to the construction site and the local roads or at the entrance and exit of the construction site.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. However, its effects on the human health may be ***Reversible*** because the impact will cease to occur after completion of construction works. The impact is considered to be ***Cumulative*** because it will be additional to the current situation on traffic accidents in the urban area.

6.3.2.14 Increased risk of fire outbreak at the construction camp site.

The project will involve storage of inflammable liquids like petroleum products and gas at the construction camp site. This is likely to result into increased risk of fire outbreak due to accidental contact between ignition sources and spilled or leaking petroleum products or gas from storage containers.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***High Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. The impact is considered to be ***Reversible*** because it will cease to occur after application of appropriate mitigation measures such as separation of ignition sources from inflammable substances. The impact is considered to be non-***Cumulative*** because it is not likely to interact with impacts from other sources.

6.3.2.15 Increased risk of Covid-19 transmission.

The project will result into induced influx of people into the project sites in form of small business operators, customers, and job seekers. This will result into increased population at the construction sites, hence increased risk of Covid-19 transmission among the construction workers and local community members.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short--term*** and ***Temporary*** as it continues only during construction phase. The impact can be Reversible by preventing influx of people into the project sites. The impact is considered to be ***Cumulative*** because it is likely to interact with other sources of Covid-19 transmission.

6.3.3 Operation Phase

6.3.3.1 Reduced dust emission due to improved road conditions.

Currently the road sections are unpaved, hence creating dust emission during dry seasons. This is resulting into air pollution and creation of health risk to the adjacent local residents and road users due to frequent exposure and inhalation of dust particles. Therefore, the improvement of road sections into asphalt or concrete pavement is likely to significantly reduce dust emissions. According to WB EHS Guidelines[76], asphalt or concrete paving of roads can efficiently reduce dust emission by 85% - 99%.

The impact has been assessed to be ***Indirect*** and ***Positive*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it will continue to occur throughout the

[76] Environmental, Health, and Safety Guidelines. General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality. Annex 1.1.5 - Fugitive PM Emissions Controls. International Finance Corporation (IFC) and World Bank Group. April 20, 2007.

operation phase. The impact is considered to be ***Synergistic*** to the positive impacts being created by other improved road sections into bitumen or concreted standards.

6.3.3.2 Increased risk of traffic accidents due to improved road conditions.

The project involves the improvement of road sections into bitumen or concrete pavements. The improvement of subproject roads is likely to trigger increased risk of traffic accidents due to over-speeding of vehicles, if precautions are not taken.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it will continue to occur throughout the operation phase. The impact is considered to be ***Reversible*** after implementation of control measures. The impact is considered to ***Cumulative*** because it is likely to be incremental to the current situation on traffic accidents in the Kinondoni Municipality.

6.3.3.3 Improved road safety for pedestrians due to dedicated walkways.

The project will involve design and construction of dedicated pedestrian walkways along the road sections. This will result into reduced risk of traffic accidents for pedestrians due to separation from the vehicular traffic.

The impact has been assessed to be ***Indirect*** and ***Positive*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it will continue to occur throughout the operation phase. The impact is considered to be ***Synergistic*** because to it will positively contribute to the current measures to improve traffic safety in the city.

6.3.3.4 Reduced traffic congestion due to improved road conditions.

The construction of sub-project roads will create a linkage between the feeder roads and local roads. This will result into reduced traffic congestion on the existing roads because some of the traffic will be able to divert into the new sub-project roads.

The impact has been assessed to be ***Indirect*** and ***Positive*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it will continue to occur throughout the operation phase. The impact is considered to be ***Synergistic*** because to it will positively contribute to the current measures to reduce traffic congestion in the city.

6.3.3.5 Reduced risks of flood events due to improved storm water drainages.

The project will involve construction of roadside storm water drainages. The current situation indicates most of the areas traversed by sub-project roads are faced by soil erosion, sedimentation and frequent floods due to lack of roadside storm water drainages. Therefore, the construction of road side storm water drainages will result into improved environmental conditions due to reduced soil erosion, sedimentation and flood evets.

The impact has been assessed to be ***Indirect*** and ***Positive*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it will continue to occur throughout the operation phase. The impact is considered to be ***Synergistic*** because to it will positively contribute to the current measures to reduce soil erosions, sedimentations and flood events in the city.

6.3.3.6 Improved ecological functions and landscape quality due to tree planting.

The project will involve greening of the open areas by planting grass and trees along the road sections, whenever feasible. This will result into improved ecological functions and landscape quality of the urban environment.

The impact has been assessed to be ***Indirect*** and ***Positive*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it will continue to occur throughout the operation phase. The impact is considered to be ***Synergistic*** because to it will positively contribute to the current landscaping measures in the city.

6.4 Social Impacts

6.4.1 Mobilization Phase

6.4.1.1 Loss of land ownership and other properties.

The project related activities along the road section include excavation of road bed; creation of road side storm water drainages; creation of pedestrian walkways; and installation of culverts. During the field investigation some of the road sections were found to have a narrow corridor. Therefore, creation of roadside storm water drainages, pedestrian walkways will require widening of the road section. The widening of the road section will trigger land acquisition, hence loss of land ownership and other properties by the adjacent local residents. The impact is likely to occur along Tegeta Police-Silver Road (2.0 km), Binti Matola Road (0.77 km), Togo 2 Road (0.36 km) and Togo 3 Road (0.20 km).

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent,*** with ***Irreversible*** effects on the socio-economic conditions of the project affected persons (PAPs). The impact can be considered to be ***non-Cumulative*** because it will occur only within the project site due to land acquisition by the project.

6.4.1.2 Disruption of social and economic services.

The findings indicate there are several public infrastructure/utilities along the road sections, whereby some of them either cross or run parallel to the road sections. These public infrastructure/utilities will ned to relocated before commencement of construction works. The relocation of existing infrastructures and utilities will result into disruption of social services and economic activities, hence leading into financial and economic loss to the affected people. The impact is likely to occur along all the road sections due to presence of public service infrastructure / utilities.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during relocation of affected infrastructure and utilities. However, its effects on small business operators can be ***Irreversible*** if it occurs. For example, financial loss due to damage caused on frozen perishable goods as a result of prolonged (more than 24 hours) power failure is an irreversible effect caused by disruption of power supply. The impact is considered to be non-***Cumulative*** because the impact will be caused only by this project, not cumulatively with other projects.

6.4.1.3 Creation of temporary employment opportunities.

The project will involve recruitment of construction workers, hence resulting into creation of employment opportunity for local people.

The impact has been assessed to be ***Direct*** and ***Positive*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. However, it can have ***Long-term*** effects on the socio-economic conditions of the local people. The impact is considered to be ***Synergistic*** to the positive impacts created by other projects in the Kinondoni Municipality.

6.4.1.4 Loss of self-employment and income generation opportunities.

The findings indicate small business operations is one of the ongoing activities along the road sections. The small business operators will have to be removed before commencement of

construction works. This will result into loss of self-employment and income generation opporurutnities by the small business operators.

The impact has been assessed to be ***Direct*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. However, it can have ***Long-term*** effects on the socio-economic conditions of the local people. The impact is considered to be ***Synergistic*** to the positive impacts created by other projects in the Kinondoni Municipality.

6.4.2 Construction Phase

6.4.2.1 Increased prevalence of HIV/AIDS and STIs.

The project is likely to result into increased prevalence of HIV/AIDS and STIs in the project areas due to social interaction between construction workers and local community is likely to result into increased prevalence of HIV/AIDS and STIs among the local community members of the project area.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it continues to occur even after construction phase. Its effects on the human health are ***Irreversible*** because there is not yet any known treatment for HIV, apart from Ant-retrovirus (ARV) drugs, which helps to increase resistance against HIV. The impact is considered to be ***Cumulative*** because it will be additional to the current situation on HIV/AIDS prevalence in the project area.

6.4.2.2 Severance of community access to the road sections.

The project will involve excavation of road bed and trenches for road side storm water drainages. This is likely to result into severance of access for local people to their residences or business premises due to presence of deep excavations along the construction road. Ultimately, this will result into increased travel time to the adjacent local residents.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Low Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. Its effects will be ***Reversible*** because it will no longer exist after provision of access. The impact is considered to be ***non-Cumulative*** because it will occur only due to excavation of road sections.

6.4.2.3 Increased income generation opportunities for food vendors.

The presence of large number of construction workers along the road sections is likely to result into increased demand for food, hence resulting into increased income generation opportunities for local food vendors.

The impact has been assessed to be ***Indirect*** and ***Positive*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it will occur only during construction phase. The impact is considered to be ***Synergistic*** to the current income generation opportunities being created by the BRT projects.

6.4.2.4 Risk of emergence of GBV, SEA, and SH.

The working relationships and social interactions among the project employees and local community members are likely to result into the risk of emergence of Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH). The female or male job seekers may become victims of sexual exploitation by corrupt senior project staff who are likely to use this opportunity to demand sexual favours in exchange for employment.

The impact has been assessed to be ***Indirect*** and ***Negative*** with ***Medium Significance***; and is expected to be ***Short-term*** and ***Temporary*** as it occurs only during construction phase. However, it can have long-term and ***Irreversible*** effects on the socio-psychological conditions of the affected people. The impact is considered to be ***Cumulative*** because it will be additional to the current situation on GBV/SEA and SH in the project area.

6.4.3 Demobilization Phase

6.4.3.1 Loss of temporary employment opportunities by local people.

The project will involve retrenchment of construction workers after completion or closure of the project. This will result into loss of employment opportunity by the local people. The manpower estimation indicates 60% of the manpower will be casual labourers who will be temporarily employed into the project. It is therefore, expected that about 34 people will be retrenched during closure or completion of the project.

The impact has been assessed to be ***Direct*** and ***Negative*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it occurs after completion of construction works. The impact will be ***Irreversible*** because the lost opportunity will never be regained after completion or closure of the project. The impact is considered to be ***Cumulative*** because it will contribute to the current unemployment condition in the project area.

6.4.4 Operation Phase

6.4.4.1 Reduced travel time for low-income communities.

The project will involve upgrading of the road sections into bitumen or concrete standards. This will result into reduced travel time for the motorised and non-motorized transport users along the road sections. This will also result into increased productivity, stimulation of economic growth and improved quality of life among the local people living along the road sections.

The impact has been assessed to be ***Indirect*** and ***Positive*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it will continue to occur throughout the operation phase. The impact is considered to be ***Synergistic*** because to it will positively contribute to the benefit obtained from other improved urban roads.

6.4.4.2 Increased access to social services for low-income communities.

The project improvement of the road section into bitumen or concrete standards will result into increased access to social services for low into communities living long the road sections. For example, the improved road section will enable the school children to easily ride bicycles along the road sections. The local people along the road sections will also be able to attend hospitals due to improved road conditions.

The impact has been assessed to be ***Indirect*** and ***Positive*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it will continue to occur throughout the operation phase. The impact is considered to be ***Synergistic*** because to it will positively contribute to the t the interact with the benefit obtained from other improved urban roads.

6.4.4.3 Reduced vehicle operation, maintenance and transportation costs.

The improvement of the road sections into bitumen or concrete standards will result into reduced vehicles operation and maintenance costs. This will also result into reduced transportation costs along the improved road sections.

The impact has been assessed to be ***Indirect*** and ***Positive*** with ***High Significance***; and is expected to be ***Long-term*** and ***Permanent*** as it will continue to occur throughout the

operation phase. The impact is considered to be ***Synergistic*** because to it will positively contribute to the t the interact with the benefit obtained from other improved urban roads.

6.5 Summary of Impact Assessment

The summary of impact assessment in **Table 6.3-1** indicates most of the negative impacts will occur during construction phase and their significance ranges from Very Low, Low and Medium and most of the positive impacts will occur during operation phase and their significance ranges from Low, Medium to High.

Table 6.3-1: Summary of Impact Assessment.

Affected Components	Potential Impacts	Significance	MP	CP	DP	OP
Atmospheric Environment	Dust emissions along unpaved access roads to construction site.	**Medium**		✓		
	Dust emissions along unpaved access roads to borrow pits/quarry sites	**Medium**		✓		
	Reduced dust emission due to improved road conditions.	**High**		✓		
Acoustic environment	Noise nuisance and vibration effects along construction roads.	**Medium**		✓		
	Noise nuisance and vibration effects along access roads to borrow pits/quarry sites.	**High**		✓		
Terrestrial environment	Loss of ecological benefits and landscape quality.	**Medium**		✓		
	Soil erosion and sedimentation of adjacent lands and properties.	**Low**		✓		
	Landscape degradation and loss of aesthetic value.	**Low**		✓		
	Risk of environmental pollution around the construction site.	**Medium**		✓		
	Reduced risks of flood events due to improved stormwater drainages.	**High**				✓
	Increased ecological benefits and landscape quality due to tree planting.	**High**				✓
Aquatic Environment	Soil erosion and sedimentation of stream/riverbeds.	**Low**		✓		
Public Health, Safety and Security	Increased prevalence of HIV/AIDS and STIs.	**High**		✓		
	Risk of occupational health and safety for construction workers.	**High**		✓		
	Risk of construction related accidents for local communities.	**Medium**		✓		
	Risk of traffic and construction related accidents for school children and sick people.	**High**		✓		
	Increased risk of Covid-19 transmission.	**Medium**		✓		
	Risk of accidents to pedestrians and other road users.	**Medium**		✓		
	Increased risk of traffic accidents during construction.	**Medium**		✓		

Affected Components	Potential Impacts	Significance	MP	CP	DP	OP
	Increased risk of fire outbreak at the construction camp site.	**Medium**		✓		
	Increased risk of traffic accidents due to improved road conditions.	**High**		✓		✓
	Improved road safety for pedestrians due to dedicated walkways.	**High**				✓
Labour and Economy	Creation of temporary employment opportunities.	**High**	✓			
	Loss of self-employment and income generation opportunities.	**High**	✓			
	Increased income generation opportunities for food vendors.	**Medium**		✓		
	Risk of emergence of GBV, SEA, and SH.	**Medium**		✓		
	Loss of temporary employment opportunities by local people.	**High**		✓		
	Reduced travel time for low-income communities.	**High**				✓
	Reduced vehicle operation, maintenance and transportation costs.	**High**				✓
Commodity and Public service infrastructure/ utilities.	Disruption of social and economic services.	**Medium**	✓			
Transportation	Reduced traffic congestion due to improved road conditions.	**High**				✓
	Severance of community access to the road sections.	**High**		✓		
	Reduced travel time for low-income communities.	**High**				✓
	Increased access to social services for low-income communities.	**High**				✓
Current Land and Resource Use	Loss of land ownership and other properties.	**Very Low**	✓			
KEY:						
MP = Mobilization Phase	**CP** = Construction Phase	**DP** = Demobilization Phase	**OP** = Operation Phase			

6.6 Assessment of Cumulative Environmental Impacts

The general approach to the assessment of cumulative environmental effects is to identify other past, present, or reasonably foreseeable future projects or activities whose environmental effects could overlap those of the Project. The cumulative effects/impacts occur if there is substantive interaction between project related environmental effects/impacts with that of ongoing projects or future planned projects or other activities. As already noted, the ongoing and future planned projects include BRT 3, BRT4 (On-going Projects), BRT 5 and BRT 6 (Future Planned Projects).

The project has been found to have a potential cumulative environmental effects/impact on Atmospheric Environment; Acoustic environment; Terrestrial environment; Aquatic

Environment; Public Health, Safety and Security; Labour and Economy; Current Land and Resource Use.

The project may or is likely to contribute to the impacts being created by other activities during construction and operation phase. However, the project contribution is considered to be small when compared to impacts being generated by other activities in the project area. In addition, there is no possibility of DMDP-2 Project to overlap with ongoing BRT 3, BRT4 Projects or future planned BRT 5 and BRT 6 Projects. Therefore, the cumulative impacts on the mentioned VECs should be considered to be not significant and therefore their mitigation measures and residual impacts should not be further considered in this study.

6.6.1 Impacts of Environment on the Project

The impacts of environment on the Project are associated with risks of natural hazards and influences of nature on the Project. These impacts may arise from physical conditions, landforms, and site characteristics or other attributes of the environment which may act on the project such that the project components, schedule, and/or costs could be substantively and adversely changed.

In this report, the assessment of the effects of the environment focuses on the environmental attributes that are considered to have potential impacts on the Project. These are based on regulatory consultation, public and stakeholder input, a review of the known past and existing conditions, and knowledge gained through projections of potential future conditions. For example, potential effects of climate change die to severe weather such as wind; precipitation; floods; electrical storms. The impact of seismic activity is also considered as impact of the environment on the project. This section provides a summary of the identified environmental effects of the Project. In general, the effects of the environment on the Project during the construction phase have been rated not significant.

6.6.1.1 Impacts of Climate Change on the Project

The Project area may experience extreme weather conditions during construction and operational life of the Project due to increasing climate change events. To assess the environmental effects of climate on the Project, current climate and climate change must both be considered. Current climate conditions are established by compiling relevant historical data and establishing a climatological background for the project area. The historical and projected extremes in temperature, intense precipitation, or other storm events, are important considerations that must be accounted for in the design of the Project and in all other aspects of construction. The study on climate projections indicates in the present century (2011–2040) Dar Es Salaam is projected to feature decreased minimum temperature in the range of −0.1°C to 0°C; and increased rainfall in the range of 0.25 to 0.5 mm/day[77].

Forecasted changes in climate may affect construction and operation in both positive and negative ways and may vary from nominal to extreme effects. Climate changes that could potentially have residual effects on the project include:

- Extreme low and high temperatures
- increased frequency and magnitude of heavy precipitation events;
- increased frequency of extreme storms accompanied by heavy precipitation, thunderstorms, and strong winds; and
- increased incidence of landslides (earth movement) and flooding.

[77] Climate Change Projections for Tanzania Based on High-Resolution Regional Climate Models From the Coordinated Regional Climate Downscaling Experiment (CORDEX)-Africa. Philbert Modest Luhunga, Agnes L. Kijazi, Ladislaus Chang'a, Afredy Kondowe, Hashim Ng'ongolo and Habiba Mtongori. https://www.frontiersin.org/articles/10.3389/fenvs.2018.00122/full

Each of these effects must be considered in terms of how they may adversely affect the Project if they are not planned, engineered, and designed to account for such effects. Such effects could cause:

- reduced visibility and inability to manoeuvre operation equipment;
- delays in shipment of materials, supplies and/or products;
- changes to the ability of workers to access the site (e.g., if a road were to wash out);
- damage to infrastructure;
- increased structural loading; and/or
- loss of electrical power resulting in potential loss of production.

Mitigation measures

The potential effects of climate on construction will be considered in the planning and design of the Project and in the scheduling of construction activities to limit delays, prevent damage to infrastructure and the environment, and to maximize the safety of construction staff. Compliance with design and building codes and standards are expected to account for weather extremes through built-in factors of safety to prevent undue damage to infrastructure from such event. **Table 6.6-1** outlines the summary of mitigation measures against the potential impacts of climate change impacts on the road construction subprojects.

The predicted effects of climate change on the Project will be carefully considered in the planning, design, and construction activities; the selection of materials to be used; and the operating plans for the Project to ensure the long-term viability and sustainability of the Project.

The likely adverse impacts of climate change on the Project during Construction and Operation will be taken into consideration in the planning and design of the Project (or managed adaptively as appropriate as information regarding climate change evolves. As a result, substantive damage to the Project or interruption to the Project schedules are not anticipated.

Table 6.6-1: Climate Change Impacts and Mitigation Measures on Road Subprojects.

Climate event	Risks to the road	Mitigation Measures
(a) Extreme temperature variations	▪ Higher temperatures can cause pavement to soften and expand, hence creating rutting and potholes, particularly in high-traffic areas and can place stress on bridge joints. ▪ Temperature fluctuations can cause changes on the performance of pavements due to changing sub-grade soil dynamics.	▪ Proper design and construction methods. ▪ The specification of construction materials must comply with the applicable standards and codes and must maintain structural integrity at the anticipated minimum and maximum ambient temperatures. ▪ Milling out rutted pavements and overlaying with more resistant asphalt. ▪ Carry out regular inspection, maintenance and repairs, ▪ Use resistant materials to extreme temperatures for road and bridge construction. ▪ Make prediction of short delays and make allowance for them to be included in the construction schedule.

	▪ Heat waves can limit construction activities, particularly in high humidity conditions. Construction workers exposed to extreme heat situation can be at risk of heat stroke and dehydration.	▪ Provide shelters with reflective roofing materials to prevent or minimize effects of sunlight on construction workers and make them easily accessible by workers. ▪ Use mechanized equipment to reduce physical labour whenever possible. Rotate tasks to reduce continuous exposure to direct sunlight. ▪ Educate workers on the signs of heat-related illnesses and proper hydration techniques. ▪ Limit or avoid work during extreme heat waves and consider working in the night under well illuminated conditions, with approvals from NEMC, DOSH, & KMC.
(b) Heavy rain for longer periods	▪ Water overtopping on road crest. ▪ Increased capacity of moistures, decreased cohesion of soil, increased seepage and infiltration across the road body. ▪ Drainage system over capacity and increased drainage erosion. ▪ Embankment instability or loss, road wash away.	▪ Increase road level to at least 0.5 m over the maximum flood level. ▪ Implement erosion protection and control measures. ▪ Increase capacity of culverts. ▪ Build up weirs and spillways. ▪ Increase capacity of compaction (lower moisture percentage). ▪ Decrease hydrodynamic force of water through planting grass.
(b) Storm events (Typhoons, Cyclones) and extreme winds	▪ Reduced visibility and inability to manoeuvre construction equipment/machinery. ▪ Disruption of construction activities and delays to the construction schedule. ▪ Delays in the transportation of construction materials to the site. ▪ Inability of construction personnel to access the	▪ Increase capacity of spillways and culverts. ▪ Undertake embankment protection by planting grass and trees/shrubs. ▪ Increase frequency of road inspections. ▪ Decrease road traffic movement during storms. ▪ Scheduling of tasks that require precise movement of equipment (*e.g.,* positioning steel I-beams in place with cranes) to periods when the weather conditions are favourable.

	construction site (e.g., if the road were to wash out) ▪ Damage to road and other infrastructure. ▪ Destabilization of bridges due to increased structural loading. ▪ Loss of electrical power resulting in potential loss of production. ▪ Falling of trees and blocking the roadway and creation of damage on the traffic signs.	

6.6.1.2 Impacts of Seismic Activity on the Project

The baseline indicates the intensity of seismic activity in the project area is ranked to be strong according to Modified Mercalli (MM) Scale (MM, VI)[78]. The baseline also indicates the earthquake hazard is classified as **medium[79].** However, the historical data for SWIO[80] indicates the possibility of earthquake occurring in the project area is low. Despite the information from historical data, there is still a 10% chance of potentially-damaging earthquake occurring in the project area in the next 50 years.

Mitigation measures

Based on the available information, the impact of earthquake will be considered in all phases of the project. The project planning decisions, project design, and construction methods will take into account the level of earthquake hazard.

6.7 Analysis of Alternatives

Preamble

The project will involve constriction of road sections into bitumen standard. This will facilitate faster transportation of passengers, comfortable travel, and reduced travel time and increased productivity. The three alternatives have been considered in this study based on technical, economic, environmental, and social point of view.

That means selected alternative must be technically feasible, economically viable, environmentally friendly, and socially acceptable. The analysis of alternatives considered whether the project should be implemented or not ("No project Alternative" vs "Project" alternative), and if it will be implemented what type of construction method should be used (Labour-intensive Method vs Machine-intensive Method). For comparison of these alternatives the Multi-Criteria Analysis Method has been used, based on Technical, Economic (Techno-economic), Environmental and Social Criteria. Another considered alternative is pavement alternatives, whereby the comparison of these alternatives has been based on their advantages and disadvantages.

[78] https://en.wikipedia.org/wiki/Modified_Mercalli_intensity_scale

[79] ThinkHazard! GFDRR and WORLD BANK GROUP. https://thinkhazard.org/en/report/48358-tanzania-dar-es-salaam/EQ

[80] Southwest Indian Ocean Risk Assessment Financing Initiative (SWIO-RAFI): Component 1 -Hazard. FINAL Report Submitted to the World Bank June 1st 2016 https://www.geonode-gfdrrlab.org/documents/1075

6.7.1 No Project Alternative VS Project Alternative

The "No project" alternative" means the project should not be implemented at all and therefore we should continue using the road sections under existing condition but only making periodic maintenance. The comparison of alternatives based on techno-economic, environmental, and social criteria is summarized in **Table 6.5-1.**

From techno-economic point of view the "No Project Alternative" will have less investment cost, but higher maintenance costs due to the need for long-term periodic maintenance. The "Project Alternative" will result into higher increased productivity due to reduced travel time and less fuel consumption due to reduced traffic congestion.

The improvement of the road condition will also result into reduced vehicle operation and maintenance costs, hence low transportation costs. Therefore, from techno-economic point of view the "No Project Alternative" should be rejected and the "Project Alternative" should be selected.

From environmental and social point of view the "No Project Alternative" will have long term impacts due to continued dust emission within unpaved or earthed sections, continued emission of exhaust fumes and more fuel consumption as a result of traffic congestion. The "Project Alternative", the above benefits will be achieved, but during construction the project is expected to have more environmental impacts including increased dust emission.

However, the environmental impacts will be short-term as they occur only during construction and could be minimized through implementation of appropriate mitigation measures. The improvement of the road condition into bitumen standard will result into more comfortable travel and improved aesthetic value of the urban environment due to less dust emission, hence socially acceptable. In addition, the Project Alternative is likely to create more temporary and income generation opportunity to the adjacent local residents during construction.
Therefore, from environmental and social point of view the "No Project Alternative" should be rejected and the "Project Alternative" should be selected.

Table 6.5-1: No Project Alternative VS Project Alternative.

Evaluation Criteria	No Project Alternative		Project Alternative	
	High	Low	High	Low
(a) Techno-economic				
Investment Costs	-	+1	-1	-
Maintenance Costs	-2	-	-	+2
Durability		-2	+2	
Transportation costs	-2	-	-	+2
Fuel consumption	-1	-	-	+1
Vehicle operation and maintenance costs	-2	-	-	+2
Travel time spent	-2	-	-	+2
Productivity	-	-2	+2	-
(b) Environmental and Social	-	-	-	-
Dust emission	-2	-	-1	-
Exhaust emission	-2	-	-1	-
Employment and income generation opportunity	+1	-	+1	-
Incidence risk of traffic accidents	-	-2	-2	-
Aesthetic and/or social acceptability	-	-2	+2	-
Total Score:	**(-13) +(+1) = -12**	**(-8) +(+1) = -7**	**(-5) +(+7) =+2**	**(+9)**
Overall Net Score:	**-12**		**+11**	

Evaluation Criteria	No Project Alternative		Project Alternative	
	High	Low	High	Low
KEY: +1 = Short-term Positive Impact -1 = Short-term Negative Impact +2 = Long-term Positive Impact -2 = Long-term Negative Impact				
Conclusion: The "No Project Alternative" has been found to have an overall score of -12 and the Project Alternative an overall score of +11. Therefore, the "Project Alternative" should be selected and "No Project Alternative should be rejected.				

6.7.2 Labour Intensive Alternative VS Machine Intensive Alternatives

The use of labour-intensive construction method is compared against machine-intensive construction method. The comparison of alternatives based on techno-economic, environmental, and social criteria is summarized in **Table 6.5-2.** From economic point of view the labour-intensive construction method makes use of manual labour and therefore likely to create employment opportunity to a large number of adjacent local residents than machine-intensive method, hence improving the local economy. The employment creation will have multiplier effect as it will also benefit their families, hence socially acceptable. However, the use of mobile equipment / machine is more costly than labour-intensive method, but it is more efficient than labour-intensive method.

From environmental point of view the labour-intensive method will have minimum risk of construction related risk of accidents to construction workers and the local community, unlike the use of mobile equipment / machinery during excavation works, Labour-intensive method has less environmental impacts compared to machine-intensive method. For example, the use of mobile equipment / machine is likely to create more dust emission than labour-intensive method. The use of mobile equipment / machine will also create air pollution and noise nuisance than labour-intensive method. The use of mobile equipment will have will create more landscape degradation than labour-intensive method.

From the analysis it can be seen that the labour-intensive method could be selected and machine-intensive method could be rejected. However, due to the nature of the project and limitations of labour-intensive method, the combination of the two methods should be more favourable. In this case, the contractor should give priority to labour-intensive method for those activities that could be done manually. For, example, excavation of roadside drainages could be done manually instead of using excavator.

Table 6.5-2: Labour-intensive VS Machine-intensive Methods.

Evaluation Criteria	Labour-intensive method		Machine-intensive method	
	High	Low	High	Low
(a) Techno-economic				
Cost of equipment / machinery	-	+1	-1	-
Employment creation	+1	-	-	-1
Efficiency and time consumption		-1	+1	
Work productivity	-	-1	+1	-
(b) Environmental and Social	-	-	-	-
Dust emission		+1	-1	-
Exhaust emission	-	-	-1	-
Landscape degradation		+1	-1	
Risk of construction related accidents	-	+1	-1	-
Social acceptability	+1	-		-1

Evaluation Criteria	Labour-intensive method		Machine-intensive method	
	High	Low	High	Low
Total Score:	**+2**	**(-2) +(+4) = +2**	**(-5) +(+2) = -3**	**-2**
Overall Net Score:	**0**		**-1**	
KEY: +1 = Positive Impact -1 = Negative Impact				
Conclusion: The "labour-intensive method|" has been found to have an overall score of 0 and machine-intensive method an overall score of -1. Therefore, the "labour-intensive method" should be favourable than machine-intensive method. However, due to the nature of the project the labour-intensive method has some limitations, and therefore the combination of the two methods should be more favourable.				

6.7.3 Asphalt Pavement VS Concrete Pavement Alternatives

The comparison between Asphalt Pavement and Concrete Pavement has been evaluated based on technical, economic, and environmental criteria as shown in **Table 6.5-3.** In addition, the advantages and disadvantages of each alternative is provided in **Table 6.5-4.** However, it seems there is no simple answer on which material is preferable. According to experts, when trying to decide between concrete vs asphalt roads, it is important to consider the specifics of your project first and foremost; and as such choosing a paving material cannot be decided on initial costs alone[81].

Table 6.5-3: Asphalt Pavement Alternative VS Concrete Pavement Alternative.

Evaluation Criteria	Bitumen Road Alternative		Concrete Pavement Alternative	
	Rank	Score	Rank	Score
(a) Techno-economic				
Durability	Low	-1	High	+1
Construction Costs	Low	+1	High	-1
Maintenance Costs	Low	+1	High	-1
Fuel efficiency	Low	-1	High	+1
Suitability under rural condition	High	+1	Low	-1
(b) Environmental and Social				
Air pollution	High	-1	Low	+1
Noise nuisance	Low	+1	High	-1
Risk of traffic accidents	Low	+1	High	-1
Heat absorption capacity	High	+1	Low	-1
	Total Score:	**(+6) (-4)**		**(+3) (-6)**
Overall Score:		**+2**		**-3**

The comparison was made between the asphalt pavement and concrete pavement based on their disadvantages and disadvantages as listed below;

- **Durability and maintenance free life:** Concrete roads have a long service life of forty years, whereas asphalt roads last for ten to twenty years. Moreover, during this service life concrete road do not require frequent repair or patching work like asphalt roads.

- **Vehicles consume less fuel:** A vehicle, when run over a concrete road, consumes 15-20% less fuel than that on asphalt roads. This is because of the fact that a concrete road does not get deflected under the wheels of loaded trucks.

[81] https://www.perrinconstructionredding.com/blog/2018/9/25/concrete-vs-asphalt-roads-pros-and-cons-of-each

- **Resistant to automobile fuel spillage and extreme weather:** Unlike asphalt roads, concrete roads do not get damaged by the leaking oils from the vehicles or by the extreme weather conditions like excess rain or extreme heat.

- **Greener process:** Asphalt (bitumen) produces lots of highly polluting gases at the time of melting it for paving. Also, less fuel consumption by the vehicle running on a concrete road means less pollution.

- **Saving of natural resources:** Asphalt (bitumen) is produced from imported petroleum, the reserve of which is becoming reduced drastically. On the other hand, concrete (cement and aggregates) is produced from abundantly available limestone and stones

- **Durability*:*** Concrete roads are highly durable and more environmentally friendly as compared to asphalt roads. However, asphalt paving costs far less than concrete paving. Also, asphalt road provides a little better safety of the vehicle against snow and skidding

Table 6.5-1: Advantages and Disadvantages of Asphalt and Concrete Pavements.

Asphalt Pavement	
Advantages	**Disadvantages**
Asphalt is very cost-effective material and time-efficient too. Asphalt dries very fast and does not need to block the road for a long time.	Asphalt pavement is more of maintenance than concrete. You need to reseal it every 3-5 year to prevent it from cracking. And after applying sealers you do not have to drive on the surface from a few hours to days.
Asphalt is a reliable weather resistant material which can be used for low and high traffic as well. Asphalt can withstand the harshest weather condition.	If you have not mixed and laid asphalt properly then it'll erode. Before paving you should also take care or uneven surfaces and previous cracked surface. First, make them compact and then pave.
Asphalt paved road will have a feature that it gets smooth like finish. It offers drivers skid resistance, splash back and better visual distinction between road markings.	If you would likely to get the best result from the asphalt then you should heat it to 250 to 350°F. Once the asphalt has been paved on the surface then it must be covered with the sand or other aggregates to get more compaction and durable lifespan.
Asphalt is 100% recyclable material. You can use it all over again because its lifecycle is endless. When you are repairing road then all the dug-up asphalt can be used again for the resealing.	Melting asphalt creates air pollution due to emission of hydrocarbons. Cutback asphalt which is used in creating asphalt cement releases more hydrocarbons.
Asphalt is time-efficient and easy when it comes for repairing. If you provide your asphalt a little routine maintenance then the deterioration of the surface can be delayed.	Asphalt, irrespective of the type used for the pavement requires heavy-equipment to install. Unless you've paving equipment's, you will not be able to lay down the asphalt.
Concrete Pavement Alternative	
Advantages	**Disadvantages**
Concrete roads have long life than any other roads.	The initial cost of concrete road is high.
These roads are durable and are practically unaffected by weathering agencies.	They are liable to crack and warp due to temperature variations.
They provide an excellent riding surface under all weather conditions.	Become noisy under iron-wheeled traffic.
They provide impervious, dustless, and clean surface.	Skilled supervision and labour are required for construction.

Asphalt Pavement	
Advantages	**Disadvantages**
They do not develop corrugations.	Less resilient than bituminous or WBM[82] roads
Can be laid on any subgrade.	Require long time for curing and thus cannot be opened to traffic earlier.
Can be easily reinforced when they are to resist high stresses due to heavy wheel loads of the traffic.	It is very difficult to locate and repair sewers and water mains lying under the pavement in their case.
Concrete roads are non-slippery and offer less tractive resistance.	
They provide good visibility for traffic during night hours	
Maintenance cost is low	

Conclusion

From the above table it can be noted that Bitumen Alternative have an overall score of +2 and Concrete Alternative has an overall score of -3. It can therefore be concluded that the Bitumen Alternative is preferable to Concrete Alternative. Moreover, the type of road sections to be constructed do not require concrete pavement because the road sections will be used mainly by small vehicles with low axle loads (<10 ton).

[82] Full form of **WBM** is Water Bound Macadam. It is the layer of broken stone aggregates bound together by stone dust or screening material and water applied during **construction** and compacted by heavy smoothed wheel roller.

CHAPTER SEVEN

7.0 MITIGATION AND ENHANCEMENT MEASURES

Preamble

Mitigation measures are developed to avoid, reduce, remedy or compensate for any negative impacts identified, and to create or enhance positive impacts such as environmental and social benefits. In this context the term mitigation measures include operational controls as well as management actions. These measures are often established through industry standards and may include:

- changes to the design of the project during the design process (e.g. changing the development approach);
- engineering controls and other physical measures applied (e.g. waste water treatment facilities);
- operational plans and procedures (e.g. waste management plans); and
- provision of like-for-like replacement, restoration or compensation.

For the identified significant impacts, the project team has worked with the client in identifying suitable and practical mitigation measures that are implementable. Some of the mitigation measures have been incorporated into the project design in order to avoid or reduce the negative impacts or enhance the positive impacts.

In general, the project has been found to have both beneficial (positive) and adverse (negative) effect/impacts. Most of the beneficial (positive) environmental and social impacts are long-term and will occur during operations phase.

The beneficial (positive) environmental impacts to be obtained from the project include reduced dust emission; reduced risks of flood events; improved ecological functions and landscape quality; improved road safety for pedestrians; and reduced traffic congestion. The socio-economic benefits include creation of temporary employment; increased income generation opportunities for food vendors; reduced travel time for low-income communities; increased access to social services for low-income communities; and reduced vehicle operation and maintenance costs, as well as transportation costs.

Despite the mentioned benefits the project is likely to create some negative environmental and social impacts. However, most of the adverse (negative) environmental and social impacts are short-term and temporary, and will occur during construction phase.

The potential environmental impacts include loss of ecological functions and landscape quality; creation of dust emissions; creation of noise nuisance and vibration effects; creation of landscape degradation; risk of environmental pollution; creation of soil erosion and sedimentation of stream/river bed; increased risk of Covid-19 transmission; creation of occupational health and safety risks; creation of construction related risk of accidents; creation of safety hazards due to deep excavations; increased risk of traffic accidents during construction; increased risk of fire outbreak; and severance of community access to the road due to deep excavations. The adverse (negative) social impacts include disruption of social services and economic activities; increased prevalence of HIV/AIDS and STIs; risk of emergence of GBV, SEA, and SH; Loss of temporary employment after closure or completion of the project;

The purpose of this Chapter is to outline some proposed enhancement and mitigation measures for the identified positive and negative impacts, respectively. In order have better understanding the information is presented in tabular form showing the identified potential impacts and proposed enhancement measures or mitigation measures. The focus of

mitigation is usually on avoiding or reducing adverse (negative) environmental and social impacts. However, measures to enhance beneficial (positive) impacts, such as economic benefits, are also taken into consideration.

7.1 Enhancement Measures for Positive Impacts

Table 7.1-1 outlines the proposed enhancement measures for the identified beneficial (positive) impacts during mobilization, construction, and operation phase.

Table 7.1-1: Proposed Enhancement Measures for Positive Impacts.

S/n	Positive Impacts	Enhancement measures
A.	**Mobilization Phase**	
A1.	Creation of temporary employment due to recruitment of construction workers	▪ Giving employment priority to the local people during recruitment of construction workers. ▪ Giving equal employment opportunities to males and females and avoid any kind of discrimination based on gender, race, religion, etc. ▪ Ensure all workers are served with Employment Contracts which stipulates all workers' rights under the labour laws such as maternity leave, sick leave, etc. ▪ Ensure workers are paid not less than minimum wage as stipulated by the government. ▪ Ensure payment of monthly contributions to the National Social Security Fund (NSSF) and Workers Compensation Fund (WCF) as required by the national laws. ▪ Ensure all workers are made aware, understand and follow the Code of Ethical Conduct.
B.	**Construction Phase**	
B1.	Increased income generation for food vendors due to demand from construction workers.	▪ Provide enabling environment for food vendors to sell their food in a clean and hygienic environment by providing shelter and water supply.
C.	**Operation Phase**	
C1.	Reduced dust emission due to improvement of road conditions into bitumen or concrete standards	▪ Enforcement of law to prevent damage on the road pavement by ensuring that the road sections are is used exclusively by vehicles with axle loads not exe=ceding 10 tons. ▪ Carrying out periodic maintenance of the road pavements. ▪ TARURA in collaboration with KMC will create awareness among the local residents and public on the importance of protecting the road furniture and avoiding encroachment into the road pavement.
C2.	Reduced risks of flood events due to improved storm water drainages.	▪ KMC in collaboration with TARURA will create awareness and education campaigns among the adjacent local residents to avoid dumping of domestic solid wastes and discharge of raw sewage wastewater into the roadside storm water drainages. ▪ Enforcement of by-laws to prevent people from dumping domestic solid wastes and discharging of raw sewage wastewater into the road side storm water drainages.
C3.	Improved ecological functions and landscape quality due to planting of grass and trees.	▪ KMC in collaboration with TARURA will promote greening of the urban areas by planting grass and trees along the road sections and adjacent open areas.

	Improved road safety for pedestrians due to presence of dedicated walkways.	▪ TARURA in collaboration with Traffic Department will initiate education and awareness campaign on road traffic safety, including the importance of using pedestrian walkways. ▪ KMC in collaboration with Traffic Department will enforce traffic regulations to prevent motorized traffic like Bodaboda from using the pedestrian walkways.
	Reduced traffic congestion due to improved linkage between feeder roads and local roads.	▪ KMC and TARURA will initiate and implement education and awareness campaigns to prevent encroachment of small business operators into the road pavements ▪ KMC in collaboration with TARURA will ensure upgrading and regular maintenance of feeder roads and local roads.
C4.	Reduced travel time for low-income communities due to improved access to BRT stations.	▪ KMC and TARURA will initiate and implement education and awareness campaigns on the importance of protecting the road furniture against vandalism. ▪ Enforcement of regulations to prevent unscrupulous people against vandalism of road furniture.
C5.	Increased access to social services for low-income communities along the road sections.	-do-
C6.	Reduced vehicle operation and maintenance costs and transportation costs.	-do-

7.2 Mitigation Measures for Negative Impacts

Most of the identified adverse impacts are short-term and will be associated with construction activities, and could be mitigated through engineering design and good construction practice. The implementation of mitigation measures will be the responsibility of the Contractor under the supervision of the Resident Engineer.

However, successful implementation of some of the mitigation measures will require participation of other stakeholders. For example, mitigation measures against HIV/AIDS prevalence during construction will require collaboration from local NGOs/CBOs and Local Community Leaders (LCLs). In addition, relocation of public service infrastructure/utilities and small business operations will require involvement of infrastructure/utility service providers and KMC. These stakeholders will help in the identification of new areas for relocation of affected small business operations and infrastructure/utilities. **Table 7.2-1** outlines the proposed mitigation measures for the identified adverse (negative) impacts during mobilization, construction, demobilization, and operation phase:

Table 7.2-1: Proposed Mitigation Measures for Negative Impacts.

S/n	Positive Impacts	Mitigation Measures
A.	**Mobilization Phase**	
A1.	Loss of ecological functions and landscape quality due to removal of vegetation cover and trees.	▪ Planting of grass and trees along the road sections. However, precautions will be taken to avoid tree species with damaging root systems and/or tree species which may cause obstruction of view from traffic due to wide canopy
A2.	Loss of land ownership and other properties due to land acquisition	▪ Payment of compensation to the Project Affected Persons (PAPs). This will also

		involve formulation and implementation of Resettlement Action Plan (RAP) to ensure fair and prompt payment of PAPs.
A3.	Disruption of social services and economic activities due to relocation of infrastructure/utilities	▪ Make consultation with relevant public service infrastructure/utility authorities to identify location of underground utilities before commencement of construction works. ▪ Conduct excavation of trial pits along each road sections to locate underground utilities before commencing excavation of road bed. ▪ Provide prior information through mass media to the public on the possible interruption of public services. ▪ Immediate relocation and restoration of affected infrastructure/utilities within 12 hours.
A4.	Loss of self-employment and income generation opportunities by small business operators	▪ KMC in collaboration with TARURA will make consultation with representatives of small business operators to identify new areas to be relocated before commencement of construction works.
B.	**Construction Phase**	
B1.	Creation of dust emissions along unpaved access roads to the road construction site.	▪ Application of water along access roads during dry seasons. ▪ Minimize stockpiling of excavated soils along the construction road by immediate removal and transportation to dumping site. ▪ Covering trucks hauling dusty construction materials with tarpaulins. ▪ Fencing of materials storage yard with corrugated iron sheets to prevent dusty construction materials against wind action.
B2.	Creation of dust emissions along unpaved access roads to borrow pits/quarry sites	▪ Application of water along access roads during dry seasons. ▪ Avoid transportation routes which passes through areas with densely populated human settlements and/or cultivated crops.
B3.	Creation of noise nuisance and vibration effects along the construction roads.	▪ Limiting noisy construction activities only to day time hours. ▪ Prohibit the use of old equipment / machinery which produce high noise levels and ensure noise emission from heavy trucks and mobile construction equipment do not exceed 75 dB, in accordance with Tanzania Noise Emission Standards[83].

[83] The United Republic of Tanzania. Environmental Management (Standards for the Control of Noise and Vibration Pollution) Regulations (2010). THIRD SCHEDULE (Made Under Regulation 15(1)).

		▪ Ensure exhausts of heavy trucks and mobile equipment /machinery are fitted with noise reducing mufflers. ▪ Carry out regular maintenance of vehicles and mobile equipment / machinery. ▪ Carry out inventory of cracks on adjacent building structures before commencement of construction works in collaboration with owners of the building structures.
B4.	Creation of noise nuisance and vibration effects along access roads to borrow pits/quarry sites.	-do-
B5.	Creation of soil erosion and sedimentation effects on the adjacent lands due to water flow from road.	▪ Ensure proper design of roadside storm water drainages and installation of culverts to ensure there is no concentration of storm water flow on adjacent properties. The Contractor will make sure all storm water from the road is directed into natural drainages.
B6.	Creation of landscape degradation due to excavatipn and accumulation of soil matearials.	▪ Ensure immediate removal and transportation of all excavated soil materials to the permitted dumping site.
B7.	Risk of environmental pollution due to lack of sanitary facilities at the construction site.	▪ Provision of mobile toilets at the construction sites. Alternatively, whenever possible the Contractor will make arrangement to hire sanitary facilities from the owners.
B8.	Creation of soil erosion and sedimentation of stream/river bed due to vegetation removal.	▪ Minimize destruction o riverbanks vegetation by confining vegetation clearing to the permitted areas. ▪ Ensure planting of grass on bare areas along the stream/river banks after completion of bridge construction works.
B9.	Creation of occupational health and safety risks due to exposure to hazardous working conditions	▪ Provision of appropriate Personal Protection Equipment (PPE) to construction workers dust protection masks to construction workers. ▪ Preparation and implementation of Health and Safety Management Plans (HSMP). This includes conducting risk assessment and mitigation, toolbox meetings; health and safety training; daily health and safety inspection by a competent person at the construction sites.
B10.	Creation of construction related risk of accidents due to people trespassing into the construction site.	▪ Fitting all mobile construction equipment / machinery and trucks with alarm and signal device to warn people, especially during backward movement. ▪ Restrict operation of mobile construction machinery / equipment to trained personnel only.

		▪ Fencing the construction site to prevent people from entering the construction site. This will include putting a written warning in both English and Kiswahili at a strategic location to prevent unauthorized people from entering the construction site. ▪ All excavated pits or trenches must be surrounded by safety nets to prevent people from falling into open pits or trenches.
B11.	Risk of traffic and construction related accidents for school children and sick persons along the construction roads.	▪ Preparation of Traffic Management Plan (TMP) which focuses on school children and sick persons crossing the construction roads. This includes putting clearly visible barricades. ▪ Construction of wall fence around the school to prevent school children from going into the construction roads.
B12.	Creation of safety hazards due to deep excavations on the construction road.	▪ Ensure installation of visible tapes and safety nets along excavated areas and putting a written warning signboard about the presence of deep excavations.
B13.	Increased risk of traffic accidents during construction due to movement of heavy trucks to and from the road construction site.	▪ Formulation and implementation of traffic management plan. This includes deploying flag persons to guide traffic movement along the road. The involvement of traffic police may be useful, whenever possible. Other measures include creation of diversion roads, and installation of speed limits signs and diversion signs.
B14.	Increased risk of fire outbreak due to accidental ignition of inflammable substances	▪ Ensure proper storage of inflammable substances far from ignition sources. ▪ Carry out regular inspection of storage containers and transmission pipes to ensure there is no any leakage.
B15.	Severance of community access to the road due to deep excavations on the construction road.	▪ Provision of temporary access for pedestrians and non-motorized transport users. The Contractor will make consultation with adjacent local residents to identify appropriate locations for placement of crossing structures (e.g. concrete slabs or culverts).
B16.	Increased risk of Covid-19 transmission due to influx of people into the project site	▪ Checking and recording temperatures of workers and provision of hand sanitizers, hand washing basins and soap at the entry gate ▪ Application of quarantine for infected persons against entering the construction site..
B17.	Increased prevalence of HIV/AIDS and STIs due to social interactions between	▪ Formulation and implementation of HIV/AIDS prevention and control programme.

	construction workers and local community members.	▪ Giving employment priority to local people to minimize the number of new comers, hence minimizing the likelihood of new HIV transmission. ▪ Collaboration with local NGOs/CBOs dealing with HIV/AIDS to promote awareness and education campaigns.
B18.	Increased income generation for food vendors due to demand from construction workers.	▪ Provide enabling environment for food vendors to sell their food in a clean and hygienic environment by providing shelter and water supply.
B19.	Risk of emergence of GBV, SEA, and SH due to working relationships and social interactions.	▪ Ensuring there are codes of conduct in place that forbid and place penalties for Gender-Based Violence and Sexual Exploitation and Abuse and should be read and signed by all project workers and attached to their Employment Contracts.. ▪ Contractor will engage a qualified NGO to carry out awareness raising campaign against GBV and SEA on monthly basis during the construction phase. ▪ Grievances Redress Mechanism will be in place to deal with any conflicts between the construction workers and the local residents.
B20.	Risk of contracting heat stroke and dehydration due to exposure to extreme heat due to climate change.	▪ Provide shelters with reflective roofing materials to prevent or minimize effects of sunlight on construction workers and make them easily accessible by workers. ▪ Use mechanized equipment to reduce physical labour whenever possible. Rotate tasks to reduce continuous exposure to direct sunlight. ▪ Educate workers on the signs of heat-related illnesses and proper hydration techniques.
C.	**Demobilization Phase**	
C1.	Loss of temporary employment due to retrenchment of construction workers after closure or completion of the project/	▪ Give employment priority to local people, because after project closure they will easily revert back to their normal economic activities. ▪ Ensure that all construction workers are registered with social security funds and are paid their terminal benefits immediately before retrenchment from jobs.
D.	**Operation Phase**	
D1.	Increased risk of traffic accidents due to improved road conditions.	▪ Installation of speed control signs and construction of speed humps at pedestrian crossings.

7.3 Assessment of residual impacts

Residual impacts are those impacts which remain once the mitigation measures have been designed and applied. Once the mitigation is applied, each impact is re-evaluated (assuming that the mitigation measure is effectively applied) and any remaining impact is rated once again using the EIA Matric. The result is a significance rating for the residual impact.

The effectiveness of mitigation measures for negative impacts can be evaluated through assessment of residual impacts after application of mitigation measures. The results in **Table 7.3-1** indicates the significance of adverse (negative) impacts before mitigation measures ranged from high to very low levels, whereby. 40% of the impacts had high significance, 44% had medium significance, 16% had low significance.

But after application of mitigation measures the significance of adverse (negative) impacts ranged from medium to negligible levels, whereby 28% of the impacts had medium significance, 40% had low significance, 32% had negligible significance. Therefore, it can be concluded that the application of mitigation measures has been very effective in reducing the significance of impacts to an acceptable level whereby 32% of the adverse (negative) impacts will not require further application of mitigation measures.

Table 7.3-1: Assessment of residual impacts.

Potential Impacts	Before Mitigation	After Mitigation
1. Creation of dust emissions along unpaved access roads to the construction site.	**Medium**	**Low**
2. Creation of dust emissions along unpaved access roads to the borrow pits/quarry sites.	**High**	**Medium**
3. Creation of noise nuisance and vibration effects due to road construction activities.	**Medium**	**Low**
4. Creation of noise nuisance and vibration effects due to transportation of construction materials.	**High**	**Medium**
5. Loss of ecological functions and landscape quality due to removal of vegetation cover and trees.	**Medium**	**Low**
6. Creation of soil erosion and sedimentation effects on the adjacent lands due to water flow from the road.	**Low**	**Negligible**
7. Creation of landscape degradation due to excavation and accumulation of soil materials.	**Low**	**Negligible**
8. Risk of environmental pollution due to lack of sanitary facilities at the construction site.	**Medium**	**Negligible**
9. Creation of soil erosion and sedimentation of stream/river bed due to vegetation removal.	**Low**	**Negligible**
10. Increased transmission of HIV/AIDS and STIs due social interactions	**High**	**Medium**
11. Increased risk of Covid-19 transmission dye to increased influx of people into the project sites.	**Medium**	**Low**
12. Creation of occupational health and safety risks due to exposure to hazardous working conditions.	**High**	**Low**
13. Creation of construction related risk of accidents due to people trespassing into construction site.	**Medium**	**Negligible**
14. Risk of traffic and construction related accidents for school children and sick people	**High**	**Medium**
15. Creation of safety hazards due to deep excavations on the construction roads.	**Medium**	**Low**

Potential Impacts	Before Mitigation	After Mitigation
16. Increased risk of traffic accidents during construction due to movement of heavy trucks to and from the road construction site.	**Medium**	**Low**
17. Increased risk of fire outbreak due to accidental ignition of inflammable substances.	**Medium**	**Low**
18. Increased risk of traffic accidents due to improved road conditions.	**High**	**Medium**
19. Loss of self-employment and income generation opportunities by small business operators.	**High**	**Medium**
20. Risk of emergence of GBV/SEA and SH due to working relationships and social interactions.	**Medium**	**Low**
21. Loss of temporary employment opportunities for local people due to completion or closure of the project	**High**	**Medium**
22. Risk of environmental pollution due to lack of sanitary facilities at the construction site.	**Medium**	**Negligible**
23. Disruption of social services and economic activities due to relocation of infrastructures and utilities.	**High**	**Negligible**
24. Severance of community access to the road due to deep excavations.	**High**	**Low**
25. Loss of land ownership and other properties due to land acquisition.	**Very Low**	**Negligible**

CHAPTER EIGHT

8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 The Objectives and Scope of ESMP

8.1.1 The Objectives of ESMP

The purpose of this Environmental and Social Management Plan (ESMP) is to ensure that the project is being implemented with minimum adverse environmental and social impacts. The ESMP focuses on avoiding, where practical, unacceptable adverse environmental, social and/or economic impacts. In the event that an impact cannot be avoided, then appropriate compensatory and/or mitigation measures have to be implemented.

For clarity in the management structure, the TARURA-Environment and Social Unit (ESU) will consult with KMC on matters relating to Environment, Social, Health and Safety (ESHS) performance. However, ESU will have overall responsibility for planning, implementation, monitoring and enforcement of activities associated with this ESMP and environmental and health and safety performance.

The objectives of this ESMP are to:

- Describe the measures required to implement construction related management and mitigation commitments made in the ESIA Report;
- Describe specific additional measures required to implement construction related good practice, approval conditions stipulated by Tanzania National Policies/Legislations and World Bank Environmental and Social Framework (ESF).
- Identify the roles and responsibilities of the environmental and social management organisation of the project; and
- Communicate environmental and social expectations and requirements to various stakeholders and relevant institutions, and regulatory agencies.

All contractors and subcontractors shall comply with ESMP requirements as applicable to the tasks they are employed to undertake. The ESMP will be incorporated into the Bidding Documents and will be part of the Contract Documents to be signed by the Contractor.

8.1.2 The Scope of ESMP

This Environmental and Social Management Plan (ESMP) has been developed to identify the environmental and social management and mitigation actions required to implement the project in accordance with the requirements of the World Bank Environmental and Social Framework (ESF). and applicable Tanzania national policies and legislation.

The ESMP will be used by the Contractor for preparation of Contractors' ESMP (C-ESMP) which will address site specific environmental and social issues. In addition, the Contractor will be required to prepare issues specific management plans, which provide details on the environmental and social management procedures, processes and mitigation and monitoring measures required to complete actions identified in the ESIA Report.

8.2 Institutional Roles and Responsibilities

The important stakeholders / agencies identified in this ESMP include the Tanzania Rural and Urban Roads Agency (TARURA; Dar Es Salaam Rapid Transit Agency (DART Agency); World Bank Group (IBRD/IDA); National Environment Management Council (NEMC); Division of Environment in the Vice President's Office (DoE-VPO); Dar Es Salaam City Council (DCC); Kinondoni Municipal Council (KMC); Ward Development Committees; Mtaa Development Committees; Local Community Members; and Non-Governmental Organisations (NGOs) / Community Based Organisations (CBOs) and dealing with project related environmental and

social aspects in the project area. The organisational structure for ESMP implementation is provided in **Figure 8.2-1.**

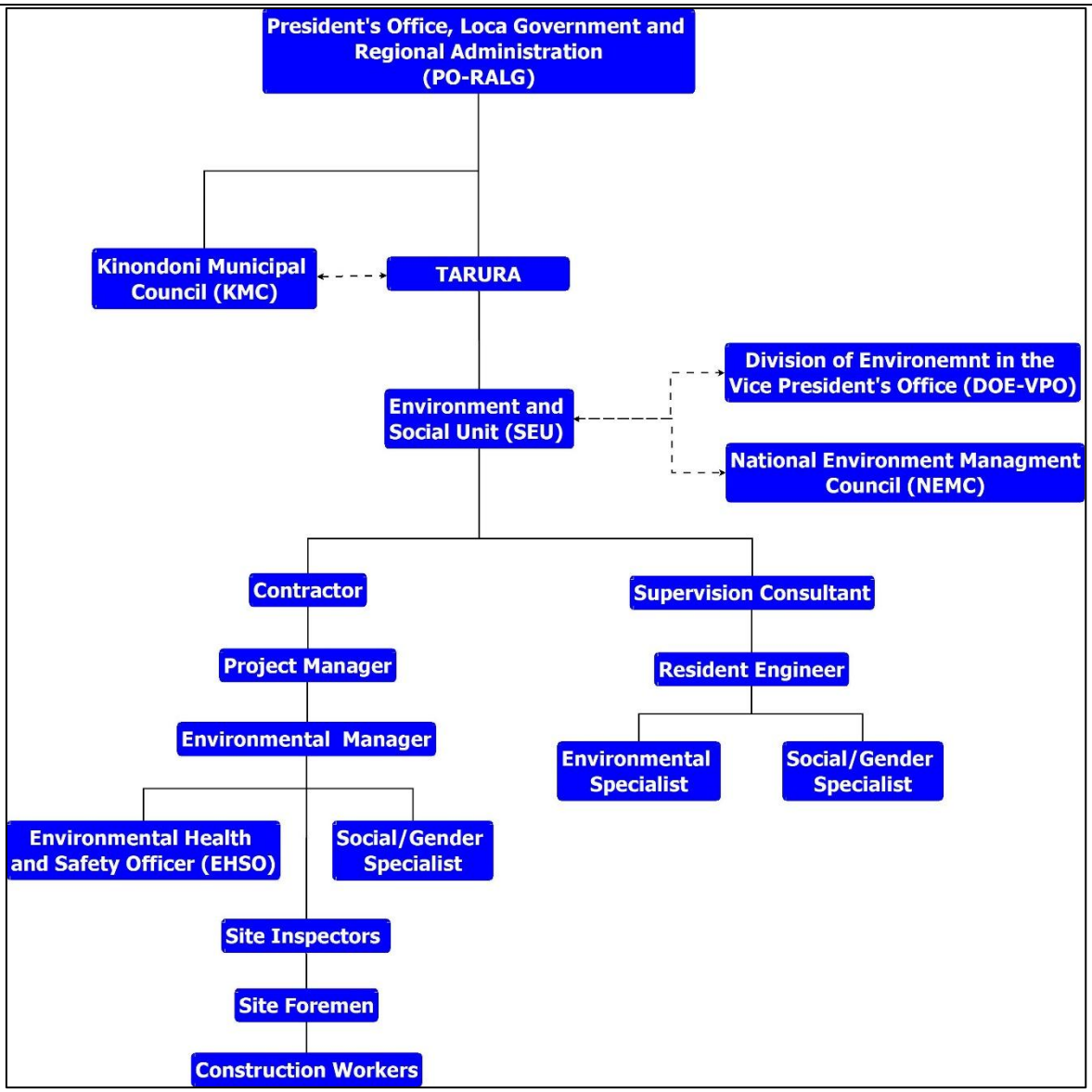


Figure 8.2-1: Organisational Structure for ESMP Implementation.

The effective implementation of ESMP also requires that all persons working for the project are aware of the importance of environmental requirements of the project; their roles and responsibilities in the implementation of the ESMP. They should also be aware of the significant actual or potential environmental impacts of their work activities; the benefits of improved performance and the consequence of not complying with environmental requirements.

In order to have effective ESMP there will be an integration of efforts among various stakeholders. This ESMP therefore specifies roles and responsibilities of various stakeholders during implementation. However, it is important that all responsible agencies / stakeholders should appreciate that they are united and should interact and work towards a common purpose.

8.2.1 Financing agency

The project is being financed by the President's Office – Regional Administration and Local Development (PO-RALG) on behalf of the Government of the United Republic of Tanzania (GoURT) in collaboration with the World Bank Group (IBRD/IDA). The PO-RALG and the World Bank (WB) shall be responsible for review and approval of Contractor's ESMP (C-ESMP), and Monthly Progress Reports to be submitted by the Supervision Consultant. The PO-RALG will also be responsible for review and approval of Monthly Environmental, Social, Health, and Safety (ESH&S) Compliance Reports submitted by the Contractor.

8.2.2 Implementing Agency

According to the Terms of Reference (ToR), the project is being implemented by Kinondoni Municipal Council (KMC) through the Tanzania Rural and Urban Roads Agency (TARURA) on behalf of the PO-RALG. The KMC is one of the five (5) Dar Es Salaam Local Authorities (DLAs). The other DLAs include the Ubungo Municipal Council (UMC); Temeke Municipal Council (TMC); Kigamboni Municipal Council (KGMC), and Dar Es Salaam City Council (DCC). In this regard, TARURA and KMC also hold final responsibility for environmental performance of the project.

Therefore, the TARURA shall be responsible for overseeing implementation of mitigation measures and compliance monitoring through its Environment and Social Unit (ESU).

Specifically, the ESU through its Environmental Health and Safety Officer (EHSO) and Social/Gender Officer (SGO) will be responsible for conducting site inspections to verify contractor's compliance with outlined mitigation measures in the ESMP. In addition, the EHSO and SGO will be responsible for attending Engineer's Monthly Site Meetings and conducting review of the Contractor's Monthly Environmental, Social, Health and Safety (ESHS) Reports. During the monthly site meetings, the EHSO and SGO shall be able to raise any non-compliance with ESHS issues and recommend remedial measures to the Supervision Consultant's Resident Engineer. Contractors shall be required to produce regular progress reports for E&S management, providing implementation status of the C-ESMP detailing out incidents, accidents, grievances, and GBV cases. The Supervision Consultant will oversee construction and monitor the contractor's work. The RE will issue Notices to Correct, indicating the non-compliances and recommend corrective action/s and timeframes for their implementation.

8.2.3 Supervision Consultant

The Supervision Consultant will be appointed by the implementing agency and will be responsible for monitoring and supervision of the construction works including implementation of ESMP. The Supervision Consultant will appoint a Resident Engineer to oversee the construction works and monitor the works undertaken by the Contractor and implementation of ESMP to ensure compliance with contract specification and contractual requirements. The Supervision Consultant will also appoint Environmental Specialist and Social/Gender Specialist to assist the Resident Engineer. The Environmental Specialist shall be responsible for Environmental, Health, Safety and Security (EHSS) Issues and Social/Gender Specialist shall be responsible for Social Issues, Worker's Welfare, Resettlement / Compensations Issues, Grievances Redress Mechanism (GRM), Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH).

8.2.4 Contractor

The Contractor shall be responsible for the implementation of construction works and ensure compliance with environmental and social requirements, including implementation of outlined mitigation measures in the ESMP. Therefore, the Contractor will be responsible for preparation

and implementation of Contractor's ESMP (C-ESMP) based on this ESMP or Project ESMP (P-ESMP). The Contractor will ensure that the implementation of C-ESMP conforms to the requirements of all local laws, regulations, and contract clauses. The Contractor shall appoint the Project Manager who will be assisted by ESH&S Team, which will be comprised of Environmental Manager assisted by Environmental Health and Safety Officer (EHSO) and Social/Gender Specialist.
The Environmental Manager shall be an overall in-charge responsible for overseeing implementation of Environmental, Social, Health, Safety and Security (ESHSS) Issues. However, for effective implementation of the ESMP, the Contractor will be required to appoint an Environmental, Health, and Safety Officer (EHSO) and a Social and Gender Officer (SGO). The EHSO shall be responsible for Environmental, Health, Safety and Security (ESHSS) Issues. The SGO shall be responsible for Social, Gender and Resettlement issues including GBV/SEA and SH issues.

In order to ensure enforcement of ESHSS issues, the Site Inspectors and Site Foremen, apart from undertaking supervision of construction works, shall also be responsible for overseeing the implementation of outlined mitigation measures in the ESMP.

8.2.5 Local Community Leaders (LCLs)

The project road is being implemented within the jurisdictional boundaries of eight (8) Wards, namely Kinondoni, Makongo, Mbezi Juu, Wazo, Kunduchi, Kawe, Mikocheni, and Msasani Wards. The Ward and Mtaa Leaders are considered as Local Community Leaders (LCLs).

The involvement of the LCL is crucial for successful implementation of ESMP because some of the mitigation measures are better undertaken by local communities with the support of the LCLs. It is therefore important that all LCLs should be involved in the implementation of this ESMP. In order to make the LCLs to be well informed on the contents of the ESIA Report, one copy of the Non-Technical Executive Summary in Kiswahili Language of the ESIA Report will be submitted to the LCLs. This is to ensure that the LCLs are aware of the environmental and social issues regarding this project and therefore shall be able to participate in the monitoring of the Contractor's compliance with mitigation measures.

8.2.6 Local Community Members

The Local Community Members include the Local Residents of all Wards / Mtaa Traversed by the road sections; Small Business Operators, Commuter Bus Transport Operators; Baja / Bodaboda Operators; Petrol Station Operators; Whole Sale and Retail Shop Operators along the road sections.

In general, consultation with these stakeholders indicates they do support the project because they believe it is going to improve transportation of passengers and goods in their areas. However, the project can obtain maximum support if it involves the local community members and make them aware of the project.

Therefore, TARURA as an implementing agency through TARURA Regional Manager-Dar Es Salaam Region and TARURA District Manager-Kinondoni will prepare and distribute brochures which provide some information about the project.

TARURA Regional Manager will encourage the local residents to participate in the project through temporary employment during construction and in the maintenance activities during operation phase. In this way the local community members will feel ownership of the project and therefore protect the project infrastructure against vandalism. For example, it is common to find people removing road signs or vandalising bridge structures.

The TARURA Regional Manager will prepare and implement education and awareness campaigns, which among others will educate the local people on the importance of protecting the road furniture against vandalism.

8.3 Contractor's ESHS Specification

The Contractor's Environmental, Social, Health and Safety (ESHS) Specification will be incorporated into the Contract Document to ensure the environment is free from the impacts of the Contractor's activities. The Contractor shall follow the guidelines determined in the Contract Document. General environmental problems related to the Contractor's activities include:

- Site Facility Management;
- Recruitment of Construction Workers
- Requirements for Contractor's Office
- Storage and treatment of fuel and material;
- Dust and noise hazard control;
- Solid Waste Management; and
- Wastewater Management.

The Contractor shall hold the copy of *Environmental and Social Management Plan (ESMP*, which shall be included in the bidding documents. Before commencement of construction works, the Contactor shall submit an *Environmental Protection Plan* for the construction site to the Supervision Consultant's Resident and PIU for review and approval.

The Plan shall include the general mitigation measures for environmental and social impacts and the specific mitigation measures for response to emergency accidents, and the general measures shall include, but not be limited to the followings:

- General Construction Plan, indicating operation area, fuel storage area, fuel supply area, parking area, equipment maintenance area, material storage area and campsite;
- Waste Management Plan;
- Dust Control Plan; and
- Noise Control Plan.

8.3.1 Site Facility Management

The Contractor's Office and Materials Storage Yard will be secured near the construction site. The Contractor will be required to prepare site plan for review and approval by the Resident Engineer. This will include drawings showing the layout of the Contractor's Office and Materials Storage Yard.

8.3.2 Recruitment of Construction Workers

The Contractor will always give employment priority to the local people. The Contractor shall publish the required positions for employment in the local media and all signboards. The construction workers and other personnel shall be employed in accordance with the Employment and Labour Relations Act No.6 of 2004. The Contractor shall provide training for the construction workers on environmental protection, GBV / SEA, and occupational health and safety issues.

8.3.3 Requirements for Contractor's Office

Since all construction workers to be recruited will be from the within the urban areas, there will not be any requirements for accommodation for the construction workers. However, the Contractor must provide cloth changing rooms, resting areas and sanitary facilities for the construction workers.

There shall be independent and sound bath facilities (toilets, bathroom) and cloth changing rooms) for male and female workers. The toilets shall have sufficient water and be equipped with soap and toilet paper, etc. All facilities shall be clean and available. The toilet shall be marked indicating separate toilets, bathrooms and cloth changing rooms for “Male” and “Female”.

Other facilities shall include:

- Kitchen supplied with clean water, and in favourable sanitary condition.
- Septic tank-Soak pit system for treatment of domestic sewage before discharge into the seawater.
- First Aid Kit complete with medicine shall be available at the Contractor’s Office managed by a qualified nurse. The nurse shall receive complete emergency rescue training and be capable of properly transferring the injured or patients to local referral hospital on time.

8.3.4 Health and Safety

The Contractor shall ensure the project conforms to all national and local safety regulations and other damage avoidance measures. Before construction, the Contractor shall execute safety training for the workers. Other measures include:

- Provision of sufficient sunlight during the day time and light during the night time.
- Provision of enclosure made up of corrugated iron sheet around the construction site, and shall be regularly inspected and maintained during construction. This will be reinforced by provision of written warning signboard in Kiswahili and English Language to prevent trespass by unauthorized persons into the construction site without the approval of the Contractor’s personnel.
- Provision of Fire-fighting equipment, like fire extinguisher at the Contractor’s Office.
- Implementation of OHS management plan based on risk assessment and mitigation measures that will prioritize avoiding and minimizing exposure to hazards using engineering and administrative controls
- Provision of sufficient PPE such as eye goggles, protective gloves, face shield, dust cover, helmet, ear plugs, steel helmet, etc.) to the construction workers.
- Safety regulations, contingency plans and emergency contact information shall be indicated in the bulletin board at the construction site.
- Conducting medical examination for the construction workers annually;
- Provision of training on personal basic hygiene and epidemic prevention, including respiratory disease and communicable disease.
- Conducting HIV/AIDS prevention and control campaigns for construction workers and fish market users, including publicity at the construction site and the surrounding areas in the form of bulletin and training course.
- Provision of basic emergency rescue service and emergency measures for the construction workers.

8.3.5 Storage of Fuel, Oil/Grease, and Other Hazardous or Toxic Material

All fuel shall be stored in a concrete paved the storage yard with bund walls and shall be 110% of the fuel storage container. Fuel storage sites shall not to be located near any water sources (i.e., within 100m from the water source). Dangerous goods shall be stored in a designated storage device. Temporary storage regulations shall be prepared for fuel, oil and paint, etc.

Only authorized personnel are allowed to enter the storage area. The storage area shall be free from vehicle damage, and shall be subject to periodic inspection for leakage, damage and pollution condition.

Equipment maintenance can only be made at the workshop / garage. The operation surface (concrete floor within the rail area) must be properly designed to ensure collection of oil and

fuel in the appropriate container. In case of oil/fuel leakage, the soil polluted must be removed and transported to the approved area. Relevant preventive measures must be taken to prevent the grease, oil, fuel, solvent and chemicals from polluting soil and water.

8.3.6 Solid Waste Management

During construction, the Contractor must take proper measure to timely remove the waste at the construction site to the approved waste treatment equipment. Construction material accumulation shall be reduced by any possibility.
Household garbage produced during the Contractor's activities at the campsite must be placed in the can (210L steel or plastic buckets) or garbage truck. The Contractor must ensure to empty the garbage container weekly or as required.

All garbage must be immediately put into the garbage can or truck. The garbage shall not be thrown about in operation area or Contractor's campsite.
The construction waste must be temporarily stored within the construction site and transported to the approved dumping site. Incineration or burning of any kind of solid wastes is strictly forbidden at the construction site.

8.3.7 Wastewater and Storm Water Management

Wastewater from the construction site and the campsite shall not be directly discharged to the surface waters. Domestic sewage must be discharged after proper treatment by using septic tank system.

Storm water must be discharged to the sea through concrete lined storm water drainages to prevent sedimentation of the marine environment. Storm runoff discharged from the construction site (temporary drainage facility) shall be through concrete lined storm water drainages.

8.3.8 Noise Control

Construction works shall be confined to the day time only and construction near the fish market users shall be noise-free. Personnels, visitors, and construction workers at the site must wear proper hearing protection device to avoid hearing injury by noise. The Environmental Specialist must check the site periodically to ensure the site comply with *Occupation Health and Safety*.

8.4 Code of Ethical Conduct

The *Code of Ethical Conduct* shall be established for the construction workers and emphasize appropriate conduct, strict prohibition of drug and alcohol and conformance to relevant laws and regulations to reduce the social impacts. All workers shall be familiar with the *Code of Ethical Conduct*. The local community shall also know the *Code of Ethical Conduct* for construction workers. The workers who fail to follow the *Code of Ethical Conduct* shall be punished. The *Code of Ethical Conduct* shall include, but not be limited to the following measures:

- All workers shall abide by national laws and regulations.
- Dangerous goods and weapon are strictly forbidden at the construction site.
- Obscene goods and gambling are strictly forbidden at the construction site.
- Fighting is strictly forbidden at the construction site.
- Life and production of the surrounding area and the local people shall not be interfered.
- Local traditional culture, customs and traditional activities shall be respected.
- Smoking is only allowed in designated area.
- Dressing and personnel hygiene shall be appropriate.
- Sanitary conditions of accommodation shall be proper.

The *Code of Ethical Conduct* shall be followed even outside the project site in their residential areas during interaction with local community members.
The followings are strictly forbidden at the construction site and the surrounding area:

- Impacting or damaging the structure with historical or architectural value;
- Burning of solid wastes into the surroundings without permission from resident engineers.
- Drinking during working time.
- Mechanical maintenance (engine oil and lubricant addition) of vehicles outside the designated area.
- Dumping of solid wastes outside the designated area.
- Dangerous driving in the surrounding area and local roads.
- Failure to PPE (safety shoes, reflective vests, face masks, and helmet) at the construction site.
- Causing any health and safety impact to the surrounding people.
- Leakage of any pollutant leakage, like waste oil; and
- Dumping of solid waste into the surrounding environment (E.g., plastic bottles, plastic bags, food cans, etc.).

All Contractors, office workers or other personnel who violate the above regulations shall be subject to punishment of verbal warning or termination of employment contract depending on the severity.

8.5 Grievances Redress Mechanism

The Contractor will be required to formulate Grievances Redress Mechanism (GRM) based on the procedures and principles outlined in the Stakeholder Engagement Plan (SEP)[84].. The purpose of the GRM is to outline a process for dealing with or resolving project-level grievances raised by Aggrieved Person (AP) regarding specific activities, and/or unanticipated social impacts resulting from Project implementation. The GRM applies to the construction workers and local residents, and other stakeholders who are directly or indirectly affected by the project. The grievance process outlined hereunder provides procedures for handling complaints/claims internally in a transparent manner, to avoid conflict and therefore maintain good relationships with various stakeholders.

The PIU will oversee implementation of GRM during execution of the Project, to ensure the protection of the rights of APs and beneficiaries during project implementation. The requirements for the GRM are as follows:

- The grievance process must not impose any cost to those raising the grievances (i.e., the complainants).
- Concerns arising from project implementation must be adequately addressed promptly.
- Participation in the grievance process must not preclude the pursuit of legal remedies under the laws of Tanzania.

The issues covered by the GRM, among others, include complaints related to employment, sexual harassment, and gender-based violence. Specifically for employment, issues may include:

- Failure by the Contractor to serve the employment contract.
- Failure by the Contractor to pay minimum wage following the labour laws.
- Failure by the Contractor to remit monthly national social security contributions.

[84] Stakeholder Engagement Plan (SEP). June 2023.

- Failure by the Contractor to provide medical treatment for a sick employee.
- Unlawful termination of a worker,
- General workers' welfare such as annual leave, and sick, maternity and family leave,
- Failure to provide project workers with adequate periods of rest per week, as required by the labour laws.

In case of GBV/SEA and SH a proper reception channel will be in place by appointing an NGO (or CBO) to handle all kind of complains related to GBV/SEA and SH), including providing appropriate counselling to the victims. The Contractor will develop GBV Action Plan which will be implemented by a qualified NGO

8.5.1 Formation of Grievances Redress Committee

To address grievances, a Grievance Redress Committee (GRC) will be formed for dealing with grievances as they arise. The GRC will be comprised of the following:

- ESU's Safeguard Officer.
- Supervision Consultant's Environmental Specialist and Social/Gender Specialist
- Contractor's Human Resource Officer.
- Municipal Environmental Management Officer (MEMO) and Municipal Community Development Officer (MCDO).
- Ward Executive Officers (WEO) of the traversed Wards by the road sections.
- Street ("Mtaa") Executive Officers from traversed Streets by the road sections.

Note that the presence of the local government authorities is important because some of the grievances may originate outside the project boundaries. The involvement of NGO / CBO will also be necessary. For example, if a project worker is involved in sexual harassment of a local community member, the matter will be handled by a qualified NGO / CBO.

The construction workers and fish market users will be informed of the existence of the GRM as soon as it is in place, as well as of the following:

- Members of the Grievances Redress Committee (GRC)
- How to access the GRC.
- How to lodge a formal complaint.
- The timeframes for each stage of the process.
- Characteristics of the GRC: confidentiality, responsiveness, and transparency.
- Alternative avenues of grievance resolution in case of conflicts of interest.

8.5.2 Role and Responsibility of Grievances Redress Committee

The Gender Redress Committee (GRC) will be chaired by ESU's Safeguard Officer who shall be responsible for receiving and registering grievances. The Supervision Consultant's Social/Gender Specialist shall be the Secretary of the GRC and shall be responsible for assisting the Chairperson in documenting, registering, communicating, and reporting issues related to grievances management.

The grievance management procedure will be simple and will be administered as far as possible by the GRC at the Project Level. The GRC will prepare monthly reports showing how received grievances were handled summary and submit to PO-RALG and WB for record purposes. To ensure transparency, the Grievance Redress Procedure will be printed in A3 Size Paper and posted at all strategic locations within the project sites to be read by construction workers and local community members.

The GRC shall disseminate detailed procedures to redress grievances and appeal process among the construction workers and local community members through their local government offices (E.g., Ward Officers and Mtaa Officers).

8.5.3 Grievance Redress Procedures

The detailed GRM to be developed will contain specific grievance procedures, including both informal and formal grievance mechanisms. In general, complaints and disputes should be resolved at the project level, and each grievance will be treated confidentially.

The grievance resolution process is comprised of four stages:

- Reception
- Investigation and inquiry.
- Response
- Follow up and
- Closeout.

The access to the GRM will be easy and quick, in particular to APs, who are the people most likely to need it. The formal grievance will be:

I. documented in a written Grievance Form and recorded in a logbook:
II. assessed on its level of urgency/severity; and
III. assigned to GRC, which will then inform the complainant within seven (7) days that it has received the grievance and that it is under review.

The Aggrieved Person (AP) will report his/her grievance to the GRC through its Chairperson. If a grievance is received face to face or over the phone and the aggrieved wishes to address the grievance formally, it is the responsibility of Chairperson who receives the grievance to complete a Grievance Registration Form provided in **APPENDIX 14.** The grievance redress mechanism for dealing with complaints is illustrated in **Figure 8.4-1.**

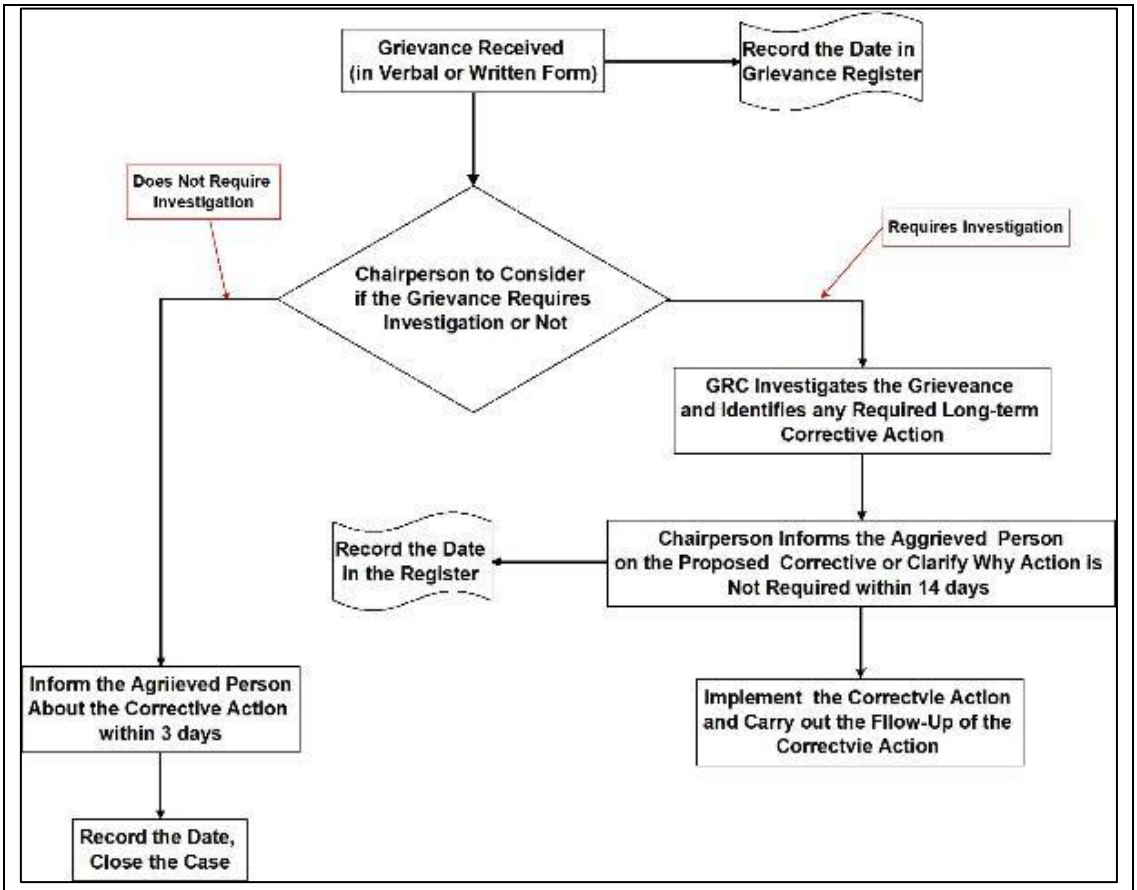


Figure 8.4-1: Grievances Redress Mechanism.

In general, grievances should be resolved within 30 days. The Chairperson will communicate the findings of the investigation and resolution and seek approval from the AP, who will either accept or appeal the outcome. If the AP is satisfied with the outcome, then the grievance is closed out and will provide his/her signature (or fingerprint) on the Grievance Form as confirmation.

If an agreement is unable to be reached between the AP and the GRC, the grievance will be submitted to TARURA as a lead Project Implementation Agency for review and a final decision through its PMU. If necessary, further action will be taken to resolve the issue. The national courts are the last avenue for addressing grievances. In case the AP reaches the judicial system, there should be no cost to the claimant.

A grievance is closed out when no further action can be or needs to be taken. Closure status will be entered into the Grievance database as follows:

- **Resolved:** the resolution of the complaint was reached and implemented and signed documentary evidence exists.

- **Unresolved:** the agreed resolution of the complaint was not reached and the case has been authorized for closeout by the Grievance Redress Committee (GRC).

- **Abandoned:** complaints in which efforts to contact a given complainant were unsuccessful for two months after receipt of the formal grievance.

Specifically, depending on the issues that may arise during project implementation the following stages will be observed in the grievances redress process:

Stage 1: Reception
The Aggrieved Persons (AP) is documented in the appropriate form to be provided by Chairperson. If during the process it appears that the AP does not understand the procedures, this will be explained. The Chairperson should not discourage the filing of a grievance form. The grievance will also be documented in the Grievance/Issues Register.

The Grievance Registration Form should be signed and dated by the aggrieved person. Where the aggrieved person is unable to write, he shall obtain assistance from the Chairperson to fill the form and emboss the form with his/her thumbprint.

Step 2: Investigation
If the issue is easily resolvable and it does not require investigation the Chairperson will refer to the GRC, which will carry out the hearing of the grievances and provide the answer within 3 days, after the date of hearing the grievances.

If the grievance is a more complex project-related issue, it will be investigated further, and then arrange the hearing within 7 days after the date of registration.
The Chairperson will arrange the hearing day within 7, which shall be attended by the AP and the party causing the grievances. The Chairperson will notify both parties within 3 days after the date of hearing the grievance.

Step 3: Response
It is assumed that all cases shall be solved at the GRC level. However, some cases may remain unresolved. For such cases, the AP shall have the option to refer his/her case to the District Commissioner for final amicable solution.

The Chairperson will prepare a preliminary report containing the details of the grievance and hearing date, and decision of GRC and submit to the District Commissioner. However, reporting on GBV/SEA and SH will observe confidentiality by using relevant channel without compromising the confidential information regarding the aggrieved person.
Step 4: Follow Up and Close-Out
If no amicable solution is reached in Step 3 the AP will have recourse to the court of law as a last resort. This can be a labour court, criminal court, or civil court depending on the type of grievance.

This is a stage that although should always be open and available, it will be discouraged by all positive means such as timely communication and open negotiations. The institutional arrangement has been designed to allow for the process to detect and deal with problems in a timely and satisfactory manner for all parties concerned. Therefore, the GRC shall take necessary measures to ensure that solutions are reached by consensus based on negotiation and agreement.

8.6 Stakeholder Consultations

The stakeholder consultation process was carried out during the Scoping Study and has continued to be carried out during the preparation of this ESIA Report. During Scoping and ESIA stage, the consulted stakeholders had the opportunity to raise issues and their concerns regarding the project. All the raised issues /concerns have been taken into consideration during the project design and preparation of ESIA Report. However, in order to properly address environmental and social issues, further stakeholder consultation will be necessary during the project implementation.

The stakeholder consultations for the Contractor are aimed at providing a two-way communication or information exchange between the Contractor and the PAPs and the public. This is to ensure that information on the impact of the project is timely delivered by the Contractor and Project Proponent to the PAPs and the public. The Contractor shall disclose relevant content of the project, potential environmental and social impacts and mitigation measures; GBV /SEA and SH issues and Environmental, Social, Health and Safety (ESHS) issues.

The following actions will be taken by the Contractor during construction phase:

- During construction, the Contractor shall keep open communication with local government, and the surrounding local community members.

- Before construction, the Contractor shall disseminate the project information to the PAPs and surrounding local community members and the public in general in the form of brochures written in both Kiswahili and English Languages.

- Relevant project information to be published in the brochures shall include, but not be limited to:
    - Project Overview;
    - Construction Plan;
    - Main Construction Activities;
    - Main Environmental Problems and Mitigation Measures; and
    - Name and phone number of the Contractor's Project Manager, the Consultant's Resident Engineer, and PIU Safeguard Officer.

The Contractor shall regularly communicate with the Supervision Consultant's Environmental Specialist and Social/Gender Specialist on the main sensitive subjects and to mitigate any unfavourable environmental and social impacts.

The Contractor shall provide training to the workers before commencement of construction works on Grievances Redress Mechanism, Contractor's Code of Ethical Conduct and Code of Conduct on EH&S and GBV/SEA, and thereafter regularly (monthly) throughout the project implementation period. The samples of Contractor's Code of Ethical Conduct and Code of Conduct on ESH&S and GBV/SEA are provided in **APPENDIX 15** and **APPENDIX 16**, respectively.

Relevant information on Grievances Redress Mechanism, Ethical Code of Conduct, and Code of Conduct on GBV/SEA will be posted at strategic locations for easy access by construction workers in Kiswahili and English Languages.

Complaint recording system shall be placed at the Contractor's Office, whereby all submitted complaints problems and other matters shall be included in the Monthly Progress Reports and submitted to the Resident Engineer and ESU for review and approval.

8.7 Institutional Capacity Building

To ensure the sustainability of this project there is a need for institutional capacity building. The purpose of institutional capacity building is to ensure the sustainability of the benefits obtained after the construction of DMDP 2 infrastructure and effective implementation of the outlined enhancement / mitigation measures in the ESMP during operation phase.
Therefore, institutional capacity building will involve:

- Establishment of Environmental and Social Unit (ESU) at the TARURA, which will be comprised of Environmental Health and Safety Officer (EHSO) and Social / Gender Officer (SGO).

- Training of ESU Staff, namely the EHSO and SGO, on the environmental, social, gender, health, and safety issues during construction phase; and environmental and social monitoring issues during operation phase.

- Training of Contractor's Staff and Construction Workers.

8.7.1 Establishment of Environmental and Social Unit (ESU)

The capacity building within the TARURA Kinondoni Office will involve establishment of Environmental and Social Unit (ESU). The ESU will be responsible for overseeing implementation of outlined enhancement / mitigation measures in the ESMP and overseeing Environmental, Social, Gender, Health, and Safety (ESGH&S) during operation phase. The Environmental and Social Unit will also be responsible for daily monitoring of environmental and social issues, including compliance with outlined mitigation measures in the ESMP, including prevention of GBV/SEA, SH, and Child Labour.

The Environmental and Social Unit will be run by Environmental Health and Safety Officer (EHSO) and Social/Gender Officer (SGO) and will be liaising with the National Environment Management Council (NEMC) and Municipal Environmental Management Officers (MEMO) and Municipal Community Development Officers (MCDOs) from Ilala and Kinondoni Municipal Councils.

The budget for strengthening and running of the Environmental and Social Unit (ESU) will be part of the recurrent budget of the TARURA. This budget will include salaries of two specialists, fully furnished office, two computers with accessories and other related facilities.

8.7.2 Training of ESU Staff

The objective of organizing training for ESU Staff is to strength environmental management during construction and operation phase, and to ensure the quality of environmental monitoring and effective environmental management, thus improving the quality of the construction works. At the end of the training the ESU Staff will be able to understand the main environmental and social issues during the construction and operation phase, and have a better understanding of existing problems and deficiencies on environmental management; and take necessary preventive and control measures as soon as possible.

The training shall be conducted by Supervision Consultant's Environmental Specialist in collaboration with Social/Gender Specialist. In addition, the ESU's Environmental Health and Safety Officer (EHSO) and Social/Gender Officer (SGO) will be involved in on-the job training by participating in the environmental and social monitoring during construction phase. They will be submitting their environmental and social monitoring reports for assessment by the Supervision Consultant's Environmental Specialist in collaboration with Social/Gender Specialist.

8.7.3 Training of Contractor's Staff and Construction Workers

Before commencement of construction works training will be organized for the responsible personnel and construction workers, in order to avoid environmental damages due to project implementation during construction. For contract responsible personnel, the objective of training is to define the environmental protection responsibilities of the contractor; and for construction workers, the objective is to ensure the proper construction practice during the

construction period in order to avoid some construction behaviours, which have adverse impacts on the environment.

The training will be helpful for the project responsible personnel to understand their obligations in environmental protection needed to be assumed and possible consequences of the environmental damage. The construction workers will have a better understanding of the protection level and methods for environmental sensitive areas. Based on the actual situation of the Project, the training period for construction workers will not be more than one week.

8.8 Cost Estimates for Mitigation Measures

The cost estimate for mitigation measures takes into consideration those costs to be incurred due to affected resources as a result of rehabilitation works/ activities and costs to be incurred as a result of the Contractor's adherence to good engineering practice. Those costs resulting from implementation of mitigation measures for negative environmental and social impacts are considered as extra costs outside the Project Budget. However, the project will not be responsible for costs that arise out of normal responsibility of the project proponent or implementing agency. Therefore, for that reason, recurrent costs during operation and maintenance are excluded.

The cost estimates for the implementation of ESMP mitigation measures are cost due to the implementation of specific mitigation measures. These include Implementation of Resettlement Action Plan (RAP)[85]; GBV/SEA Awareness Programme; Prevention and Control of Covid-19; HIV/AIDS Prevention and Control Programme; According to the Valuation Report, the cost of compensation of PAPs is estimated to be Tanzania Shillings (TZS) **1,770,466,800.00**. In this regard, the following cost estimates for mitigation measures have been considered for protection of environmental and social resources; and as such for implementation of ESMP:

S/n	Particulars of Cost Items	Amount (TZS)
1.	Cost of Compensation and RAP implementation	1,770,466,800.00
2.	GBV/SEA Awareness Programme	50,000,000.00
3.	Prevention and Control of COVID-19	50,000,000.00
4.	HIV/AIDS Prevention and Control Programme	50,000.000.00
	Total 1:	1,920,466,800.00
	Add 10% Contingency:	192,046,680.00
	Total 2:	**2,112,513,480.00**

This makes the total cost for implementation of mitigation measures to be Tanzania Shillings (TZS) **2,112,513,480**. This cost will be included in the Bill of Quantities during the preparation of the Bidding Document. However, these are just tentative cost estimates as the actual cost will be known during the preparation of the Bidding Document. The cost estimates have been based on the Consultant's experience on projects of similar nature.

8.9 ESMP Schedule

The role of ESMP is to outline environmental requirements for the project and provide guidance for the Contractor to follow and properly manage environmental impacts during construction. It specifies mitigation and institutional measures to be taken during construction and operation phases to eliminate any adverse environmental and social impacts, offset them or reduce them to acceptable levels. Specifically, ESMP schedule as shown in **Table 8.8-1**, summarizes all anticipated significant adverse environmental impacts and provides specific description of institutional arrangement for carrying out mitigation measures. In order to have

[85] This includes compensation of assets, transport, accommodation and disturbance allowance for PAPs.

effective ESMP there must be an integration of efforts among various institutions/stakeholders. This ESMP therefore specifies roles and responsibilities of various institutions/stakeholders during implementation. However, it is important that all responsible institutions /stakeholders should appreciate that they are united and should interact and work towards a common purpose.

Table 8.8-1: ESMP Implementation Schedule.

S/n	Positive Impacts	Mitigation Measures	Responsibility	Cost Estimates
A.	**Mobilization Phase**			
A1.	Loss of ecological functions and landscape quality due to removal of vegetation cover and trees.	▪ Planting of grass and trees along the road sections. However, precautions will be taken to avoid tree species with damaging root systems and/or tree species which may cause obstruction of view from traffic due to wide canopy	▪ KMC assisted by Design Consultant in collaboration with PAPs and Local Community Leaders.	1,770,466,800.00
A2.	Loss of land ownership and other properties due to land acquisition	▪ Payment of compensation to the Project Affected Persons (PAPs). This will also involve formulation and implementation of Resettlement Action Plan (RAP) to ensure fair and prompt payment of PAPs.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
A3.	Disruption of social services and economic activities due to relocation of infrastructure/utilities	▪ Make consultation with relevant public service infrastructure/utility authorities to identify location of underground utilities before commencement of construction works. ▪ Conduct excavation of trial pits along each road sections to locate underground utilities before commencing excavation of road bed. ▪ Provide prior information through mass media to the public on the possible interruption of public services. ▪ Immediate relocation and restoration of affected infrastructure/utilities within 12 hours.	▪ Contractor in collaboration with Utility / Infrastructure Authorities monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert.	To be provided m the BOQ for Other Items
A4.	Creation of temporary employment due to recruitment of construction workers	▪ Giving employment priority to the local people during recruitment of construction workers. ▪ Giving equal employment opportunities to males and females and avoid any kind of discrimination based on gender, race, religion, etc. ▪ Ensure all workers are served with Employment Contracts which stipulates all workers' rights under the labour laws such as maternity leave, sick leave, etc.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items

		▪ Ensure workers are paid not less than minimum wage as stipulated by the government. ▪ Ensure payment of monthly contributions to the National Social Security Fund (NSSF) and Workers Compensation Fund (WCF) as required by the national laws. ▪ Ensure all workers are made aware, understand and follow the Code of Ethical Conduct.		
A5.	Loss of self-employment and income generation opportunities by small; business operators due to displacement from the road sections.	▪ KMC in collaboration with TARURA will make consultation with representatives of small business operators to identify new areas to be relocated before commencement of construction works	▪ KMC and TARURA assisted by the Supervision Consultant.	NA
B.	**Construction Phase**			
B1.	Creation of dust emissions along unpaved access roads to the road construction site.	▪ Application of water along access roads during dry seasons. ▪ Minimize stockpiling of excavated soils along the construction road by immediate removal and transportation to dumping site. ▪ Covering trucks hauling dusty construction materials with tarpaulins. ▪ Fencing of materials storage yard with corrugated iron sheets to prevent dusty construction materials against wind action.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B2.	Creation of dust emissions along unpaved access roads to borrow pits/quarry sites	▪ Application of water along access roads during dry seasons. ▪ Avoid transportation routes which passes through areas with densely populated human settlements and/or cultivated crops.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B3.	Creation of noise nuisance and vibration effects along the construction roads.	▪ Limiting noisy construction activities only to day time hours. ▪ Prohibit the use of old equipment / machinery which produce high noise levels and ensure noise emission from heavy trucks and mobile construction equipment do not exceed 75 dB,	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items

		in accordance with Tanzania Noise Emission Standards[86]. ▪ Ensure exhausts of heavy trucks and mobile equipment /machinery are fitted with noise reducing mufflers. ▪ Carry out regular maintenance of vehicles and mobile equipment / machinery. ▪ Carry out inventory of cracks on adjacent building structures before commencement of construction works in collaboration with owners of the building structures.		
B4.	Creation of noise nuisance and vibration effects along access roads to borrow pits/quarry sites.	-do-	Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B5.	Creation of soil erosion and sedimentation effects on the adjacent lands due to water flow from road.	▪ Ensure proper design of roadside storm water drainages and installation of culverts to ensure there is no concentration of storm water flow on adjacent properties. The Contractor will make sure all storm water from the road is directed into natural drainages.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B6.	Creation of landscape degradation due to excavatipn and accumulation of soil matearials.	▪ Ensure immediate removal and transportation of all excavated soil materials to the permitted dumping site.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B7.	Risk of environmental pollution due to lack of sanitary facilities at the construction site.	▪ Provision of mobile toilets at the construction sites. Alternatively, whenever possible the Contractor will make arrangement to hire sanitary facilities from the owners.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B8.	Creation of soil erosion and sedimentation of stream/river bed due to vegetation removal.	▪ Minimize destruction o riverbanks vegetation by confining vegetation clearing to the permitted areas.	▪ Contractor monitored by Supervision Consultant's Environmental Expert	To be provided m the BOQ for Other Items

[86] The United Republic of Tanzania. Environmental Management (Standards for the Control of Noise and Vibration Pollution) Regulations (2010). THIRD SCHEDULE (Made Under Regulation 15(1)).

		▪ Ensure planting of grass on bare areas along the stream/river banks after completion of bridge construction works.	and Social/Gender Expert	
B9.	Creation of occupational health and safety risks due to exposure to hazardous working conditions	▪ Provision of appropriate Personal Protection Equipment (PPE) to construction workers dust protection masks to construction workers. ▪ Preparation and implementation of Health and Safety Management Plans (HSMP). This includes conducting risk assessment and mitigation, toolbox meetings; health and safety training; daily health and safety inspection by a competent person at the construction sites.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B11.	Creation of construction related risk of accidents due to people trespassing into the construction site.	▪ Fitting all mobile construction equipment / machinery and trucks with alarm and signal device to warn people, especially during backward movement. ▪ Restrict operation of mobile construction machinery / equipment to trained personnel only. ▪ Fencing the construction site to prevent people from entering the construction site. This will include putting a written warning in both English and Kiswahili at a strategic location to prevent unauthorized people from entering the construction site. ▪ All excavated pits or trenches must be surrounded by safety nets to prevent people from falling into open pits or trenches.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B11.	Risk of traffic and construction related accidents for school children and sick persons along the construction roads.	▪ Preparation of Traffic Management Plan (TMP) which focuses on school children and sick persons crossing the construction roads. This includes putting clearly visible barricades. ▪ Construction of wall fence around the school to prevent school children from going into the construction roads.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B12.	Creation of safety hazards due to deep excavations on the construction road.	▪ Ensure installation of visible tapes and safety nets along excavated areas and putting a	▪ Contractor monitored by Supervision Consultant's Environmental Expert	To be provided m the BOQ for Other Items

		written warning signboard about the presence of deep excavations.	and Social/Gender Expert	
B13.	Increased risk of traffic accidents during construction due to movement of heavy trucks to and from the road construction site.	▪ Formulation and implementation of traffic management plan. This includes deploying flag persons to guide traffic movement along the road. The involvement of traffic police may be useful, whenever possible. Other measures include creation of diversion roads, and installation of speed limits signs and diversion signs.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B14.	Increased risk of fire outbreak due to accidental ignition of inflammable substances	▪ Ensure proper storage of inflammable substances far from ignition sources. ▪ Carry out regular inspection of storage containers and transmission pipes to ensure there is no any leakage.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B15.	Severance of community access to the road due to deep excavations on the construction road.	▪ Provision of temporary access for pedestrians and non-motorized transport users. The Contractor will make consultation with adjacent local residents to identify appropriate locations for placement of crossing structures (e.g. concrete slabs or culverts).	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	To be provided m the BOQ for Other Items
B16.	Increased risk of Covid-19 transmission due to influx of people into the project site	▪ Checking and recording temperatures of workers and other people entering the site or requiring self-reporting prior to or on entering the site. ▪ Providing daily briefings to workers prior to commencing work, focusing on COVID-19 specific considerations including cough etiquette, hand hygiene and distancing measures, using demonstrations and participatory methods. ▪ Preventing a worker from an affected area or who has been in contact with an infected person from returning to the site for 14 days or isolating such worker for 14 days, and referring them to local health facilities. ▪ Stakeholder consultations will be carried out before commencement of construction works	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	50,000,000.00

		to create awareness among the local residents on prevention and control of Covid-19.		
B17.	Increased prevalence of HIV/AIDS and STIs due to social interactions between construction workers and local community members.	▪ Formulation and implementation of HIV/AIDS prevention and control programme. ▪ Giving employment priority to local people to minimize the number of new comers, hence minimizing the likelihood of new HIV transmission. ▪ Collaboration with local NGOs/CBOs dealing with HIV/AIDS to promote awareness and education campaigns.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	50,000,000.00
B18.	Increased income generation for food vendors due to demand from construction workers.	▪ Provide enabling environment for food vendors to sell their food in a clean and hygienic environment by providing shelter and water supply.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	
B19.	Risk of emergence of GBV, SEA, and SH due to working relationships and social interactions.	▪ Checking and recording temperatures of workers and other people entering the site or requiring self-reporting prior to or on entering the site. ▪ Providing daily briefings to workers prior to commencing work, focusing on COVID-19 specific considerations including cough etiquette, hand hygiene and distancing measures, using demonstrations and participatory methods. ▪ Preventing a worker from an affected area or who has been in contact with an infected person from returning to the site for 14 days or isolating such worker for 14 days, and referring them to local health facilities. ▪ Stakeholder consultations will be carried out before commencement of construction works to create awareness among the local residents on prevention and control of Covid-19.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	50,000,000.00
B20.	Risk of contracting heat stroke and dehydration due to	▪ Provide shelters with reflective roofing materials to prevent or minimize effects of	▪ Contractor monitored by Supervision Consultant's Environmental Expert	To be provided m the BOQ for Other Items

	exposure to extreme heat due to climate change.	sunlight on construction workers and make them easily accessible by workers. ▪ Use mechanized equipment to reduce physical labour whenever possible. Rotate tasks to reduce continuous exposure to direct sunlight. ▪ Educate workers on the signs of heat-related illnesses and proper hydration techniques.	and Social/Gender Expert	
C.	**Demobilization Phase**			
C1.	Loss of temporary employment due to retrenchment of construction workers after closure or completion of the project/	▪ Give employment priority to local people, because after project closure they will easily revert back to their normal economic activities. ▪ Ensure that all construction workers are registered with social security funds and are paid their terminal benefits immediately before retrenchment from jobs.	▪ Contractor monitored by Supervision Consultant's Environmental Expert and Social/Gender Expert	
D.	**Operation Phase**			
D1.	Reduced dust emission due to improvement of road conditions into bitumen or concrete standards	▪ Enforcement of law to prevent damage on the road pavement by ensuring that the road sections are is used exclusively by vehicles with axle loads not exe=ceding 10 tons. ▪ Carrying out periodic maintenance of the road pavements. ▪ TARURA in collaboration with KMC will create awareness among the local residents and public on the importance of protecting the road furniture and avoiding encroachment into the road pavement.	▪ KMC in collaboration with TARURA	NA
D2.	Increased risk of traffic accidents due to improved road conditions.	▪ Installation of speed control signs and construction of speed humps at pedestrian crossings.	▪ TARURA in collaboration with Traffic Department and local community members.	NA
D3.	Reduced risks of flood events due to improved storm water drainages.	▪ KMC in collaboration with TARURA will create awareness and education campaigns among the adjacent local residents to avoid dumping of domestic solid wastes and discharge of raw	▪ KMC in collaboration with TARURA	NA

		sewage wastewater into the roadside storm water drainages. ▪ Enforcement of by-laws to prevent people from dumping domestic solid wastes and discharging of raw sewage wastewater into the road side storm water drainages.		
D4.	Improved road safety for pedestrians due to presence of dedicated walkways.	▪ TARURA in collaboration with Traffic Department will initiate education and awareness campaign on road traffic safety, including the importance of using pedestrian walkways. ▪ KMC in collaboration with Traffic Department will enforce traffic regulations to prevent motorized traffic like Bodaboda from using the pedestrian walkways.	▪ KMC in collaboration with TARURA	NA
D5.	Reduced traffic congestion due to improved linkage between feeder roads and local roads.	▪ KMC and TARURA will initiate and implement education and awareness campaigns to prevent encroachment of small business operators into the road pavements ▪ KMC in collaboration with TARURA will ensure upgrading and regular maintenance of feeder roads and local roads.	▪ KMC in collaboration with TARURA	NA
D6.	Reduced travel time for low-income communities due to improved access to BRT stations.	▪ KMC and TARURA will initiate and implement education and awareness campaigns on the importance of protecting the road furniture against vandalism. ▪ Enforcement of regulations to prevent unscrupulous people against vandalism of road furniture.	▪ KMC in collaboration with TARURA	NA
D7.	Increased access to social services for low-income communities along the road sections.	-do-	▪ KMC in collaboration with TARURA	NA

D8.	Reduced vehicle operation and maintenance costs and transportation costs.	-do-	▪ KMC in collaboration with TARURA	NA

CHAPTER NINE

9.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

9.1 Implementation of Monitoring Plan

The information collected during monitoring exercise helps to improve ESMP by adapting measures to ensure that the anticipated impacts are mitigated. For example, in case environmental monitoring identifies some environmental concerns during construction or operation phase then construction or operation works has to be modified or stopped, whenever necessary.

Thus, the objectives of environmental monitoring programme are:

- To ensure that mitigation and benefit enhancement measures have been adopted and are effective.
- To identify any unforeseen negative impacts during EIA stage and propose appropriate mitigation measures.
- To provide information on the actual nature and extent of key impacts and effectiveness of mitigation and benefit enhancement measures, which through feedback mechanism can improve the planning and execution of future, similar projects.

The ESMP monitoring during construction phase will be comprised of two activities:

- Review of Contractor's plans, methods statement, and temporary works design and arrangements to ensure that environmental protection measures specified in the contract documents are adopted and Contractor's proposals provide acceptable levels of impact control.
- Systematic observation of all site activities and the Contractor's offsite facilities, including borrow pits and quarry sites areas. To ensure that the contract requirements relating to environmental matters are being complied with and that mitigation measures for those unforeseen impacts are formulated and implemented by the contractor.

The monitoring activities will be comprised of visual observation during site inspection and will be carried out at the same time as the engineering supervision activities. Site inspections will take place with emphasis on early identification of any environmental problems and the initiation of suitable remedial action. Where remedial actions have been required on the part of the Contractor, further checks will need to be made to ensure that these are actually being implemented to the agreed schedule and in the required form.

All sites where construction is taking place will be formally inspected from an environmental view point on a regular basis. However, in addition to visual observation there shall be informal questioning of members of the local communities and their leaders who live near the project. This is because they may be aware of matters which are unsatisfactory but may not be readily apparent or recognized during normal site inspection visits.

The monitoring plan will also be integrated with other construction supervision and carried out by the Resident Engineer. The Resident Engineer will decide on the appropriate course of action to be taken in cases where unsatisfactory reports are received from the field staff regarding environmental matters. In case of relatively minor matters, advice to the Contractor on the need for remedial action may suffice, but in all serious cases, the Resident Engineer

will issue a formal instruction to the Contractor to take remedial action, depending on the extent of delegated powers.

9.2 Monitoring and Reporting Responsibilities

9.2.1 Supervision Consultant

The Supervision Consultant will appoint an Environmental Specialist and Social /Gender Specialist who shall be responsible for Environmental and Social Compliance Monitoring. The Supervision Consultant's Environmental Specialist and Social / Gender Specialist shall be making a daily site inspection and shall be attending Engineer's Site Meetings.

The participation of Environmental Specialist and Social /Gender Specialist in the Engineer's Site Meetings shall enable the Environmental Specialist and Social /Gender Specialist to:

- Review the status of any problem addressed in the previous meeting; propose additional mitigation measures, if the problem has not been resolved.
- Review the main construction activities and any environmental problem that occurred since the last meeting.
- Review the construction activities and general environmental performance as listed in the ESMP.

The Environmental Specialist and Social/Gender Specialist shall be preparing Monthly Environmental and Social Monitoring Reports which will highlight:

- The extent to which the Contractor is complying with the environmental and social specifications and contract conditions (compliance monitoring).
- Any unforeseen environmental and social impacts (i.e., the failure or inadequacy of the mitigation measures) and recommendations on how to manage unforeseen impacts.

In addition, the Chief Executive Officer of TARURA shall deploy an Environmental Officer and Social/Gender Officer who shall be collaborating with the Supervision Consultant's Environmental Specialist and Social /Gender Specialist to oversee implementation of ESMP. The Environmental Officer and Social/Gender Officer apart from making a close follow-up on engineering issues shall be responsible for environmental and social monitoring on monthly basis.

There must be feedback from monitoring to ensure that failure to implement an approved measure incurs a penalty to the Contractor. The Resident Engineer's responsibility will include enforcement of mitigation measures. In case an approved measure turns out to be ineffective or results into unforeseen adverse impacts it should be reported to the Chief Executive Officer of TARURA through the Regional Manager's Office, which would be capable of finding out why, and of commissioning appropriate further measures.

9.2.2 Contractor

The Contractor will be responsible for implementation of environmental and social mitigation measures under the supervision of Resident Engineer. This is to ensure that technical and environmental clauses are followed and well implemented by the Contractor.

The Contractor shall assign an Environmental Manager who shall be responsible for carrying out monitoring on daily basis and overseeing compliance with environmental and social mitigation measures. The Contractor's Environmental Manager will be assisted by EHSO and Social/Gender Specialist.

The Contractor's Environmental Manager shall submit a Monthly Environmental, Social, Health, and Safety (ESH&S) Compliance report to the Resident Engineer specifying that:

- All previously notified failures to comply with the mitigation measures have been rectified.

- All newly notified requirements have been fulfilled and all standard requirements (as specified in this report) have been put into effect.

The Resident Engineer shall countersign the report and make it available to the PO-RALG and World Bank. PO-RALG in turn should pass a copy to the KMC within a reasonable period not exceeding 30 days from receipt.

9.2.3 Monitoring Methods

The purpose of monitoring is to ensure that the Contractor implements the outlined mitigation measures in the ESMP. Therefore, monitoring methods will be based mainly on visual inspection and will be carried out by the Supervision Consultant's Environmental Specialist and Social/Gender Specialists in collaboration with Contractor's Environmental Manager assisted by Environmental, Health and Safety Officer (EHSO) and Social/Gender Specialist on daily basis.

To verify environmental effects predictions, and to evaluate the effectiveness of mitigation measures committed during the ESMP preparation, it is necessary to collect baseline data before the commencement of the construction works that may result in changes to the environment. The purpose of baseline data collection is to update the baseline information and establish the existing conditions at the construction sites.

Establishing baseline conditions allows for a comparison with conditions before and after construction works to determine the extent of any project-related environmental effects, the need for additional mitigation measures, and/or to confirm the effectiveness of mitigation measures that have been or are being implemented.

In case any environmentally and socially sensitive issues have been identified during baseline monitoring and not covered during the ESMP preparation, adaptive measures and additional monitoring or mitigation will be developed and implemented as may be necessary.

9.3 Environmental and Social Monitoring Costs

The cost of environmental and social monitoring will be included in the cost of Construction Supervision. The Supervision Consultant will be responsible for the cost of environmental and social monitoring. These costs include payment of professional fees for Environmental Specialist and Social/Gender Specialist. However, these costs will be included in the overall costs of commissioning the Supervision Consultant.

9.4 ESMP Monitoring Schedule

The ESMP monitoring schedule as summarized in **Table 9.4-1** addresses the following questions:

- WHAT parameter to be monitored? (Monitoring Parameters)
- WHY is the parameter being monitored? (Monitoring Objective)
- WHAT indicator to be used in monitoring? (Monitoring Indicators)
- WHERE to be monitored? (Monitoring Location).
- HOW is to be monitored? (Monitoring Methods).
- HOW frequent is to be monitored? (Monitoring Frequency)
- WHAT is the monitoring targets or standards? (Performance Standards)
- WHO is responsible for monitoring? (Monitoring Responsibility)

Table 9.4-1: ESMP Monitoring Schedule.

Monitoring Parameters	Monitoring Objective	Monitoring Indicators	Monitoring Locations	Monitoring Methods	Monitoring Frequency	Performance Indicators	Monitoring Responsibility
1. Mobilization Phase							
1.1 Compensation of PAPs.	To ensure all PAPs have been fairly and promptly compensated before land acquisition.	Number of compensated PAPs.	Along the road sections.	RAP Report	Once before construction works	All PAPs have been fairly and promptly compensated	TARURA in collaboration with KMC monitored by Supervision Consultant's Social / Gender Specialist.
1.2 Relocation of public infrastructure / utilities.	To ensure all infrastructure / utilities have been relocated and restored within 24 hours before construction works.	Presence of infrastructure /utilities at the construction site.	Along the road sections.	Visual inspection	Once before construction works.	All infrastructure/ utilities have been relocated and restored within 24 hours. No complaints from the public regarding disruption of services.	Contractor in collaboration with Utility / Infrastructure Authorities monitored by Supervision Consultant's Environmental Specialist and Social/Gender Specialist.
1.3 Access of local people to employment in the project area	To ensure employment priority is given to local people. To ensure equal employment opportunity without gender and/or racial discrimination. To ensure Contractor is providing	Number of local people employed in the project by gender.	Contractor's Office.	Interview with local people. Sample of Employment Contract.	Continues throughout construction period.	Employment priority is being given to the local people. Number of reported aces of gender or racial discrimination. Employment contracts are in accordance with labour laws.	Supervision Consultant's Social/Gender Specialist

Monitoring Parameters	Monitoring Objective	Monitoring Indicators	Monitoring Locations	Monitoring Methods	Monitoring Frequency	Performance Indicators	Monitoring Responsibility
	employment contracts in accordance with the labour laws.						
1.5 Destruction of archaeological artefacts due to land excavation during construction of road sections.	To ensure that the prescribed chance find procedures are followed during discovery of archaeological artefacts.	Presence of archaeological artefacts.	Along the road sections.	Visual inspection.	Continuous during construction.	Chance find procedures has been followed during discovery of archaeological Artefacts.	Contractor monitored by Supervision Consultant's Environmental Specialist and Social/Gender Specialist
1.6 Submission of C-ESMP, HSMP and HIV/AIDS Programme.	To ensure compliance with EH&S issues by Contractor.	Submitted C-ESMP, HSMP, HIV/AIDS programme.	Based on submission of the documents to the Engineer.	Review of C-ESMP and HSMP documents.	Before construction works.	C-ESMP, HSMP and HIV/AIDs Programme has been approved and being implemented.	Supervision Consultant's Environmental Specialist in collaboration with Social/Gender Specialist
1.7 Submission of Contractor's Site Plan	To ensure compatibility of the site plan with local land use plan.	Submitted Contractor's Site Plan	Based on submission of Site Plan	Visual inspection.	Before commencement of construction works.	Location of office/camp site and materials/equipment storage yard is compatible with local land use plan. Office / camp site is equipped with all support facilities.	Supervision Consultant's Site Engineer.
2. Construction Phase							

Monitoring Parameters	Monitoring Objective	Monitoring Indicators	Monitoring Locations	Monitoring Methods	Monitoring Frequency	Performance Indicators	Monitoring Responsibility
2.1 Dust and smoke emission around the project site.	To minimize impacts of air pollution from dust and exhaust emission.	Intensity of visible dust and smoke	Construction sites.	Visual inspection.	Daily, throughout construction period.	The contractor is regularly applying water on dusty areas. There is no visible smoke emission from vehicles and mobile equipment/machinery. The stockpiled dusty materials storage area has been fenced to prevent wind action. All trucks hauling dusty construction materials are always covered with tarpaulins.	Supervision Consultant's Environmental Specialist in collaboration with Social/Gender Specialist
2.2 Noise nuisance and vibration effects.	To minimize noise impacts from construction activities and transportation of materials along access roads to borrow pits /quarry sites.	Noise and Vibration Levels	At the construction sites and along access roads to borrow pits / quarry sites.	Audible noise.	Daily during construction and transportation of materials.	No complaints from adjacent local residents regarding noise nuisance.	Supervision Consultant's Environmental Specialist in collaboration with Social/Gender Specialist

Monitoring Parameters	Monitoring Objective	Monitoring Indicators	Monitoring Locations	Monitoring Methods	Monitoring Frequency	Performance Indicators	Monitoring Responsibility
2.3 Construction related accidents.	To minimize risk of construction accidents.	Presence of risk factors.	Construction site	Incidents Report Forms. Monthly EH&S Compliance Reports.	Daily, throughout the construction period.	Number of reported cases of construction-related accidents. The construction site has been fenced by using a corrugated iron sheet. There is a written warning signboard in Kiswahili and English Languages. All trucks and mobile equipment have been fitted with wring signal devices and audible warning alarms.	Supervision Consultant's Environmental Specialist
2.4 Accumulation of demolition wastes and other solid wastes.	To minimize impacts due to accumulation of demolition / solid wastes.	Presence of demolition / solid wastes in the surrounding environment.	Construction sites	Visual inspection.	Continues throughout construction period.	No accumulation of demolition wastes around the site. All solid wastes are being collected and transported to	Supervision Consultant's Environmental Specialist

Monitoring Parameters	Monitoring Objective	Monitoring Indicators	Monitoring Locations	Monitoring Methods	Monitoring Frequency	Performance Indicators	Monitoring Responsibility
						the municipal dumping site.	
2.5 Health and Safety of Construction workers.	To minimize occupational occupations health and safety risks.	Number of toolbox sessions. Number of workers provided with and using appropriate PPE. Presence of approved Health & Safety Management Plan (HSMP)."	Construction sites	Visual inspection. An informal interview with workers. Monthly ESH&S Compliance Reports.	Daily, throughout construction period.	Number of reported incidences of occupational diseases and accidents.	Supervision Consultant's Environmental Specialist in collaboration with Social/Gender Specialist
2.6 Implementation of HIV/AIDs Prevention and Control Programme.	To minimize risk of HIV transmission.	Number of HIV/AIDS campaigns and training sessions. Number of participants by gender.	Based on submission of HIV/AIDS reports	Monthly HIV/AIDS Campaign Reports.	Monthly	Number of reported cases of new HIV transmission as indicated by Voluntary Clinical Testes (VCTs) HIV//AIDS program is in place and being implemented on a regular basis.	Supervision Consultant's Social/Gender Specialist in collaboration with Contractor's Social /Gender Specialist.

Monitoring Parameters	Monitoring Objective	Monitoring Indicators	Monitoring Locations	Monitoring Methods	Monitoring Frequency	Performance Indicators	Monitoring Responsibility
2.7 Workers Welfare[87] and Child labour.	To ensure compliance with labour laws.	Monthly Salary Slips; NSSF Monthly Payment Receipts. WCF Monthly Payment Receipts	Based on submission of Monthly Compliance Reports.	Monthly ESH&S Compliance Reports	Monthly	Number of reported complaints regarding minimum wages. Reported cases of non-payment of Monthly NSSF and WCF contributions.	Supervision Consultant's Environmental Specialist in collaboration with Social/Gender Specialist
2.8 Movement of heavy trucks to and from the construction site.	To minimize risk of traffic accidents.	Incidence of traffic accidents. Number of awareness sessions organized on road traffic safety for workers and fish market community members.	Access road to the Construction sites.	Visual inspection	Daily, during Construction period.	Number of reported cases of traffic accidents. The traffic management plan is in place and being implemented by the Contractor. Flag person has been deployed to guide movement heavy trucks to and from the construction site.	
2.9 Incidence of GBV, SEA, and SH	To prevent incidence of	Number of awareness sessions.	Office/Camp Site and Construction sites.	Verification of awareness sessions	After every 15 days	Number of workers who participated in	Supervision Consultant's Social/Gender

[87] (1) Payment of Minimum Wage (2) NSSF and WCF Contributions by the Contractor (3/ Deductions from payment of wages to be made as allowed by national law (project workers to be informed of the conditions under which such deductions will be made). (4) Project workers to be provided with adequate periods of rest per week, annual holiday, and sick, maternity and family leave, as required by national law.

Monitoring Parameters	Monitoring Objective	Monitoring Indicators	Monitoring Locations	Monitoring Methods	Monitoring Frequency	Performance Indicators	Monitoring Responsibility
	GBV/SEA and SH.			organized with workers Verification of consultations with and involvement of local communities		awareness sessions by gender. Consistent and regular involvement of local community members	Specialist in collaboration with Contractor's Social/Gender Specialist
3. Demobilization Phase							
3.1 Retrenchment of workers during project completion.	To ensure NSSF contributions and terminal benefits have been paid to all retrenched workers.	Number of retrenched workers	Contractor's and Engineer's Office	Monthly Compliance Site Closure Report	Once, during project completion.	Ensure that 100% of no skilled workers are hired in the project area	Supervision Consultant's Social/Gender Specialist in collaboration with Contractor's Social/Gender Specialist
3.2 Site restoration and clean up or removal of excess construction materials.	To ensure the site is restored to its original condition.	Presence of excess construction materials.	Construction site	Visual inspection	Once, during completion of construction works.	All demolition and solid wastes have been removed from the construction site.	Supervision Consultant's Environmental Specialist.
3.3 Climate change factors such as temperatures, rainfalls,	To ensure protection of road pavement and drainage structures against climate change effects.	Temperatures and rainfalls	Meteorological Stations	Visual inspection	Annually	Road infrastructure is able to achieve its deign life of 20 years for bituminous pavement and 40 years for concrete pavement.	TARURA in collaboration with Tanzania Meteorological Authority (TMA)

CHAPTER TEN

10.0 RESOURCE EVALUATION OR COST BENEFIT ANALYSIS

10.1 Project Costs and Benefits

10.1.1 Project Costs

The project cost has been estimated to be US D 16,180,000.00, which is equivalent to TZS 37,586,787,200, based on the Bank of Tanzania (BoT) Exchange Rate of 1 US D = TZS 2323.04 on 3rd April 2023[88]. This cost excludes the cost of operation and maintenance as well as cost of implementation of Environmental and Social Management Plan (ESMP) and Monitoring Plan (MP).

10.1.2 Project Benefits

The project is expected to have both short-term and long-term environmental and socio-economic benefits to the local community and the nation.

10.1.2.1 Short-term Benefits

The short-term socio-economic benefits include creation of temporary employment and increased income generation opportunities to the local people. It is expected that during construction employment priority will be given to the local people.

During construction some local people, especially women will get opportunity to increase their income by selling food items to the construction workers. This benefit will be enhanced by providing water supply and sanitary facilities to enable them sell their food in clean and hygienic environment, hence preventing transmission of hygiene related disseises like cholera and diarrhoea to the construction workers.

10.1.2.2 Long-term Benefits

The long-term environmental and socio-economic benefits will be realized from rehabilitation of the road section into bitumen standard. The long-term environmental and socio-economic benefits include:

- Reduced travel time, increased productivity and stimulation of local economic growth.
- Reduced dust emission due to improvement of the road sections into bitumen standard.
- Reduced vehicle operation and maintenance costs due to improvement of the road sections into bitumen standard.

The environmental and socio-economic benefits accrued from improvement of the road sections into bitumen standard are very significant although some of them cannot be easily quantified in financial terms. The improvement of the road sections into bitumen standard is also expected to lead into increased price of land, transformation of land use, and changes in the socio-economic condition of the population living along the road sections.

10.2 Environmental Costs

10.2.1 Direct Environmental Costs

The cost of environmental mitigation measures as shown in **Table 10-1** is considered to be the direct environmental[89] cost to be incurred by the project. The cost of environmental mitigation measures is considered to be the environmental cost to be incurred due to implementation of mitigation measures for this project, which is estimated to be TZS 2,651,416,900.00.

[88] Concept Note Disclosure Date.
[89]The term “environmental” in this report also means “social” and “cultural”, unless otherwise specified.

Table 10-1: Direct Environmental Cost Estimates.

S/n	Particulars of Cost Items	Amount (TZS)
1.	Compensation of PAPs due to Land Acquisition	2,260,379,000.00
2.	GBV/SEA Awareness Programme	50,000,000.00
3.	Prevention and Control of COVID-19	50,000,000.00
4.	HIV/AIDS Prevention and Control Programme	50,000.000.00
5.	Environmental, Health and Safety Management Plan	50,000,000.00
	Total 1:	2,410,379,000.00
	Add 10% Contingency:	241,037,900.00
	Total 2:	**2,651,416,900.00**

10.2.2 Indirect Environmental Cost

The indirect environmental cost as shown in **Table 10-2** includes the cost of Cost of Project Registration to NEMC; Cost of undertaking ESIA Study by Consultant; Publication of Scoping Report and ESIA Report; Review of ESIA Report by NEMC; Engagement of Environmental Monitoring Consultant[90]. This makes the estimated indirect environmental cost to be TZS 502,200,000.00.

Table 10-2: Indirect Environmental Cost Estimates.

Costed Items	Cost Estimates (in TZS)
(a) Cost of Project Registration to NEMC	200,000.00
(b) Cost of undertaking ESIA and RAP Study by Consultant	90,000,000.00
(c) Publication of Scoping Report, ESIA Report and RAP Report	2,000,000.00
(d) Review of ESIA Report by NEMC	50,000,000.00
(e) Engagement of Environmental Monitoring Consultant	360,000,000.00
Total:	502,200,000.00

10.3 Determination of Benefit/Cost Ratio

The resource evaluation or cost benefits analysis focuses on comparing the project costs and environmental costs. The environmental costs include direct and indirect environmental costs, which make the total environmental cost for this project to be TZS 3,153,616,900, and the total project costs to be TZS 40,740,404,100, after including the overall environmental costs.

When compared with total project costs (TZS 40,740,404,100), the overall environmental cost (TZS 3,153,616,900) is about 7.74% of the total project cost. It can be concluded that the environmental cost is significantly small and can be tolerated for this project.

[90] Guide to Estimating Environmental Costs. Prepared By: ICF International, Venner Consulting, CH2M Hill and the University of Florida. October 2008.

CHAPTER ELEVEN

11.0 DEMOBILIZATION PLAN

11.1 Implementation of Demobilization Plan

The demobilization and site reclamation process are one of the required project management activities during the project completion or closure of the projects. The demobilization activities will involve removal of all mobilized items and cleaning up of the construction sites. It will include the removal of all temporary ramps, access ways, road signs, temporary fencing, construction debris including crushed stone aggregates, pieces of wood, construction stakes, and other construction-related refuse, and temporary facilities or works. The restoration of surfaces, to an equal or better than existing condition, shall also be considered as part of the demobilization activities. Site reclamation includes reclamation of areas disturbed during construction, other than access and staging areas, to pre-project conditions or better.

In order to ensure that all demobilization and site reclamation works are done in a comprehensive way right from the beginning, it is important to have a demobilization checklist which shows all items that need to be completed during implementation of demobilization plan. An example of Environmental and Social Demobilization Checklist is provided in **APPENDIX 17**, which groups the different items that need to be completed and inspected. The checklist covers the following issues and areas to be considered during implementation of demonization plan:

- Workers Welfare Management
- Camp Sites and Office Facilities; Solid Waste Management; Soil Erosion and
- Sedimentation Control; Groundwater and Dewatering Contol.
- Workshops/Garages,Vehicle Washing and Refuelling Areas.
- Fuel and Chemical Storage Area
- Sanitary and Wastewater Disposal Facilities.
- Landscape Management and Run-off Control
- Borrow pits/Quarry Sites Rehabilitation.

The demobilization checklist will be used by Supervision Consultant's Environmental Specialist. For each inspection item, the form has a column for the work completion status (Yes, No or Not Applicable), observation comments made by the inspector for non-compliance works that need to be rectified by the Contractor and the target completion date for completing the non-conformant works. The Environmental Inspector will be taking some photographs during the site inspection for recording purpose. The photographs will be attached to the Environmental Demobilization Checklist and submitted to the Resident Engineer for action.

11.2 Retrenchment of Employees

Three months before completion of the project, the Contractor through Human Resource Officer (HRO) will make sure NSSF contributions for all construction workers have been paid to the NSSF. This will involve posting of the names of all employees on the notice board indicating their Names, NSSF numbers and Monthly NSSF contributions. This is to ensure that that the monthly NSSF deductions have been paid by the Contractor and allow rectification for any identified shortcomings before retrenchment of employees.

11.3 Exit Medical Examination for Employees

The Contractor will carry out an exit medical examination for all employees before retrenchment. This is the requirements of Sub-section 24(2) of the Occupational Health and Safety Act No. 5 of 2003. The legislation requires the Contractor shall carry out an exit medical examination through a qualified occupational health physician. According to Sub-section 24(3), the Contractor shall be responsible for the prescribed fee and all other medical expenses.

11.4 Restoration of Utilities, Drainage Systems and Landscape

During demobilization phase all work areas, offices, workshops /garages, and other temporary installations will be cleaned up and the site will be restored. These includes removal of temporary buildings, surplus materials, pieces of wood, pieces of bricks or any other material that is not in the area before constriction works.

All drainage systems will be de-silted to allow storm water flow and damaged areas will be repaired to make them compatible with urban land use and maintain the aesthetic value of the urban environment. All permanent installations such as traffic lights, street lights, electricity power supply, water supply, and sewerage systems will be restored / repaired to their initial state.

The compacted soils around buildings will be scarified to at least 15cm deep to loosen it and facilitate vegetation growth. Damaged trees will be chopped / lopped and crosscut and removed from the construction sites. The site will be cleared of equipment, solid wastes, debris, and overburden resulting from construction works.

11.5 Restoration of Workshops / Garages and Materials Storage Areas

The workshop and other materials storage areas will be cleaned to remove petroleum products like oils and grease. The petroleum products should be handled in accordance with the provisions given in the Standard Specification for Road Works (2000).

All asphalts, cements, stockpiled gravels, and any other surplus materials will be removed from the Materials storage yard. The useable materials should be taken away and stored in a safe place far from the abandoned site. The spilled materials must be removed and the site must be properly cleaned and restored to its original state. If possible, the site must be prepared and planted with vegetation. The stockpiled soils along within the project site will be spread or disposed of into permitted area by the Resident Engineer.

11.6 Restoration of Solid Wastes and Spoil Materials Dumping Sites

All unwanted soil/spoil materials will be removed from temporary dumping sites and transported to permitted disposal site. The remaining useful soil materials will be mixed with surrounding topsoil, properly levelled, and graded to allow vegetation growth.

The solid waste dump site will be cleared, levelled, and returned to a regular form. All non-toxic wastes in the dump site will be thoroughly covered with topsoil. The Contractor will ensure that no wastes are visible and no surface water drains into the site.

The eliminated dry materials should form a stable slope and must be in harmony with the surrounding landscape. The wastes will be covered with 1 m of topsoil. The soils will be compacted thoroughly, the slope flattened and spread a layer of additional cover material and cover with topsoil to allow growth of natural vegetation.

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CHAPTER TWELVE

12.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

12.1 Summary

The Component 1 of the DMDP II Project involves construction of road sections into bitumen standard, roadside storm water drainages, landscaping /greening of open areas/parks and community infrastructure. The justification for the project has been prompted by the need to improve quality of life, enhance economic opportunities, and increase resilience to climate shocks and stresses in the Dar Es Salaam City.

Thus, Component 1 responds to ongoing demands for basic transport, drainage, parks and open space, and community infrastructure. It integrates climate adaptation measures into all infrastructure investments and will address the city's high flood risk by combining conventional engineering technologies (grey infrastructure) with nature-based solutions (green and blue infrastructure), creating additional benefits of urban cooling and increased green spaces for public use. Component 1 also encourages a shift towards low carbon transport modes and urban infill, through the clustering and co-location of multispectral investments around the BRT in the city center and in underserved and marginalized urban neighborhoods. Spatial targeting of investments around public transit will promote densification and improve accessibility of underserved and marginalized people to mass transportation, economic hubs, and open spaces[91].

The indicative construction cost estimates is about US D 16,180,000[92], which is equivalent of TZS 37,586,787,200, based on the Bank of Tanzania (BoT) Exchange Rate of 1 US D = TZS 2323.04 on 3rd April 2023[93]. The project will be funded by the World Bank (WB) and the Government of the United Republic of Tanzania (GoURT). However, the construction costs will be financed by the World Bank, and the GoURT will be responsible mainly for compensation of affected people due to land acquisition if any.

The review of relevant policies, legalisations and institutional framework indicate the project is compatible and complies with the national development policies, legal requirements and the institutional framework for environmental management is well established at all levels (i.e., national, regional, district, ward, village levels).

The review study also indicates the project will trigger the three World Bank Environmental and Social Standards, namely the ESS 1-Assessment and Management of Environmental and Social Risks and Impacts, ESS 2-Labor and Working Conditions, ESS 3-Resource Efficiency and Pollution Prevention and Management, ESS 4-Community Health and Safety, ESS 5-Land Acquisition, Restrictions on Land Use and Involuntary Resettlement, and ESS 10-Stakeholder Engagement and Information Disclosure

Some international conventions to which the country is a signatory has been found to be relevant to this project, namely the biodiversity conventions, and ILO Conventions on air pollution, noise and vibration; child labour; discrimination at work place; and workman's compensation. The Contractor will be required to comply with the requirements of national policies/legislations, WB ESS and relevant international conventions / treaties during the project implementation phase.

[91] This will be complemented by Component 3 which will support planning reform and capacity building to support densification and transit-oriented development.

[92] Refer Annex 1 of the Terms of Reference.

[93] Concept Note Disclosure Date.

The baseline data collection was carried to establish the biophysical and socio-economic characteristics along road sections. The findings indicate the project road sections traverse through undulating and flat topography, dissected by natural drainages.

The road sections traverse through built up environment with public infrastructure and utilities such as water supply pipelines, electricity power lines (Underground or overhead), and telephone cables (underground nor overhead). These infrastructure / utilities can be found to be either running parallel or crossing the road sections and are likely to be affected during construction, hence the need for relocation before commencement of construction works.

There is no significant natural vegetation cover along the road sections apart from short grass, planted trees and few remaining indigenous trees. Most of the planted trees are mainly for ornamental purpose or for providing shade to the local people.

The road sections are congested by numerous small business operations, parking of Bajaj and Bodaboda. It is also common to find small business operators close to the road and some of them doing business over storm water drainages and within the road reserve. All these small business operations and parking of Bodaboda and Bajaj will have to be removed before commencement of construction works.

The potential environmental effects of the project have been assessed to meet the requirements of the Environmental Impact Assessment and Audit Regulations (2005) and its Amendment Regulations (2018). The assessment of environmental effects/impacts was based on the interaction between the Project Related Activities and Valued Environmental Components (VECs) of relevance and importance to this project. The findings indicate most of the negative impacts are of medium to low significance and will occur during construction phase. Most of the positive impacts have been found to have high significance and will occur during operation phase.

The assessment of cumulative environmental impacts indicates the project is expected to have negative impacts with very low significance, which occur during construction phase and positive cumulative (synergistic) impacts with medium and high significance during operation phase. The residual cumulative environmental effects/impacts of the Project on the VECs have been assessed and expected to be not significant due to the applied mitigation measures.

The assessment of environmental effects/impacts of credible accidents, malfunctions and unplanned events indicate most of the effects/impacts will not be significant. The only potentially significant environmental effects due to such credible events would be if a Project-related fire put the life and/or health of the public and/or Project employees in immediate danger, or if a Project-related fire or vehicle collision resulted in the death of pedestrians. However, the environmental effects/impacts were predicted to be highly unlikely to occur due to several mitigation measures, including formulation of emergency response plan.

The effects of the environment on the Project were predicted to be not significant due to the engineering design that incorporates climate change factors and other mitigation strategies to minimize the likelihood of a significant adverse effect of the environment on the Project.

Furthermore, the Environmental and Social Management (ESMP) and Environmental Monitoring Plan have been prepared to ensure the implementation of the proposed mitigation measures during construction. In order to be effective, the ESMP and Monitoring Plan have specified the institutional roles and responsibilities, with cost estimates.

12.2 Conclusion

In general, the project has been found to have short-term and long-term environmental and socio-economic benefits to the local community and the nation. The short-term socio-economic benefits include creation of temporary employment and increased income generation opportunities to the local people. It is expected that during construction some local people, especially women will get an opportunity to increase their income by selling food items to the construction workers. These benefits will be enhanced by providing clean and safe water supply and sanitary facilities to enable the food vendors sell their food in hygienic environment, hence preventing transmission of hygiene related diseases like cholera to the construction workers.

The long-term socio-economic benefits include increased productivity due to reduced travel time; reduced vehicle operation and maintenance costs and improved access to social services.

The environmental benefit to be obtained from the project includes improved air quality due to reduced dust emission as a result of improvement of the road sections into bitumen standards. The application of green technology (vegetation planting) will also result into improved landscape quality and ecological benefits as planted trees will provide natural habitats for variety of insects, small mammals and provide a carbon sink in the urban environment.

Most of the identified negative impacts are short-term with low significance and will mainly occur during construction phase. Moreover, the mitigation measures have been proposed for the identified negative impacts. The cost estimates for the planned mitigation measures have will be incorporated into the Bill of Quantities (BOQ) during preparation of Tender/Bidding Document.

12.3 Recommendations

The project has been found to have long-term environmental and socio-economic benefits and its adverse (negative impacts), are temporary and short-term as they occur mainly during construction phase. In addition, the cost/benefit analysis and economic analysis have already found the project to be highly beneficial and economically viable, respectively. It is therefore, recommended that the project should be implemented immediately to avoid increased construction costs due to increasing inflation rate.

In order to ensure the successful implementation and sustainability of the project, the Consultant provides the following recommendations:

- TARURA should consider the climate change factor during the design and construction phase to ensure the long-term durability of the road pavement and associated bridge structures.

- TARURA should collaborate with Local Government Authorities (LGAs) to relocate small business operators before commencement of the construction works.

- TARURA should promote awareness and education campaign among the road users on the importance of using pedestrian walkways to minimize risk of traffic accidents due to interaction between pedestrians and vehicles.

- TARURA should promote awareness and education campaign among the small business operators to avoid encroachment into the road pavements.

- TARURA should ensure that the design incorporates the provision of parking areas for Bodaboda and Bajaj Operators.

In addition to the Consultant's recommendations the consulted stakeholders had the following recommendations:

- The project design must consider prevention of floods by construction of concrete or cement lined storm water drainages.
- The project should ensure continuous supply of water either by relocating, replacement or protecting water supply pipes.
- Detailed design report should be submitted to OSHA explaining the potential hazards, risks and the use of PPE at the work area/place.
- During the design stage, all drawings should be submitted to OSHA for review before project implementation.
- Compensation of affected people (PAPs) should be fair and timely to avoid inflation.
- Companies with utilities along and across the road like DAWASA should relocate their infrastructure/utilities before construction to avoid inconveniences.
- Pedestrian walkways should be included in the design.
- The contractor should give the priority of employment to the people living adjacent to the project sites during construction.
- Contractors should cooperate with community in case of any damages caused by project activities to the properties.
- During construction phase; drainage system should be well constructed for handling floods during rain seasons.
- Construction should take into account historical background of a place before preparation of design drawings.
- People should be educated about possible social interactions which may lead to HIV/AIDS provenances and unwanted pregnancies and infidelity.

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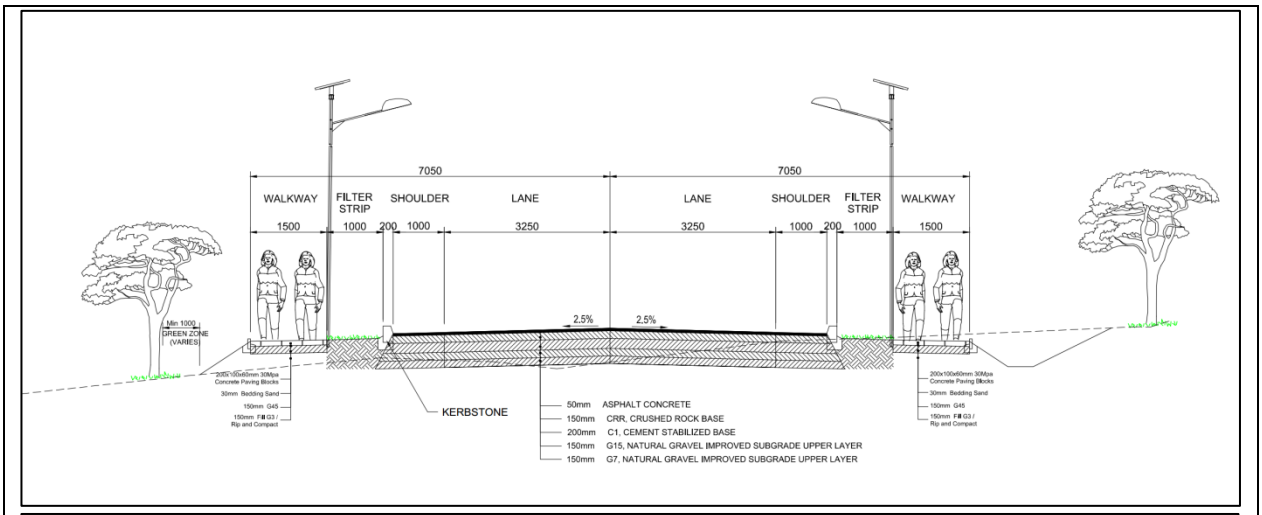
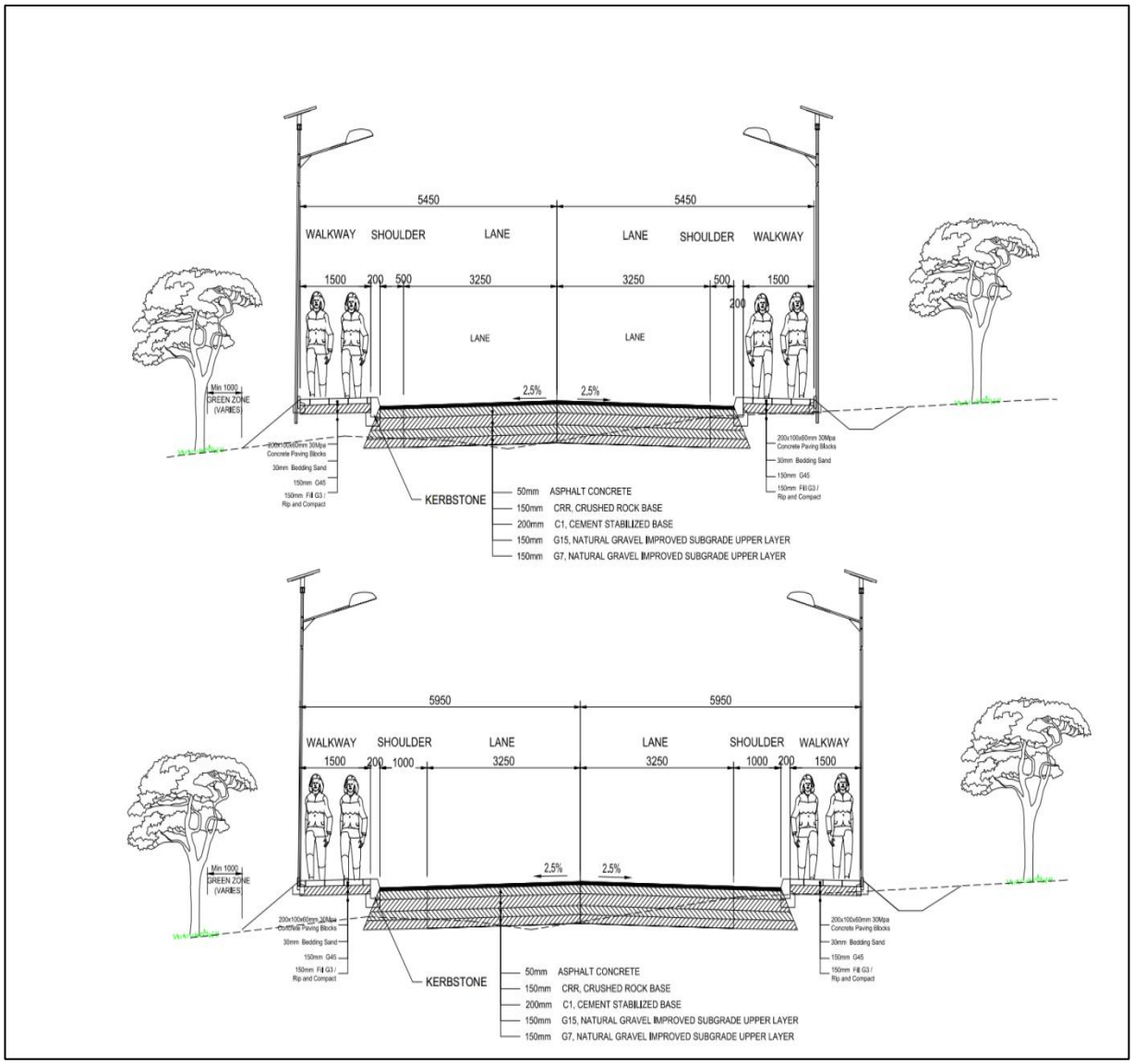
APPENDICES

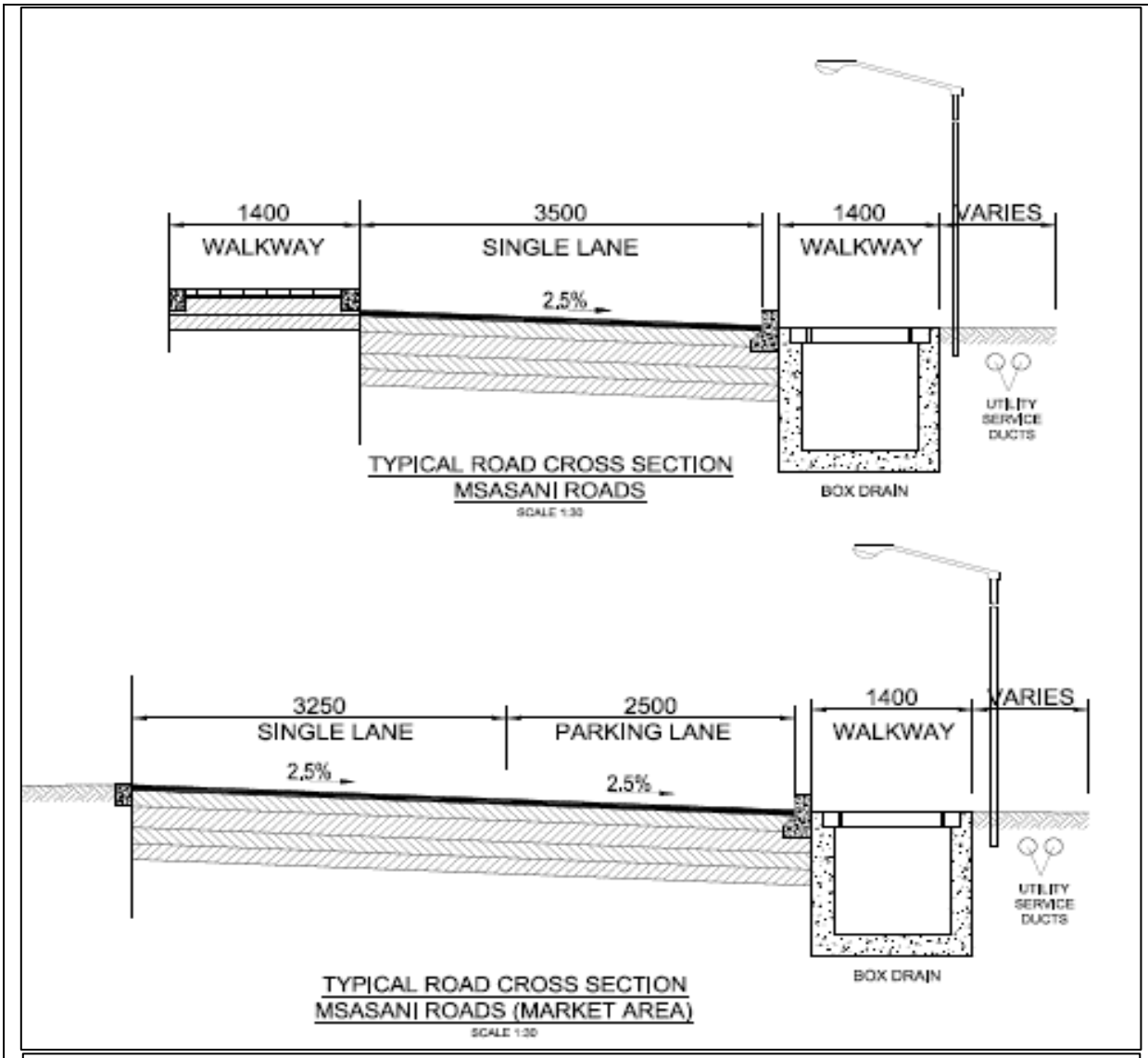
APPENDIX 1: TABLE OF CONCORDANCE WITH SUB-REGULATON 18(1).

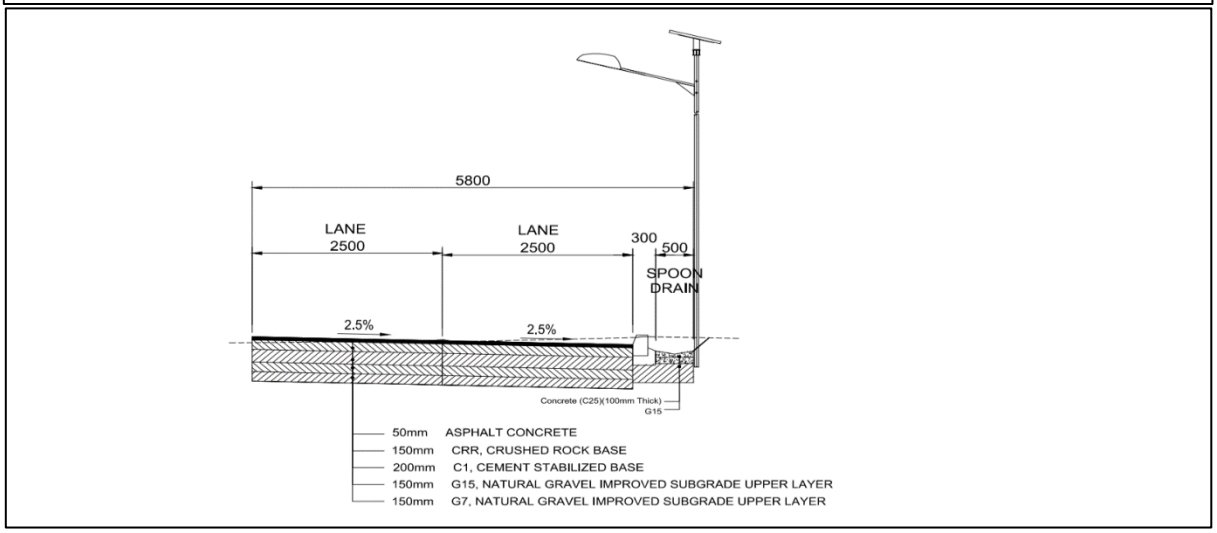
Requirements of Sub-regulation 18(1) of the EIA and Audit Regulations (2005)	Chapters / Sections of the ESIA Report
(a) the project and the activities that it is likely to generate;	Section 2.2.2
(b) the proposed location of the project and reasons for rejecting alternative locations;	Section 2.2.1
(c) a concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project;	Chapter 3
(d) the objectives of the project;	Section 2.1.2
(e) the technology, procedures and processes to be used, in the implementation of the project;	Section 2.4
(f) the materials to be used in the construction and implementation of the project;	Section 2.5
(g) the products, by products and waste generated by the project;	Section 2.5.4
(h) a description of the potentially affected environment including specific information necessary for identifying and assessing the environmental effects of the project;	Chapter 4
(i) 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;	Chapter 6
(j) alternative technologies and processes available and reasons for preferring the chosen technology and processes;	Section 6.4
(k) analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies;	Section 6.4
(l) an environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment; including the cost, timeframe and responsibility to implement the measures;	Chapter 8
(m) 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;	Section 7.3
(n) the measures to prevent health hazards and to ensure security in the working environment for the employees and for management of emergencies; of emergencies;	Section 7.4
(o) an identification of gaps in knowledge and uncertainties which were encountered in compiling the information;	Section 1.8
(p) an economic and social analysis of the project;	Section 7.3
(q) positive impacts and how to enhance them.	Section 7.2

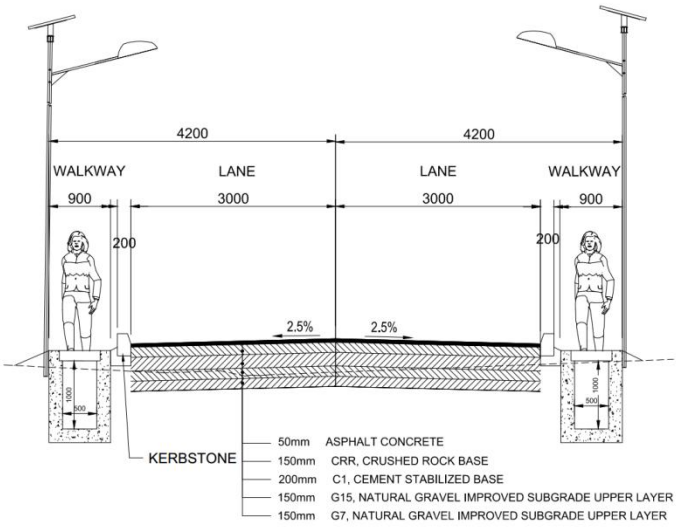
APPENDIX 2: PROPOSED TYPICAL CROSS SECTIONS FOR KINONDONI ROADS.



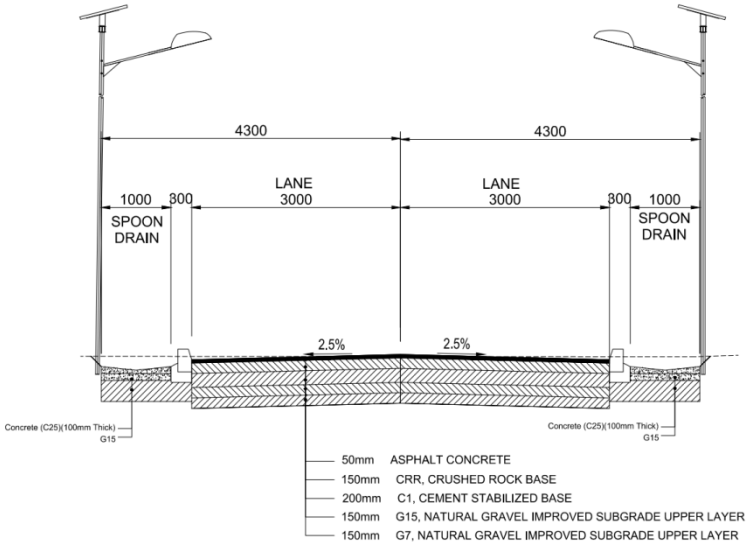



1400
WALKWAY
3500
SINGLE LANE
1400
WALKWAY
VARIES
2.5%
UTILITY SERVICE DUCTS
BOX DRAIN
TYPICAL ROAD CROSS SECTION
MSASANI ROADS
SCALE 1:30
3250
SINGLE LANE
2500
PARKING LANE
1400
WALKWAY
VARIES
2.5%
2.5%
UTILITY SERVICE DUCTS
BOX DRAIN
TYPICAL ROAD CROSS SECTION
MSASANI ROADS (MARKET AREA)
SCALE 1:30


5800
LANE
2500
LANE
2500
300
500
SPOON DRAIN
2.5%
2.5%
Concrete (C25)(100mm Thick)
G15
50mm ASPHALT CONCRETE
150mm CRR, CRUSHED ROCK BASE
200mm C1, CEMENT STABILIZED BASE
150mm G15, NATURAL GRAVEL IMPROVED SUBGRADE UPPER LAYER
150mm G7, NATURAL GRAVEL IMPROVED SUBGRADE UPPER LAYER



The proposed road cross section which has Narrow corridor in urban area



APPENDIX 3: ESTIMATEIOM OF LABOUR REQUIREMENTS.

1. Project Data

(a) Contract Type:	Urban Infrastructure Investment Project
(b) Supervised by:	Consultant
(c) Contract Value or Project Estimate:	$16.38M
(d) Contract Duration	24 Months

2. Calculation of Average Core Cash Flow Per Year

= Project Estimate/ (0.9 x Contract Period)
= $16.38M / (0.9 x 2 years)
= $16.38 /1.8
= $ 9.1M

3. Calculation of Labour Requirements in Man-days Per Year

= average core cash flow per year x corresponding multiplier
= 9.1 x 525
= 4,778 man-days per year

4. Conversion of Labour Man-days to Number of Causal Labourers Per Year
Given that 1 man-year = 295 man-days
Therefore,
No. of Labour Per Year
= Labour Man-days / 295
= 4,778 / 295
= 16.2
= 17

5. Calculation of No. of Contractor Staff and Resident Site Staff (RSS) Per Year

For Civil Engineering Project the Ratio of Contractor Staff to Causal Labourers is taken as 1:6.6 and Ratio of RSS to Causal Labourers is taken as 1:12.4
Hence,

- no. of Contractor Staff = 17/6.6 = 2.6 = 3

- no. of RSS = 17/12.4 = 1.4 = 2

6. Calculation of No. Professional Staff and Technical & Ancillary Staff

6.1 For Contractor Staff

The following ratios will be used

- Ratio of Professional; Staff = 13%
- Ratio of Technical Staff = 68%

- Ratio of Ancillary Staff = 19%

Hence,
- no. of professional staff= 3 x 0.13 = 0.39 = 1
- no. of technical & ancillary staff= 3 x 0.87 = 2.61 = 3
-

6.2 For Resident Site Staff (RSS)

The following ratios will be used
- Ratio of Professional; Staff = 22%
- Ratio of Technical Staff = 70%
- Ratio of Ancillary Staff = 8%

Hence,
- no. of professional staff= 2 x 0.122 = 0.264 = 1
- no. of technical & ancillary staff= 1.2 x 0.78 = 0.9 = 1

Summary

S/n	Requirements	Estimates/Year	Contract Period
1.	No. of Causal Labourers	17	32
2.	No. of Contractor Staff	3	6
3.	No. of Resident Site Staff (RSS)	2	4
4.	No. of Contractor Professional Staff	1	
5.	No. of Contractor Technical & Ancillary Staff	2	
6.	No. of RSS Professional Staff	1	
7.	No. of RSS Technical & Ancillary Staff	1	

APPENDIX 4: SCREENING OF WORLD BANK ESS.

S/n	Safeguard Policy	Relevant/ Applicable ? (Yes /No)	Remarks
1.	ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Yes	The project is likely to create some environmental and social risk/impacts.
2.	ESS 2: Labour and Working Conditions	Yes	The project will involve recruitment of construction workers, hence creation of temporary employment opportunities for local people. The presence of construction workers will result into increased demand for food, hence creation of income generation opportunity for local people.
3.	ESS 3: Resource Efficiency and Pollution Prevention and Management	Yes	The Project is likely to create air pollution due to dust emission from construction activities. The project will also result into consumption of finite land based resources like sand, gravel, and crushed stone aggregates.
4.	ESS 4: Community Health and Safety	Yes	The project is likely to create health and safety risk to the local community members. For example, the project is likely to create construction related risk of accidents due to trespassing of unauthorized people into the construction site.
5.	ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	No	The project will not result into land acquisition or resettlement of people. The construction site is located within the CoICT Kijitonyama Campus area, which is owned by the Government of Tanzania.
6.	ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Yes	This ESS will be triggered because the project involves widening of the road sections and construction of storm water drainages, hence likely to create destruction of planted trees along the road sections. The planted trees are considered as living natural resources because they provide some ecological functions in the urban environment.
7.	ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	No	There is no Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities in the project area as defined in paragraph 8 and 9 of ESS7.

8.	ESS 8: Cultural Heritage	Yes	The project involves land excavation along the road sections, hence likely to encounter some archaeological artefacts.
9.	ESS 9: Financial Intermediaries	No	The project does not involve any financial intermediary.
10.	ESS 10: Stakeholder Engagement and Information Disclosure	Yes	This ESS is triggered because the project is likely to affect various stakeholders directly or indirectly and positively or negatively. Therefore, stakeholder engagement and consultation will be necessary at all stages of the project implementation.

APPENDIX 5: METHODOLOGY FOR NOISE AND VIBRATION MEASUREMENT.

Field Sampling

Different sampling points were established based on the local standards (TBS) as stipulated in TZS837 and 845:2005 and the Environmental Management (Air Quality Standard) Regulations, 2007. Furthermore, for each sampling point at least three (3) measurement readings were recorded and the average value was calculated to determine current levels of suspended particulate matters, ambient gases emission, noise level and vibrations of the proposed DMDP 2 sub-project road construction sites. The study was conducted between 17th and 18th August 2023 during day time Depending on physical and socio-economic environment, field measurements were taken at the starting, mid, end, road intersecting and busy points of the sub-project roads (See Attached Maps Below).

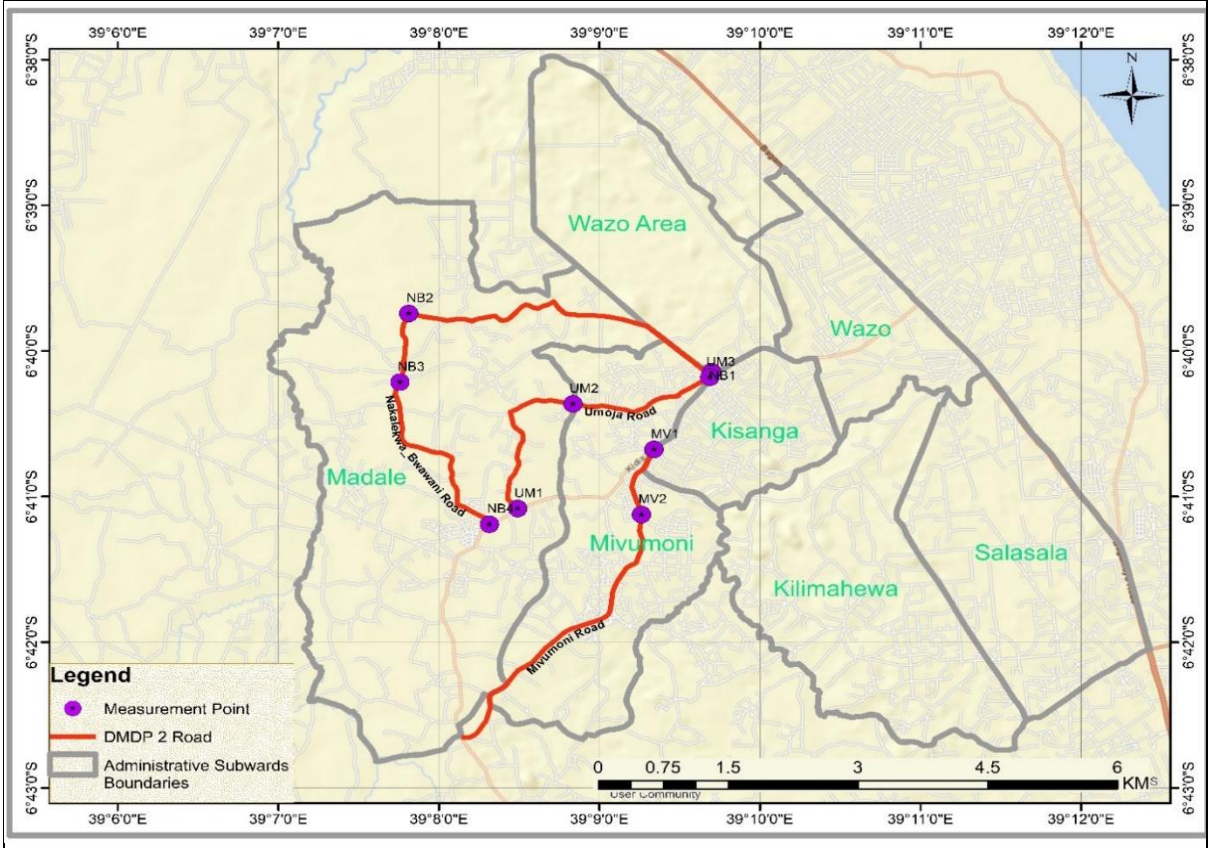
Measurement of Noise Level

Noise level was measured by using BT-8820 Sound Level Meter which have A & C weighting network selection of measuring range from 30 to 130dB.The instrument has high speed (FAST)/Low speed (SLOW) response rate selection, max/min value, data Hold, auto range, Backlight and good anti-interference performance.

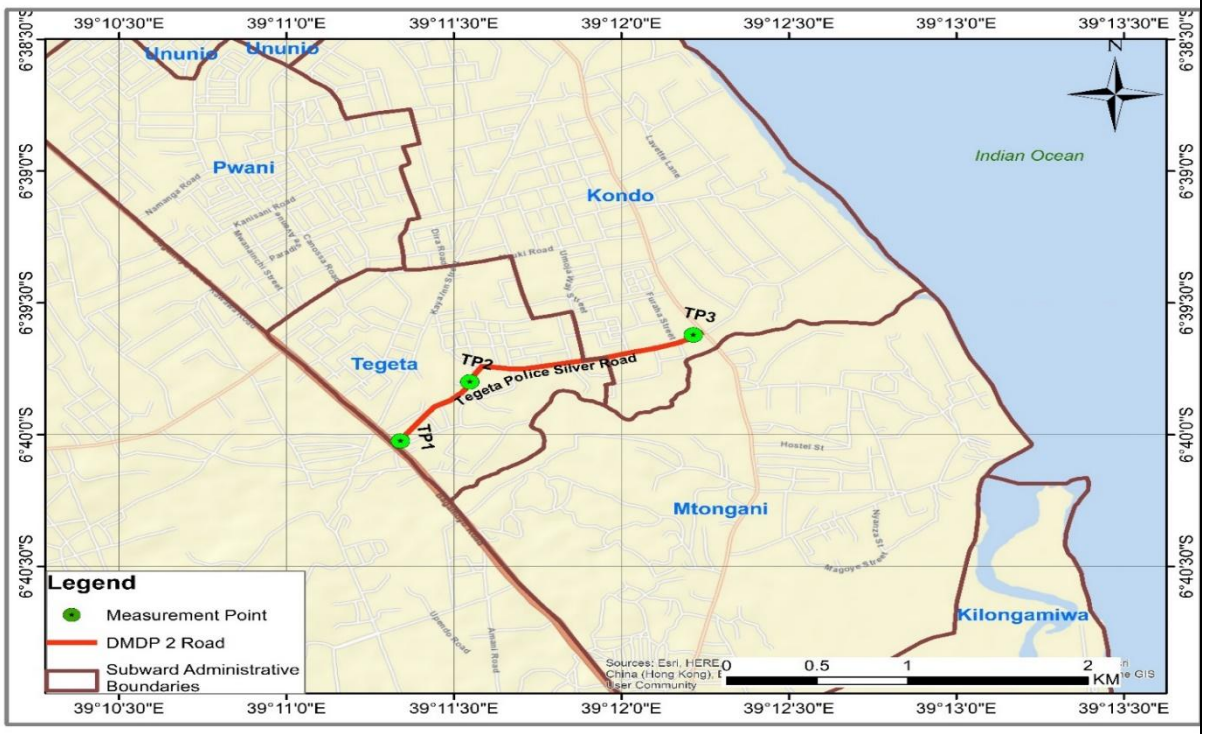
Data Analysis

The data collected under each measured parameter were compiled and analyzed with MS Excel by computing average, maximum and minimum values of the readings. Interpretation of the data utilized Tanzania and WHO standards.

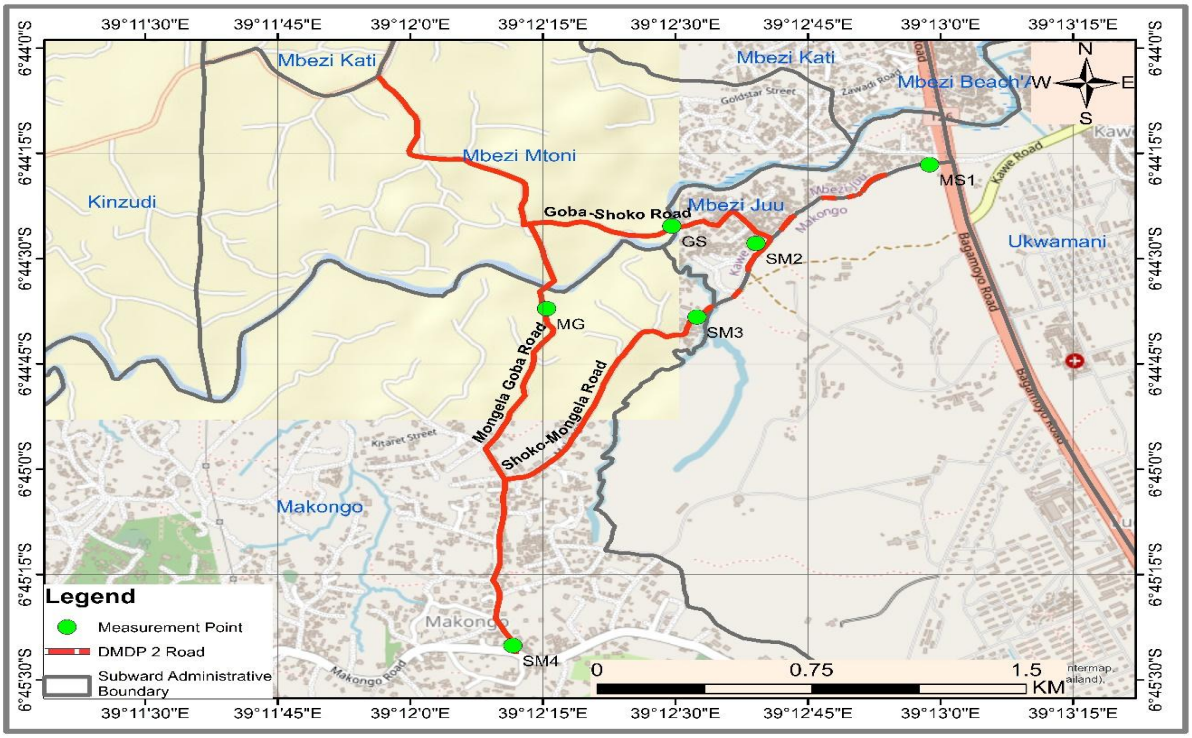
1: Nakalekwa Bwawani, Umoja and Mivumoni Roads



2: Tegeta Police - Silver Road

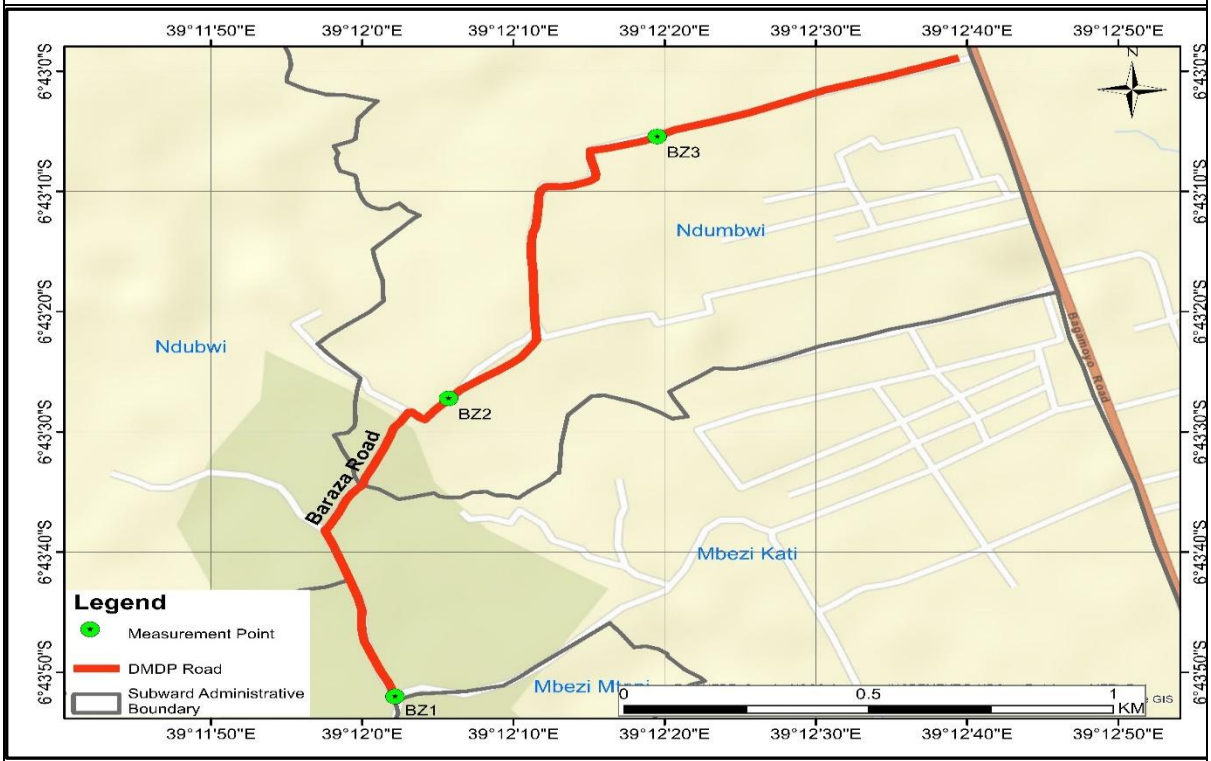


3. Mongela – Goba Roads



4. Tingisha, Togo, Amiri and Binti Matola Roads

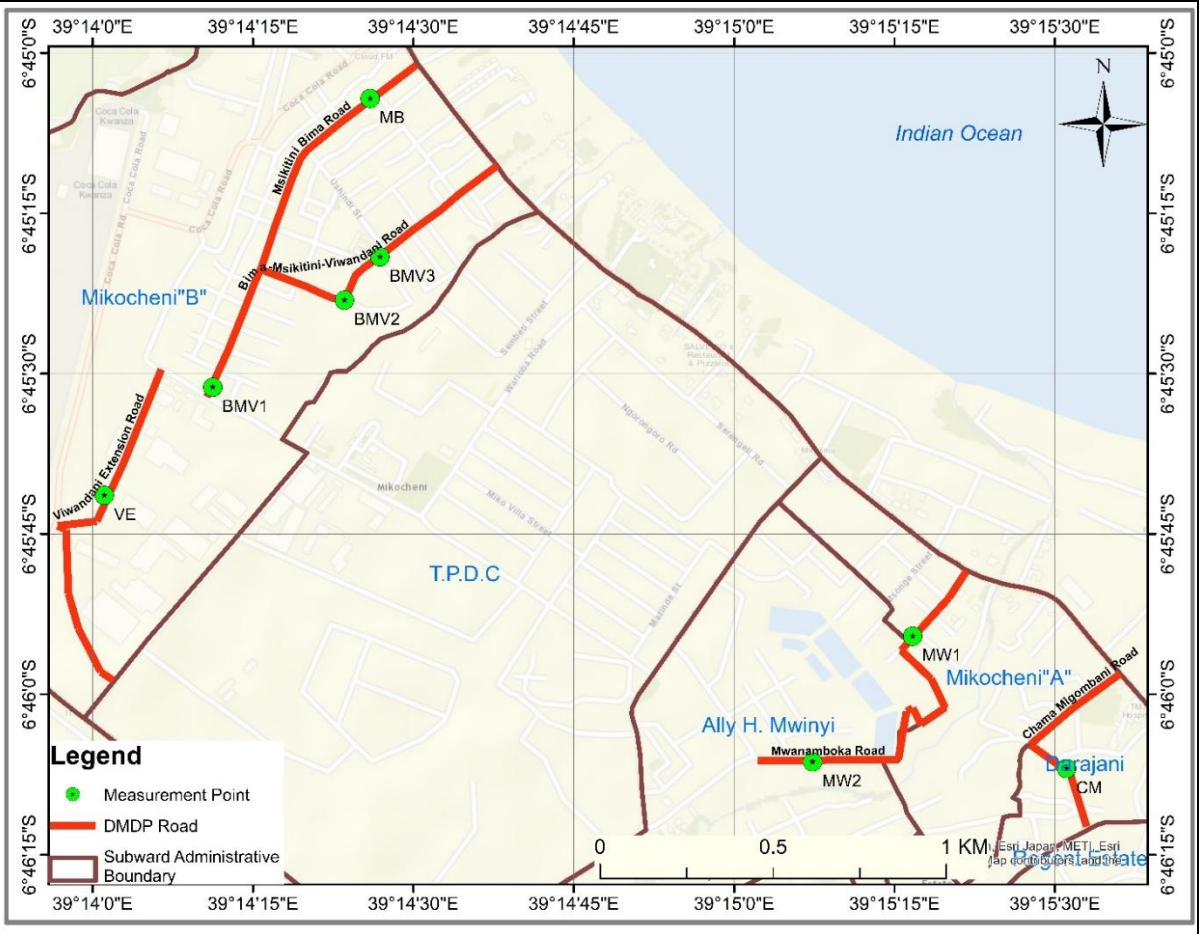
5. Baraza Road



6. Makonde and Mbezi Beach Roads

7. Msasani Roads

8. Mikocheni (Msikitini, Bima, Viwandani and Chama – Migombani Roads)



APPENDIX 6: METHODOLOGY FOR AIR QUALITY MEASUREMENT

Field Sampling

Different sampling points were established based on the local standards (TBS) as stipulated in TZS837 and 845:2005 and the Environmental Management (Air Quality Standard) Regulations, 2007. Furthermore, for each sampling point at least three (3) measurement readings were recorded and the average value was calculated to determine current levels of suspended particulate matters, ambient gases emission, noise level and vibrations of the proposed DMDP 2 sub-project road construction sites. The study was conducted between 17th and 18th August 2023 during day time Depending on physical and socio-economic environment, field measurements were taken at the starting, mid, end, road intersecting and busy points of the sub-project roads (See Attached Maps Below).

Measurement of Suspended Particulate Matter Concentration

Suspended particulate matter (dust) concentration was measured by using BLATN BR – WP6930S smart series instrument. This device is a real-time air quality monitoring instrument which use high-precision sensor and translate the pollutant concentration in the air directly into intuitive data to provide air quality monitoring information.

The advanced core technology adopts high precision import sensor, the sensor drift error is the lowest in the industry, through the patented algorithm can eventually accurately distinguish virus-level particulate matter. SMART series can detect a variety of pollutants, including PM2.5, PM10, formaldehyde (HCHO) and Total Volatile Organic Compounds (TVOCs). The instrument uses light scattering measuring method in a range of 0-999μg/m3 and resolution of 1.0μg/m3 for PM2.5 and PM10.

Data Analysis

The data collected under each measured parameter were compiled and analysed with MS Excel by computing average, maximum and minimum values of the readings. Interpretation of the data utilized Tanzania and WHO standards.

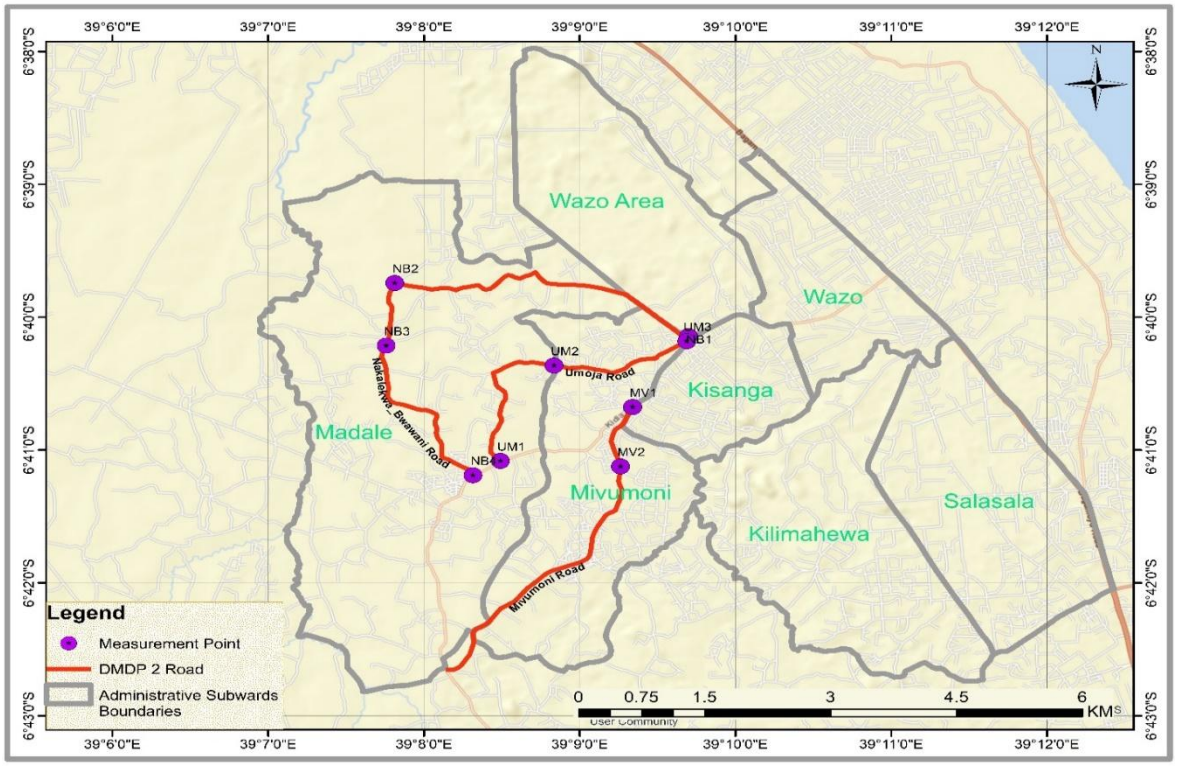
Measurement of Ambient Gaseous

Ambient gaseous were measured by using two devices of BH-4S Portable Multi-Gas Detectors. The first set of BH-4S Portable Multi-Gas Detector device measures concentration of Ozone: O3 (in ppm94); NO (in ppm); Sulphur dioxide SO2 (in ppm); and Carbon dioxide: CO2 (in % by Volume of air).

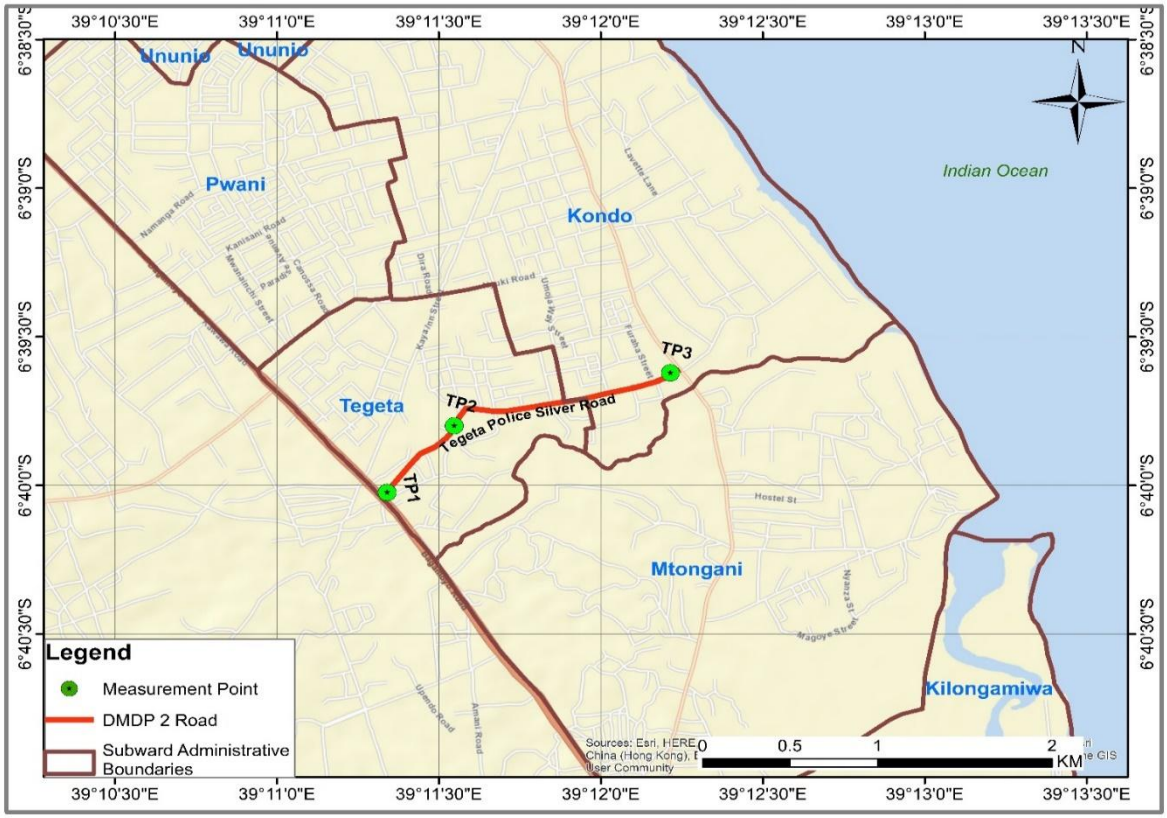
The second set of Portable Multi-Gas Detector device measures concentration of Oxygen: O2 (in % by Volume of air); Methane: CH4 (in % Level); Hydrogen Sulphide: H2S (in ppm) and Carbon monoxide: CO (in ppm) Both of the devices use natural diffusion sampling method and high-sensitivity sensor. The equipment accuracy is less than or equal to ±5%, response time is less than or equal to 30s. The devices have Light-Emitting-Diode (LED), audio and vibration alert for gas leakage, fault and low voltage. BH-4S Portable Multi-Gas Detectors can work in the temperature between of -200C to around 500C for toxic gases, and between -400C and around 700C for Ex, with relative humidity of less than 95%.

[94] 1ppm is equal to 1mg/m^3

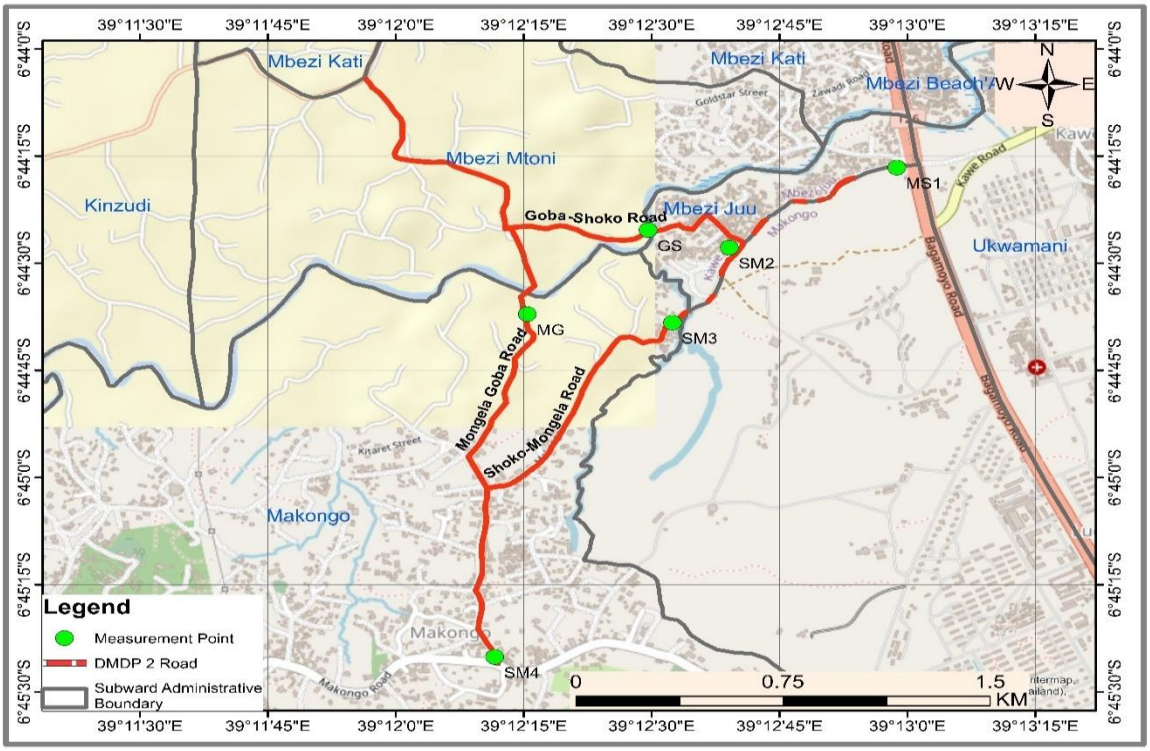
1: Nakalekwa Bwawani, Umoja and Mivumoni Roads



2: Tegeta Police - Silver Road

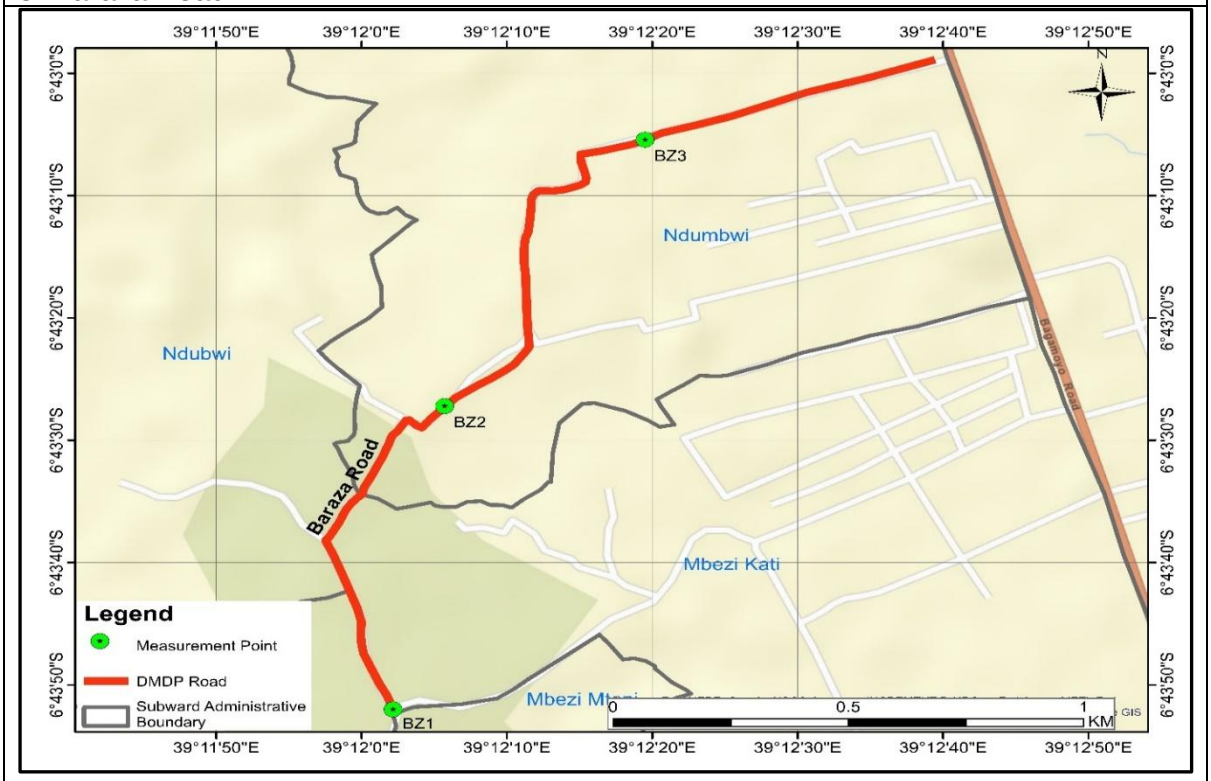


3. Mongela – Goba Roads



4. Tingisha, Togo, Amiri and Binti Matola Roads

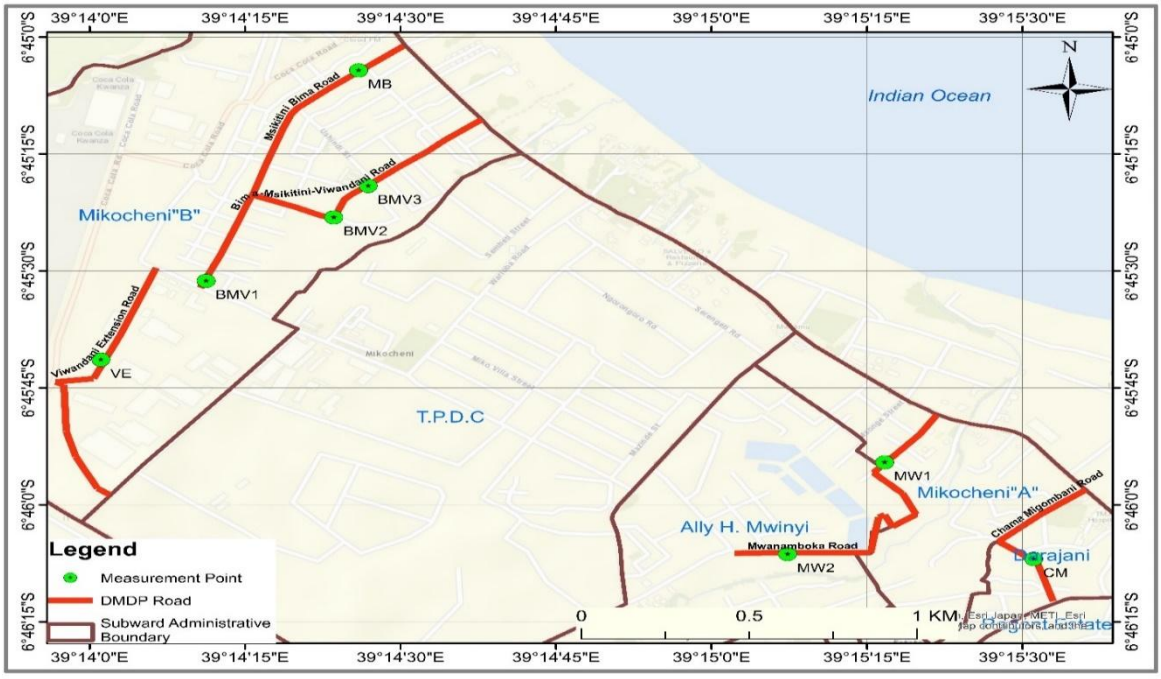
5. Baraza Road



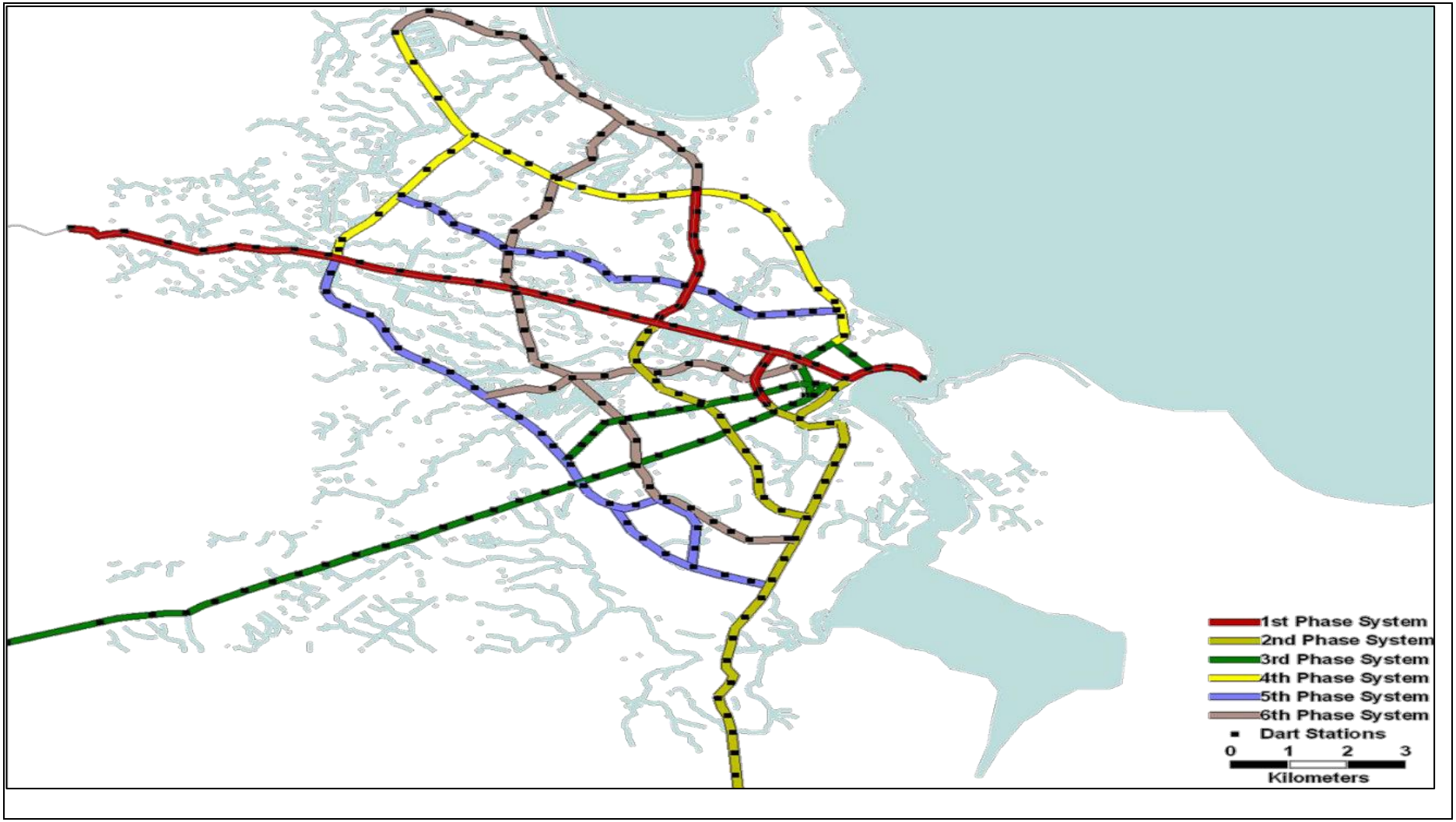
6. Makonde and Mbezi Beach Roads

7. Msasani Roads

8. Mikocheni (Msikitini, Bima, Viwandani and Chama – Migombani Roads)



APPENDIX 7: LOCATION OF BRT PROJECTS IN THE DAR ES SALAAM CITY.



APPENDIX 8: RECORD OF ISSUES/CONCERS BY STAKEHOLDER REPS.

Date	Stakeholders	Issues/Concerns	Response
25/08/23	RAS	The project design must consider prevention of floods by construction of paved drainage or terraces (Mitaro ya maji) The drainage should be constructed with bridges for those who are walking on foot Also, when the drainages are built during the project should ensure that DAWASA has continuous supply of water on residential areas Protection of the biodiversity Protection of the water infrastructures along the roads The project should ensure continuous supply of water either by relocating, replacement or protecting water supply pipes	The proposal will be shared with the Client. The Contractor must implement ESMP the design will consider flooding areas to make the project user friendly. It will be taken into consideration on project design
25/08/23	TTCL	TTTCL will visit the roads and provide relocation budget Construction of culverts on rough roads The project design must consider prevention of floods by construction of paved drainage or terraces	It will be taken into consideration on project design.
28/08/2023	OSHA	The project must be registered with OSHA The project must be inspected by officers from OSHA Supervisors should attend specialized training from OSHA All workers must undergo medical check-ups done by offices and doctors from OSHA A detailed report must be submitted to OSHA explaining the potentially hazardous, risks and the use of PPE at the work area/place Action plan and a letter should be submitted to OSHA to get a compliance certificate which will be valid for one year. OSHA will do a regular check-up during project implementation and offer professional advice Drinking water, changing room etc should be provided at the site. During the design stage, all drawings must be submitted to OSHA for review before project implementation.	Client and Contractor will comply with raised issues

Date	Stakeholders	Issues/Concerns	Response
		A Flagman, road signs and diversion should be applied at the site to prevent accidents.	

APPENDIX 9: ANALYSIS OF ISSUES/CONCERNS RAISED BY STAKHOLDER REPS.

Number of Issues/Concerns	Affected VECs								
	Atmospheric Environment	Acoustic Environment	Transportation	Terrestrial Environment	Public Health, Safety and Security	Public and Community Services Infrastructure / Utilities	Laboutr and Economy	Historical and Cultural Heritage Resources	Current Lanf and Resources Use
The project design must consider prevention of floods by construction of concrete or cement lined storm water drainages.				✓					
The drainage should be constructed with bridges for those who are walking on foot and when the drainages are built during the project should ensure that DAWASA has continuous supply of water on residential areas.			✓						
The project should ensure continuous supply of water either by relocating, replacement or protecting water supply pipes.						✓			
TTTCL will visit the roads and provide relocation budget.						✓			
The project must be registered with OSHA.					✓				
The project must be inspected by officers from OSHA					✓				
Supervisors should attend specialized training from OSHA.					✓				
All workers must undergo medical check-ups done by offices and doctors from OSHA.					✓				
A detailed report must be submitted to OSHA explaining the potentially hazardous, risks and the use of PPE at the work area/place.					✓				

Number of Issues/Concerns	Affected VECs								
	Atmospheric Environment	Acoustic Environment	Transportation	Terrestrial Environment	Public Health, Safety and Security	Public and Community Services Infrastructure / Utilities	Laboutr and Economy	Historical and Cultural Heritage Resources	Current Lanf and Resources Use
Action plan and a letter should be submitted to OSHA to get a compliance certificate which will be valid for one year.					✓				
OSHA will do a regular check-up during project implementation and offer professional advice.					✓				
Drinking water and cloth changing room should be provided to at the project site.							✓		
During the design stage, all drawings must be submitted to OSHA for review before project implementation					✓				
Flag persons, road signs and diversions should be applied at the site to prevent accidents.					✓				
Total Number of Issues/Concerns	**0**	**0**	**1**	**1**	**9**	**2**	**1**	**0**	**0**

Conclusion:
The consulted stakeholder representatives were more concerned on Public Health, Safety and Security (9 Issues), followed ny Pubic Services Infrastructure/Utilities (2 Issues), and lastly Labour and Economy, Transportation, and Terrestrial Environment (1 Issue@).

APPENDIX 10: ISSUES/CONCERNS RAISED BY LOCAL COMMUNITY LEADERS.

S/n	Issues/Concerns from community Leaders	Response from the Consultant
1	We need the paved/tarmac roads than what we can explain because during rains the whole area is impassable due to floods and muddy.	The engineering design will consider floods in order to limit floods
2	Formerly the roads had enough space/width where two trucks could go through in different direction but now even tri cycle (bajaji) cannot pass smoothly. People have encroached so every structure encroached the road must remove/demolish all annexed houses to pave the way for construction	The Ward and Mtaa authority will discuss with the the people encroached to push back to the former plot.
3	In case there will be Compensation of affected people (PAPs) it must be fair and timely paid to avoid inflation	It will be fair as long as RAP will provide means of assessment and valuation according to Tanzania Laws.
4	Pedestrian walk should be included in the design.	The Client will be advised and the design will provide walkways.
5	The project will affect a good number of business people who found along the project area. People with business should be informed in advance on the intention of the Government to construct DMDP2 and they must look for other areas for their business.	Early notification will be provided as soon as design is in place.
6	Companies with utilities along and across the road like DAWASA should relocate their respective utilities before construction to avoid inconvenience. During relocation of utilities community will have some challenges like water cut and electricity cut.	The arrangement between Proponent/Contractor and Utility owners will be held before construction and all utilities will be relocated to avoid denying basic social services to the communities/customers.
7.	Noise and dust pollution due to machinery and excavation.	Contractor will be advised to lubricate machines to minimize noise and use water to suppress dust during construction
8.	Employment Opportunities. The contractor should give the priority of employment to the people hailing along the project site during the construction. The residents (youth & women) may be involved in some activities as labourers during the construction phase. Furthermore, carpenters and masonry in the community should get first priority in getting skilled labour in the construction.	Construction of DMDP2 Roads will stimulate individual's income for those who will be employed by the project. Skills acquired during recruitment and construction will remain an asset to community members. However, employment opportunities will only be provided to those people aged l8 years and above. The women

		are also encouraged to participate in the road construction activities
9.	There will be spread of HIV/AIDS and other sexually transmitted infections because of labour influx.	The contractor will identify local capacity in dealing with HIV/AIDS and arrange for HIV/AIDS prevention programme targeting both the construction camp and local communities. Positive discrimination in favour of resident workers to minimize risk of increased infection among local population. Programme on HIV/AIDS will target groups at risk such as food vendors, and business women in the construction camp. There will be a separate consultant to implement and manage HIV/AIDS alleviation programs. The contractor will implement HIV/AIDS programs on his part by allowing his employees to attend awareness seminars and campaigns and carrying out any directives of the Consultant in this regard.
10.	Vibration during construction can cause cracks to the nearby houses	Before construction the Contractor will take inventory of all houses along the road sections so that in the event new cracks do occur due to construction works, then the Contractor will be responsible for repairing the damaged buildings.
11.	Domestic water supply and waste water systems which are within the project area should be designed and constructed separately to avoid interference between systems.	The design will take care of these issues and propose viable solutions.
12.	Contractors has to give cooperation to the community in case of any damages caused by project activities to the properties	Contractor will work very close with Mtaa leaders and he will let the community know if any damage has happened and when remedial will take place.
13.	During construction phase; drainage system should be well constructed for handling floods during rain seasons.	The construction of roadside storm water drainages is part of the construction works for this project.
14.	Construction must take into account historical background of a place before designing drawings	It will take care of. Engineers will seek historical background of every place especially areas with unique features.

15.	People should be educated about possible social interactions which may lead to HIV/AIDS provenances and unwanted pregnancies and infidelity.	Respective Municipals should continue with HIV/AIDS awareness and education. For the project there will be a programme on HIV/AIDS and STDs awareness campaign.
16.	During construction cracks on nearby houses mighty happen due to vibration, therefore compensation must be done to the affected person.	As explained in item 7 above

APPENDIX 11: ANALYSIS OF ISSUES RAISED BY LOCAL COMMUNITY LEADERS.

Number of Issues/Concerns	Affected VECs								
	Atmospheric Environment	Acoustic Environment	Transportation	Terrestrial Environment	Public Health, Safety and Security	Public and Community Services Infrastructure / Utilities	Laboutr and Economy	Historical and Cultural Heritage Resources	Current Lanf and Resources Use
We need the paved/tarmac roads than what we can explain because during rains the whole area is impassable due to floods and muddy.			✓						
Formerly the roads had enough space/width where two trucks could go through in different direction but now even a bajaj cannot pass smoothly. People have encroached so every structure encroached the road must remove/demolish all annexed houses to pave the way for construction									✓
In case there will be compensation of affected people (PAPs) it must be fair and timely paid to avoid inflation.									✓
The project will affect a good number of business people who found along the project area. People with business should be informed in advance on the intention of the Government to construct DMDP2 and they must look for other areas for their business.									✓
Companies with utilities along and across the road like DAWASA should relocate their respective utilities before construction to avoid inconvenience. During relocation of utilities community will have some challenges like water cut and electricity cut.						✓			
Pedestrian walkways should be included in the design.			✓						

Number of Issues/Concerns	Affected VECs								
	Atmospheric Environment	Acoustic Environment	Transportation	Terrestrial Environment	Public Health, Safety and Security	Public and Community Services Infrastructure / Utilities	Laboutr and Economy	Historical and Cultural Heritage Resources	Current Lanf and Resources Use
There will be noise nuisance and dust pollution due to machinery and excavation.	✓	✓							
The contractor should give the priority of employment to the people living adjacent to the project sites during construction. The residents (youth and women) may be involved in some activities as labourers during the construction phase. Furthermore, carpenters and masonry in the community should get first priority in getting skilled labour in the construction.							✓		
There will be spread of HIV/AIDS and other sexually transmitted infections because of labour influx.					✓				
Vibration during construction can cause cracks to the nearby buildings.									✓
Domestic water supply and waste water systems which are within the project area should be designed and constructed separately to avoid interference between systems.						✓			
Contractors should cooperate with community in case of any damages caused by project activities to the properties									✓
During construction phase; drainage system should be well constructed for handling floods during rain seasons.				✓					

Number of Issues/Concerns	Affected VECs								
	Atmospheric Environment	Acoustic Environment	Transportation	Terrestrial Environment	Public Health, Safety and Security	Public and Community Services Infrastructure / Utilities	Laboutr and Economy	Historical and Cultural Heritage Resources	Current Lanf and Resources Use
Construction should take into account historical background of a place before preparation of design drawings.			✓						
People should be educated about possible social interactions which may lead to HIV/AIDS provenances and unwanted pregnancies and infidelity.					✓				
During construction cracks on nearby houses mighty happen due to vibration, therefore compensation must be paid to the affected persons.									✓
Total Number of Issues/Concerns	**1**	**1**	**3**	**1**	**2**	**2**	**1**	**0**	**6**

Conclusion:
The consulted stakeholder representatives were more concerned on Current Land and Resources Use (6 Issues), followed by Transportation (3 Issues), Public Health, Safety and Security (2 Issues), Pubic Services Infrastructure/Utilities (2 Issues), and lastly Atmospheric Environment, Acoustic Environment, Transportation, and Labour and Economy (Issue@).

APPENDIX 12: DESCRIPTION OF SITE-SPECIFIC RISKS/IMPACTS.

S/n	Sub-project Road	Project Related Activities	Potential Risks/Impacts	Affected Component	Mitigation measures
1.	Nakalekwa -Bwawani Road (7.32 km) Umoja Road (3.86 km) Mivumoni Road (4.79 km) Amiri/Leni Tatu (Dawasa) Road (0.68 km) Togo 1 Road (0.36 km)	The major activities along the road section include excavation of road bed; creation of road side storm water drainages; creation of pedestrian walkways; and installation of culverts. As already mentioned, the road section has got adequate corridor and therefore, the construction of road side storm water drainage and pedestrian walkways will not trigger any land acquisition and compensation issues. The construction of the road section will also not require removal of existing vegetation cover/trees along the road section.	None	None	None
	All Road Sections	Movement of construction equipment and vehicles along the construction road and/or diversion roads will result into increased air pollution due to dust emission during dry seasons.	Creation of air pollution due to dust emission along the construction roads and/or diversion roads.	Atmospheric Environment	The impact will be mitigated through application of water along the construction roads and/or diversion roads.
	Nakalekwa -Bwawani Road (7.32 km)	Construction of bridge across Nakalekwa Stream/River is likely to create destruction of vegetation cover along the stream/river banks, hence resulting into soil erosion and sedimentation of the stream/riverbed.	Creation of soil erosion and sedimentation effects on the stream/river bed.	Aquatic Environment	Precautions will be taken to minimize soil erosion along the stream/river banks and sedimentation of the stream/river bed by limiting construction works within the permitted site. Other measures may include

S/n	Sub-project Road	Project Related Activities	Potential Risks/Impacts	Affected Component	Mitigation measures
					installation of gabions and planting of grass and shrubs on bare areas along the stream banks.
	All Road Sections	Operation of mobile construction equipment and heavy trucks along the road section will result into creation of noise nuisance.	Creation of noise nuisance to the adjacent sensitive receptors.	Acoustic Environment	Contractor will be required to limit construction works to day time (06:00 am to 18:00 pm). Presence of primary school buildings at km 0+591 on both sides of the road will trigger the need for installation of noise abatement structures to minimise the impact on the adjacent school buildings.
	All Road Sections	Excavation of road bed will be followed by back-filling with gravel/ soil materials and compaction works, hence resulting into vibration effects on the adjacent building structures.	Creation of vibration effects on the adjacent building structures	Acoustic Environment	Before commencement of construction works the Contractor will take inventory of cracks on the adjacent buildings in collaboration with owners of the building structures. This will enable the Contractor to establish if cracks have occurred due to construction/compaction works or not and pay compensation or repair the affected buildings.
	All Road Sections	Excavation of road bed and storm water drainages is likely to result into	Severance of community access to and from their	Transportatio n	Installation of culverts and/or provision of concrete slabs

S/n	Sub-project Road	Project Related Activities	Potential Risks/Impacts	Affected Component	Mitigation measures
		severance of community access to and from their residence, hence the need for installation of culverts and/or provision of concrete slabs over the storm water drainages.	residences/business premises.		over the storm water drainages at important community access.
	All Road Sections	Excavation of road bed and roadside storm water drainages will result into accumulation of soil materials, hence resulting into loss of aesthetic value of the surrounding environment.	Loss of aesthetic value of the surrounding environment due to accumulation of construction solid wastes.	Terrestrial Environment	The impact will be minimized by immediate removal and transportation to the municipal dumping site. However, some useful soil materials will be properly stockpiled for landscaping purpose.
	All Road Sections	Trespassing by unauthorized persons into the construction site is likely to result into construction related risk of accidents.	Creation of construction related risk of accidents.	Public Health and Safety	Precautions will be taken during construction through installation of barricades and safety nets to prevent people from entering the construction site. Installation of safety nets and visible tapes around the excavated trenches/pits along the road section to minimize risk of people falling into open trenches/pits.
	All Road Sections	Relocation of public service infrastructure /utilities before commencement of the construction works.	Disruption of social and economic activities.	Community and Public Service Infrastructure /Utilities	Contractor will be required to make public announcement through appropriate news media in collaboration with infrastructure/utility company on the possible disruption of

S/n	Sub-project Road	Project Related Activities	Potential Risks/Impacts	Affected Component	Mitigation measures
					public infrastructure/ utility services before relocation works. Contractor will ensure immediate restoration of affected public infrastructure/ utilities within 24 hours.
4.	Tegeta Police - Silver Road (2.0 km) Binti Matola Road (0.77 km) Togo 2 Road (0.36 km) Togo 3 Road (0.20 km)	The project related activities along the road section include excavation of road bed; creation of road side storm water drainages; creation of pedestrian walkways; and installation of culverts. As already mentioned, the road has a narrow corridor, therefore creation of roadside storm water drainages, pedestrian walkways will require widening of the road section. Widening of the road section will trigger land acquisition, hence loss of land ownership and other properties by the adjacent local residents.	Loss of land ownership and other properties by adjacent local residents.	Current Land and Resources Use	Payment of compensation to the Project Affected Perrsons (PAPs). However, the cost of compensation could be minimized through proper design, whereby roadside storm water drainages will be covered with concrete slabs and used as pedestrian walkways.
	Tegeta Police - Silver Road (2.0 km) Binti Matola Road (0.77 km) Togo 2 Road (0.36 km) Togo 3 Road (0.20 km)	Widening of the road section will also require removal of existing vegetation cover/trees along the road section, hence resulting into loss of ecological functions and landscape quality of the surrounding environment.	Loss of ecological functions and landscape quality due to removal of adjacent vegetation cover/trees.	Terrestrial Environment	The impact could be mitigated by planting trees along the road sections, whenever possible, depending the availability of space.

APPENDIX 13: ENVIRONEMNTAL IMPACT ASSESSMENT MATRIX.

Affected Valued Environmental Components (VECs)	Potential Environmental Effects/Impacts	Importance (A1)	Magnitude (A2)	Permanence (B1)	Reversibility (B2)	Commulative / Synergistic (B3)	α1xα2 = ∂T	β1+β2+β3=σT	∂TxσT=ES	Significance	Mobilization Phase	Construction Phase	Demobilization Phase	Operation Phase
Atmospheric Environment	Reduced dust emission due to improvement of road conditions into bitumen or concrete standard.	3	3	2	1	3	9	6	54	High	0	0	0	✓
	Creation of dust emissions along unpaved access roads to the construction site.	2	-2	2	2	3	-4	7	-28	Medium	0	✓	0	0
	Creation of dust emissions along unpaved access roads to the borrow pits/quarry sites.	3	-2	2	2	3	-6	7	-42	High	0	✓	0	0
Acoustic environment	Creation of noise nuisance and vibration effects along the access roads to borrow pits/quarry sites.	2	-2	2	2	3	-4	7	-28	Medium	0	✓	0	0
	Creation of noise nuisance and vibration effects along the construction roads.	1	-2	2	3	3	-2	8	-16	Low	0	✓	0	0
Terrestrial environment	Loss of ecological functions and landscape quality due to removal of vegetation cover and trees.	2	-2	3	3	2	-4	8	-32	Medium	0	✓	0	0
	Creation of soil erosin and sedimentation effects on the adjacent lands due to water flow from the road.	2	-1	2	2	2	-2	6	-12	Low	0	✓	0	0
	Creation of landscape degradation due to excavation and accumulation of soil materials.	1	-2	2	2	2	-2	6	-12	Low	0	✓	0	0
	Risk of environmental pollution due to lack of sanitary facilities at the construction site.	2	-2	2	2	2	-4	6	-24	Medium	0	✓	0	0

Aquatic Evironment	Creation of soil erosin and sedimentation of stream/river bed due to vegetation removal.	1	-2	2	2	3	-2	7	-14	Low	0	✓	0	0
Public Health, Safety and Security	Increased transmission of HIV/AIDS and STIs due social interactions	3	-2	2	3	3	-6	8	-48	High	0	✓	0	0
	Increased risk of Covid-19 transmission dye to increased influx of people into the project sites.	1	-3	2	3	3	-3	8	-24	Medium	0	✓	0	0
	Creation of occupational health and safety risks due to exposure to hazardous working conditions.	3	-3	2	2	2	-9	6	-54	High	0	✓	0	0
	Creation of construction related risk of accidents due to people tresspassing into construction site.	1	-3	2	3	2	-3	7	-21	Medium	0	✓	0	0
	Creation of safety hazards due to deep excavations on the construction roads.	2	-2	2	3	2	-4	7	-28	Medium	0	✓	0	0
	Increased risk of traffic accidents during construction due to movement of heavy trucks to and from the road construction site.	1	-3	2	2	3	-3	7	-21	Medium	0	✓	0	0
	Increased risk of fire outbreak due to accidental ignition of iinflamable substances.	1	-3	3	2	2	-3	7	-21	Medium	0	✓	0	0
	Increased risk of traffic accidents due to improved road conditions.	3	-2	2	2	3	-6	7	-42	High	0	0	0	✓
Labour and Economy	Creation of temporary employment due to recruitment of construction workers	3	2	2	1	3	6	6	36	High	0	✓	0	0
	Risk of emergence of GBV/SEA and SH due to working relationships and social interactions.	3	-2	2	1	2	-6	5	-30	Medium	0	✓	0	0
	Increased income generation for food vendors due to demand from construction workers	2	+2	2	1	3	4	6	+24	Medium	0	✓	0	0
	Loss of temporary employment opportunities for local people due to completion or closure of the project	3	-2	3	3	3	-6	9	-54	High	0	0	✓	0

	Reduced travel time for low-income communities due to improved access to BRT stations.	3	+3	3	1	3	+9	7	+63	High	0	0	0	✓
	Increased access to social services for low-income communities along the road sections.	3	+3	3	1	3	+9	7	+63	High	0	0	0	✓
	Reduced vehicle operation and maintenance costs and transportation costs.	3	+3	3	1	3	+9	7	+63	High	0	0	0	✓
Public service infrastructure/utilities.	Disruption of social serviices and economic activities due to relocation of infrastructures and utilities.	3	-2	2	2	2	-6	6	-36	High	✓	0	0	0
Transportation	Severance of community access to the road due to deep excavtions.	3	-2	2	2	2	-6	6	-36	High	0	✓	0	0
Current Land and Resource Use	Loss of land ownrership and other properties due to land acqusition.	1	-1	3	3	2	-1	8	-8	Very Low	✓	0	0	0

APPENDIX 14: A SAMPLE OF GRIEVANCEIS REGISTRATION FORM.

Grievance Registration Form

Name:		☐ Please do not use my name when talking about this concern in the public	
Company: (If applicable)			
Date:		Time:	
Preferred Contact method:	☐ Telephone ☐ E-mail ☐ Mail Please provide contact detail: _____		
Supporting documents attached?	☐ Yes ☐ No		
Please provide details of your grievance			
What outcome are you seeking?			
Additional Information			

Claimant Signature: …… Date: ……..

WEO Signature: …… Date:……..……..

For Office Use only

Stakeholder Reference:	NGO	Government - Central
	Neighbour - Fisherman	Government - Local
	Neighbour - Fisherman	Contractor
	Neighbour – Business man/W.man	Consultant
	Neighbour - Farmer	
	Other	
	Comments:	

APPENDIX 15: CONTRACTOR'S CODE OF ETHICAL CONDUCT.

1. INTRODUCTION

As employees, we all make decisions every day that affect one another, our community around and the organization. The actions we choose to take as individual employees reflect on us all and influence how others perceive our organization. Each of us, through our actions and decisions has the power to improve our productivity.

2. LEGAL FRAMEWORK

This Code of Ethical Conduct (CEC) is attuned to Part III (Employment Standards), Section 14 (Contracts with employees) of the Tanzanian Employment and Labour Relations Act No. 6 of 2004.

3. WHAT IS A CODE OF ETHICAL CONDUCT?

A Code of Ethical Conduct (CEC) is a set of guidelines intended to support ethical behaviour and decision making for all employees of CONTRACTOR. The term 'employees' here include all management, staff, volunteers, students, contractors and others who provide services for the organization.

In this booklet you will read about the values, policies and behavioural expectations that, together, comprise the Contractor's CEC. That covers in the working area and outside the working surrounding.

Building and maintaining trusted relationships with employees and the community is fundamental to our work, our reputation and our success. Managing in an ethical way, guided by a sense of social responsibility, is not just a matter of good practice but is the right thing to do.

We are often faced with challenges that require difficult decisions. This CEC explains the behaviour that is expected of all employees at all levels in the organization.

Each employee is responsible to become familiar with this CEC, comply with ethical and legal standards of conduct, and to lead by example in the workplace and outside the working area.

Implementation of this CEC will be done through inductions to new employees, and regular trainings, seminars, workshops etc. to current employees. This CEC will be signed by all employees and shall be part of their contracts.

4. COMPLIANCE TO CEC AT WORKPLACE

Employees are expected to comply with this CEC and the policies it represents. Violations of the Code of Conduct and/or policies may result in disciplinary action up to and including dismissal.

a. What Employees Can Expect from CONTRACTOR
CONTRACTOR commits to providing all employees with:

i. A safe, healthy, respectful and productive work environment.
ii. An environment free from discrimination and harassment that promotes and protects
iii. Equal opportunities
iv. Fair and equitable treatment
v. Respect for diversity; and
vi. Protection from retaliation after good faith disclosures of improper activities.

b. CONTRACTOR Expectations from All Employees
CONTRACTOR expects all employees to:

i. Act with integrity at all times;
ii. Be present and productive during working hours;
iii. Operate within the law;
iv. Follow the CEC and related policies;
v. Adhere to professional practice guidelines and practice within professional boundaries;
vi. Take personal accountability for their own workplace actions;
vii. Demonstrate a sense of respect, loyalty, good faith and responsibility toward one another, and the community around the working place.
viii. Keep all organization information confidential;
ix. Exercise sound judgment in decision making; and x.Report violations of the CEC and related policies.

5. COMPLIANCE TO THE CEC OUTSIDE WORKPLACE

Just like employees are vigilant about workplace they should also be vigilant about their overall conduct outside the workplace. Inappropriate conduct can harm an employer regardless of where it occurs. So while outside the working place workers should behave well not limited to the following:

i. Behaving in a manner that is appropriate when interacting with general public, and other staff;
ii. Acting at all times in such a manner to represent CONTRACTOR in the community in a positive manner;
iii. Avoid all acts of sexual harassment to the people around the community; and
iv. Avoid conduct which is not criminal but place others in harm way.

6. DOs AND DON'Ts AS CONTRACTOR EMPLOYEE

The matrix below specifies what workers should do and what they should not do as CONTRACTOR employees.

Workers Should	Workers Should Not
Report to and leave work according to specified work hours.	Report late for work on a regular or habitual basis, leaving the work place early and without following established protocol.
Provide a doctor's note for sick leave as required.	Take extended lunch or breaks.
Submit time-off requests in Leave Management CONTRACTOR for all leaves in an accurate and timely manner.	Be absent from work without authorization or justifiable reason.
Comply with the directions of the employer.	Use lieu time or vacation or other approved credits to address personal issues.
Perform tasks as directed by the supervisor and within acceptable standards.	Work in Substandard, incompetent and/or careless work performance that is within the control of the employee.
Be in their working cloths i.e., Personal Protective Equipment (PPE) during all working hours.	Spend time on non-work-related matters (i.e. personal phone calls, chatting with co-workers about non-work related matters etc.).
Care and maintain the property appropriately and use of CONTRACTOR property such as	Conduct the work of the union on agency time, except as provided in the

Workers Should	Workers Should Not
equipment, (computers, copiers, vehicles) properly.	Collective Bargaining Agreement (CBA). Failing to seek clarification or failing to access agency guidelines when information or guidance is needed.
Co-operate with co-workers in work-related activities.	Refuse to perform work assignments.
Perform work according to the job requirements, and in a competent, careful and productive manner, in compliance with CONTRACTOR policies, procedures and practices and policies.	Show dishonesty; deception; theft; falsification of records including that contained in a resume or job application; fraudulent conduct and any other illegal behavior (i.e., contravention of the Criminal Code).
Meet professional regulations and standards for regulated professionals.	Use profane language, threatening or abusive language to co-workers, visitors, sub-contractors, and local people
Maintain professional credentials and/or licenses as required for position and providing proof to the employer.	Use physical abuse, violence, threats of violence, bullying or intimidating behavior aimed at or involving use alcohol or illegal drugs while in performance of their duties.
Service equipment as required, avoid deliberate damage to CONTRACTOR property and/or unauthorized use of CONTRACTOR equipment, supplies, resources or property.	

7. PENALTIES FOR VIOLATION OF CEC

Violation of the CEC will lead to serious disciplinary measures including termination from the working place. The matrix below specifies the penalties for violating CEC items i.e. what they should not do as CONTRACTOR employees.

Act of violation of CEC	Penalty
1. Report late for work on a regular or habitual basis, leaving the work place early and without following established protocol.	Verbal warning or 1st written warning letter
2. Take extended lunch or breaks.	Verbal warning or 1ST written
3. Be absence from work without authorization or justifiable reason.	First and second written warning
4. Use lieu time or vacation or other approved credits to address personal issues.	First and second written warning
5. Work in Substandard, incompetent and/or careless work performance that is within the control of the employee.	First and second written warning
6. Spend time on non-work-related matters (i.e. personal phone calls, chatting with co- workers about non-work related matters etc.).	Verbal warning or 1st written warning letter

7. Conduct the work of the union on agency time, except as provided in the Collective Bargaining Agreement (CBA). Failing to seek clarification or failing to access agency guidelines when information or guidance is needed.	First and second written warning
8. Refuse to perform work assignments.	Third warning followed by disciplinary hearing
9. Show dishonesty; deception; theft; falsification of records including that contained in a resume or job application; fraudulent conduct and any other illegal behaviour (i.e., contravention of the Criminal Code).	Dismissal but an employee will be given the right to be heard Reported to police station
10. Use profane language, threatening or abusive language to co-workers, visitors, sub-contractors, and local people.	Call for disciplinary hearing for judging the case
11. Use physical abuse, violence, threats of violence, bullying or intimidating behaviour aimed at or involving use alcohol or illegal drugs while in performance of their duties.	□ Dismissal but an employee will be given the right to be heard □ Reported to police

8. ACCEPTANCE OF CEC BY EMPLOYEE

I……., employed by (CONTRACTOR), have read and clearly understood this Code of Ethical Conduct (CEC) (i.e. the Dos and Don'ts as CONTRACTOR employee) and in case I violate this CEC appropriate disciplinary actions shall be taken as prescribed in this CEC.

Name of employee……..……

Position……

Signature……

Date……

APPENDIX 16: CODE OF CONDUCT FOR ESHS AND GENDER-BASED VIOLENCE.

I, _____, acknowledge that adhering to environmental, social, health and safety (ESHS) standards, following the project's occupational health and safety (OHS) requirements, and preventing Gender Based Violence (GBV) is important.

The Company considers that failure to follow ESHS and OHS standards, or to partake in activities constituting GBV—be it on the worksite, the worksite surroundings, at workers' camps, or the surrounding communities—constitute acts of gross misconduct and are therefore grounds for sanctions, penalties or potential termination of employment. Prosecution by the Police of those who commit GBV may be pursued if appropriate.

I agree that while working on the project I will:

1. Consent to Police background check.
2. Attend and actively partake in training courses related to ESHS, OHS, and GBV as requested by my employer.
3. Will wear my protective equipment (PPE) at all times when at the worksite or engaged in project-related activities.
4. Take all practical steps to implement the contractor's environmental and social management plan (C-ESMP).
5. Implement the OHS Management Plan.
6. Adhere to a zero-alcohol policy during work activities, and refrain from the use of narcotics or other substances which can impair faculties at all times.
7. Treat women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or another opinion, national, ethnic or social origin, property, disability, birth, or another status.
8. Not use language or behaviour towards women, children, or men that are inappropriate, harassing, abusive, sexually provocative, demeaning, or culturally inappropriate.
9. Not sexually exploit or abuse project beneficiaries and members of the surrounding communities.
10. Not engage in sexual harassment of work personnel and staff —for instance, making unwelcome sexual advances, requests for sexual favours, and other verbal or physical conduct of a sexual nature is prohibited. E.g. looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; in some instances, giving personal gifts.
11. Not engage in sexual favours —for instance, making promises of favourable treatment (e.g. promotion), threats of unfavourable treatment (e.g. loss of job) or payments in kind or cash, dependent on sexual acts—or other forms of humiliating, degrading or exploitative behaviour.
12. Not use prostitution in any form at any time.
13. Not participate in sexual contact or activity with children under the age of 18—including grooming, or contact through digital media. Mistaken belief regarding the age of a child is not a defence. Consent from the child is also not a defence or excuse.
14. Unless there is full consent by all parties involved, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of a benefit (monetary or non-monetary) to community members in exchange for sex (including prostitution). Such sexual activity is considered "non-consensual" within the scope of this Code.
15. Consider reporting through the GRM or to my manager any suspected or actual GBV by a fellow worker, whether employed by my company or not or any breaches of this Code of Conduct.

Concerning children under the age of 18:

16. Bring to the attention of my manager the presence of any children on the construction site or engaged in hazardous activities.
17. Wherever possible, ensure that another adult is present when working in the proximity of children.
18. Not invite unaccompanied children unrelated to my family into my home, unless they are at immediate risk of injury or in physical danger.
19. Not use any computers, mobile phones, video, and digital cameras or any other medium to exploit or harass children or to access child pornography (see also "Use of children's images for work-related purposes" below).
20. Refrain from physical punishment or discipline of children.
21. Refrain from hiring children for domestic or other labour below the minimum age of 14 unless national law specifies a higher age, or which places them at a significant risk of injury.
22. Comply with all relevant local legislation, including labour laws concerning child labour and the World Bank's ESS2 on child labour and minimum age.
23. Take appropriate caution when photographing or filming children (See Annex 2 for details).

Use of children's images for work-related purposes

When photographing or filming a child for work-related purposes, I must:

24. Before photographing or filming a child, assess and endeavour to comply with local traditions or restrictions for reproducing personal images.
25. Before photographing or filming a child, obtain informed consent from the child and a parent or guardian of the child. As part of this, I must explain how the photograph or film will be used.
26. Ensure photographs, films, videos, and DVDs present children in a dignified and respectful manner and not in a vulnerable or submissive manner. Children should be adequately clothed and not in poses that could be seen as sexually suggestive.
27. Ensure images are honest representations of the context and the facts.
28. Ensure file labels do not reveal identifying information about a child when sending images electronically.

Sanctions

I understand that if I breach this Individual Code of Conduct, my employer will take disciplinary action which could include:

1. Informal warning.
2. Formal warning.
3. Additional Training.
4. Loss of up to one week's salary.
5. Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
6. Termination of employment.
7. Report to the Police if warranted.

I understand that it is my responsibility to ensure that the environmental, social, health, and safety standards are met. That I will adhere to the occupational health and safety management plan. That I will avoid actions or behaviours that could be construed as GBV. Any such actions will be a breach of this Individual Code of Conduct. I do hereby acknowledge that I have read the foregoing Individual Code of Conduct, do agree to comply with the standards contained therein, and understand my roles and responsibilities to prevent and respond to ESHS, OHS, and GBV issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to act mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: _____

Printed Name: _____
Title: _____
Date: _____

APPENDIX 17: ENVIRONMENTAL AND SOCIAL DEMOBILIZATION CHECKLIST.

Note: Put a tick (✓) at appropriate place and always take photographs for illustration.

S/n	Description of Works	Yes	No	NA*	Comments	Target Completion Date
1.	**Employment and Workers welfare**					
1.1	Have all employees been paid their terminal benefits before retrenchment?					
1.2	Has the Contractor NSSF and WCF contributions for all employees before retrenchment?					
2.	**Camp Sites and Office Facilities**					
2.1	Has all camp site and office facilities been demolished or handed over to the relevant authorities?					
2.2	Has the all the bare areas been scarified and planted trees after demolition or removal of camp site or office buildings?					
3.	**Solid Waste Management**					
3.1	Has all construction and demolition solid wastes been removed?					
3.2	Has all hazardous wastes been removed (e.g. waste oils, used batteries, used tyres, scrap metals, etc)					
3.3	Has all excavated soil and spoil materials been removed?					
3.4	Has the tempoerary solid waste collection bay been dismannlted and remvoed?					
4.	**Soil Erosion and Sedimentation Control**					
4,1	Has all execess construction mateirals been removed?					
4.2	Has all sediment control structures been reomved?					
4.3	Has suceptible areas to erosion been adequaltely stabilized ?					
4.4	Have all stockpiles been removed or appropriately landscaped?					
4.5	Has all temporary storm water control system (e.g. drains, settling ponds, etc.) been removed?					
5.	**Groundwater and Dewatering Contol**					
5.1	Has all dewatering equipment (pumps, hose pipes, etc.) been removed?					

S/n	Description of Works	Yes	No	NA*	Comments	Target Completion Date
5.2	Has all settlement tanks / water bowsers been removed?					
5.3	Has all temporary lagoons, settlement basins been removed and retunred to its orginal state?					
5.4	Has all inert matetrials from laggons been disposed of appropriately?					
5.5	Have all well casing been removed?					
5.6	Have all wells been adequately backfilled?					
5.7	Have all wells been caped with concrete (500 mm)?					
6.	**Workshops/Garages, Vehicle Washing and Refuleing Areas**					
6.1	Have all vehicle maintenace, washing and refuleing areas been scanned for soil decontamination?					
6.2	Has all contaminated soil been collected and appropriately diposed of?					
6.3	Has all contaimineated water been removed from sumps, intercetors, etc?					
6.4	Has all cncrete bunds and floor slabls been scanned for signs of contamination?					
6.5	Has all contaminated cocnrete (portion of floor slabs, bunds and refueling aprons) been removed as hazardous wastes?					
7.	**Fuel and Chemical Storage Areas**					
7.1	Has all chemical substances and PCLs been removed?					
7.2	Has chemical and bulk fuel stoagre areas been scanned for oil contamination?					
7.3	Has all contaminated soil been collcted and appropriately dispos of?					
7.4	Have bulk fuel tanks been remvoed?					
7.5	Have conrete bunds been scanned for signs of contamination?					
7.6	Have alll contaminated conrete (portions of floor slabs, bunds, and refuleing apron been removed as hazardous wastes?					
8.	**Sanitary and Wastewater Disposal Facilities**					
8.1	Have all septic tanks from temporary facilites been emptied?					
8.2	Have all spetic tanks been removed?					

S/n	Description of Works	Yes	No	NA*	Comments	Target Completion Date
8.3	Have all spetic tanks drainage networks and insepction manholes been removed?					
8.5	Have all raw sewage discharge chambers or pti latrines been demolished and backfilled?					
9.	**Landscape Management and Run-off Control**					
9.1	Has the contractor planted grass on bare areas around the buildings?					
9.4	Has the contractor used pavement blocks instead of conrete on foot paths to promote infiltration and minimze run-off?					
10.	**Borrow pits/Quarry Sites Rehabilitation**					
10.1	Has all borrow ptis been properly rehsped and backfilled with surounding soil materials?					
10.2	Has all access roads to borroiw pits beenscarified and planted grass?					
10.2	Has the usable borrow pit for livestock water drinking been properly reshaped and handed over to local authority?					

Note: *NA = Not Applicable