

**UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE REGIONAL ADMINISTRATION AND
LOCAL GOVERNMENT**



PROVISION OF CONSULTANCY SERVICES

FOR

**CARRYING OUT 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 TEMEKE
MUNICIPALITY- PREPARATION OF DMDP PHASE 2
CONTRACT NO. ME/022/2022/2023/CR/18**

**FINAL DRAFT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)
FOR
ROADS AND DRAINAGE SUB-PROJECTS
IN
TEMEKE MUNICIPAL COUNCIL**

SEPTEMBER 2025

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REPORT
FOR ROADS AND DRAINAGE SUB-PROJECTS (TOTTALLING 31.02KM) IN
TEMEKE MUNICIPAL COUNCIL**



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EXECUTIVE SUMMARY

A. Background

The Government of the United Republic of Tanzania through The President's Office - Regional Administration and Local Development (PO-RALG) has received a credit from the World Bank towards implementing Dar es Salaam Metropolitan Development Project (DMDP Phase 2), which will be implemented through the President's Office - Regional Administration and Local Development (PO-RALG).

DMDP phase 2 will be implemented by the 5 Dar es Salaam Local Authorities (DLAs), i.e. The Municipal Councils (MCs) of Kinondoni, Ubungu, Temeke and Temeke, and the Dar es Salaam City Council (DCC). The assignment is intended to be an international best practice example of urban development that enhances economic productivity and job growth, inclusiveness, and builds resilience to hazards.

DMDP Phase 2 will scale-up priority infrastructure, continue to strengthen urban institutions, and introduce new investments in solid waste management. During DMDP Phase 1's implementation, the effects of climate change, particularly flooding, became an increasingly significant threat to Dar es Salaam's urban infrastructure and population. Accordingly, Components 1 and 2 of the proposed projects will address urban infrastructure gaps in a way that responds to increased hazards and risks from climate change and urbanization and helps reduce greenhouse gas emissions through investment in low-carbon infrastructure and services. Component 3 will complement these investments by building institutional capacity in climate-responsive planning, design and urban management functions with an emphasis on proactive measures to effectively guide future urban growth towards densification and transit-oriented development, and to protect space for future infrastructure and adaptations to climate change.

This ESIA is concerned with the upgrading of selected roads to bitumen standards including the side drains in the wards of the wards of Chang'ombe, Miburani, Kurasini, Temeke, Tandika, Yombo-Vituka, Azimio, Chamazi, Charambe, Mbagala Kuu, Mianzini and Toangoma Wards. Details of each of road is described in Chapter two in section 2.7 and Table 2-1.

B. Requirements for ESIA

This Project falls under the list of projects requiring EIA pursuant to the First Schedule made under Regulation 6(1) of the Tanzanian Environmental Impacts Assessment and Audit Regulations, 2005 and Regulation 17 of its amendments of 2018. Moreover, the requirement of ESIA is in accordance with World Bank Environmental and Social Framework, 2017, specifically under ESS1 (Assessment and management of environmental and social risks and impacts).

In terms of the EIA and Audit Regulations, 2005 read together with amendments of 2018. The proposed Road Construction project falls into "Type A" projects which are mandatory to ESIA, under section 9 "TRANSPORT AND INFRASTRUCTURE" subsection (a) construction and/or expansion of trunk roads.

In accordance with the World Bank's Environmental and Social, Policy for Investment Project Financing the DMDP II projects has been classified as a high risk which renders eight E&S standards relevant/ applicable, namely:

- i. Environmental and Social Standard 1: Assessment and Management of Environmental and Social Risks and Impacts.
- ii. Environmental and Social Standard 2: Labour and Working Conditions.
- iii. Environmental and Social Standard 3: Resource Efficiency and Pollution Prevention and Management.
- iv. Environmental and Social Standard 4: Community Health and Safety.
- v. Environmental and Social Standard 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.
- vi. Environmental and Social Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- vii. Environmental and Social Standard 8: Cultural Heritage.
- viii. Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure.

The ESIA will also address these policies apart from subscribing to the national environmental policies and guidelines. Where the World Bank's Environmental and Social Standards differ from the EIA and Audit Regulations, the project is required to meet the more stringent standard to protect people and the environment.

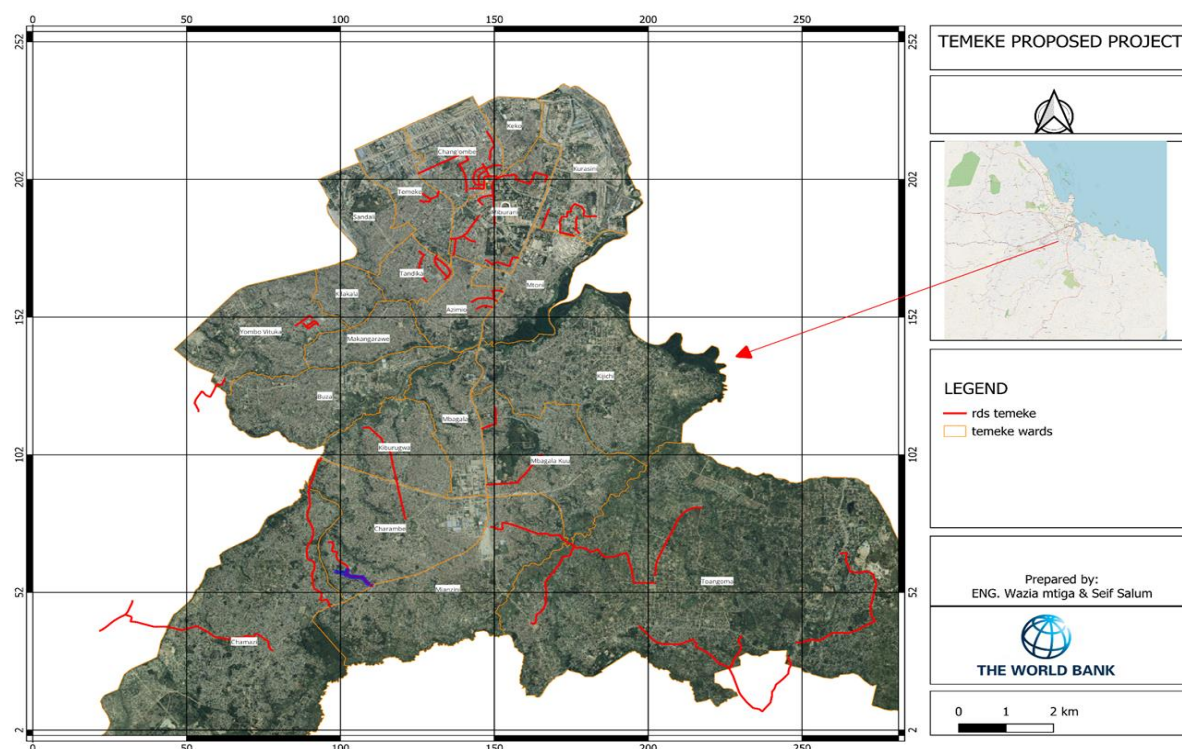
C. Project Location

Geographically, Temeke Municipal Council is bordered by Coast Region to the south, Ilala Municipality to the north and west, and the Indian Ocean and Kigamboni Municipal Council to the east. It covers 240 sq km with a 5 km coastal line, positioned between coordinates 39°12' - 39°33' east and 6°48' - 7°33' south.

Land in Temeke faces challenges like degradation and urbanization. It includes hilly Chamazi, areas like Miburani for development, and lowlands near Yombo River suitable for urban farming but prone to unplanned settlements and floods.

Temeke's ecology comprises northern uplands (Mtoni Kijichi escarpment, Keko, Temeke, Mtoni, Tandika) and a central zone (Mbagala, Chamazi, Yombo Dovya, Kongowe plateau).

The proposed sites for roads and Footbridges fall in chang'ombe, Miburani, Kurasini, Temeke, Tandika, Yombo-Vituka, Azimio, Chamazi, Charambe, Mbagala Kuu, Mianzini and Toangoma Wards (Figure A-1).



D. Land Acquisition

Upgrading of proposed roads and drainage systems shall be done within existing routes; however, there will be partial land take during the construction as realignment will result into minor take or even restrictions to access to some petty businesses that may be found along the route. The roads are within developed areas, despite fact that, construction will focus mainly within RoW but there will be element of minor land take as RoW are not uniform throughout each of the roads that are to be constructed, land take and compensation will be minor and through monitoring all will be addressed as they occur. Assets that are eligible for compensation are buildings, land and development made on land such as crops, trees, bore holes and so forth. These categories are used to determine PAPs to be considered eligible for compensation and other forms of resettlement assistance in accordance with Tanzanian laws, Environmental and Social Standard 5 (ESS 5) of the and World Bank Resettlement Policy Framework.

For purposes of compensation, cut-off dates established during the meeting between August 9th and September 22nd, 2023 will take into account only properties, which existed before enumeration of properties and assets in the project area, However, the cut-off dates was disseminated through public meetings, TVs and local Radio

Therefore, the proposed upgrading of urban infrastructure is expected to cause limited resettlement of people and properties. RAP that has been prepared for this project will address all physical and economic displacements that are likely to occur in the course of implementing this project in this Municipality.

E. Condition of the Existing Road

The visits conducted to the subproject's sites revealed that the some of the subproject roads are not connected thus fall under separate Wards within Temeke Municipality and others that are connected falling within the same and different wards within the Municipality. Selected Roads carry different characteristics that are to be considered during the design period.

F. Key Components of the Proposed Road Project

A summary of the key components of the proposed project is described below. It should be noted at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering design phase.

- a. Carriage Way
- b. Shoulders
- c. Pedestrian Walkways
- d. Storm water Drains
- e. Service Roads
- f. Outlet Ditches
- g. Side Ditches
- h. Culverts
- i. T/Y Junctions
- j. Bus Bays
- k. Road Signs and Crossings
- l. Roadside Parking Lots
- m. Road Lights

Upgrading of proposed roads and drainage systems shall be done within existing RoW. The roads are within Municipal Roads' Reserves while drainage systems' way leaves/buffer zone are governed by Water Resource Management Act, 2019. Therefore, the proposed upgrading of urban infrastructure is not expected to be a cause of resettlement of people and properties. However, there might be some business premises which can be affected during construction by disturbing accessibility. This will be addressed by Contractors providing temporary access to the premises. This would constitute temporary physical and economic resettlement. The latter might require compensation above and beyond the proposed 'temporary access. For PAPs whose business premises will be totally displaced, will be illegible for compensation as per ESS5 requirement in accordance with RAP prepared and assisted to access financial knowledges from financial institutions and access affordable alternative plots by the Temeke Municipal Council. Pedestrian and roadside parking lots, road safety design features for vulnerable groups, space for vendors, and street tree planting will be incorporated into the design of the available right-of-way through a "Complete Streets"⁵ people-centered approach. Therefore, all proposed auxiliary infrastructure (whether temporary or permanent) that will be added within the framework of this sub-project and any land needs during construction will be within the existing RoW or in the acquired land

Acquisition Process

Loss of Structures (residential structures)

There will be a significant impact of loss of structures that will be caused by the proposed project mainly in utilizing the width of 7m in areas which the roads have less width of 7m. These local roads are likely to have a major impact to the livelihood of the PAPs if not well compensated. Types of houses to be affected are mixture Stem comprised of both residential and commercial buildings. For the impact of residential structures, they are mainly of three types that include those used as residents for the owner of the house, those used with tenants and therefore a source of income for the owner and other residential structures that combine both residents for the property owner sharing with tenants. PAPs losing residential structures are entitled to the following compensation:

- ☐ Compensation of the residential structure according to the type of structure and Replacement cost;
- ☐ Compensation of land according to the market value if the PAP owns the land;
- ☐ Loss of Accommodation allowance;
- ☐ Transport allowance;
- ☐ Disturbance allowance.

Apart from resettlement assistance mentioned above, the PAP will be assisted in Legal assistance for purchase or Search assistance. Other people with structures outside the RoW will be assessed through inventory and photographs by the Contractor to know the status of structures before construction. During construction some structures may suffer cracks or other damages caused by compaction by heavy machines and in this case new cracks or other damages will be repaired by the Contractor. The cost for the repair will be borne by the Contractor. Consultations with communities under the project will continue to the end of the project.

For tenants that reside in these houses they will receive the following compensation under this RAP

- ☐ Transport allowance and
- ☐ Disturbance allowance

2.2.2 Commercial Structures

It has been revealed that the project will have a major impact on structures that are used for commercial purposes that including renting houses or renting part of the houses for other types of business such as shops, so two main categories of business in the area i.e those that are registered and

have records with their business and those that have no records of which most of them are petty business. Therefore, entitlements for PAPs losing commercial structures under this RAP will be categorized as follows:

PAPs losing commercial structures will be compensated for the following:

- ☐ Compensation of the commercial structure according to the type “of structure and Replacement cost;
- ☐ Compensation of land where the structure is according to the replacement value if PAPs own the land
- ☐ Loss of revenue;
- ☐ Transport allowance
- ☐ Disturbance allowance

PAPs losing Commercial Structures with Business that does not have record Methods used to calculate revenue for business with no records are:

- ☐ Estimating income regarding to nature and type of the business
- ☐ Conducting research on average income/revenue of similar business
- ☐ Compensation of the commercial structure according to the type of structure and Replacement cost;
- ☐ Compensation of land where the structure is according to the market value if PAPs own the land;
- ☐ Loss of revenue calculated for 36 months
- ☐ Transport allowance;
- ☐ Disturbance allowance.

Loss of Commercial Structure Tenant with Business Record

- ☐ Loss of revenue allowance calculated for 36 months Transport and Disturbance allowances

Loss of Commercial structure tenant with no business record

In this scenario the Valuer will assess the business of all PAPs under this category and calculate an average of income then distribute to all PAPs. This will be the loss of revenue to business without records. Other compensation parameters will be as follow: -

- Compensation of the commercial structure according to the type of structure and replacement cost;
- Compensation of land where the structure is according to the market value if PAPs own the land;
- Loss of revenue calculated for 36 months from the average income;
- Transport allowance;
- Disturbance allowance.

Loss of Commercial structure tenant with business, with no records

- ☐ Loss of revenue calculated for 36 months;
- ☐ Transport and disturbance allowance;

G. Project Phases

- a) Planning
- b) Site preparation
- c) Construction
- d) Operation
- e) Decommissioning

H. Labour Forces

The proposed construction of the proposed roads and side drains is anticipated to employ 300 direct workers of different categories ranging from skilled, semi-skilled and unskilled.

I. Policy, Administrative and Legal Framework

Several relevant policies and legal documents have been reviewed to ensure that “Upgrading of the proposed Road Project” under DMDP II at Temeke Municipality meets policy and legislative criteria.

National Policies

National Environment Policy 2021, National Employment Policy 2008, National Land Policy, 1997, The Construction Industry Policy 2003, National Mineral Policy 2009, Human Settlement Development Policy 2000, National Water Policy 2002, National Action Plan to end Violence against Women and Children (2017/18-2021/22), Policy on HIV/AIDS Policy 2001 and National Energy Policy 2015.

National Legal Framework

Environmental Management Act (2004), Urban Planning Act, No 7, 1982, RE 200; The Road Act (2007), Energy and Water Utilities Act (2001), Water Resources Management Act (2019), Mining Act 2017, Occupational Safety and Health Act (2003), HIV and AIDS (Prevention and Control) Act No. 28/08 (2008) and Land Act No. 2/04 (2004); Valuation and Valuers Registration Act No.7 of 2016.

J. Physical Environment

General Setting of the Project Area

The proposed project is located in Temeke District, officially known as The Temeke Municipal Council is one of five districts of the Dar es Salaam Region of Tanzania. The district is bordered to the north by Ilala District, to the east by the Indian Ocean, the west by Temeke District, and to the south by the Mkuranga District of Pwani Region.

Temperature Distribution

Temperatures across the country are normally characterized by relatively less fluctuation throughout the year. The annual long-term average temperature over different stations in the country ranges from 14.4 °C to 26.4 °C. Regions with the highest temperatures are along the coast and western parts of the country. The season with high temperatures starts from October through February or March of the following year, whilst the cold season is from May to August. The annual minimum air temperature (Tmin) and maximum air temperature (Tmax) across the stations in the country ranges from 9.6 °C to 22 °C and 19.1 °C to 30.7 °C respectively.

Rainfall Distribution

The rainfall distribution and variability are driven by multiple factors including East African Monsoon, El-Niño Southern Oscillation (ENSO), and westerlies from Congo, tropical cyclones, and Inter-Tropical Convergence Zone (ITCZ). The migration of ITCZ north and south across the equator is among the main factors affecting the distribution and variability of rainfall in Tanzania and the entire East African region.

Topography

The project is in Temeke district located in the Southeastern part of Dar es Salaam, Tanzania, boasts a diverse topography that encompasses coastal beauty, urban developments, and natural elements. Situated along the Indian Ocean coastline, Temeke features sandy beaches, rocky formations, and tidal areas that attract both tourists and locals. The district's narrow peninsula configuration creates a unique geographical setting, flanked by the Indian Ocean to the east and the Kurasini Creek to the west.

Geology

The geology of the Temeke area involves sedimentary rock formations such as sandstone and limestone, typical of coastal regions shaped by past marine environments. Being situated near the eastern coast of Africa, Temeke's geology could be influenced by the East African Rift System, a significant tectonic feature.

Soil

Temeke is characterized by its diverse and significant soil resources as outlined by the Food and Agriculture Organization (FAO). The soil information pertaining to Temeke highlights various soil types and their characteristics.

Floods and Erosion

Temeke which forms part of Dar es Salaam Region faces significant risks from floods and erosion, exacerbated by poor stormwater drainage, unplanned urban development, and waste dumping, while landslides are less common but can occur in hilly areas. Though generally low, earthquake risk cannot be ignored, requiring monitoring for seismic activity and disaster preparedness. Hydrology focuses on water systems, and hydrogeology on groundwater, providing crucial data for understanding Dar es Salaam's vulnerability to water-related hazards like flooding and erosion.

K. Stakeholders Consultations

Engagement of stakeholders was done in line with the categories of stakeholders, namely those that are interested with the project and those that are likely to be affected by the proposed sub-projects as per ESS.10.

Likely Project Affected parties: At the local level the engagement was done from the Municipal Council, Wards and Mitaa (lowest administrative setting in the Municipality) and residents and traders along each road including Mitaa Government leaders, land and buildings owners, tenants, traders and women groups. There were two focus group discussions in each Mtaa with local government leaders; owners and traders; women and boys groups running businesses within the areas of the planned sub-projects activities. We organized interviews with key informants mainly Wards and Mtaa leaders, that is, the Ward and Mtaa Councillors and Chairpersons; Wards and Mtaa Executive Officers.

Interested Stakeholders consulted include the Ministry of Lands, Housing and Human Settlements Development; Temeke Municipal Council(Mayor, Councillors, Staff in Departments of urban Planning; works; community development), TANESCO zone manager, DAWASA; OSHA; Dar es Salaam Regional Administrative Secretary(RAS); Temeke District Commissioner(KDC); TANROADS Regional offices; TARURA; DAR Rapid Transit Agency; Tanzania Telecommunications Corporation Limited(TTCL); Tanzania Railways Corporation(TRC).

Results of Public Consultations

The following issues were raised by stakeholders;

Land take and compensation: There had been fear from project affected parties (PAPs) about unfair assessment and compensation of affected properties. This was echoed at every Mtaa meeting. Inability of the proponent to mark out the Right of way (RoW) in advance and people are worried about government officials' who may embezzle compensation funds. There may be no land acquisition per se but there may be temporary or permanent ESS5-associated impact (for example in relation to loss of livelihood due to restricted access) whose mitigation measures are explained in the RAP. The eligibility criteria for assessment and determination of compensation will be disclosed to the affected parties as per ESS5 and ESS10 requirements. The PAPs should be educated and counselled in implementing resettlement. Majority of people are insisting that the government should help them to find new land to relocate despite of being compensated. The PAPs should be educated and counselled in implementing resettlement. Majority of people are insisting that the government should help them to find new land to relocate despite of being compensated.

Likelihood for destruction of parts of property within RoW: Some of the roads within Temeke Municipality will have resettlement and livelihood impacts some properties and businesses that are likely to be partially affected in the form of requiring partial demolition. These are likely to include front parts of residential or commercial properties; trees, fence, and temporary business sheds. The partial or full touch by the project activities of these properties will result into economic displacements-temporary termination of businesses. Will result into economic displacements-temporary termination of businesses.

Increased Road accidents: Accidents will increase during operations therefore precautions of installation of bumps; zebra crossing should be included in the road design. It is also important to educate communities on road uses as well as road act.

Compensation of affected properties: The affected properties might not be compensated or the compensations may not consider market value of the properties.

Construction of the road below specified standard: The community is concerned about the quality of construction work requesting for integrity and commitment by contractors to ensure that sustainable roads are constructed.

L. Identified Impacts

The development of local roads can cause a wide range of environmental and social impacts on a number of receptors. The impacts are of both positive and negative nature. The significant environmental and social impacts identified include;

Impacts During pre-construction phase

- (i) Impact on temporal uses along the roads to be upgraded
- (ii) Vegetation clearance/ loss
- (iii) Displacement of Communities
- (iv) Cultural Heritage
- (v) Dust pollution
- (vi) Occupational and Community Health and Safety impacts, including security

- (vii) Damage to houses due to vibrations from heavy machinery/ construction equipment
- (viii) Cultural heritage impacts, including chance finds
- (ix) Labour and working conditions

Impacts during construction phase;

- (i) Impacts on Atmospheric Environment and dust pollution
- (ii) Impacts on Acoustic Environment
- (iii) Impacts on Terrestrial Environment
- (iv) Impacts on Labour and Economy
- (v) Visual and Aesthetic Impact
- (vi) Mismanagement of Wastes
- (vii) Possible escalation of HIV/AIDS and other STD's spread
- (viii) Impacts on physical and economy in the form of partial land take and restriction to access
- (ix) Occupational and Community Health and Safety impacts, including security
- (x) Damage to houses due to vibrations from heavy machinery/ construction equipment
- (xi) Cultural heritage impacts, including chance finds
- (xii) Labour and working conditions

Impacts during operational phase;

- (i) Impacts on Public Health, Safety and Security
- (ii) Impacts on Labour and Economy
- (iii) Enhancement of aesthetic value of the project area
- (iv) Improved accessibility and connectivity of the project areas.

M. Project Alternatives

Three alternatives were considered in this study including no project alternative, alternative sites and alternative designs. The no project alternative was disqualified because choosing that alternative shall mean to remain with the status quo (without project) and losing all the benefits of the project. The selection of project sites (roads) and sub projects was done through a rigorous process which involved technical personnel and the proposed communities while observing the laid down criteria for selection of local roads. Alternative design looked at the advantages and disadvantages of using asphalt concrete over other pavement materials and covered channels over open channels. Asphalt concrete and covered channels seemed to have more advantages than the other alternatives considered.

N. Mitigation Measures

- i. Land Use Planning: Engage with local authorities and community stakeholders to develop comprehensive land use plans and collaborate with urban planners and zoning authorities to identify areas suitable for road expansion while preserving critical community spaces.
- ii. Air Pollution and dust emissions: Avoid use of obsolete equipment, ensuring regular service and undertaking dust suppression by water sprinkling periodically based on the weather conditions, regulating speed on construction sites using speed humps.
- iii. Vegetation Loss: Undertake revegetation for any trees lost and where space is available within the RoW, plant trees along the road reserves.
- iv. Economic displacement impacts: Undertake compensation for any economic displacement impacts.
- v. Labour and Working Conditions: Ensure all workers are provided with employment contracts in line with the labour laws and ESS2, providing appropriate working conditions including their rights related to hours of work, wages, overtime, compensation and benefits, as well as those arising from the requirements of ESS2.
- vi. Cultural Heritage: Undertake inventory of any cultural heritage resources and avoid them, and require the Contractors to develop and implement a Chance Finds Procedure as part of their C-ESMP before commencement of any site clearance and excavation works.
- vii. Noise Pollution: Undertake construction and noisy activities during day-time and only work at night in areas where there are no residential homes.
- viii. Resource Assessment: Conduct a thorough assessment of natural resources before construction begins to Identify and protect areas of ecological significance, ensuring minimal disturbance to habitats, water bodies and agricultural lands.
- ix. Land for Land Compensation: Offer land-for-land compensation whenever feasible.
- x. Public Awareness Campaigns: Conduct public awareness campaigns to inform the community about construction activities, potential hazards, and safety measures.
- xi. Waste Management: Avoid and/or minimize generation of waste, undertaking waste segregation at source, using colour coded waste collection bins and using licensed waste handlers to transport and dispose it off.
- xii. Spread of HIV/AIDS in the community: Undertake community sensitization, provide condoms to workers free of charge, and enforce a Workers' Code of Conduct to regulate illicit behaviour and promiscuity.
- xiii. Work Zone Barrier Implementation: Installation barriers and barricades to separate construction areas from active traffic lanes, protecting both workers and the public.
- xiv. Safety Training for Workers: Provide comprehensive safety training for construction workers, emphasizing the importance of following safety protocols and procedures.

O. Environmental and Social Management Plan (ESMP)

The proposed mitigation measures provide the basis for the development of environmental and social management plan and monitoring plan for the Project, required to meet NEMC's environmental approval and permitting requirements as indicated in Tables 8-1 & 9-1 of this report as well as World Bank requirements for meeting all environmental and social requirements throughout the life of the sub-project.

P. Summary and Conclusion

Summary

The construction of proposed road projects under DMDP II at the Temeke Municipal Council will reduce transport cost and facilitate the transportation services within the Municipal areas as well as to the other surrounding Municipalities.

The proposed project has undergone ESIA study as a legal requirement under the National Environmental Management Act, 2004 as well as EIA and Audit Regulations, 2005 read together with amendments of 2018.

Environmental and Social Impact Assessment study was conducted in 2023 which involved the collection of baseline information including secondary data, focused approach impacts mapping, engagement of communities along the proposed road, Impacts identification, impacts evaluation and preparation of Environmental and Social Management Plan.

Impacts identified include various categories; physical, biological, social, economic and climate change risks. Evaluation of impacts indicates low magnitude on physical and biological negative impacts. Positive economic impacts are anticipated to be of medium magnitude.

The identified adverse impacts should be managed through the proposed mitigation measures and monitoring schedules outlined in chapters 8 and 9 of this report.

Conclusion

In summing up, the implementation of the proposed project will not cause significant negative environmental and social impacts provided that the recommended mitigation measures are adequately and timely put in place.

STUDY TEAM

Name	Position
Eng. Shabani Marijani	Team Leader and Environmental Expert
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Mr. Chrispin Mwansanga	Sociologist/RAP Expert
Mr. Conrad Concedo	Environmental Expert
Eng. Wazia Mtiga	Environmental Expert & Baseline Data Expert
Ms. Hawa Kalinga	Assistant Sociologist/RAP Expert

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LIST OF ABBREVIATIONS/ ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AoI	Area of Influence
AQRB	Architects and Quantity Surveyors Registration Board
BS	British Standard
CRB	Contractors Registration Board
DCC	Dar es Salaam City Council
DIZ	Direct Impact Zone
DLAs	Dar es Salaam Local Authorities
DMDP II	Dar es Salaam Metropolitan Development Project Two
EHSGs	Environmental Health and Safety Guidelines
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
ERB	Engineering Registration Board
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
GBV	Gender Based Violence
GIIP	Good International Industry Practice
GOT	Government of Tanzania
GRM	Grievance Redress Mechanism
HIV	Human Immunodeficiency Virus
MC	Municipal Council

MOW	Ministry of Works
NACP	National HIV/AIDS Control Programme
NEMC	National Environmental Management Council
PIT	Project Implementation Team
PLHAS	People Living with HIV/AIDS
PO-RALG	President's Office - Regional Administration and Local Development
QS	Quantity Surveyors
RAP	Resettlement Action Plan
RAS	Regional Administrative Secretary
RE	Resident Engineer
REA	Rural Energy Agency
ROW	Right of Way
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SH	Sexual harassment
TANESCO	Tanzania Electric Supply Company
URT	United Republic of Tanzania
USD	United States Dollars
WBG	World Bank Group

1. INTRODUCTION

1.1 Background of The Proposed Project

The Government of the United Republic of Tanzania through The President's Office - Regional Administration and Local Development (PO-RALG) has received a credit from the World Bank towards implementing Dar es Salaam Metropolitan Development Project (DMDP Phase 2), which will be implemented through the President's Office - Regional Administration and Local Development (PO-RALG).

DMDP phase 2 will be implemented by the 5 Dar es Salaam Local Authorities (DLAs) i.e., the Municipal Councils (MCs) of Kinondoni, Ubungu, Kigamboni and Temeke, and the Dar es Salaam City Council (DCC). The assignment is intended to be an international best practice example of urban development that enhances economic productivity and job growth, inclusiveness, and builds resilience to hazards.

DMDP Phase 2 will scale-up priority infrastructure, continue to strengthen urban institutions, and introduce new investments in solid waste management. During DMDP Phase 1's implementation, the effects of climate change, particularly flooding, became an increasingly significant threat to Dar es Salaam's urban infrastructure and population. Accordingly, Components 1 and 2 of the proposed projects will address urban infrastructure gaps in a way that responds to increased hazards and risks from climate change and urbanization and helps reduce greenhouse gas emissions through investment in low-carbon infrastructure and services. Component 3 will complement these investments by building institutional capacity in climate-responsive planning, design and urban management functions with an emphasis on proactive measures to effectively guide future urban growth towards densification and transit-oriented development, and to protect space for future infrastructure and adaptations to climate change.

In Temeke Municipal Council, DMDP-2 will support construction of the roads and drainage systems sub-projects within twelve (12) different wards namely chang'ombe, Miburani, Kurasini, Temeke, Tandika, Yombo-Vituka, Azimio, Chamazi, Charambe, Mbagala Kuu, Mianzini and Toangoma Wards. The list of selected sub-project roads in Temeke Municipal and detailed description of the road corridors are explained in Chapter two (2) within table 2-1 and section 2.7 respectively.

1.2 The Need and Justification for the Proposed Sub-projects

The need and justification are based on the analysis of the first phase of DMDP in this Municipality where there was stock of dilapidated roads and drains infrastructure that required completion in this Municipality. This ESIA focused on the upgrading of 44.4 km of roads to bitumen standards including foot/pedestrian bridges.

1.3 Project Cost and Sources of Funding

The proposed 44.4 Km Road section construction including footbridges is estimated to cost 30.00 million USD. This includes the cost for construction, purchasing materials, labour cost and all miscellaneous expenses subjected in the implementation of the project. Source of funds for construction is the Government of Tanzania with credit from the World Bank.

1.4 Project Life Span

Construction of the proposed road sections at the Temeke Municipality under DMDP II shall start soon after approval of all related studies, i.e., Feasibility, engineering designs and environmental clearance and construction tender award early in 2025. The project design period is expected to be 20 years.

1.5 The Purpose and Scope of the Assignment

General Objective

The objective of the ESIA study is to identify potential negative and positive (social and environmental) impacts of the project and provide mitigation measures for negative impacts and enhancement measures for positive impacts, respectively. Ultimately, the intention is to ensure that the project is not only technically feasible and economically viable but also environmentally friendly and socially acceptable. However, according to the First Schedule to the Environmental Impact Assessment and Audit Regulations G.N. No. 349 of 2005, as amended in 2018, before undertaking an ESIA study, the Project Proponent is required to register the project to the National Environment Management Council (NEMC) by submitting a scoping report and filling Form No. 1 and 4 as outlined in the named Regulations. The Terms of reference report for conducting this EIA study is also submitted in tandem with this report.

Specific Objectives

Specific objectives of the ESIA are:

- ✓ To document and describe, in as much detail as possible, the socio-economic and environmental baseline conditions before the commencement of project development.
- ✓ To describe the project's components and activities of relevance to the environmental and social assessments.
- ✓ To identify all relevant national and international institutional and legal policy requirements and guidelines to assure full compliance.
- ✓ To consider project alternatives
- ✓ To assess and document likely magnitudes and significance of all potential negative impacts to the environment and people.
- ✓ Propose reasonable mitigation measures for negative impacts.
- ✓ Develop environmental and social management and monitoring plan in compliance with the relevant national and international legislation.
- ✓ Establish the roles and responsibilities of all parties involved in the project's environmental and social management and monitoring.
- ✓ Document key environmental and social concerns raised by stakeholders during public consultation activities.
- ✓ Ensure the existence and operation of a grievance mechanism (GM) system to handle complaints by all relevant stakeholders.

Scope of Work

The scope of work includes;

- ✓ To identify, predict, evaluate and suggest mitigation measures for the negative environmental impacts likely to be associated with the project;
- ✓ To predict and assess, in quantitative terms as far as possible, the impacts of changes brought about by the Project on the baseline environmental conditions;
- ✓ To assess and provide an environmental and socio-economic profile of the population and available infrastructure facilities for services and community resources; and
- ✓ To develop monitoring and evaluation mechanisms for assessing and monitoring the effectiveness of mitigation measures that will be put in place including resettlement outcomes during and after Project completion.
- ✓ To screen for environmental and social risk and impact:
 - scoping of the required studies for impact identification and characterization;
 - impact assessment; and
 - development of plans to mitigate impacts to the requirements of the applicable standards.

1.6 Nature and Category of the Project

According to EMA and Audit Regulations, 2005 read together with amendments of 2018. The proposed Road Construction project falls into “Type A” projects which are mandatory to ESIA, under section 9 “TRANSPORT AND INFRASTRUCTURE” subsection (a) construction and/or expansion of trunk roads. This Project falls under the list of projects requiring EIA pursuant to the First Schedule made under Regulation 6(1) of the Environmental Impacts Assessment and Audit Regulations, 2005 and Regulation 17 of its amendments of 2018. World Bank environmental risk rating is substantial, and the World Bank social risk rating is high, rendering the DMDP-2 a HIGH-risk category project.

1.7 Rationale for Undertaking ESIA Study

The Environmental Management Act, (EMA) 2004, as well as the World Bank Environmental and Social Framework (ESF) specifically Environmental and Social Standard one (ESS 1) on the assessment and management of environmental and social risks and impacts requires that the proposed development and its associated works undergo through a process of environmental and social impact assessment.

The ESIA study was conducted in accordance with the National Environmental Impact Assessment and Audit regulations (2005) and its Amendment Regulations of (2018), formulated to enforce the Environmental Management Act No. 20 of 2004. This Act specifically requires mandatory carrying out of ESIA for development projects implemented

in Tanzania. The ESIA study was also conducted in line with the requirements of the relevant World Bank Environmental and Social Standards.

1.8 Methodology and Approach to the Study

1.8.1 Methodology

The methodology employed in conducting the study is in line with the Environmental Impact Assessment and Audit Regulations, 2005 as amended in 2018, GN No.349 of 2005. Observations of the proposed project site and surrounding habitats were made. Also, literature review in terms of reports and documents was done. The study adopted the following methodology:

1.8.2 Public Consultations

Stakeholders Identification and Analysis

The identification of stakeholders was done in line with the provisions of ESS10 that categorises stakeholders into two: namely, those with interests to the project (IPs) and those likely to be affected by the projects (PAPs). The following stakeholders were identified and consulted whereby their views and concerns are attached to this report:

The IPs were the Ministries responsible for Land and Urban Development; Works, Transport, Agencies and authorities such as Tanzania Telecommunications Company Limited (TTCL), Tanzania Railways Corporation (TRC), Occupation Safety and Health Authority (OSHA), Tanzania Roads Agency (TANROADS), Tanzania Rural and Urban Roads Agency (TARURA), Dar es Salaam Regional Administrative Secretary (RAS), Assistant Administrative Secretary for Infrastructure; Community Development Advisors. District Levels: Temeke Municipal Council (the proponent)

PAPs included communities in all wards where the proposed roads pass; traders, tenants; owners of houses that front the roads to be upgraded; Wards and Mitaa Leaders such as the Ward Councillors, Mitaa Chairpersons; Wards and Mitaa Executive Officers; Community Development officers working in the Wards and Mtaa Levels.

Involvement of stakeholders

The study applied different participatory methods to involve all the concerned stakeholders. One on one interviews were held with every identified stakeholder. Every individual was given an opportunity to give his or her comments freely. Every detail of each stakeholder's comment was considered important and noted down.

Identification of stakeholders' concerns

Through interviews and discussions, stakeholders pointed out a number of issues and concerns. Relevant issues were noted and have been included in this study report.

1.8.3 Baseline Data Collection

In order to understand the existing baseline environmental and social conditions in the area, a variety of data collection methods were used as detailed in the following subsections. Methodologies used for baseline data collection covered all the baseline parameters of (socio-economic, physical and biological) as described in details in chapter 4 in this ESIA report.

1.8.4 Document Review

A literature review was undertaken based on the findings of the reconnaissance process, which involved reviewing legislation, policies, the County Integrated Development Plan, and previous studies carried out in the area to determine the baseline conditions and establish the legal, institutional and biophysical/socio-economic environmental setting of the Project area. The desk-based study also included the development of fieldwork tools, fieldwork schedules as well as the approach to stakeholder engagement.

1.8.5 Site Visits

Site investigations were undertaken between 24th July 2023 to 15th September 2023 during which detailed environmental and social baseline data was collected as well as conduct of stakeholder engagement although the design was ready, there should be design review that will be done to ensure the information are updated and if substantial changes in environmental or social/socioeconomic conditions in relation to this sub-project, the supervision consultant will conduct design review to reflected this ESIA, prior to the start of any sub-project activities.

Data was collected through:

- A number of stakeholder meetings (including public meetings/*barazas*).
- Key Informant Interviews (KII) especially with the technocrats of the relevant institutions.
- Focus Group Discussions (FGD) with residents; and
- Site walkovers.

Photography and Global Positioning Systems (GPS) were used to record the salient features and baseline conditions at the Project sites and surrounding environs.

1.9 Impact Assessment and Analysis

1.9.1 Impact Assessment Process

The purpose of impact assessment is to identify and evaluate the significance of potential impacts on identified receptors and resources according to defined assessment criteria and to develop and describe mitigation measures that will be taken to avoid or minimize any potential adverse effects and to enhance the potential benefits of the project.

The impacts of the proposed sub-project were identified based on the findings of stakeholder consultation, the existing baseline conditions, the proposed sub-project activities and professional knowledge of the consultants. Impacts are first distinguished as either positive or negative. The cross-sectoral issues and aspects are health; safety; air quality, especially dust; waste management; social aspects, particularly labour recruitment and management; infrastructure; and utilities.

The ESS5 related impacts include physical and economic displacements hence, partial land take especially fronts of buildings; restrictions to access to properties during the construction phase; restrictions to livelihoods activities that are land based hence requiring temporary relocations. Other potential social risks relate to influx of labour; Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) and Sexual harassment (SH) .ur recruitment and management; infrastructure, and utilities.

1.9.2 Impact Types and Definitions

An impact is any change to a resource or receptor brought about by the presence of a Project component or by the execution of a Project related activity. The evaluation of baseline data provides crucial information for the process of evaluating and describing how the Project could affect the biophysical and socio-economic environment.

Impacts are described according to their nature or type, as summarized in Table 1-1.

Table 1-1: Impact Nature and Type

Nature or Type	Definition
Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Negative	An impact that is considered to represent an adverse change from the baseline or introduces a new undesirable factor.
Direct impact	An impact that results from a direct interaction between a planned project activity and the receiving environment/receptors (e.g., between occupation of a site and the pre-existing habitats or between an effluent discharge and receiving water quality).
Indirect impact	An impact that results from other activities that are encouraged to happen as a consequence of the Project (e.g., in-migration for employment placing a demand on resources).
Induced impact	An impact that results from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).
Cumulative impact	An impact that acts together with other impacts (including those from concurrent or planned future third-party activities) to affect the same resources and/or receptors as the Project.

1.9.3 GBV/SEA Safeguards and Response Measures

To safeguard community members and workers during the implementation of the upgrading of Roads, a dedicated GBV/SEA Action Plan will be integrated into the project's broader Grievance Redress Mechanism (GRM). The Plan will ensure that project activities do not perpetuate or exacerbate risks of gender-based violence or exploitation, particularly as labor influx and tourism-related operations increase.

The GBV/SEA Action Plan will draw upon established World Bank protection and prevention frameworks and be coordinated jointly by the DMDP Project Coordination Team (PCT), Temeke Municipal Council, and other relevant local stakeholders. An experienced service provider specializing in GBV/SEA response will be engaged to support implementation. This will include establishing a confidential reporting hotline for survivors of GBV, SEA, and child abuse, with built-in safeguards to protect the survivor's privacy and safety. Confidentiality protocols will be clearly articulated in the Terms of Reference (ToR) for the provider.

To prevent stigma, psychological trauma, or retaliation, all GBV/SEA-related grievances will be handled sensitively and in accordance with the informed consent of the complainant. When a case is reported, the survivor will be informed of available services, including:

- Referral to the designated GBV Service Provider.
- 5 Access to confidential medical and psychological support.
- 6 Emergency shelter or transitional accommodation, if needed.
- 7 Legal aid and counselling services.

All project staff and GRM focal points will be trained to respond appropriately to such disclosures. If contacted, staff will only document whether the case involves a project worker, the nature of the incident, the age and sex of the survivor, and confirmation of referral to support services. In cases where the perpetrator is linked to the project, the incident will be reported immediately to the Project Coordinator, who will escalate and act upon guidance from the World Bank.

1.9.4 Prevention Measures

- Contractual Clauses: Include zero-tolerance GBV provisions in all contractor and subcontractor agreements.
- Worker Code of Conduct: Mandate signed codes for all personnel covering behavior and anti-harassment expectations.
- Training & Induction: Conduct GBV prevention training for workers, supervisors, and project staff; refreshers quarterly.
- Signage & Outreach: Display visual materials around site on GBV reporting, respectful conduct, and community rights.
- Community Engagement: Collaborate with the Kigamboni Municipal Gender Unit on awareness and consultation with local women's groups.

Response Protocol

- Confidential Reporting Channels: Provide designated reporting officers and discreet complaint mechanisms (e.g. suggestion boxes, hotline).
- Referral Services: Establish links with Kigamboni-based legal aid, health services, and psychosocial support providers.
- Survivor-Centered Approach: Guarantee privacy, informed consent, and non-retaliation in handling all GBV cases.
- Incident Register: Maintain secure and confidential logbook for GBV grievances and outcomes.

Impacts are described in terms of 'significant' Significance is a function of the **magnitude** of the impact and the **sensitivity/vulnerability/importance of resource/receptor**.

Determining Impact Magnitude

Impact magnitude (sometimes termed severity) is a function of the **type, extent, duration, scale** and **frequency** of the impact. These characteristics apply to both planned and unplanned events/ impacts and are briefly described in Table 1.2.

An additional characteristic that pertains only to unplanned events is likelihood. The likelihood of an unplanned event occurring is designated using a qualitative scale, as described in Table 1.2.

Table 1-2: Impact Characteristics Terminology

Characteristic	Definition	Designations
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect) as explained in Table 1.2.	Direct Indirect Induced
Extent	The “reach” of the impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc.).	Local - impacts that affect an area in a radius of 20km around the development site. Regional - impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by administrative boundaries, habitat type/ecosystem. International - impacts that cross national borders, affect nationally important environmental resources or affect an area that is nationally important/or have macro-economic consequences.
Duration	The time period over which a resource receptor is affected.	Temporary - impacts are predicted to be of short duration and intermittent/occasional. Short-term - impacts that are predicted to last only for the duration of the construction period. Long-term - impacts that will continue for the life of the Project but ceases when the Project stops operating. Permanent - impacts that cause a permanent change in the affected receptor or resource (e.g., removal or destruction of ecological habitat) that endures substantially beyond the Project lifetime.
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.)	[No fixed designations; intended to be a numerical value or a qualitative description of “intensity”]
Frequency	A measure of the constancy or periodicity of the impact.	[No fixed designations; intended to be a numerical value or a qualitative description]

1.9.5 Mitigation Measures To propose environmental and social mitigation measures for the proposed project, the Consultant identified potential environmental and social impacts like air pollution, noise, water pollution, habitat disruption, and soil erosion, then suggested specific actions to minimize or avoid these impacts during construction and operation phases, including: site selection optimization, responsible material sourcing, dust control measures, noise reduction strategies, water management practices, habitat restoration, community health and safety, labour influx management, and regular monitoring and reporting; always considering local regulations and environmental sensitivities. In developing the mitigation measures, the mitigation hierarchy was followed: (i) Anticipate and avoid risks and impacts, (ii) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; (iii) Once risks and impacts have been minimized or reduced, mitigate, and (iv) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible

General Considerations

This chapter outlines measures that shall be undertaken to avoid, minimize, mitigate, or compensate for potential environmental and social impacts identified in Chapter 6. These mitigation measures are aligned with the mitigation hierarchy prescribed under World Bank's ESS1—namely: avoid, minimize, mitigate, and, as a last resort, offset. Measures are organized across the project's lifecycle stages: pre-construction, construction, operation, and decommissioning.

Mitigation Measures

The mitigation measure for the construction of a market sub-project entails that of pre-construction, construction, and operation phase throughout the project periods. The following mitigation measure entails the sub-project's negative impacts. Therefore, the following sections provide the mitigation measure for the market project.

Mitigation Hierarchy

- Mitigation hierarchy will be considered by starting with avoidance, then minimisation, followed by restoration, and finally compensation/offsetting as a last resort. This is illustrated graphically in **Figure 7.1**- and elaborated as follows:
- **Avoidance:** The primary goal is to prevent impacts from occurring in the first place by modifying project plans or choosing alternative locations or methods.
- **Minimization/Reduction:** When avoidance is not possible, measures are taken to minimize or reduce the duration, intensity, and/or extent of impacts.
- **Restoration/Rectification:** Focuses on reversing the impacts and restoring the affected area to its pre-disturbance state, if possible.
- **Compensation/Offsetting:** As a last resort, compensation or offsetting involves mitigating residual impacts through measures that generate ecological gains elsewhere.

For activities with significant impacts, the ESIA process is required to identify, in collaboration with the Project Developers, suitable and practical mitigation measures that can

be implemented. Mitigation that can be incorporated into the project design, in order to avoid or reduce the negative impacts or enhance the positive impacts, have been defined and require final agreement with the client as these are likely to form the basis for any conditions of approval by NEMC. The implementation of the mitigation is ensured through compliance with the Environmental and Social Management Plan (ESMP).

Residual Impact Evaluation

After first assigning significance in the absence of mitigation, each impact is re-evaluated assuming the appropriate mitigation measure(s) is/are effectively applied, and this results in a significant rating for the residual impact.

General Approach

A multi-disciplinary team of experienced sociologist, scientists and environmental professionals was assembled to carry out the required resource assessment, generation of baseline data, determination of potential impacts and recommendation of mitigation measures. An iterative approach among the environmental team members and other project professionals was adopted.

The team utilized the checklist for data gathering, analysis, and presentation whereby team members conducted the reconnaissance investigations together to determine the critical elements for analysis and the issues to be highlighted in the design and planning process. Team meetings were held to discuss the progress of investigations and analyses and facilitate integration of data toward an understanding of the systems at work in both the natural and built environments. The study approach was done extensively in the following aspect of the environment:

The Detailed Engineering Design team conducted Traffic studies that among others established and determined the design as well safety measures of the roads.

1.9.5 Air Environment

Collection of surface meteorological data like wind speed, wind direction, relative humidity, rainfall, ambient temperature etc. Design of ambient air quality monitoring network Measurement of 24-hourly average background concentrations of PM, RPM (size <10 µm), SO₂, O₃, NO₂ and CO. The Consultant used K-600M Gas Analyser to measures (PM_{2.5} (Dust particles), PM₁₀ (Dust particles), Carbon Dioxide (CO₂), NO₂, SO₂, Organic Volatile substances (TVOC), Temperature and Humidity

Monitoring was conducted in respect of the following parameters:

- Particulate Matter (PM 10)
- Particulate Matter (PM 2.5)
- Sulphur Dioxide (SO₂)
- Oxides of Nitrogen (NO_x)
- Carbon Monoxide (CO)

To gauge levels of Particulate matter (PM₁₀ & PM_{2.5}), Sulphur Dioxide (SO₂) and Nitrogen Oxides (NO_x) pollutants, an advanced and responsive environmental monitoring kit was employed (Shown figure 1-11): the 3M™ EVM 7 Environment Monitor Kit. **Error! Reference source not found.** These portable air samplers utilize cutting-edge technology and conform to global and industry-specific standards, ensuring accurate outcomes. Meeting strict Electromagnetic Compatibility (EMC) standards, they function effectively without

interference. They also comply with the Generic Emissions Standard for various settings, as well as ISO and TZS regulations for particulate matter measurements.



Figure 1-1: Ambient Air Quality Monitoring

During the sampling process, great care was taken to ensure that the monitoring stations were fixed at a breathing height of approximately 1.5 meters above the ground for both PM10 and PM2.5 measurements. This height is critical as it represents the level at which human exposure to these particles is most relevant. Each monitoring station was meticulously prepared and calibrated before use, in strict accordance with the equipment's manual, to guarantee precise and consistent measurements. To ascertain the variety of gas concentrations over time, a comprehensive gas sampling effort was undertaken.

Each monitoring station underwent testing for a minimum period of one hour to ensure adequate data collection and to capture variations in air quality over time. The duration of the sampling allowed for the assessment of short-term fluctuations and provided valuable insights into the potential risks posed by different pollutants.

Table 1-3: Methodology for Ambient Air Quality Monitoring

Parameter	Measurement Methods	As Per
PM ₁₀	Gravimetric	TZS 837, Part 7:
PM 2.5	Gravimetric	TZS 837, Part 7:
SO ₂	Calorimetric (EPA modified West & Gaeke Method)	TZS 837 Parts (1, 2, and 4).
NO _x	Calorimetric (Arsenate modified Jacobs & Hochheiser Method)	TZS 837 Part 1, 2, and 5
CO	Non-Dispersive Infra-Red (NDIR) Spectroscopy Technique	TZS 837 Parts 1,2, and 6

1.9.7 Noise Environment

Establishing existing status of noise levels in residential, commercial, industrial areas and silence zones within the block area for proposed project. The Consultant used TA8000-Environmental Tester for Noise level measurements.

The measurements and assessment of environmental noise levels were determined in accordance with ISO standards using SLM-25 sound level meter. On taking measurements, the device-meter scale was set to the “A” weighed measurement scale which enables the devices to respond in the same manner as the human ear. Measurement made according to ISO 1996-1 and BS 7445-1. The device was stationed approximately 1.5 m above the surface and at least 3.5 m away from hard-reflecting surfaces. The Instrument was checked and calibrated prior to use.

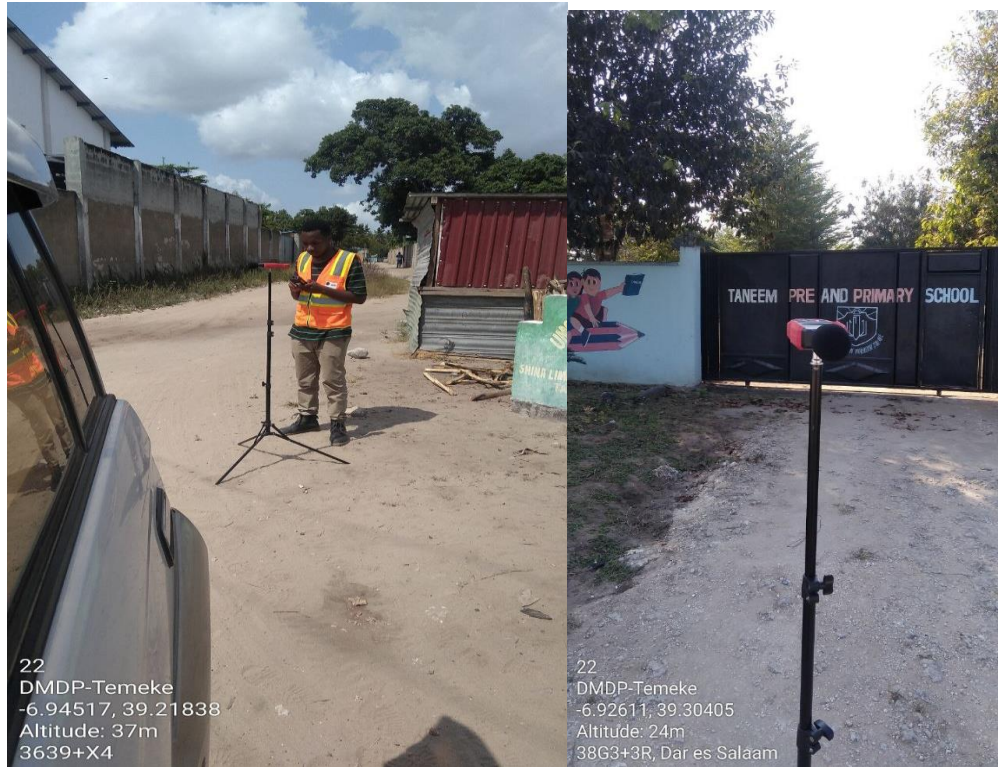


Figure 1-2: Noise monitoring within the proposed project area

The equivalent Night Time Noise levels were computed as follows,

$$LA_{eq, T} = 10 \log \left(\frac{1}{N} \sum_{i=1}^N 10^{L_{pAi}} \right)$$

Where:

$LA_{eq, T}$ is equivalent noise levels at a representative time period, T

N=Total number of samples

L_{pAi} =Sampled values of pressure levels

Where T, was chosen to be a 1-hour time period, which gives enough representation measurement for entertainment spots noise in time from 8:00pm to 12:00pm

Area category:

A -- Any building used as a hospital, convalescence home, home for the aged, sanatorium or institute of higher learning etc.,

B -- Residential building,

C -- Mixed Residential (with some commercial and used for entertainment purposes),

D -- Residential and industrial (small-scale production and commercial activities),

E -- Industrial area.

Noise monitoring Tools/equipment

- **SLM**

SLM-25 sound level meter is a noise sound measuring device for measuring noise level over a period of time and have the ability to save the data measured (shown in the table 4.11).

- **Hand GPS**

Hand GPS was used to collect coordinate data of every location, for noise sampling and measurement.

Table 11-4: Tools used for Noise measurements.

S/n	Tool
1	 SLM-25 noise meter
2	 Hand GPS

Land Environment

Collection and assessment of representative soil samples within the study area. Assessment of productivity and fertility of soil found within the study area.

Water Environment

Collection of surface and ground water resources for determining quality of water in the study area. The samples were sent to Laboratory for Physical and Chemical analyses.

Biological Environment

Collection of data on flora and fauna with respect to project area; Collection of information on wildlife sanctuaries / reserve forest if any in the vicinity of the project area; Assessment of species diversity, density and abundance etc., within the study region. The study focuses much in the available literature review and site observations.

Socio-economic Environment

Rapid field appraisal techniques in conjunction with desk research were employed to investigate.

The socio-economic considerations within the project area,

- Population and settlement characteristics
- Land uses and livelihoods.
- Developments underway
- Infrastructures in place
- Water supply and other utilities
- Waste management practices
- Recreational activities
- Communication and Welfare facilities i.e., hospital, educational institutions and project awareness amongst the public

impact assessment methodology Identification of Environmental and Social Impacts associated with project activities.

Assessment of Environmental Impacts due to the proposed activity on air, land, water, biological and on human interests; Prediction of adverse impacts due to activities related to proposed project activities.

Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) will be drawn after identifying, predicting and evaluating the significant impacts on each component of the environment with a view of maximizing the benefits from the proposed project. The following measures will also be included in the ESMP.

Recommend mitigation measures required to address environmental and social concerns such as wildlife and habitat protection, cultural and archaeological site protection, terrain stabilization, maintaining freshwater horizons, debris disposal and conservation of natural drainage and water flow.

Provide a comprehensive and detailed plan covering environmental and social variables to be monitored, the location and timing of sampling and the use to be made of monitoring data to ensure compliance with the applicable environmental rules/regulations throughout the life of the project.

Delineate post-closure plan coexisting with natural surroundings for abandonment of project components.

1.10 The ESIA Study Assumptions

The ESIA study shall be conducted within six months to completion of the NEMC registration process, whereby the study assumes that.

- The consulted stakeholders provided information that is reliable on the implementation of the project.
- The Design Consultant shall incorporate ESIA mitigations into the design; and
- The project contractor will be required to adhere to his Contractor's Environmental and Social Management Plan (C-ESMP) once approved by the Supervision Consultant.

1.10.1 The Structure of the Report

This report is divided into Eleven (11) chapters:

Chapter One: contains the introduction to the background information of the proposed project, its development objectives and rationale of the proposed project.

Chapter Two: contains the project description, in which there is a description of the location and relevant components of the project and their activities.

Chapter Three: illustrates policy, legal and administrative framework, which is the relevant Tanzanian, and International environmental and social policies and legislation applicable to construction projects.

Chapter Four: has the baseline information relevant to environmental characteristics, which gives details concerning the Bio-physical environment and socio-economic environment at the project area.

Chapter Five: express the consultation exercise at the project area detailing the list of stakeholders consulted and the issues raised.

Chapter Six: describes the positive and negative environmental impacts of the project that are likely to be generated from the different phases (the planning and designing, construction, operation and maintenance and the demobilization phases).

Chapter Seven: presents Impact mitigation and enhancement measures.

Chapter Eight: presents the Environmental and Social Management Plan (ESMP).

Chapter Nine: presents the Environmental Monitoring Plan that contains the proposed institutions to carry out the monitoring activities, the monitoring indicators, time frame and the proposed budget for monitoring.

Chapter Ten: provides the decommissioning plan for the proposed project however the decommissioning is not anticipated in the foreseeable future.

Chapter Eleven: gives the summary and conclusions of the study.

Report structure conforms to that specified in sections 18(2) and 19(1) & (2) of the Environmental Impact Assessment and Audit Regulations, 2005. Appendices containing some key primary information collected during the study are attached at the end of this report.

2 PROJECT DESCRIPTION

2.1 Overview

Temeke Municipal Council is one of the five Municipal Councils that form the Dar es Salaam Region. It borders Mkuranga District in the South; to the North Indian Ocean; and to the north east Dar es Salaam City Council (formerly Ilala Municipal Council).

Project Location

Geographically, Temeke Municipal Council is bordered by Coast Region to the south, Ilala Municipality to the north and west, and the Indian Ocean and Kigamboni Municipal Council to the east. It covers 240 sq km with a 5 km coastal line, positioned between coordinates 39°12' - 39°33' east and 6°48' - 7°33' south.

Land in Temeke faces challenges like degradation and urbanization. It includes hilly Chamazi, areas like Miburani for development, and lowlands near Yombo River suitable for urban farming but prone to unplanned settlements and floods.

Temeke's ecology comprises northern uplands (Mtoni Kijichi escarpment, Keko, Temeke, Mtoni, Tandika) and a central zone (Mbagala, Chamazi, Yombo Dovya, Kongowe plateau).

The proposed sites for roads and Footbridges fall in Chang'ombe, Miburani, Kurasini, Temeke, Tandika, Yombo-Vituka, Azimio, Chamazi, Charambe, Mbagala Kuu, Mianzini and Toangoma Wards (Figure 2-1).

Sub-Project Schedule of Activities

The schedule of activities for the DMDP 2 project is as follows:

Sub-project identification; This is a participatory activity where each council including Temeke selects sub-projects as per the stipulated requirements

Detailed Engineering Design and preparation of safeguard documents that include ESIA

Procurement of Contractors and Supervising consultants

Start of Works and finally

Operation phase of the project

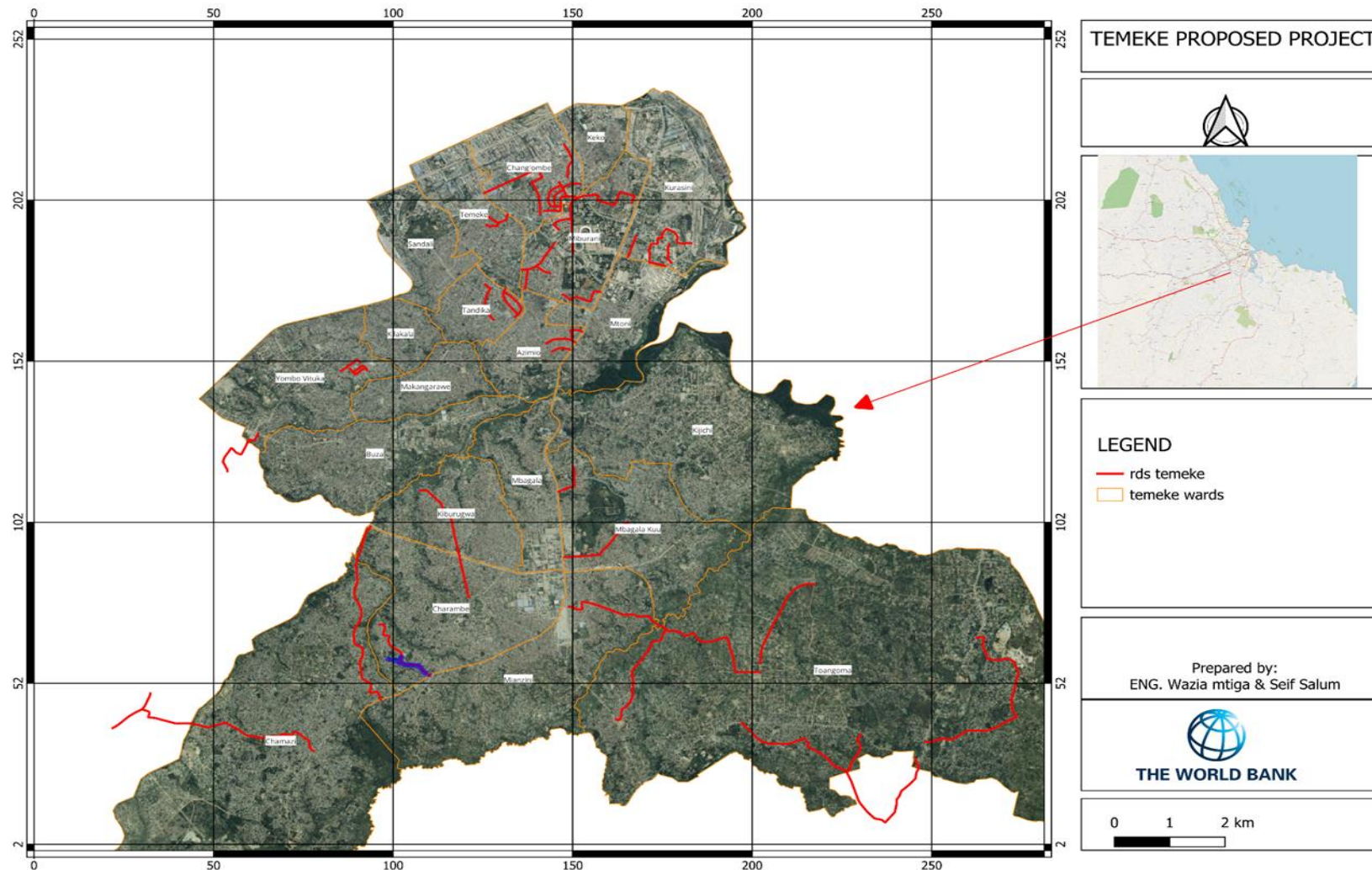


Figure 2-1: Proposed project site

2.2 Project Boundaries

The identification of project boundaries process focused and undertaken as an important component of the study within subproject area where impacts, both positive and negative were assessed, the types of boundaries considered were institutional, temporal and spatial in nature.

2.3.1 Spatial boundaries

Spatial boundaries refer to the area affected by the project. The area of direct impact for the proposed roads and drains will be within the legal boundaries of Road Reserve where most of the activities will take place. In addition, PO-RALG, the Ministry of Lands, Vice Presidents Office/ Environment and District Authorities may all have input regarding land ownership and construction permits and issues.

2.3.2 Temporal boundaries

The temporal boundaries refer to project life span and the reversibility of impacts. The temporal boundaries of the project can be categorized into weeks, months and years.

Institutional boundaries

The institutional boundaries are comprised of institutions and sectors, which are relevant to the project development. These institutions for the construction sector are such as: National Environment Management Council (NEMC), PO-RALG, Municipal Environment Management Committees, OSHA, TTCL, DAWASA, Ward Committees and Street Committees.

2.3 Land take and Compensation

Upgrading of proposed roads and drainage systems though are to be done within the existing routes; these routes are not likely to be adequate for the intended design standards of roads including movements of equipment during the mobilization and construction. Based on this, there will cause a partial land take and economic displacements for some portion of each of these proposed roads as RAP prepared. Therefore, the proposed upgrading of urban infrastructure-roads is likely to cause minor economic displacements for small shops, front veranda for some houses; restriction to access to some properties that are fronting some of these roads. A RAP has been prepared to mitigate these impacts. As such the need for RAP is in place although livelihood restoration program (LRP) is not anticipated. Loss of livelihood might be driven by temporary or permanent loss of access, which is likely to occur on this sub-project.

2.4 Nature of Subproject and Its Components

The proposed subprojects involve the improvement of Roads in Temeke Municipality. The ESIA study was conducted based on the subproject components identified in the Terms of Reference (TOR) by consultant and subsequent reviews PO-RALG. All these components were assessed and sites' visits were conducted. The components of this subproject include Forty (40) Roads (see Figure 2.1 and Drainage Systems as described in subsequent sections). The criteria used to select these roads included population in the areas between which they pass through; the connectivity to the ongoing BRT projects as feeders.

2.5 Condition of Existing Roads

The visits conducted to the subproject's sites revealed that some of the subproject roads and Footbridges are not connected thus fall under separate Wards within Temeke Municipality and others that are connected falling within the same and different wards within the Municipality. Selected Roads and Footbridges carry different characteristics that are to be considered during the design period. Considering scope of the assignment, studies were done on the selected Roads as indicated in the table 2-1.

2.6.1 Location of the project roads

Temeke Municipality has 23 wards. Out of these 23 wards, DMDPII (30%) covers roads in 11 wards namely Kurasini, Temeke, Azimio, Tandika, Kilungule, Chamazi, Kibondemaji, Toangoma, Mbagala kuu, Yombo vituka, and Miburani ward. The table below show the project roads, their location and short description.

Table 2-1: Summary of Ambient noise levels monitored

Package	Road	Length	Street (Mtaa)	Ward
Keko Taifa Roads	Taifa road	1.31	U-Taifa	miburani
			Bora	Chang'ombe
	Songambebe road	0.32	Chang'ombe A	Chang'ombe
	Mwakalinga road	1.07	U-Taifa	Miburani
	Markas Road	0.48	Bora	Chang'ombe
	Majimaji Road	0.32	Keko juu	Miburani
	Magorofani Road	1.42	Bora	Chang'ombe
	Igombe (Yemen)Raod	0.85	Chang'ombe B	Chang'ombe
		0.67	Toroli	Chang'ombe
	Diwani Road	0.71	Chang'ombe B	Chang'ombe
	Chuma Road	0.4		Chang'ombe
	Basra Road	7.55		
	Sub Total			
Kurasini Roads	Konisaga 1 Road	0.29	Minazini	Kurasini
			Minazini	
	Konisaga 3	0.4	Kurasini,Shimo	Kurasini
	Kurasini Road	1.12	la udongo	Kurasini
			Minazini	Kurasini
	Taningira Road	0.42	Minazini	Kurasini
	Uhasibu Road	0.44		kurasini

Package	Road	Length	Street (Mtaa)	Ward
	Sub Total	2.67		
Temeke Roads	Kizota Road	0.91	Wailes Miburani	Miburani
	Lushoto Road	0.3	Temeke	Miburani
	Pendamoyo Road	0.55	Temeke	Temeke
	Pendamoyo 1 Road	0.2	U-Taifa	Temeke
	Mandera Road	0.85	Miburani	Miburani
	Mkumba – Miburani Road	0.39		Miburani
	Sub Total	3.21		
Tandika Roads	Boa Bank CIUP Road	0.42	Mtongani	Azimio
		0.57	Mtongani	Azimio
	Mtongani RC Church Road	0.34	Mtongani	Azimio
	Raha Road	0.68	Tandika	Tandika
	Kitunda Road	0.6	Tandika	Tandika
	Chiwanda Road	0.83	Tamla Kilimahewa, Tandika	Tandika
	Mvomero Road	3.44		
Buza Chamazi Roads	Buza Kipera Road	2.4	Sigara	Yombo Vituka
	Chasimba Road	1.72	Majimatitu B	Kilungule
	Magengeni (Chamazi) Road	4.68	Msufini	Chamazi
	Saku Road	3.99	Mkondogwa	Chamazi
	Zomboko Kigungi Road	2.51	Zomboko, Kwa mzungu, Kingugi, Kiburugwa, Nzasa A	Kilungule
		1.88		
	Tambani Road	17.18	Magengeni	Chamazi
Mbagala Toangoma Road	Sub Total			
	Ndunguru – Masaki Road	4.58	Mchikichini Masaki	Kibondemaji, Toangoma
	Masaki Road	3.6	Ponde,	Toangoma
	Masuliza Road	4.04	Mwapemba, Mikwambe	Toangoma
	Maandaz Road			

Package	Road	Length	Street (Mtaa)	Ward
	Kipati Road		Kibonde maji B	Mbagala kuu
	Sub Total	1.55	Makuka kusini	Mbagala kuu
		0.72		
		14.49		
Yombi Vituka Roads	Msikitini Road	0.45	Mzambarauni	Yombo vituka
	Mwembeni(Nyika)	0.44	Mzambarauni	Yombo vituka
	Malawi west Road	0.28	Mzambarauni	Yombo Vituka
	Sub Total	51.97		

Description of the Road Corridors

Igome (Yemen) Road (0.88 km)

The proposed road section has a total length of 0.88 km with an average carriage way width of 7m. The road start at T Junction with Taifa Road and ends to Chang'ombe road intersection. Generally, the nature of the existing road is gravel without side storm drains, there are few observed sharp corners that may cause poor visibility and few utility services like water and electricity.

Below is the observed bio-physical features and descriptions along the road geometry.

At chainage 0+000 meters

This intersection, which leads to Taifa Road, is defined by the presence of institutional offices on the right-hand side, housing the Temeke Prevention and Combating of Corruption Bureau (PCCB) branch. On the left-hand side, a sports academy takes its place, accompanied by the essential underground utilities of the Public Agency for Telecommunications (PAT) (Figure 2-2).

At chainage 02+409 meters

This location features the Yemen Schools Conference Centre and a few residential houses, forming a junction. On the left-hand side (LHS), there is designated truck parking space, while on the right-hand side (RHS), you'll find additional residential houses (Figure 2-3).



Sports Academy on LHS

Transformer and PCCB offices on LHS

Figure 2-2: Existing condition along Igome (Yemen) road at chainage 0+000

Source: Site Pictures, August 2023



Yemen schools conference center a truck parking LHS Residential houses and few vegetation RHS

Figure 2-3: Existing condition along Igome (Yemen) road at chainage 0+2200

Source: Site Pictures, August 2023

Songambebe Road (0.34 km)

The proposed road section has a total length of 0.34 km. The road start at Vijibweni hospital and ends at Vijibweni centre. Generally, the nature of the existing road is unpaved road with no storm drains, the road is characterized with narrow corridor passing through unplanned settlement establishment that may affect the design and construction of the tarmac road proposed in other way the location will be affected with the construction and operation phases of the proposed development.

Below is the observed bio-physical features and descriptions along the road.

At chainage 0+000

Intersection with Igome (Yemen) Road, presenting a combination of elements including electric poles, residential houses, cable TV utilities, and greenery on the left-hand side (LHS). On the right-hand side (RHS), the TTC Club Sport Centre is accompanied by electric utility poles and lush vegetation (Figure 2-4).



TTC club on LHS

Residential houses an electric and cable utilities RHS

Figure 2-4: Existing condition along Songambebe road at chainage 0+900

Source: Site Pictures, August 2023

At chainage 0+326 meters

Junction with Chang'ombe Road is defined by a mixture of commercial and residential land uses, accompanied by distinct features. On the left-hand side (LHS), you'll encounter a combination of commercial and residential properties, complemented by the presence of mango trees and cable TV utilities. On the right-hand side (RHS), a transformer and electric utilities are positioned see Figure 2-5.



Electric pole adjacent to a residential house fence RHS

An electric pole stands near the fence of a residential house LHS

Figure 2-5: Existing condition along Songambebe road at chainage 0+1300

Source: Site Pictures, August 2023

Maji Maji (0.32 km)

The proposed road section has a total length of 0.32 km. The road starts at an intersection with Songambebe road and ends at residential area. The nature of the road is unpaved road; the road is located at the residential zone.

Below is the observed bio-physical features and descriptions along the road geometry.

At 0+000 meters

This location marks an intersection with Songambebe Road, showcasing a mix of residential houses on the left-hand side (LHS) and a combination of residential houses, electric and water utilities, along with patches of small vegetation cover on the right-hand side (RHS).

At 0+1500 meters

Area is an intersection embodies a residential setting, emphasizing the surrounding housing landscape. On the left-hand side (LHS), a collection of residential houses contributes to the residential character of the area. On the right-hand side (RHS), more residential houses are accompanied by essential electric utilities, highlighting the prevalence of housing and essential services in this location.



Residential houses and utility services LHS Electricity utility pole. RHS

Figure 2-6: Existing condition along Maji Maji at chainage 0+500

Source: Site Pictures, August 2023



A collection of residential houses LHS

A blend of residential houses, shops and Electric utility services RHS

Figure 2-7: Existing condition along Maji Maji road at chainage 0+500

Source: Site Pictures, August 2023

Mwakalinga Road (1.09 km)

The proposed road section has a total length of 1.09 kilometres, the road surface nature is slightly gravel paved corridor without storm drains, the area is characterized with industrial zones where there is the presence of container depots and gas storage tanks, along the stretch of the road alignment other utility services runs up ground and underground, where there are gas, water and electrical. The road starts at Kibada Road and ends at an intersection with Lingia Nyakwale Road.

At chainage 0+000

Intersection is situated within an industrial zone, characterized by distinct features that contribute to the local landscape. On the left-hand side (LHS), the SSB Inland Container Depot represents a key industrial establishment, showcasing the industrial nature of the area. On the right-hand side (RHS), the presence of street food vendors, commonly known as "Mama Ntilie," and a Boda centre adds a dynamic and diverse aspect to the intersection. This description captures the industrial and commercial essence of the area, along with the presence of local vendors and services (Figure 2-8).



SSB container depot LHS

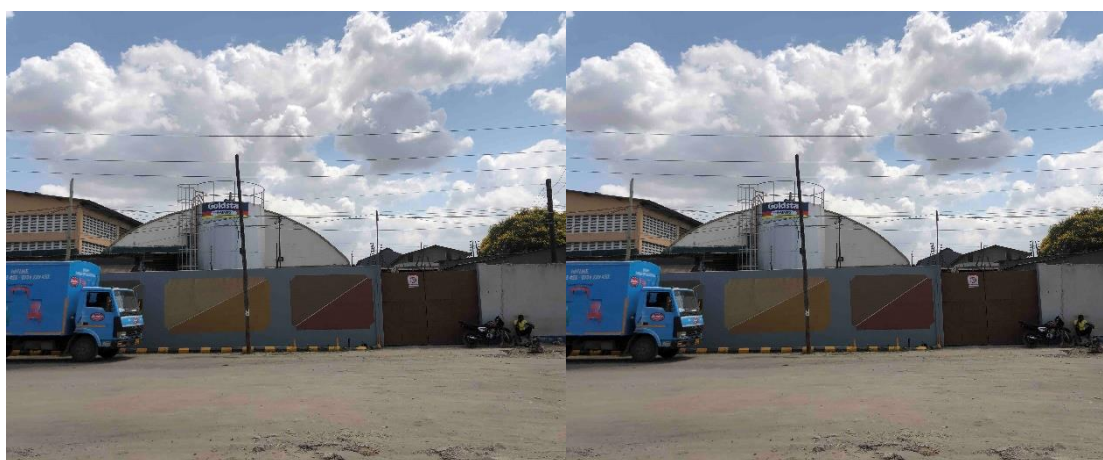
Street food vendors RHS

Figure 2-8: Existing condition along Mwakalinga Road at chainage 0+600

Source: Site Pictures, August 2023

At chainage 01+070

Industrial area, characterized by its focus on industrial activities. On the left-hand side (LHS), the gold paints industry is a prominent feature, representing a key player in the industrial landscape. On the right-hand side (RHS), an electric utility pole is positioned, serving as a vital element of the area's infrastructure (Figure 2-9).



Gold paints industry LHS

Container depot and electric utility poles
RHS

Figure 2-9: Existing condition along Mwakalinga Road at chainage 0+600

Source: Site Pictures, August 2023

Mandela Road (0.88 Km)

The proposed road section has a total length of 0.88 kilometers, tarmac paved road with storm drains. The location is mixed use where there is a blend of residential commercial and institutional.

At chainage 0+000 meters

This intersection is situated along Mandela Highway and exhibits a distinctive juxtaposition of land uses. On the left-hand side (LHS), the presence of GP lubricants signifies a commercial activity, contributing to the functional diversity of the area. On the right-hand side (RHS), a graveyard stands alongside electrical utility infrastructure and sparse vegetation. This unique combination highlights the coexistence of commercial operations, a place of remembrance, and essential services at this intersection with Mandela Highway.

At chainage 0+188 meters

This locale embodies a blend of residential, commercial, and institutional land uses, each contributing to its diverse character. However, the area is marked by shallow and clogged storm drains, which may lead to drainage issues. The presence of few trees and light vegetation cover accentuates the surroundings. On the left-hand side (LHS), Miburani Secondary School stands as an educational institution, while the right-hand side (RHS) features a mixture of commercial and residential properties.

Mikumba Road (0.4 Km)

The proposed road section has a total length of 0.4 kilometers, unpaved road with no storm drains. The area is suburban with mixed land use but at high percentage residential houses, the road has a narrow corridor since most of the houses and service utilities are in road reserve.

At chainage 0+390 meters

This intersection is distinguished by its vibrant commercial atmosphere. On the left-hand side (LHS), a bustling boda boda center and city bus stand are nestled amidst the presence of trees, creating a dynamic and functional urban space. On the right-hand side (RHS), a cluster of commercial auto shops and retail stores further contribute to the commercial vitality of the area.

Pendamoyo Road (0.25 Km)

The proposed road has a total length of 0.25 kilometers. It's located on the residential areas and its nature is unpaved it starts at Temeke road and ends at Yombo street.

At chainage 0+000 meters

At this intersection, a predominantly residential area with a sprinkling of garages defines the surroundings. On the left-hand side, a collection of residential houses and street vendors contribute to the residential ambiance, showcasing a mix of daily activities. On the right-hand side, a garage stands alongside an electric utility pole, underscoring the presence of essential services and maintenance facilities in this dynamic neighbourhood.

Pendamoyo 1 Road (0.21 Km)

The proposed road has a total length of 0.21 kilometers with an average corridor width of 7 meters along the most percentage of the road alignment. The road is unpaved and lacks side drains, it passes through the residential areas and it starts from yombo street and links with Pendamoyo road.

At chainage 0+093 meters

This area presents a fusion of residential and institutional elements, contributing to a multifaceted environment. On the left-hand side, a collection of residential houses forms a significant part of the landscape, reflecting the predominant residential nature of the vicinity. On the right-hand side, the Pendamoyo Secondary School stands as a notable institution, adding an educational dimension to the area. This coexistence of residential and institutional features creates a diverse and balanced setting that caters to both living and educational needs within the community.

Markas Road (0.5 Km)

The proposed road has a total length of 0.5 kilometers. It passes through container depots, schools and school. The nature of the road is unpaved roads.

At chainage 0+355 meters

This residential area is characterized by a blend of natural elements and educational institutions. On the left-hand side, you'll find a collection of residential houses accompanied by the presence of vegetation cover, including Neem plants and Manila tamarind trees, contributing to the green ambiance of the surroundings. On the right-hand side, Taifa Secondary School stands as an educational institution, adding to the diverse functions within this residential enclave. The harmonious coexistence of residential dwellings, vegetation, and an educational facility enhances the character and vitality of the area.

Maghorofani Road (0.27 Km)

The proposed road has a total length of 0.27 kilometers. It passes through police quarters its nature is slightly paved road; it starts at an intersection Chang'ombe road an end at kilwa road.

Amidst this residential area, a harmonious blend of nature and utility services emerges. On the left-hand side (LHS), clusters of residential houses are adorned with a gentle touch of vegetation cover, including Ipil-Ipil and Neem trees, contributing to the natural ambiance. On the right-hand side (RHS), multi-storey residential buildings take center stage, accompanied by essential utility services such as gas and electricity, exemplifying the integration of modern comforts. This synergy between greenery and utility services encapsulates the essence of this residential community.

Kurasini Roads (1.14 Km)

The proposed road has a total length of 1.14 kilometers uhasibu road, The road starts at an intersection with Nelson Mandela Road and ends at RC church junction. The road passes through residential houses, the nature of all these roads is unpaved roads with slightly vegetations.

At the intersection with Kurasini Road 1.12km, konisaga 1 0.29km, taningira 0.42, and uhasibu0.44. all these are located in a blend of industrial and residential houses. The nature of all these roads is unpaved roads with slightly vegetations.

Kipati Road (1.57 Km)

The proposed road has a total length of 1.57 kilometers. The road starts at an intersection with Mwanamtoti Road and ends at Nelson Mandela Road junction. The road passes through residential houses.

At chainage 0+000 meters

At the intersection with Mwanamtoti Road, the area takes on a serene residential ambiance. On the left-hand side (LHS), a prominent neem tree stands alongside a well-maintained storm drain, harmoniously coexisting with the surrounding residential houses. On the right-hand side (RHS), an electric utility pole provides essential services to the residential houses that complete the tranquil setting of this residential intersection.

Maandazi Road (0.8 Km)

The proposed road has a total length of 0.8 kilometers. The road starts at an intersection with Kilwa Road and ends somewhere in Mbagala kuu area. The road passes through residential houses.

At chainage 0+000 meters

At the intersection with Kilwa Road, the area exhibits a blend of commercial and residential elements. On the left-hand side, an electric utility transformer is situated adjacent to the Zakhem Complex toilets, catering to both commercial and public needs. On the right-hand side, the presence of KCB Bank is complemented by additional electric utility transformers. This configuration reflects the harmonious coexistence of commercial and residential activities, supported by essential infrastructure.

2.6 Key Components of the Proposed Roads' Subprojects

A summary of the key components of the proposed urban roads' subprojects is described below. It should be noted at the outset that the exact specifications of the proposed project components have been described in the detailed engineering design phase.

Carriage, Way Shoulders; Pedestrian Walkways, Storm water Drains, Service Roads, Outlet Ditches, Side Ditches; Culverts, T/Y Junctions, Bus Bays; Road Signs and Crossings; Roadside Parking Lots; Road Lights.

2.7 Summary on Observations and recommendations

Generally, in all subprojects or roads inspected there were indications of encroachment partly because many of these roads are in unplanned areas. Besides, even where the roads are planned there had been installation of utilities that does not consider proper plans, hence some are on top of roads or the poles are erected in areas that cannot be developed without relocation. Thus, the design will have work closely with safeguards team to ensure that mitigation hierarchy approach is employed effectively.

2.8 Proposed Road Design Standards

The roads to be rehabilitated under this project are all urban roads and have been designed to a maximum speed limit of 50kph or less in accordance with current legislation. The normal

road criteria for horizontal and vertical curves, sight distances and super elevation, etc. Based on design speed have somehow been compromised under this situation.

However, the geometric design criteria adopted for the road is based on the guidelines contained in the Road Design Manual of the Ministry of Works, (2011 edition). The design has also been aided by our in-house computer facilities using AutoCAD Civil 3D software.

Pavement design has been carried out according to the Ministry of Works' Pavement and Materials Design Manual (1999).

The drainage system to be constructed are mainly side drains using stone pitching or concrete the drains will be open or covered depending on availability of space (will be covered to accommodate walk ways) or covered for safety reasons in cases where the drains are wide and deep and close to residential areas. However, the water run-off from the drains will be treated and/or discharged to the main storm drains, natural water channels like rivers so as to avoid flooding.

Geometric Design

General

Geometric design is the process whereby the layout of the road terrain is designed to meet the needs of the road users. The principal geometric features are the road cross section, horizontal alignment and vertical alignment. The use of geometric design standards fulfils three inter-related objectives. Firstly, standards are intended to provide minimum levels of safety and comfort for drivers and pedestrian by the provision of adequate sight distance, road space for vehicle manoeuvres; Secondly, they provide the framework for economic design; and thirdly they ensure consistency of alignment. The design standards adopted taking into account the environmental road conditions, traffic characteristics and driver behaviour.

Horizontal Alignment

After careful study and review of the project proposed roads, the Consultant came to conclude that:

The alignment of the existing roads is generally acceptable all along the roads and thus has been followed in principle. The positioning of the road centreline and intersection point was guided by the existing road alignment since most of the roads are existing and traverses the surveyed areas/ plots but for only a few roads where the utility services and residential houses have interfered with the road reserve area. The intention was to try to centralize the road within the Right of Way (RoW) in case the existing road centreline is mainly on one side of the RoW and existing beacons are also available.

Most of the roads are within the built-up areas and most sections of the project roads satisfy the requirements of satisfactory horizontal alignment with minor improvement, safety and aesthetics for the selected design speeds. Minor modifications have also been required to suit drainage, intersections, to save utilities and properties, but these do not affect the geometric standards of the road. Obviously being urban roads, many intersections have been designed to serve the link streets/roads.

Normally, selection of the horizontal alignments for design of roads takes into consideration the following:

- Horizontal alignments follow the existing road corridor (available space) and minimize properties to be affected.

- Horizontal alignments match existing alignments including the intersections.
- Minimization of earthworks.
- Maximization of re-use of the existing road formation; and
- Compliance to the minimum requirements of design standards.

Vertical Alignment

Design speed is one of the crucial factors while designing the vertical alignment of any road. The vertical alignment is further a function of the sight distance, the material and drainage requirement of the project areas. For township or municipal roads, however, the roads are short and usually on a constant grade terrain, thus rendering sight distance secondary in the design. Urban and township roads are intended to provide access to plots and properties, and this therefore is the major consideration when designing the vertical geometry of the roads. Vertical alignment is also influenced by the thickness of pavement layers and the height of the drainage structures. Thickness of pavement layers is a function of the conditions of in situ soils and traffic loading. However, in our specific case we followed, the following in designing the vertical alignment:

The vertical alignments have been designed to approximately follow the existing ground on each road. Minor changes were made to suit drainage, existing features, intersections or other requirements. All roads are essentially flat or gently sloping. Consideration was given to existing buildings on both sides of the road; this implies that access (crossings) will be provided as part of road furniture.

Selection of vertical alignments for designs of urban roads takes into consideration the following parameters:

- Wherever practicable, compliance with the minimum design standards requirements in terms of minimum and maximum gradients, critical length of gradients, vertical sight distance, etc.
- Minimization of earthworks by putting new pavement on top of the existing earth/gravel road surface.
- Minimization of level difference between finished road levels and entrance gate levels of existing properties with enough clearances for cross drainage structures.
- To direct the longitudinal slope (grade) towards the cross-drainage structures so as to drain the storm water from the side ditches.

Typical Cross Sections

Generally, typical cross sections proposed for each road are as illustrated in the figures below. The project roads are passing on a built-up area with many public facilities including churches, schools and hospitals which attract pedestrians. In order to design a successful road incorporating an attractive and welcoming pedestrian environment, it is important to establish standard design criteria for all users. The following design dimensions and parameters were considered and used for each road design.

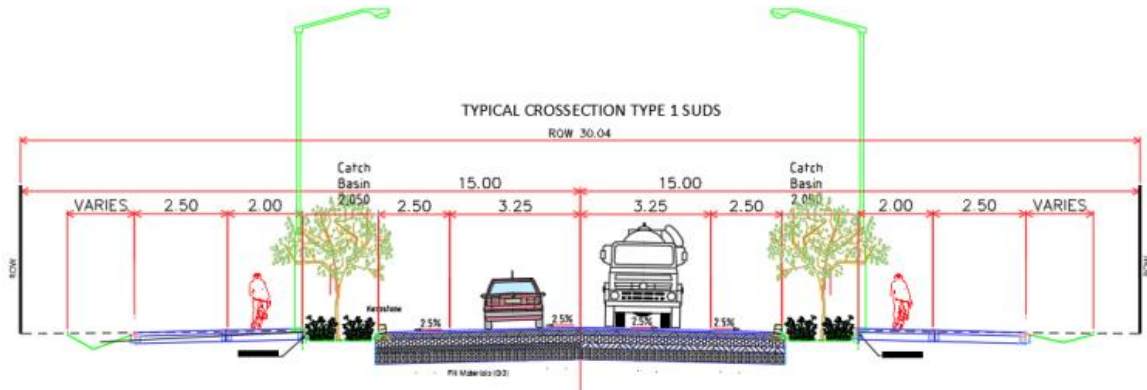


Figure 2-10: Typical Cross section Type 1 SUDS

Source: Design document, November, 2023

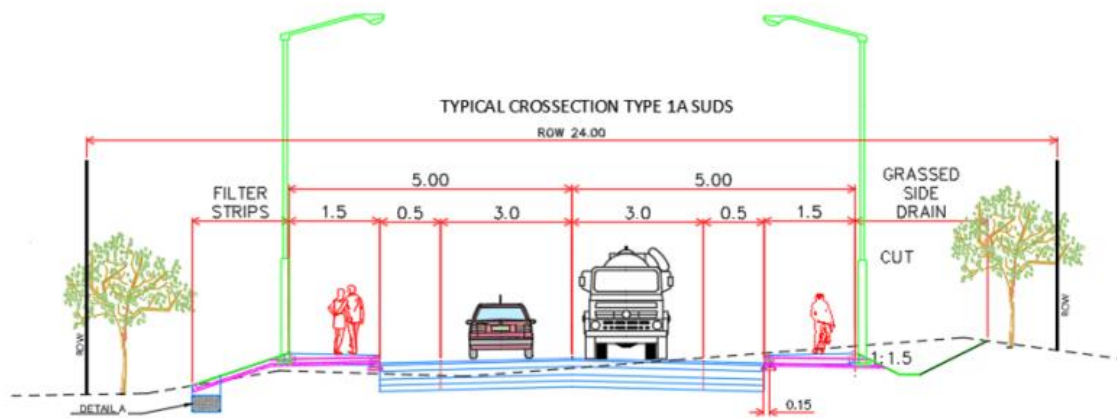


Figure 2-11: Typical Cross section Type 1A SUDS

Source: Design document, November, 2023

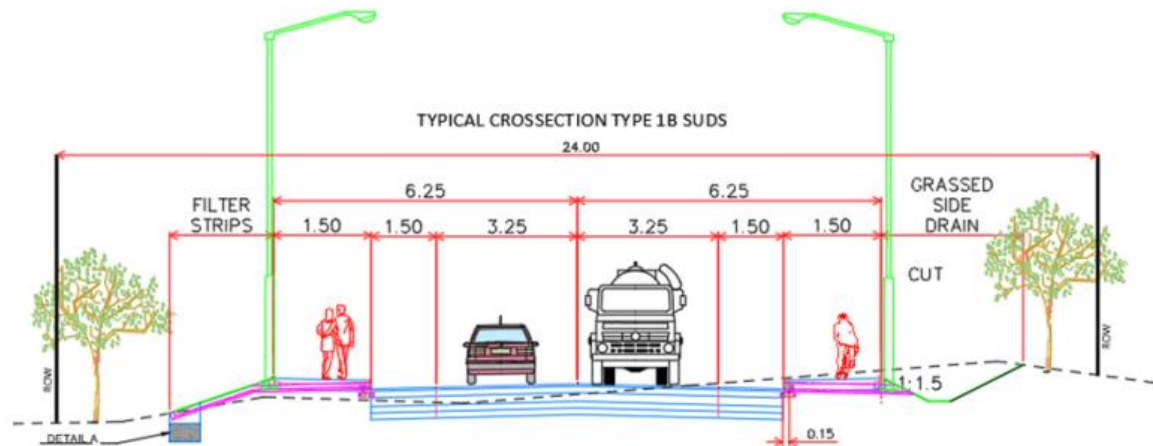


Figure 2-12: Typical Cross section Type 1B SUDS

Source: Design document, November, 2023

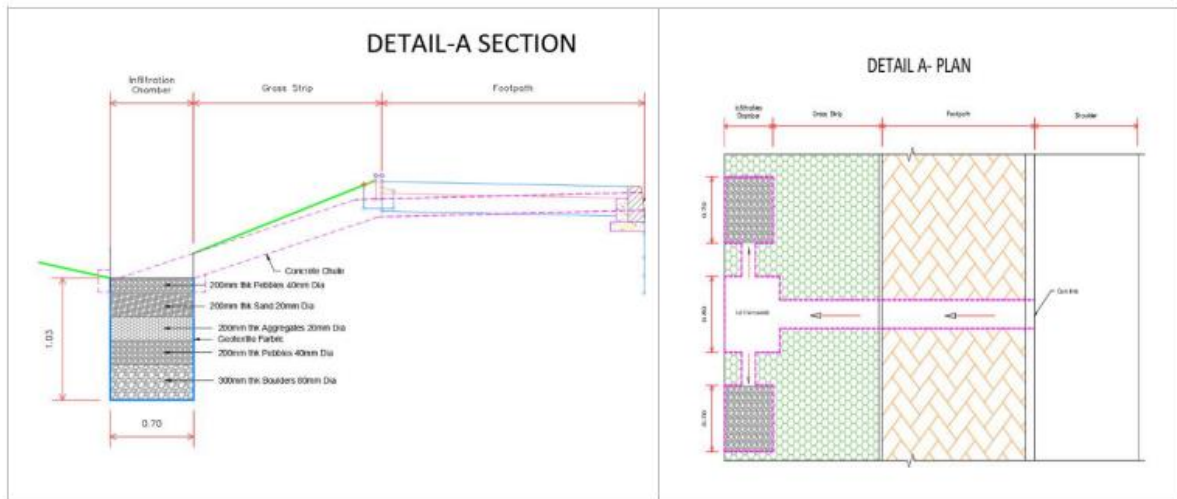


Figure 2-13: SUDS Details for Typical Cross section Type 1, 1A&1B SUDS

Source: Design document, November 2023

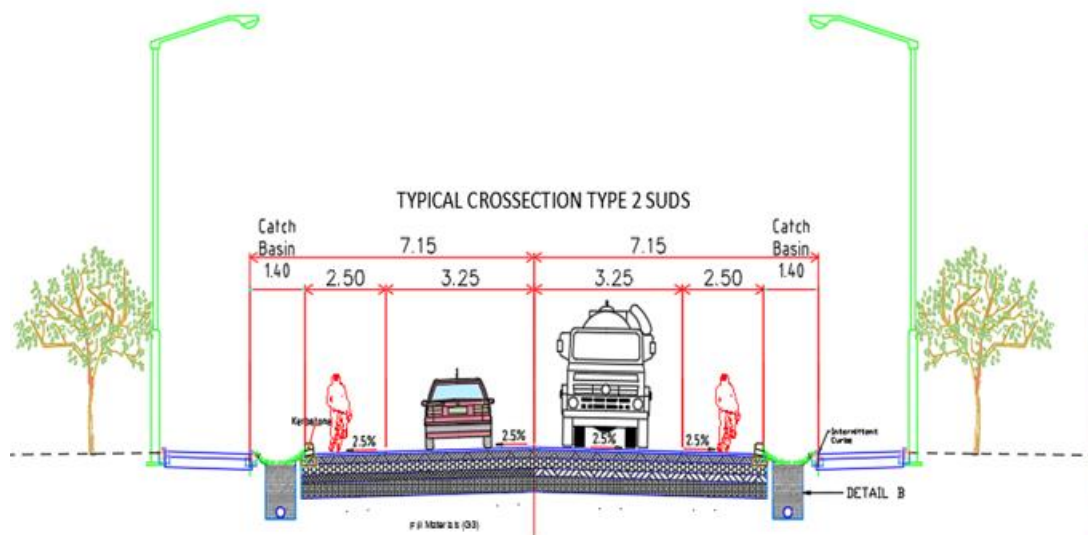


Figure 2-14: SUDS Details for Typical Cross section Type 2 SUDS

Source: Design document, August 2023

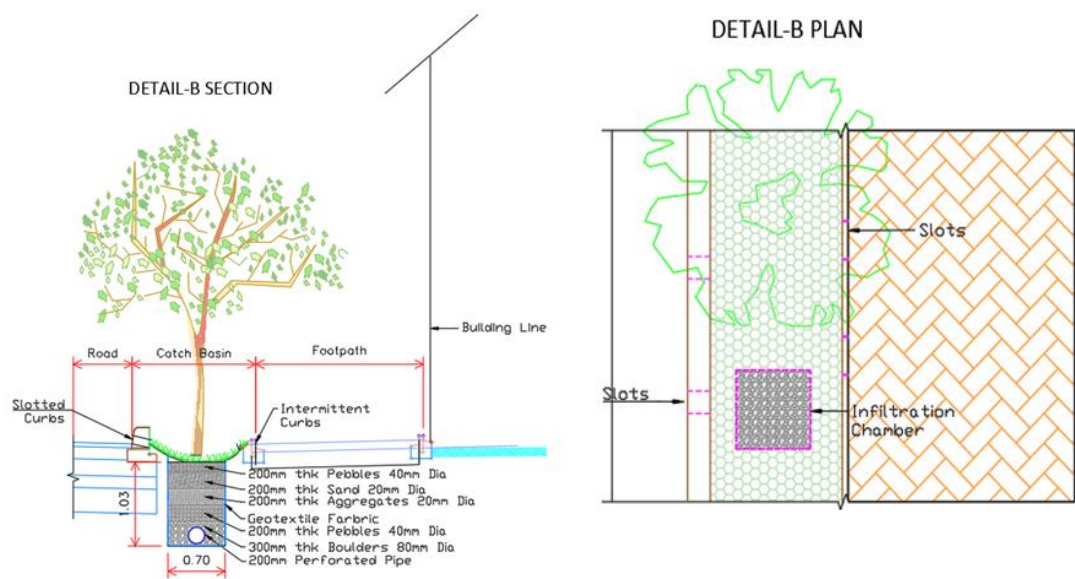


Figure 2-15: SUDS Details for Typical Cross section Type 2

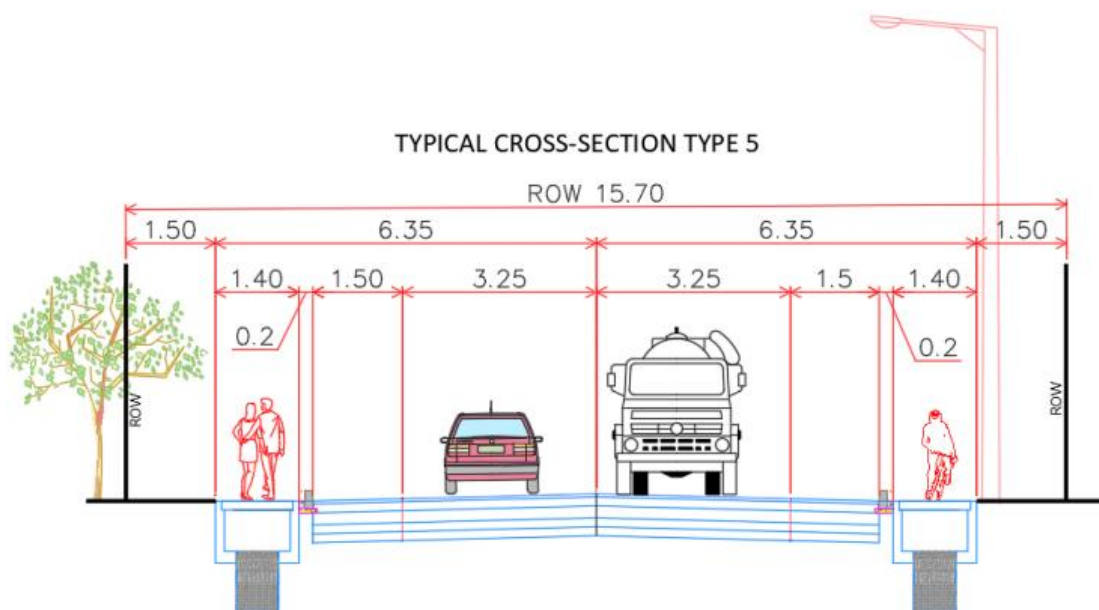


Figure 2-16: Typical cross sections Type 5 for Collector roads (Urban Area)

Source: Design document, November 2023

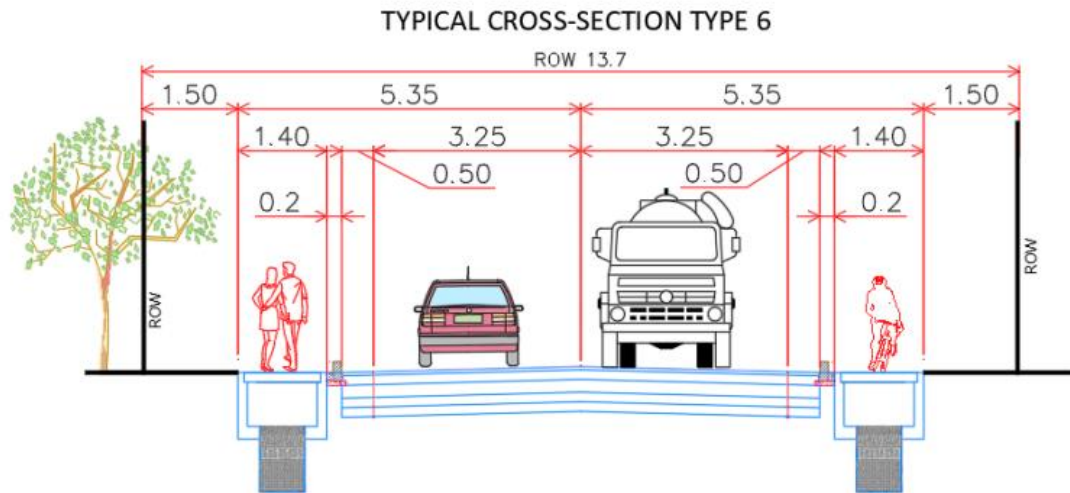


Figure 2-17: Typical cross sections Type 6 for Collector roads (Urban Area)

Source: Design document, November 2023

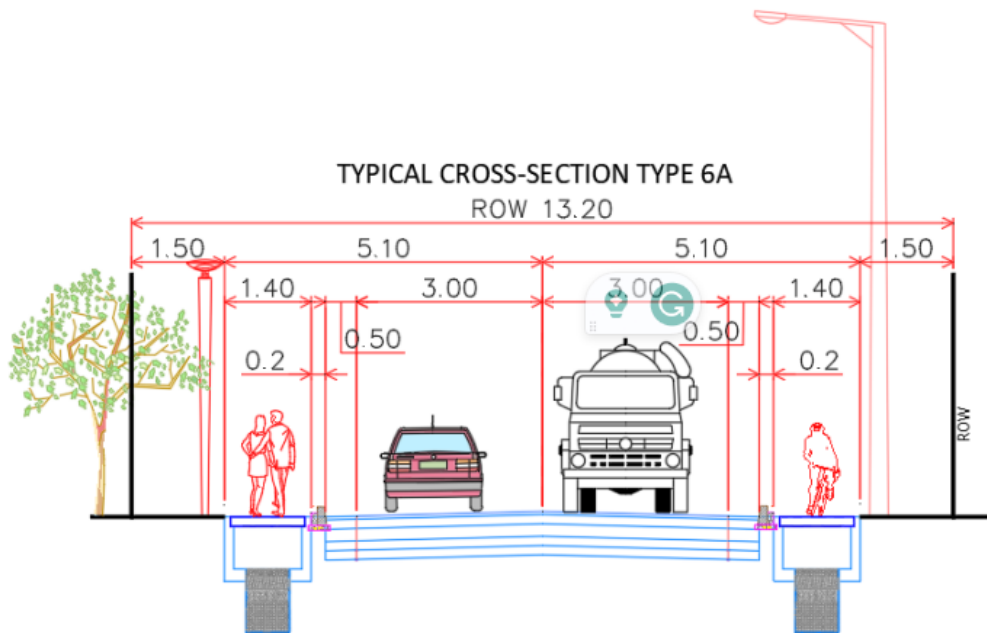


Figure 2-18: Typical cross sections Type 6A for Collector roads (Urban Area)

Source: Design document, November 2023

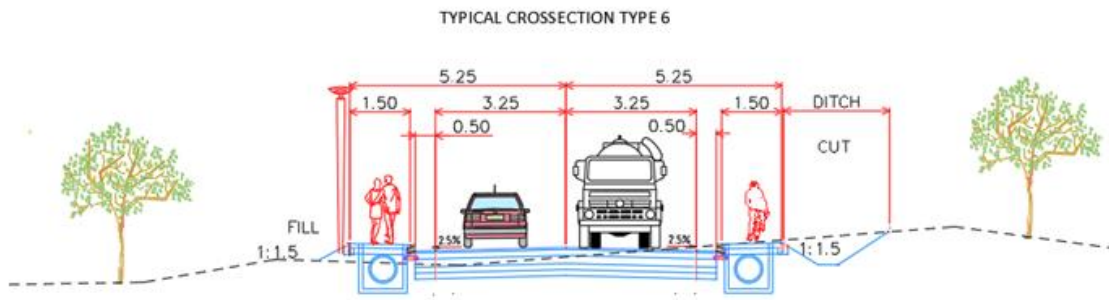


Figure 2-19: Typical cross sections Type 6 for Collector roads (Urban Area)

Source: Design document, August 2023

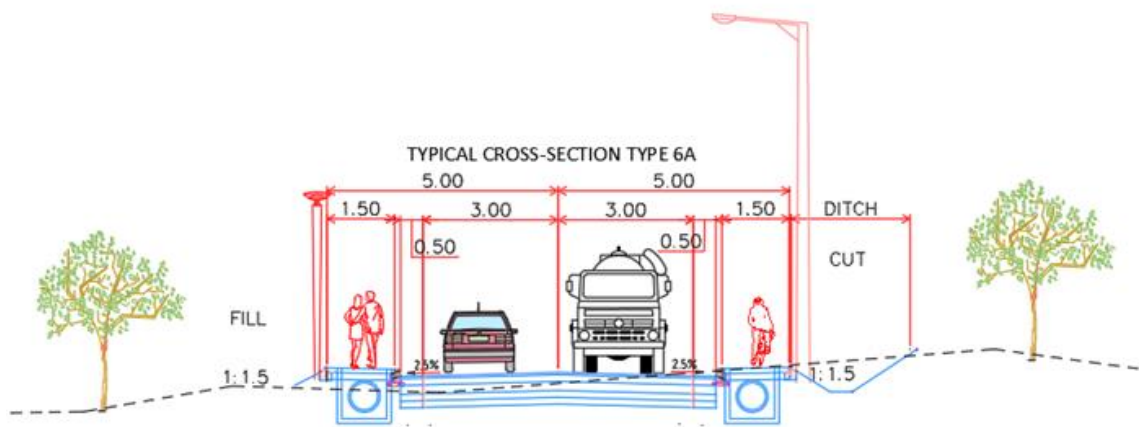


Figure 2-20: Typical cross sections Type 6A for Collector roads (Urban Area)

Source: Design document, August 2023

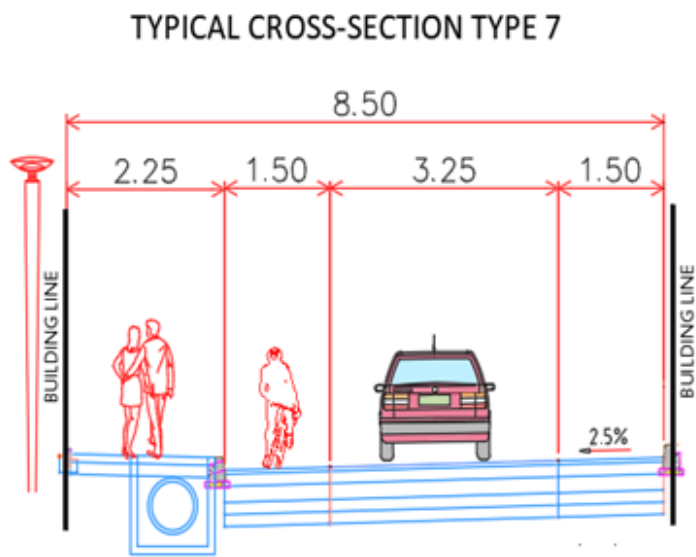


Figure 2-21: Typical Cross section Type 7 one-way Feeder Road

Source: Design documents, August 2023

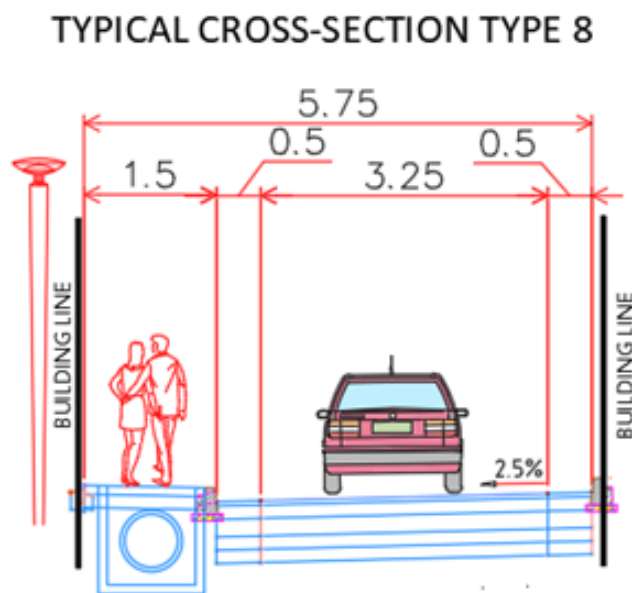


Figure 2-22: Typical Cross section Type 8 one-way Feeder Road

Source: Design document, August 2023

Footpaths/Cycle paths

Separate Footpaths (Walkways) of 1.5m width have been provided for Pedestrians in all project roads at Temeke Municipal Council. No separate cycle paths are provided in these roads due to space limitations as well as to minimise resettlement impact considering that most roads are within unplanned settlements. Instead, wider carriageways were selected to accommodate the cyclists. For the roads in the outskirts, wider shoulders will serve both pedestrians and non motorised cyclists. To ensure safety of both pedestrian and cyclists, signage will be provided as part of mitigation measures as well as awareness to communities and the public in general. Minimum widths of the shoulder have been set at 1.5m both sides of the carriageway.

Pedestrian Crossings

Pedestrian crossings are provided with roads in areas where there is a potential of heavy non-motorized traffic. In Temeke Municipal, these areas include markets/shopping centres, colleges/universities, schools, hospitals/health centres and religious institutions (mosques, churches).

Road Safety Measures for Non-Motorised Traffic (NMT)

The following are proposed safety measures for NMT:

- The pedestrian crossings are raised and protected by a pair of rumble strips (strip humps) at either side of the crossing and relevant road signs and markings.
- Concrete bollards are installed on entries and exits of the footpaths/cycle paths to separate motorized traffic from using the NMT facilities.
- Cyclist ramps are provided at cross over kerbs or raised areas.
- Any service/utility pits that are located with the paths are specified to have their surface levelled flush with the surfaces of the paths to minimize trip hazards for NMT.
- Traffic lights in critical areas such as junctions with major highways.

Ancillary Works

Road Signs

Signs have been proposed for the following purposes:

- Regulatory Signs—used to control the actions of road users in the interest of safety and efficient use of road space. Failure to obey regulatory signs is an offence.
- Warning Signs—used to alert drivers to danger or potential danger ahead. They indicate a need for extra caution by road users and may require a reduction in speed or other manoeuvres.
- Guidance Signs—give Road users information on how to find their way to their destination.
- Information Signs—provides additional information to that given on the primary sign.
- It should be noted that specific temporary signage for construction activities will also be erected as well as barricading where relevant as part of safety measures.

Road Markings

Road Markings are used to control, warn, or guide road users. These consist of:

- Regulatory Markings
- Warning Markings
- Guidance Markings

The proposed types of pavement markings include the following:

- Centreline Markings
- Edge Line Markings
- Lane or Parking Lines
- Zebra crossings on the raised pedestrian crossings.
- Stop/give way lines.

Speed Humps, Raised Pedestrian Crossings and Rumble Strips

Speed humps, Raised Pedestrian Crossings and Rumble strips are provided at sections of roads where limited speeds are required to ensure safety of all traffic (i.e., non and motorized) for instance, markets and other public institutions (schools, hospitals).

Preliminary Drainage Design Standards

On completion of the conditional assessment, the preliminary design was done for the major structures to be adopted. The extent of design carried out at this stage however is only to enable establishing the quantities required for the economic assessment.

The Code of Practice used for the design of drainage structures is British Standard 5400, with a design load for the new major drainage structures being taken in accordance with the specifications for loads in Part 2 of BS 5400. All live loadings including HA live load and 37.5 units of HB as defined in the terms of reference have been used.

Box culverts

Concrete box culverts will be cast in situ and will be founded on an improved soil base (possibly with the incorporation of geotextile material) in the event that samples from trial pits at the proposed location confirm the visual assessment of the existence of black cotton soils.

For protection on the riverbanks, gabion boxes will also be adopted based on the hydraulic considerations and river flow conditions. All these will be included in the detailed design stage.

Pipe culverts

New pipe culverts will be made of concrete and will have a minimum diameter of 900mm.

Materials

Concrete Class for bridges has adopted various classes. For the bridge deck including beams Class 35 will be used, abutment, piers, and foundation Class 30 will be used. For box culverts, concrete Class used is Class 30. Class 15 concrete will be used in channel linings and erosion protection works and in blinding layers.

Reinforcement Quantities

For the purpose of quantification of reinforcement, appropriate unit weights were used based on the experience of the consultant in the completed projects.

2.9 Project Packaging

The proposed project has been subdivided into Packages 1 and 2, and each package has Lot 1 and 2 for easy management as detailed in Table 2-2.

Table 2-2: Packages for works for Temeke Municipal

DLA	Package	Description
Temeke MC	Package 1	Temeke Package 1 - Upgrading of Mbagala Tuangoma Roads in Temeke Municipality:
		Lot 1: Nduguru, Masaki, Maandazi and Kipati Roads
		Lot 2: Masuliza and Kilimahewa - Tuangoma Roads
	Package 2	Temeke Package 2 - Upgrading of Yombo Vituka, Keko Taifa, Kurasini and Temeke Roads in Temeke Municipality:
		Lot 1: Yombo Vituka Roads (Msikitini, Mwembeni/Nyika & Malawi West), Keko Taifa Roads (Songambebe, Mwakalinga, Markas, Majimaji, Magorofani, Igome/Yemen, Diwani, Keko Machungwa & Basri) and Footbridges (Chaurembo 1 & Chaurembo 2)
		Lot 2: Kurasini Roads (Konisaga 1, Konisaga 3, Kurasini, Taningra & Uhasibu), Temeke Roads (Temeke, Lushoto, Pendamoyo, Pendamoyo 1, Manderu & Mkumba Miburani) and Footbridges (Mdeda, Mpeta, Baajun, Msalaka Mashine ya Maji, Shehe Muckhi & Azimio Msalaka)

Selected Typical Cross Sections are detailed in the following Tables

Table 2-3: Package 1: Mbagala Toangoma Roads

Road	Length, km	Typical Cross section
Masaki Road	3.91	Type 5
Masuliza Road	4.04	Type 6
Maandazi Road	2.0	Type 6A
Kipati Road	0.72	Type 6A
Kilimahewa – Toangoma	6.17	Type 6A

Table 2-4: Package 1: Yombo Vituka Roads

Road	Length, Km	Typical Cross section
Msikitini Road	0.45	Type 6
Mwembeni (Nyika) Road	0.44	Type 6
Malawi West Road	0.28	Type 6
Footbridges		
Chaurembo 1 Chaurembo 2		

Table 2-5: Package 2: Keko Taifa Roads

Road	Length, km	Typical Cross section
Songambebe Road	0.32	Type 6 (Rigid)
Mwakalinga Road	1.08	Type 6 (Rigid)
Markas Road	0.48	Type 6A (Rigid)
Majimaji Road	0.32	Type 6A (Rigid)
Keko Machungwa Road	0.57	Type 6A
Magorofani Road	0.31	Type 8
Igome (Yemen) Road	0.85	Type 5 (Rigid)
Diwani Road	0.67	Type 6A
Chuma Road	0.71	Type 8
Basri Road	0.88	Type 6

Table 2-6: Package 2: Kurasini Roads

Road	Length, km	Typical Cross section
Konisaga 1 Road	0.29	Type 7 (Rigid)
Konisaga 3	0.38	Type 6A (Rigid)
Kurasini Road	1.12	Type 6 (Rigid)
Taningira Road	0.42	Type 6A (Rigid)
Uhasibu Road	0.44	Type 8 (Rigid)

Table 2-7: Package 2: Temeke Roads

Road	Length, km	Typical Cross section
Kizota Road	0.91	Type 7
Lushoto Road	0.3	Type 6A (Rigid)
Pendamoyo Road	0.56	Type 6
Pendamoyo 1 Road	0.2	Type 7
Mandera Road	0.85	Type 5 (Rigid)
Mkumba – Miburani Road	0.39	Type 5 (Rigid)

Table 2-8: Package 2: Foot Bridges

Location	Span	Typical Cross section
Mdede	1	
Mpeta	1	
Baajun	1	
Msalaka- Mashine ya Maji	1	
Shehe Muckhi	1	
Azimio Msalaka	1	

2.10 Assessment of Existing Road Structures

The existing road is gravel which is planned to be improved to a bitumen standard as required by the terms of reference.

Dimensions

The existing structures range from 600mm pipe culverts, box culverts of various sizes. Most of the pipes are wide enough covering the entire road width that reaches the dimensions of dual carriageway.

Type of structures

The existing pipe culverts are of concrete and steel (Armco). All box culverts are reinforced concrete whereas for bridges there is a combination of concrete bridge deck and stone pitching abutments.

Condition of superstructure

The assessment made in the superstructure indicated that most of the structures appear to be older and with the workmanship that is not very good but without a notable crack. Structurally, all the concrete culverts appear to be intact.

2.11 Project Activities

Planning Phase

During the planning phase, different studies in all proposed sub-project sites had been conducted including, Feasibility study, this ESIA and RAP, preliminary engineering planning, final engineering, planning and construction planning forms the planning phase of the project. The compensation cost that includes compensations for identified standing crops, partial land and buildings, accommodation allowance, transport allowance, and disturbance allowance is estimated to be TZS 622,767,959.37 (Temeke Municipal Council, RAP 2024). The compensations cost is estimated to be This includes compensations for crops value, land value, buildings value, accommodation allowance, transport allowance, and disturbance allowance estimated to be TZS 622,767,959.37(Temeke Municipal Council, RAP 2024). The compensations cost is estimated to be This includes compensations for crops value, land value, buildings value, accommodation allowance, transport allowance, and disturbance allowance.

Compensation is paid for any damage caused to external property during the final engineering or construction planning and construction. The Temeke Municipal Council (TMC) will be responsible for the payment of compensation for impacts that will be identified during the planning phase in line with the provisions of the ESS5 as mitigated upon in the RAP. However, should the contractor during the construction phase be required to conduct any ex-ante inspections or enter any properties so as to limit damage or pay compensation for inadvertent damage; then he will be responsible for compensation in line with the contracts. This will apply for those impacts not addressed during the planning phase such as relocation of utilities etc.

Environmental certification by the National Environment Management Council (NEMC) is also done/finalized at this stage.

During project planning phase only, documentary review involved as summarized below:

Evaluation of project concepts and alternative selection; Design of all project components; Topographic survey; Geo-technical Investigations; Soils and Materials Investigations; Carrying out RAP for the affected people (with completion note); Carrying out ESIA of the project and the ESMP. Tendering for construction works. Approval of Engineering designs and Environmental Certification.

Mobilization or Pre-Construction Phase

Upon hiring the contractor and finalization of contract formalities and site handing over to the contractor, preparation of the proposed site shall follow by involving clearing of the site, when clearance is over, the site will be ready for receiving actual works. Surplus material generated from the site preparation works like demolitions and trees clearance is over, the wastes generated will be moved to the appropriate disposal sites. Site preparation will also involve the relocation of infrastructures/utilities found in the subproject areas; these include water supply pipes, wastewater collection system (pipes and associated chambers or manholes).

Road sections under improvement on any day will necessarily be closed to traffic and to pedestrians, thus affecting their access to work, commercial centers, recreational facilities, religious facilities, etc. Also, presumably delivery of raw materials and transport of workers to construction sites will increase traffic generally in this area of Dar es Salaam during the construction phase. The Contractor/s will be required to develop a Traffic Management Plan as part of the C-ESMP to address traffic related impacts.

Also, as necessary, the Contractor will hire labour and erect necessary temporary facilities to cater for offices and storage yards near the construction sites or outside the sites as it may be agreed and permitted by the Temeke Municipal Council. Mobilization phase will also involve the purchase and stockpiling of the materials such as aggregates, sand, cement, timber and reinforcing steel including delivery of plant and equipment at the site/s.

Construction Phase

The major items of Works to be executed under the construction contract will include but not limited to the following: clearing and grubbing, excavation and cut to spoil and cut to fill, borrow to fill, fill with improved subgrade, natural gravel sub-base materials fills, cement improved gravel subbase compaction, fill with crushed aggregate road base materials and erection of structural excavation foundations, installation of reinforced concrete, erection of reinforced concrete pipe culverts alongside concrete class 15 and 30 structures and this will be followed with application of prime coat coatings after which, single and double bituminous surface dressing will be applied.

In summary, the major construction activities include;

- Extraction and transportation of materials (gravel, sand, hard stones, aggregates, water and bitumen).

- Clearing the right of Right of Way (RoW) while leaving intact the trees (if any) which do not interfere with the construction.
- Formation of the approach road embankment, establishment of sub-base and base, and road surfacing.

This phase also will include provision of walkways, Culverts and streetlights.

- Treating of old roads and temporary diversion.

Restriction to use will occur to some sections of roads under improvement on any day will necessarily be temporarily closed to traffic and to pedestrians but with alternative routes suggested as diversion. Also, presumably delivery of raw materials and transport of workers to construction sites will increase traffic generally in this area of Dar es Salaam during the construction phase.

This section should include techniques to be employed during construction of the various road segments and associated infrastructure (sidewalks, culverts, etc.).

There will be excavation and removal of top soils; transportation of debris to identified areas; compaction and construction works.

Maintenance Phase

The actual usage of the road and drainage system is expected to commence after the construction works. These roads are under urban roads directly managed by TARURA-Temeke.

The design period of the roads is 20 years. During this phase, TARURA will carry out routine maintenance by attending to potholes, clearance of vegetation within the ROW (road reserve area) and monitoring.

Other activities shall include Installation of road signs, reinforcement and replacement of road furniture (such as traffic lights, guardrails, marker posts, fences, reflectors and centre-line pads, rest areas/ bus shelters, as applicable), and control of litter accumulation on roadsides, awareness rising on proper use of roads management to the communities, monitoring and evaluation, management to reduce pollutant concentrations in runoff, disposal of wastes from road maintenance activities, storage and management of maintenance materials and equipment.

Drainage channels after complete construction as per design shall be handed over to the Municipal Council for overall management throughout the operation phase. This shall also include all necessary drainage channels' regular maintenance and cleaning.

Demobilization Phase

During demobilization or decommissioning of the road project, there will be activities including moving and demolition of constructed facilities, restoration of borrow pits, termination of the temporary workers' employment, waste management, etc. These borrow pits are established under the Mining law and the land law thus are guided by the Environmental Management Act and the EIA and Audits Regulations, 2005 where environmental clearances and environmental and social management plans are prepared with rehabilitation plan set as mandatory.

Table 2-9 schedule of activities

Activities	Duration (Month)
Mobilization	1
Construction	24
Demobilization	1
Operation	240

2.12 Project raw material Requirements

Gravel/Fill Materials

The possible borrow areas/sites for supply of materials are existing as they have been used in other projects such as the DMDPI. The locations are for coral gravels are obtained. These facilities are owned by independent firms.

Crushed Stone Aggregates

The Lugoba and Msata quarries are operational and are the only sources of granite aggregates which are used within the Dar es Salaam and Coast regions. The crushed aggregates from these two quarries comply with the Tanzanian Standard Specification for Road Works (2000).

Sand Materials

Chamazi sand mine and Mbande Sand mine can be used as feasible sand sources for the project.

Manufactures Materials

Most of the materials such as cement shall be obtained within Tanzania except bitumen which shall be imported. It should also be noted that construction materials such as gravel, sand and stone aggregates will be obtained of existing source and as part of due diligence the site that the contractor will obtain material will be verified by PO-RALG, Consultant and the PIT; verification will also include all relevant permits as per the legal requirements.

Table 2-9: Type, Sources and Quantities of Construction Materials

S/No	Type of Construction Material	Unit	Quantity	Source/s
1	Sand	M3	9000	Chamazi/Mbande Sand Mines
2	Cement	Ton	18000	Twiga/Nyati/Dangote cement Depots
3	Aggregates	M3	19800	Lugoba quarries
4	Reinforcements/Steel	Ton	6520	Steel factories in Dar es Salaam

5	Timber	M3	900	Local Suppliers (Iringa & Dar es Salaam)
6	Stones	M3	6000	Mji Mwema (Mbutu), Boko and Kisarawe Vigama

Power Supply for the Project

Power supply for the proposed project's construction activities will be provided by TANESCO from the existing supply drop points and generators for performing hot works, lighting etc. During the operation phase of the roads, the project ancillaries might use solar power.

Construction Water

Water during construction shall be drawn from DAWASA network as well as deep borehole to be drilled near the project site, additional water sources identified include: Kizinga River in Temeke, and Msimbazi River. The construction activities are expected to use water optimally, an average of 30m³ per day.

Labour Force

The construction works is anticipated to employ about 300 workers categorised as skilled semi-skilled and unskilled ones. Numbers per category is subject to changes as scope of works changes.

Construction Equipment

The lists of construction equipment's are described in table 2.10 below

Table 2-10: Types, Amounts and Sources of Project Equipment's

Requirements	Type	Source	Quantity (estimate) required
Equipment	Dump Truck	• Contractor	3
	Graders	• Contractor	5
	Dozer	• Contractor	8
	Water Boozers	• Contractor	3
	Vibrators	• Contractor	7
	Excavator	• Contractor	4
	Motor grader	• Contractor	1
	Roller Compactor	• Contractor	1
	Plate compactor	• Contractor	1
	Tippers	• Contractor	2

2.13 Waste Management

During Mobilization Phase

Below is a summary of activities during the mobilization phase of the proposed project;

- Preparation of the campsite whose location to be identified
- Implementation of the RAP
- Installation of temporary security fence at the camp sites, site office and storage facilities.
- Acquisition of materials from a reliable sources and storage.
- Testing of the construction materials.
- Acquisition of other permits such as water use permits.
- Confirmation of data and accuracy of topographical survey.
- Mobilization of labour force, equipment and plant for construction works.
- Relocation of utilities,

Types, amounts and treatment/disposal of wastes during the pre-construction phase are shown in the Table 2.11 below.

Table 2-11: Types, Amounts and Treatment/Disposal of Wastes during the Pre-Construction Phase

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Vegetation (Trees, Shrubs and Grasses) and remnants of timber.	10m ³ (Clearance for office)	Source of energy for cooking at the site or villages nearby.
	Food remains, cardboards and papers	0.5kg/day (based on generation rate of 20g/day/ person and 25 workers)	Collected in a large skip bucket at the office site then to be composted and used as manure for the gardens at the Office site
Solid Waste (Non-Degradable)	Top soils	1,000m ³ (Based on removal of 10 cm topsoil from the (100x100) m ² area for Contractor's and Engineer's office erection	Backfilling material in the borrow pits, fill the diversions. The top soil will be stored as necessary, to be used for restoration of cleared/ excavated areas.

Waste	Types	Amount	Treatment/ Disposal
	Scrap metals and plastics	1- 2kg per day	Sold to Recyclers
	Tins, glasses	1- 2 kg per day	Taken to the Authorised dumpsite at Pugu
Liquid waste	Sewage	0.6 m3 (Based on 25 people, 40l/capita/day water consumption and 80% becomes wastewater)	Septic tank – Soakaway system at the office for isolated areas, mobile toilets shall be used by workers and regularly emptied and generated faecal matter disposed at sewage treatment plants.
	Oils and greases		Car maintenance will be done in proper garages Oil spills will be managed in line with Oil Spill management work procedure to be developed by each Contractor/s. Used oil will be given out to companies for re-use and excess disposed by licensed waste handlers.

During Construction Phase

The major construction activities include;

- Extraction and transportation of materials (gravel, sand, hard stones, aggregates, water and bitumen)
- Clearing the right of Right of Way (RoW) while leaving intact the trees (if any) which do not interfere with the construction
- Formation of the approach road embankment, establishment of sub-base and base, and road surfacing
- Treating of old roads and temporary diversion

Types, amounts and treatment/disposal of wastes during the construction phase are shown in table 2.12.

Table 2-12: Types, Amounts and Treatment/Disposal of Wastes during the Construction Phase

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Vegetation (Trees, Grasses) and remnants of timber.	Approximately about 30m3 of biomass	Source of energy for cooking by nearby community
	Food remains, cardboards and papers	10kg/day (based on generation rate of 0.2-/day/ person for 50	Collected in a large skip bucket at the office site then to be composted and used as manure for the gardens at the

Waste	Types	Amount	Treatment/ Disposal
		people)	office site
Solid Waste (Non-Degradable)	Scrap metals, drums and plastics	1-2kg per day	Sold to Recyclers
	Tins, glasses	2-3 kg per day	Taken to the authorised dumpsite at Pugu Dar es salaam
Liquid waste	Sewage	1. 6m3/day (Based on 50 people, 40l/capita/day water consumption and 80% becomes wastewater)	Septic tank –Soak away system at the office site
Hazardous Wastes	Waste Oils	160lts	Cars/vehicles maintenance will be done at proper garages, Wastes shall be collected by the licensed hazardous waste collector. Temporal collection and storage area will be designated at the construction camp, with paved/impervious surface, with proper drainage, measures to handle accidental spills, and stored in drums.
	Oil Filters	72Nos	
	Used Batteries	18Nos	
	Grease		

During Demobilization Phase

The major activities include;

- Demobilization of temporary structures will be done for proper restoration of the site e.g., removing/spreading top-soils piled along the road, to restore disturbed areas as required, and removal of all temporary structures.
- Collect and disposer all wastes to the authorised dumpsite.

2.14 Transportation

Materials (fine and coarse aggregates) from quarries will be transported by trucks to the construction site. Other materials like cement, timber and reinforcement bars will be transported by trucks to the construction site.

2.15 Storage

Materials from borrow pits will be used directly after delivery and as such no piling up is expected. Other materials like aggregates and sand will be stored at the crushing area (usually

near the quarry site) site ready for use. Cement and reinforcement bars will be stored in special storage rooms (Bands which do not allow moisture). Timber will directly be used in the required areas and consequently there will be no stockpiling of timber at the office sites.

2.16 Climate Change Adaptation Strategies

The proposed construction of roads in Temeke Municipality should be resilient to climate change scenarios. Adaptation measures shall do so by:

- Protecting the road infrastructure from the impacts of climate change and,
- Ensuring that the road infrastructure does not increase the vulnerability of the surrounding area to climate change.

In that case, the design has considered two climatic factors:

- i. Temperature and
- ii. Rainfall

With regard to Temperature: Possible adaptation measures for managing pavements for extreme temperatures include:

- Assessment of pavement material compositions during planning and before construction phases.
- Building on good-working practices from areas with warmer temperatures.
- Using more rut-resistant and/or stripping-resistant resurfacing.
- Surface dressing chippings with higher reflectivity.
- Pervious wearing courses; and
- Improving surface and sub-surface drainage systems.

With regard to Rainfall Adaptation measures that have been considered are:

- Reviewing storm water drainage requirements.
- Frequent clearing of ditches and culverts during the post construction phase.
- Resizing drainage systems to meet the threat.
- Paving ditches to reduce erosion.
- Reviewing design storm return periods in the light of new weather information; and
- In extreme case, rerouting

3 RELEVANT POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

3.1 Introduction

This section is aimed at reviewing relevant environmental and social resource and planning legislations and regulations and World Bank's Environmental and Social Framework (ESF) to ensure that proposed upgrading of urban roads and drainage channels meets policy and legislative criteria, and that relevant requirements are built into project design and implementation. The policy review also outlines specific procedures and measures to be carried out before, during and after project development.

Below are identified policies, legislations, the World Bank's Environmental and Social Standards (ESSs) and International Conventions reviewed and included in this ESIA describing their relevance to the proposed subproject.

3.2 International Policies and Standards

The World Bank Environmental and Social Framework

sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards that are designed to support GoT' projects, with the aim of ending extreme poverty and promoting shared prosperity.

This Framework comprises:

- A Vision for Sustainable Development, which sets out the Bank's aspirations regarding environmental and social sustainability.
- The World Bank Environmental and Social Policy for Investment Project Financing, which sets out the mandatory requirements that apply to the Bank; and

- The Environmental and Social Standards, together with their Annexes, which set out the mandatory requirements that apply to the borrowers, for the case of this project the GoT. This ESIA has reviewed the above framework's components' relevant to the Project as shown in the below subsections.

Vision for Sustainable Development

The World Bank Group is globally committed to environmental sustainability, including stronger collective action to support climate change mitigation and adaptation, recognizing this as essential in a world of finite natural resources. It recognizes that climate change is affecting the nature and location of projects, and that World Bank-financed projects should reduce their impact on the climate by choosing alternatives with lower carbon emissions.

Equally, social development and inclusion are critical for all of the World Bank's development interventions and for achieving sustainable development.

At the project level, these global aspirations translate into enhancing development opportunities for all, particularly the poor and vulnerable, and promoting the sustainable management of natural and living resources. Therefore, within the parameters of a project, the Bank seeks to:

- Address project-level impacts on climate change and consider the impacts of climate change on the selection, siting, planning, design and implementation and decommissioning of projects.
- Maximize stakeholder engagement through enhanced consultation, participation and accountability.

The designs of urban roads and drainage channels for Temeke Municipality have observed the vision of sustainable development by ensuring climate change adaptation strategies have been taken into considerations.

World Bank Environmental and Social Policy for Investment Project Financing

This Environmental and Social Policy for Investment Project Financing sets out the mandatory requirements of the Bank in relation to the projects it supports through Investment Project Financing. The Bank is committed to supporting GoT in the development and implementation of projects that are environmentally and socially sustainable, and to enhancing the capacity of GoT 'environmental and social frameworks to assess and manage the environmental and social risks and impacts of projects.

The Bank will assist GoT in their application of the ESSs to projects supported through Investment Project Financing in accordance with this Environmental and Social Policy for Investment Project Financing (Policy).

To carry out this Policy, the Bank will:

- Undertake its own due diligence of proposed projects, proportionate to the nature and potential significance of the environmental and social risks and impacts related to the project.
- As and where required, support the GoT to carry out early and continuing engagement and meaningful consultation with stakeholders, in particular affected communities, and in providing project-based grievance mechanisms.

The Banks shall evaluate the environmental and social risks management plan including the extent of stakeholders' engagement on the project throughout.

DMDP Phase 2 project engaged various stakeholders during preparation of World Bank Environmental Framework documents. However, at subprojects level, the proposed urban roads and drainage channels have been conducted with ESIA study to comply with Environmental and Social Policy for Investment Project Financing. During the study, various stakeholders from Mtaa level to National Level were engaged, their views captured and used for influencing the design of proposed subprojects as indicated in *chapter 5 of this ESIA*.

In addition, specific RAP has been prepared for subprojects to guide the implementation and operation of the proposed subprojects.

ESF and Environmental and Social Standards

I. Environmental and Social Standards (ESS.1): Assessment and Management of Environmental and Social Risks and Impacts

ESS1 sets out the Borrower's (GoT) responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing, in order to achieve environmental and social out-comes consistent with the Environmental and Social Standards (ESSs).

The Government of Tanzania through PO-RALG is required to conduct environmental and social assessment of DMDP Phase 2 project for Bank financing to help ensure that projects are environmentally and socially sound and sustainable. The environmental and social assessment should be proportionate to the risks and impacts of the subproject. It will inform the design of the project and be used to identify mitigation measures and actions and to improve decision-making.

PO-RALG will manage environmental and social risks and impacts of the project throughout the project life cycle in a systematic manner, proportionate to the nature and scale of the project and the potential risks and impacts.

Among the requirements under ESS1 relevant to the Upgrading of the DMDP Phase 2 project include:

- Conduct an environmental and social assessment of the proposed project, including stakeholder engagement.
- Undertake stakeholder engagement and disclose appropriate information.
- Develop an Environmental and Social Commitment Plan (ESCP), and implement all measures and actions set out in the legal agreement including the ESCP; and
- Conduct monitoring and reporting on the environmental and social performance of the ESF mitigation hierarchy approach was followed:

(a) Anticipate and avoid risks and impacts;

(b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels;

(c) Once risks and impacts have been minimized or reduced, mitigate; and

(d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

Further, the ESIA has adopted differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities resulting from the project. During preparation of the ESIA the project utilized national environmental and social institutions, systems, laws, regulations, and procedures in the assessment, development of ESMP, and shall during implementation of the same. To promote improved environmental and social performance, the ESIA has recommended measures which recognize and enhance Borrower capacity.

II. ESS.2: Labour and Working Conditions.

ESS2 recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. GoT can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions.

Among ESS2 objectives include:

- To promote safety and health at work
- To promote the fair treatment, non-discrimination and equal opportunity of project workers
- To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate.
- To prevent the use of all forms of forced labour and child labour
- To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law.
- To provide project workers with accessible means to raise workplace concerns.

The project contractor shall adhere to the objectives under regular audits to be conducted by the PO-RALG, OSHA and the project Supervising Engineer. However, specific subproject's Labor Management Procedures (LMP) have been prepared to guide labour issues during construction and operation of the proposed roads and drainage channels. The procedures will address the way in which this ESS will apply to different categories of project workers, including direct workers, and the way in which the Project will require third parties to manage their workers in accordance with ESS2.

Terms and Conditions: Project workers will be provided with information and documentation that is clear and understandable regarding their terms and conditions of employment. The information and documentation will set out their rights under national labour and employment law (which will include any applicable collective agreements), including their rights related to hours of work, wages, overtime, compensation, and benefits, as well as those arising from the requirements of this ESS. This information and documentation will be provided at the beginning of the working relationship, and when any material changes, to the terms or conditions of employment occur.

Child Labor and Minimum Age: A child under the minimum age 18 years will not be employed or engaged in connection with the project.

Forced Labor: Forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty, will not be used in connection with the project. This prohibition covers any kind of involuntary or compulsory labour, such as indentured labour, bonded labour, or similar labour-contracting arrangements. No trafficked persons will be employed in connection with the project.

Grievance Redress Mechanism: There will be project level GRM that will be extended to sub-projects so that those working in the project can be use them to implement the project. However, each contractor will prepare workers GRM in line with the provision of ESS2 and the Tanzania Employment and Labour Relations Act 2004. A grievance mechanism will be provided for all direct workers and contracted workers raise workplace concerns. Such workers will be informed of the grievance mechanism at the time of recruitment and the measures put in place to protect them against reprisal for its use. Measures will be put in place to make the grievance mechanism easily accessible to all such project workers.

Occupational Health and Safety (OHS): Measures relating to occupational health and safety will be applied to the project. The OHS measures will include the requirements of ESS2, and will take into account the General Environmental Health and Safety Guidelines (EHSGs) and, as appropriate, the industry-specific EHSGs for Toll Roads, Extraction of Construction Materials and other Good International Industry Practice (GIIP). The OHS measures will be designed and implemented to address: (a) identification of potential hazards to project workers, particularly those that may be life-threatening; (b) provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (c) training of project workers and maintenance of training records; (d) documentation and reporting of occupational accidents, diseases and incidents; (e) emergency prevention and preparedness and response arrangements to emergency situations; and (f) remedies for adverse impacts such as occupational injuries, deaths, disability, and disease.

Contracted Workers: The Project will make reasonable efforts to ascertain that third parties who engage contracted workers are legitimate and reliable entities and have in place labor management procedures applicable to the project that will allow them to operate in accordance with the requirements of this ESS.

III. Environmental and Social Standard 3: Resource Efficiency and Pollution Prevention and Management.

ESS3 recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, eco- system services and the environment at the local, regional, and global levels. The current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of current and future generations. At the same time, more efficient and effective resource use, pollution prevention and GHG emission avoidance, and mitigation technologies and practices have become more accessible and achievable.

Among ESS3 objectives include:

- To promote the sustainable use of resources, including energy, water and raw materials,
- To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities,
- To avoid or minimize project-related emissions of short and long-lived climate pollutants,
- To avoid or minimize the generation of hazardous and non-hazardous waste,
- To minimize and manage the risks and impacts associated with pesticide use.

On pollution prevention and management, the GoT will avoid the release of pollutants or, when avoidance is not feasible, minimize and control the concentration and mass flow of their release using the performance levels and measures specified in national law or the

EHSGs, whichever is most stringent. The Project will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention measures in accordance with the mitigation hierarchy, ensuring resource efficiency in consumption of energy, water, and raw materials.

The GoT will avoid the generation of hazardous and non-hazardous waste. Where waste generation cannot be avoided, the project will minimize the generation of waste, and reuse, recycle and recover waste in a manner that is safe for human health and the environment. Where waste cannot be reused, recycled or recovered, the project will treat, destroy, or dispose of it in an environmentally sound and safe manner that includes the appropriate control of emissions and residues resulting from the handling and processing of the waste material.

Upgrading of DMDP Phase 2 project will significantly reduce emissions from vehicles that are currently likely generated as a result of low vehicles' speeds along the road. During construction, the contractor shall adhere to all recommended actions to reduce GHG emissions from operating vehicles and plant.

IV. Environmental and Social Standard 4: Community Health and Safety.

ESS4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subject to impacts from climate change may also experience an acceleration or intensification of impacts due to project activities.

ESS4 addresses the health, safety, and security risks and impacts on a project-affected communities and the corresponding responsibility of GoT to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable.

The objectives of the ESS4 include:

- To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances.
- To promote quality and safety, and consider actions relating to climate change, in the design and construction of infrastructure, including dams.
- To avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials.
- To have in place effective measures to address emergency events.
- To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities ESS4 requires:

The GoT will design, construct, operate, and decommission the structural elements of the project in accordance with national legal requirements, the EHSGs and other GIIP, taking into consideration safety risks to third parties and affected communities.

Where the project involves the provision of services to communities, the GoT will establish and implement appropriate quality management systems to anticipate and minimize risks and impacts that such services may have on community health and safety. In such circumstances, the GoT will also apply the concept of universal access, where technically and financially feasible

The GoT will identify, evaluate and monitor the potential traffic and road safety risks to workers, affected communities and road users throughout the project life cycle and, where

appropriate, will develop measures and plans to address them. The GoT will incorporate technically and financially feasible road safety measures into the project design to prevent and mitigate potential road safety risks to road users and affected communities.

The GoT will avoid or minimize the potential for community exposure to waterborne, water based, water-related, and vector-borne diseases, and communicable and non-communicable diseases that could result from project activities, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups. Where specific diseases are endemic in communities in the project area, the project is encouraged to explore opportunities during the project life cycle to improve environmental conditions that could help minimize their incidence. The GoT will take measures to avoid or minimize transmission of communicable diseases that may be associated with the influx of temporary or permanent project labour.

The GoT will implement measures and actions to control the safety of deliveries of hazardous materials, and of storage, transportation, and disposal of hazardous materials and wastes, and will implement measures to avoid or control community exposure to such hazardous material.

The GoT will identify and implement measures to address emergency events. An emergency event is an unanticipated incident, arising from both natural and man-made hazards, typically in the form of fire, explosions, leaks, or spills, which may occur for a variety of different reasons, including failure to implement operating procedures that are designed to prevent their occurrence, extreme weather, or lack of early warning. The measures will be designed to address the emergency event in a coordinated and expeditious manner; to prevent it from injuring the health and safety of the community; and to minimize, mitigate, and compensate for any impacts that may occur.

V. Environmental and Social Standard 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.

ESS5 recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. Project-related land acquisition or restrictions on land use may cause physical displacement (relocation, loss of residential land or loss of shelter), economic displacement (loss of land, assets, or access to assets, leading to loss of income sources or other means of livelihood), or both. The term “involuntary resettlement” refers to these impacts. Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in displacement.

Objectives of ESS5 include:

- To avoid involuntary resettlement or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives,
- To avoid forced eviction,
- To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use by:
 - (a) Providing timely compensation for loss of assets at replacement cost and
 - (b) Assisting displaced persons in their efforts to improve, or at least restore, their livelihoods and living standards, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

- To improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure.
- To conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the project, as the nature of the project may warrant.
- To ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and the informed participation of those affected.

Among the requirements of ESS5 include the following:

- a. The GoT will demonstrate that involuntary land acquisition or restrictions on land use are limited to direct project requirements for clearly specified project purposes within a clearly specified period of time. The GoT will consider feasible alternative project designs to avoid or minimize land acquisition or restrictions on land use, especially where this would result in physical or economic displacement, while balancing environmental, social, and financial costs and benefits, and paying particular attention to gender impacts and impacts on the poor and vulnerable.
- b. When land acquisition or restrictions on land use (whether permanent or temporary) cannot be avoided, the GoT will offer affected people's compensation at replacement cost, and other assistance as may be necessary to help them improve or at least restore their standards of living or livelihoods, subject to the provisions of paragraph 26 through 36 of this ESS.
- c. Compensation standards for categories of land and fixed assets will be disclosed and applied consistently. Compensation rates may be subject to upward adjustment where negotiation strategies are employed. In all cases, a clear basis for calculation of compensation will be documented, and compensation distributed in accordance with transparent procedures.
- d.
- e. Where livelihoods of displaced persons are land-based, or where land is collectively owned, the GoT will offer the displaced persons an option for replacement land in accordance with paragraph 35(a), unless it can be demonstrated to the Bank's satisfaction that equivalent replacement land is unavailable.
- f.
- g. The GoT will take possession of acquired land and related assets only after compensation in accordance with this ESS has been made available and, where applicable. In addition, livelihood restoration and improvement programs will commence in a timely fashion in order to ensure that affected persons are sufficiently prepared to take advantage of alternative livelihood opportunities as the need to do so arises.
- h. The GoT will ensure that a grievance mechanism for the project is in place, in accordance with ESS10 as early as possible in project development to address specific concerns about compensation, relocation or livelihood restoration measures raised by displaced persons (or others) in a timely fashion.

Temeke Municipal Council (TMC) has prepared Resettlement Action Plan (RAP) that entails mitigation measures for all likely physical and economic displacements that are likely to occur while implementing these sub-projects. .

During Construction phase the Contractor will as much as possibly avoid further resettlement impact by ensuring the construction activities are within the confined project area, minimal or no denial of access to livelihood activities. However, in case of any impact that is covered under ESS5 the PAP will be handled as per the requirements of the ESS5.

VI. Environmental and Social Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

ESS6 recognizes the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support. This ESS also addresses the sustainable management of primary production and harvesting of living natural resources. ESS6 recognizes the need to consider the livelihood of project-affected parties, including Indigenous.

Peoples, whose access to, or use of, biodiversity or living natural resources may be affected by a project. The potential, positive role of project affected parties, including Indigenous Peoples, in biodiversity conservation and sustainable management of living natural resources is also considered.

Objective of ESS6 includes but not limited to:

- To protect and conserve biodiversity and habitats,
- To apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity,
- To promote the sustainable management of living natural resources,
- To support the livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.

ESS6 requirements include among others:

- a. The environmental and social assessment as set out in ESS1 will consider direct, indirect and cumulative project-related impacts on habitats and the biodiversity they support. This assessment will consider threats to biodiversity, for example, habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading, pollution and incidental take, as well as projected climate change impacts.
- b. Through the environmental and social assessment, the GoT will identify the potential project related risks to and impacts on habitats and the biodiversity that they support.
- c. The GoT assessment will include characterization of baseline conditions to a degree that is proportional and specific to the anticipated risk and significance of impacts.

The roads under Temeke Municipality ESS6 is not triggered

VII. Environmental and Social Standard 8: Cultural Heritage.

This ESS sets out general provisions on the risks and impacts to cultural heritage from project activities ESS7 sets out additional requirements for cultural heritage in the context of Indigenous Peoples. ESS6 recognizes the social and cultural values of biodiversity. Provisions on Stakeholder Engagement and Information Disclosure are set out in ESS10.

The objectives of the ESS8 include:

- To protect cultural heritage from the adverse impacts of project activities and support its preservation.

- To address cultural heritage as an integral aspect of sustainable development
- To promote meaningful consultation with stakeholders regarding cultural heritage
- To promote the equitable sharing of benefits from the use of cultural heritage

The requirements of this ESS8 apply to all projects that are likely to have risks or impacts on cultural heritage. This include a project which: (a) Involves excavations, demolition, movement of earth, flooding, or other changes in the physical environment, directly applying to the proposed road works; (b) Is located within a legally protected area or a legally defined buffer zone; (c) Is located in, or in the vicinity of, a recognized cultural heritage site; or (d) Is specifically designed to support the conservation, management, and use of cultural heritage.

ESS8 requires:

- a) The environmental and social assessment, as set out in ESS1, will consider direct, indirect and cumulative project-specific risks and impacts on cultural heritage. Through the environmental and social assessment, the GoT will determine the potential risks and impacts of the proposed activities of the project on cultural heritage.
- b) The GoT will avoid impacts on cultural heritage. When avoidance of impacts is not possible, the GoT will identify and implement measures to address impacts on cultural heritage in accordance with the mitigation hierarchy.

During the impact assessment study and through communities and stakeholders' consultations, no heritage site was identified to be within or near the proposed sites for implementation of urban roads and drainage channels.

However, a chance finds procedure will be developed to be followed if previously unknown cultural heritage is encountered during project activities. It will be included in all contracts relating to construction of the project, including excavations, demolition, movement of earth, flooding, or other changes in the physical environment. The chance finds procedure sets out how chance finds associated with the project will be managed. The procedure includes a requirement to notify relevant authorities of found objects or sites by cultural heritage experts; to fence-off the area of finds or sites to avoid further disturbance; to conduct an assessment of found objects or sites by cultural heritage experts; to identify and implement actions consistent with the requirements of this ESS and national law; and to train project personnel and project workers on chance find procedures.

VIII. Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure

This ESS recognizes the importance of open and transparent engagement between the GoT and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.

Objectives of ESS10 are:

- To establish a systematic approach to stakeholder engagement that will help GoT identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties.
- To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance.

- To promote and provide a means for effective and inclusive engagement with project affected parties throughout the project life cycle on issues that could potentially affect them.
- To ensure that the appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.
- To provide project-affected parties with accessible and inclusive means to raise issues and grievances and allow GoT to respond to and manage such grievances.

ESS10 requirements among others include:

- a. GoT will engage with stakeholders through- out the project life cycle, commencing such engagement as early as possible in the project development process and in a timeframe that enables meaningful consultations with stakeholders on project design. The nature, scope and frequency of stakeholder engagement will be proportionate to the nature and scale of the project and its potential risks and impacts.
- b. GoT will engage in meaningful consultations with all stakeholders. GoT will provide stakeholders with timely, relevant, understandable and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination and intimidation.
- c. The process of stakeholder engagement will involve the following, as set out in further detail in this ESS:
 - (i) Stakeholder identification and analysis.
 - (ii) Planning how the engagement with stakeholders will take place.
 - (iii) Disclosure of information.
 - (iv) Consultation with stakeholders.
 - (v) Addressing and responding to grievances; and
 - (vi) Reporting to stakeholders.

The DMDP Phase 2 project has prepared a specific Stakeholder Engagement Plan (SEP) for the proposed urban roads and drainage channels' Subprojects which guided consultations during the ESIA scoping stage as a 1st round stakeholders' engagement and shall also guide during the feedback stage/2nd round community/ies engagement. 1st round was purposely for stakeholders to air their views, comments and concerns on the type of urban roads and drainage channels' Subprojects under DMDP Phase 2 program as indicated in chapter 5 of this ESIA report. There will be continuous engagement of stakeholders both interested and affected as per procedures narrated in the SEP.

3.3The World Bank ESH Guidelines

3.3.1 The World Bank Environmental, Health, and Safety General Guidelines

Once a member of the World Bank Group is involved in a project, adherence to the EHS Guidelines is mandatory as a matter of policy. The General EHS Guidelines are a set of technical reference documents which addresses "Good International Industry Practices" in four focus areas:

- (i) Environmental
- (ii) Occupational Health and Safety
- (iii)Community Health and Safety and
- (iv)Construction and Decommissioning

These General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines which provide guidance to users on EHS issues in specific industry sectors. For complex projects, use of multiple industry-sector guidelines may be necessary. The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. Relevant aspects of General EHS Guidelines have been incorporated into the ESIA to address aspects related to environmental management largely guided by ESS1, occupational health and safety measures which are also guided by ESS2, community health and safety measures which are also guided by ESS4. The General EHSGs have also been used to inform the decommissioning phase of the subprojects. In addition, Contractors will also be required to refer to and use the General EHSGs when developing and implementing the Contractor's ESMPs.

Environmental, Health, and Safety Guidelines for Toll Roads

The EHS Guidelines for Toll Roads include information relevant to construction, operation and maintenance of large, sealed road projects including associated bridges and overpasses. Issues associated with sourcing of construction materials are presented in the EHS Guidelines for Construction Materials Extraction, while those related to vehicle service areas are included in the EHS Guidelines for Retail Petroleum. This document is organized according to Industry-Specific Impacts and Management, Performance Indicators and Monitoring, References and Additional Sources and General Description of Industry Activities sections.

3.3.3 Environmental, Health, and Safety Guidelines for Construction Materials Extraction

This document includes information relevant to construction materials extraction activities such as aggregates, limestone, slates, sand, gravel, clay, gypsum, feldspar, silica sands, and quartzite, as well as to the extraction of dimension stone. It addresses stand-alone projects and extraction activities supporting construction, civil works, and cement projects.

Although the construction materials extraction guidelines emphasize major and complex extraction schemes, the concepts are also applicable to small operations. This document is organized according to the industry-Specific Impacts and Management Section, Performance Indicators and Monitoring Section, References and General Description of Industry Activities sections:

3.4 National Policies

Environmental awareness in the country has significantly increased in recent years. The government has been developing and reviewing national policies to address environmental management in various sectors. Among others, the objective of these policies is to regulate the development undertaken within the respective sectors so that they are not undertaken at the expense of the environment. The national policies that address environmental management as far as DMDP Phase 2 project is concerned and which form the corner stone of the present study include the following:

3.4.1 The National Environment Policy 2021

The National Environmental Policy seeks to provide the framework for making fundamental changes that are needed to bring environmental considerations into the mainstream of decision making in Tanzania.

Some of the key objectives of the National Environmental Policy are to prevent and control degradation of land, water, vegetation, and air which constitute our life support systems; to raise public awareness and understanding of the essential linkages between environment and development and to promote individual and community participation in environmental action.

Chapter 3; section 51, paragraph (a), (b) and(c) of this policy states that transport sector shall focus on improvement in mass transport systems to reduce fuel consumption and traffic congestion. It shall also control pollution and minimize transport emission of gases, noise, dust and particulates; in addition, preventing disaster/spill and formulating response plans and standard for transportation of hazardous and dangerous material. Subject to this, is section 63 which dictates to use Environmental Impact Assessment tool to tackle immediate environmental problems, precautionary, anticipatory and preventive approaches that are the most effective social economic measure for achieving environmentally sound development.

The proposed upgrading roads has observed the policy objectives at various stages where there will be environmental impacts including transport emission gases, noise, dust, particulates and spills, road accidents etc. Prior to the execution of the proposed roads and drainage channels' subproject, Environmental and Social Impact Assessment (ESIA) has been conducted including preparation of Environmental and social Management Plan that will be implemented by the contractor for the purpose of preventing and minimize environmental and social impacts resulted from the project activities.

The National Employment Policy 2008

Due to the growing number of unemployed labour force, the specific objective of the National Employment Policy was to provide strategies for employment creation and sustainability. Among its specific objectives is section 3.5 improvement and transformation of the informal sector for creating decent jobs, section 3.7 facilitates Tanzania job seekers to acquire appropriate skills and section 3.9 employment of individual through enhancing accessibility to business support services including capital, market access for private sector entrepreneurs including self-employers for increased productivity and income.

The proposed implementation of sub-projects is estimated to employ about 300 workers in different categories of skilled, semi, skilled and unskilled including others such as food vendors.

During the operation phase, the proposed infrastructure will bring business development, open up markets, and facilitate the economic growth as well as improvement of social services, all of which will bring more employment opportunities.

The National Land Policy, 1995

The policy requires that, in accordance with sub-section 7.1.1, before any development activity is taken on the land, the government will ensure that permits, licenses, claims and rights for exploitation of natural resources are issued in line with land use policies, and environment conservation policies and programs.

Some of the key Objectives of the policy are presented in section 2.4 to ensure that land is put to its most productive use to promote rapid social and economic development of the country and section 2.8 to protect land resources from degradation for sustainable development.

On land tenure, the policy dictates in subsection 4.1.1 (I) c) that the rights and interests of citizens in land shall not be taken without due process of the law and paragraph (d) that full, fair and prompt compensation shall be paid when land is acquired.

The proposed subproject will ensure that soil erosion measures are taken into consideration during construction and afforestation plan is put forth along the road so as to protect land resource from degradation for sustainable development.

Although the subproject will use existing routes for roads and drainage channels, construction activities within the proposed RoW might impact people's houses, shops, farms, market, electrical distribution line, telecommunication line, *boda-boda* and Bajaji stand etc. However, all affected parties will be identified, and their properties valued and fairly compensated.

The Construction Industry Policy 2003

The National Construction Industry Policy aims 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.

One of the key objectives of the Policy in section 7.2 (b) is to emphasize the development of an efficient and self-sustaining roads network that is capable of meeting the diverse needs for construction, rehabilitation and maintenance of civil works for trunk, regional, districts and feeder roads network. Also subject to paragraph (c) to improve capacity of public sector and private sector client so as to ensure efficient transparent and effective implementation and management of construction project. The policy directs that the government shall ensure both local and donor procurement policies provide a comprehensive framework for fostering the local construction industry in Tanzania. And paragraph (g) to mobilize adequate resource from the public sector and private sector for construction and maintenance of public infrastructure.

The proposed DMDP Phase 2 roads and drainage channels will lead to the achievement of the policy's objectives by employing local consultants and contractors as part of the capacity building strategy.

The National Mineral Policy 2009

The Mineral Policy seeks to address the challenges of the mineral sector and increase the mineral sector's contribution to the GDP and alleviate poverty by integrating the mining industry with the rest of the economy.

One of the key policy objectives of the Policy in section 4.0 (a) is to improve the economic environment in order to attract and sustain local and international private investment in the mineral sector; Efficient and reliable infrastructure facilities such as roads accelerate commissioning of new mining projects and increase profits to be taxed by the Government. The policy emphasizes in section 5.1(ii) that the Government in its own or in collaboration with the private sector will provide reliable infrastructure to service the mining industry where feasible.

The proposed DMDP Phase 2 project will lead to the achievement of the objectives of the mining policy by upgrading to bitumen standard and lining of drainage channels to provide efficient infrastructure services which are all weather accessible and promotes a good

economic environment for the country's development. In addition, the subproject shall use locally available sources of sand, gravel, aggregates etc. As part of implementation of policy's objectives.

The Human Settlement Development Policy 2000

The policy defines Human settlement as not simply housing, merely the physical structure of the city, town or village but an integrated combination of all human activity processes including residence, education, health, work, culture, leisure and the physical structure that supports them.

One of the key objectives of the policy in section 3.2(ii) is to promote the level of provision of infrastructure and social services for sustainable human settlement development and (iii) to facilitate the level of employment opportunities and eradication of poverty. The policy states that Infrastructure and services constitute the backbone of urban economies and economic activities. Therefore, all-weather roads for efficient transport are essential for increased productivity and the establishment of manufacturing industries. Lacking of roads and other services in many settlement results to poor environmental condition.

The proposed upgrading of urban roads to bitumen standard roads will provide efficient year-round transportation services and easy access to various socioeconomic areas. Employments shall be generated during construction of both roads and drainage channels.

The National Water Policy 2002

One of the key objectives of water policy in subsection 4.1.1 is to have in place fair and equal procedures in access to and allocation of water resources so that all social and economic activities are able to maximize their capacity; Subsection 4.1.2 to have criteria for prioritization of water allocations so as to ensure that socio-economic activities and the environment receive their adequate share of the water resources on the basis of its availability, and to enable the sectors increase productivity and to mitigate conflicts.

Section 2 of this Policy explains that water is a basic natural resource for sustenance of life and for socioeconomic development. Many social and economic activities rely heavily on the availability of an adequate supply of fresh water. As a sink, water sources are used as receptors for wastewater discharges from industrial, municipal and agricultural sources. Deliberate efforts are, therefore, needed towards protecting and sustaining the resource and to ensure that it is used efficiently and effectively for the benefit of the present and future generation.

Chapter 4 of this policy dictates that all water abstractions and effluent discharges into water bodies shall be subject to a "water use permit" or "discharge permit" to be issued for a specific duration. Water use permits shall be issued only for a determined beneficial water use. Procedures, criteria and guidelines for issuing of the permits will be prepared and operationalized.

The construction activities of proposed roads and drainage channels will use water from different surface water sources within Temeke Municipality and thus, water use/abstraction permit from the Wami Ruvu Water Basin under the Ministry of Water shall be applied for.

The National Action Plan to end Violence against Women and Children (2017/18-2021/22)

Addressing violence against women and children is a central development goal in its own right, and key to achieving other development outcomes for women, children, their families, communities, and the nation.

Tanzania has committed itself to working towards Agenda 2030 and is party to numerous regional and international instruments and declarations on child rights, gender equality, and women's empowerment. The National Action Plan is preceded through eight (8) foundational plans relevant to the protection of women and children that work on creating systems for violence response. The Plan has the mission in section 2.2 to Prevent and respond to all forms of violence against women and children through comprehensive.

The action plan calls upon multi-sectoral collaboration at all levels to address multiple forms of discrimination that contribute to increased vulnerability to violence on the basis of class, age, disability, gender identity and other factors. The national response to addressing violence against women and children needs to be comprehensive, coordinated and multi-sectoral. It also requires coordination and partnerships between the public and private sector, as well as civil society, professional associations and other relevant stakeholders.

During construction of sub projects, women groups with business such as food vendors will be encouraged to sell food to workers. This will help women to improve their economic well-being.

National Policy on HIV/AIDS Policy 2001

HIV/AIDS is a major National crisis that affects all sectors at all levels. Therefore, one of the main objectives of the policy is to prevent transmission of HIV/AIDS through various strategies such as section 3.2 (a) i) to create and sustain an increased awareness of HIV/AIDS through targeted advocacy, information, education, and communication for behaviour change at all levels by all sectors. This hinges on the effective community involvement and empowerment to develop appropriate approaches in the prevention of HIV Infection, care and support to those infected and affected by the epidemic including widows and orphans.

The policy focuses on a coordinated and effective multi-sectoral approach to curb this epidemic and mobilize sufficient financial resources for HIV/AIDS activities, and calls forth for every sector to budget, raise funds and mobilize material and human resources for its own HIV/AIDS prevention and control activities.

HIV/AIDS awareness and education to workers and neighbouring communities will be provided by a social specialist to be employed by the contractor. The contractor shall be responsible for the provision of free condoms to construction workers and voluntary HIV testing to both communities and workers.

The Women and Gender Development Policy 2000

The main objective of the Policy in section 12 is to create an enabling environment for women and men to fulfil their roles in society based on gender needs. Also, this policy aims at balancing the gaps in women's participation in development activities. The policy enables Tanzanian women to participate effectively and efficiently in identifying their potential and identifying problems and resolving them by using available resources to supplement their income and alleviate poverty as a whole and bring a better life. This includes the ability to make decisions in various areas of implementation. The policy has taken into account that in

achieving that goal men must fulfil their roles in our communities and thus engage with women in various social and economic roles.

The policy dictates in section 34 that in order for both women and men to be involved, to ensure that the contribution of women and men to the development of the nation is recognized and appreciated and to ensure both men and women actively participate in development projects.

The National Transport Policy 2011

The vision of the policy is to have efficient and cost-effective domestic and international transport services to all segments of the population and sectors of the national economy with maximum safety and minimum environmental degradation.

And the mission is to develop safe, reliable, effective, efficient and fully integrated transport Infrastructure and Operations which will best meet the needs of travel and transport at improving levels of Service at lower costs in a manner, which supports government strategies for, socio-economic Development whilst being economically and environmentally sustainable.

The proposed DMDP Phase 2 project Zone 3 is in line with the policy's vision and mission since it will provide service to the urban population of Temeke Municipality, the roads shall facilitate economic boost through provision of reliable and timely transportation needs.

The National Population Policy 2006

Among the Policy Objectives is: To harmonies population and economic growth and in the Policy Direction is to enhance awareness to the leaders and communities about the linkages between population, resources, the environment, poverty eradication and sustainable development.

The proposed urban roads and drainage channels are in line with the policy's objectives and direction. The population along the road will benefit economically from the upgrading of the roads and improvement of drainage channels that will provide conducive environment for economic growth even during rain seasons.

3.5 National Development Strategies

Tanzania Development Vision (2025)

The National Vision 2025 foresees the alleviation of widespread poverty through improved socio-economic opportunities, good governance, transparency and improved public sector performance. These objectives don't only deal with economic issues, but also include social challenges such as education, health, the environment and increasing involvement of the people in working for their own development. The thrust of these objectives is to attain a sustainable development of the people.

Through implementation of the proposed upgrading of roads and drainage channels under DMDP Phase 2, the GoT through PO-RALG will contribute towards the realization of the Vision's objectives by making a conducive environment for all passengers on achieving their goals.

The National Strategy for Growth and Reduction of Poverty (NSGRP) II (2015)

The NSGRP-II paper recognizes that reliable infrastructure such as urban city roads and drains system Subprojects is critical for the attainment of the NSGRP II which was launched in 2010 and Sustainable Development Goals which were laid down by the United Nations in 2015. These SDGs are such as Goal No.1 to end poverty, Goal No. 2 on zero hunger, Goal No. 3. To ensure Health life and promote wellbeing for all at all ages, Goal No. 5 on Gender equality and Goal No. 9 on Industry, Innovation and Infrastructure which fosters the importance to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

The National Climate Change Strategy (NCCS) - 2012

The goal of this Strategy is to enable Tanzania to effectively adapt to and participate in global efforts to mitigate to climate change with a view to achieving sustainable economic growth in the context of the Tanzania's national development blueprint, Vision 2025; Five Years National Development plan; and national cross sectoral policies.

To achieve the stated goal, the following specific objectives have been set.

- To build the capacity of Tanzania to adapt to climate change impacts.
- To enhance the resilience of ecosystems to the challenges posed by climate change.
- To enable accessibility and utilization of the available climate change opportunities.
- To enhance participation in climate change mitigation activities that lead to sustainable development.
- To enhance public awareness on climate change.
- To strengthen information management on climate change.
- To enhance institutional arrangements to adequately address climate change and
- To enhance mobilization of resources in particular finance to address climate change.

Design and implementation of urban roads and drainage channels subprojects shall include climate change adaptation measures for infrastructural resilience to climate change.

3.6 Relevant Legal Framework

Environmental Management Act (2004)

The provisions of Part V section 60(1) require that an applicant for water use permit issued under relevant laws governing the management of water resources, abstraction and use of water shall be required to make a statement on the likely impact on the environment due to the use of water requested.

The proposed DMDP Phase 2 Project will use water from DAWASA and other various available sources which will require the contractor to apply for water use permit issued by Wami Ruvu Water Basin under relevant governing laws and as required by this Act.

Subject to the provisions of section 110(2) which require that a person who discharges any hazardous substances, chemical, oil or a mixture containing oil in any water, or any other segment of the environment commits an offense. And (4) it will be the duty of every organization producing, transporting, trading, storing and disposing of such wastes.

The proposed DMDP Phase 2 Project will comply with the provisions of this section by ensuring proper management of hazardous substances, chemical and oils as recommended in the Environmental and Social Management Plan.

EMA through the EIA and Audits Regulations 2005 and the Amended Regulations 2018 requires the proponent to register the project with the NEMC through the online system whereby Scoping report and Terms of Reference for conducting ESIA are submitted. After review of the document by NEMC then proponent through his/her consultant will embark on the ESIA study which include review of documents and engagement with stakeholders proposed in the terms of reference. Thereafter, NEMC upon receipt of the draft ESIA report will conduct a site verification study. Then a Technical Advisory Committee formed by NEMC will review the ESIA report give comments that the consultant will have to work on and submit the Final Report. After approval of the Final report a ESIA Certificate with Conditions will be granted to the Proponent.

The Road Act (2007)

The provisions of Part III, section 16 of this Act direct that where it becomes necessary for the road authority to acquire a land owned by any person for the purposes of this Act, the owner of such land shall be entitled to compensation for any development on such land in accordance with the Land Acquisition Act. Land Act, Village Land Act and any other written law. The proposed project will ensure to comply with this Act as directed in the provision of this section by conducting Resettlement Action Plan whereby all affected parties will be fairly evaluated for their properties and compensated.

The provisions of part IV, section 18(1) require that the road authority or an authorized officer or surveyor will do consultation with relevant authorities and ensure that public interest is considered and settle matters pertaining land use for road construction purpose. Subject to subsection (2) that during execution of the road, the Road authority, authorized officer or surveyor shall give at least fourteen days' notice in writing of his intention to do so. The proposed road project will ensure to comply with the provisions of this Act.

The provisions of Part V, section 33 (1) requires that the road authority shall ensure the safety of road users during the design, construction, maintenance and operation of public road by providing sidewalks, overhead bridges, zebra crossings and other matters related thereto. The proposed DMDP Phase 2 Project shall comply with the provisions of this section by ensuring the safety of road users by providing enough carriage way, pedestrian walkways, road markings and safety signs and sight visibility.

The provision of Part VII, section 42 (1) requires that notwithstanding anything contained in any other written law regulating the maximum weight, speed and dimensions to be carried on any public road.

During the operation phase, the proposed DMDP Phase 2 Project under the PO-RALG shall ensure to comply with the provision of this Act for the purpose of safeguarding the safety of the public or of preserving the condition of a road by fixing a limit to the maximum weight, speed or dimensions of vehicles which may lawfully be driven or hauled over any part of a road.

However, in any case, individual lands should be required for construction activities, the affected parties shall be entitled to compensations.

The Energy and Water Utilities Authority (EWURA) Act (2001)

This Act provides guidance in EWURA administrative system by specifying roles and responsibilities of every actor and related stakeholders, power and proceedings of authority, complains and dispute resolutions, enforcement and compliance.

The provision Part II section 6(f) dictates that it shall be the duty of authority (Energy and Water Utilities Regulatory Authority) that in carrying out its functions it shall strive to enhance the welfare of Tanzanians society by taking into account the need to protect and preserve the environment.

The proposed DMDP Phase 2 Project through the contractor shall take into account the need to preserve and protect the environment by ensuring good storage and transportation of fuel, control oil seepage and ensure proper re-use or disposal of waste oil.

The Water Resources Management Act No 11 of (2009)

The Act provides a description of water resource management framework in Tanzania including roles and responsibilities of every actor and related stakeholders. One of the Key objectives of this Act in Part II section 4(1) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account the fundamental principles of sustainability including subsection (h) preventing and controlling pollution and degradation of water resources.

The proposed DMDP Phase 2 Project will adhere to the objective of this Act by ensuring that water sources are protected from pollution during construction.

The provision of Part VI, section 39(1) requires that the owner or occupier of land on which any activity or process is performed which is likely to cause pollution of a water source, shall take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.

The proposed DMDP Phase 2 Project will comply with this Act by adhering to proper waste management practices during road construction activities.

The provision of Part VIIA, section 43(1) requires that any person who diverts, dams, stores, abstracts or uses water from surface or underground water source, or for any such purpose constructs or maintains any works, shall apply for a Water Use Permit in accordance with this Act. And subject to section 45(2) The Basin Water Board may grant the applicant a temporary Water Use Permit for any purpose under such conditions as may be deemed fit. In addition to section 48 (b) as the user of water use permit granted under this Act you are required to prevent any damage to the source from which water is taken, or to which water is discharged after use.

The proposed DMDP Phase 2 Project will comply with this Act, the water will be obtained from boreholes which shall require water use permit to be granted under requirement of this Act and ensures the conservation of its water sources within or near the project site during construction phase.

The Mining Act 2010

This Act provides guidance on general principles, administrative system of mineral in Tanzania and responsibilities of each actor and related stakeholders, categorizations of mineral rights, types of mineral licenses, charges, right of entry, registration and dispute settlement.

One of the key general principles of this Act in Part II, section 6(1) states that no person shall, on or in any land to which this Act applies, prospect for minerals or carry on mining operations except under the authority of a mineral right granted or deemed to have been granted, under this Act. However, section 7(3) states that nothing in this Act shall prevent any person engaged in the construction of tunnels, road, dams, aerodromes and similar public works of an engineering nature from utilizing as building materials any minerals derived from a source approved by the Minister in writing. The operator through the contractor entered into between the Government will be required to rehabilitate the borrow pits as per the approved Mine Closure Plan.

The proposed DMDP Phase 2 Project will comply with the provisions of this Act by ensuring that all suppliers/sources for aggregates and sand are licensed by the Ministry of Minerals.

The Occupational Health and Safety Act (2003)

This act provides guidance on health and safety administrative system and responsibilities of every actor, requirements and procedures for registration of workplaces, safety provision, health and welfare provisions, safety special provision, hazardous material and processes, chemical handling provisions, offences, penalties and regal proceedings.

The provisions of Part III, section 15 requires that there shall be a register of workplace in which inspector shall enter such particulars in relation to every workplace as he may consider necessary for the purpose of this Act and subject to section 16(1) that any person being an occupier of the workplace shall before be operating being required to register under this Act.

The proposed DMDP Phase 2 Project will comply with the provisions of this Act by ensuring that the contractor registers the workplace by following all required procedures under this Act.

The provisions of Part IV section 24, requires that all employees will be provided periodic occupation medical examination carried out by qualified occupational health physician for fitness for employment and all the expenses and prescribed fee will be paid by the employer.

Subject to the provisions of Section 26 which requires that the employees should be protected from every danger of machinery use through fencing and by providing operators with protective safety devices from machinery parts. Section 27 that the efficiency of the machine should be provided and maintained; section 28 and 30 that an examination or lubrication, adjustment or cleaning of the machinery should not be carried out while the machine is in motion. And section 32 that corrosive or poisonous liquids should be covered or fenced to a reasonable height according to the nature of the work and a warning sign should be posted in the plant or nearby.

Also subject to the provisions of Part IV, section 50(1) a), the employer shall ensure that the workplace is equipped with fire extinguishers which shall be adequate and suitable having regard to fire risks; and paragraph (b) stocks of inflammable materials should be kept in a safe place.

The proposed DMDP Phase 2 Project will comply with the provisions of part IV of this Act by ensuring that all protection needed for safety of employees is provided as required.

The provisions of Part V, section 54(1), requires that the employer shall ensure supply of safe and clean drinking water that is readily accessible to all employees; section 55(1) sufficient and suitable sanitary conveniences shall be provided in a workplace and shall be maintained and kept clean and shall be provided with lighting. Section 65(1) there should be washing facilities which should be kept clean and orderly condition. And section 58 there should be

provision of first aid box, a person trained and qualified for first aid and there should be a reliable means of transport if a person required further medical attention.

The proposed DMDP Phase 2 Project will comply with the provisions of Part V of this Act by ensuring that all requirements are met include providing clean drinking water and hygiene services.

The provisions of Part VI, section 60(a) requires that in work environment where activities involve hazardous chemical substances, equipment and processes which are likely to result in adverse health effects to people or environment, the employer shall ensure that risks assessment is done either annually or when deems necessary by approved inspector. Subject to section 61(1) that all practical measures should be taken to protect employees against inhalation of dust or fume or any impurity and against the working environment.

The proposed DMDP Phase 2 Project will comply with the provisions of part VI of this Act by ensuring that all protective devices are provided as stipulated in the Environmental and Social Management Plan (ESMP) and required by this Act.

The provisions of Part VII, section 67(1) and (2) requires that toxic materials or substances shall only be used where the use of non-toxic materials is not reasonably practicable. During this situation the number of employees exposed should be minimum and recognized antidote should be kept ready. Subject to section 68 that where there are dangerous or corrosive liquids in case of emergence there should be ready and accessible means of drenching with water for any person who has been splashed with such liquid. And Section 71 that no employer shall make an employee carry out work that is not adapted to their physical and cognitive capabilities and limitation.

The proposed DMDP Phase 2 Project will comply with the provisions of part VII of this Act by ensuring that all precautionary measures are taken against hazardous substances as recommended in the Environmental and Social Management Plan and by this Act.

The provisions of Part VIII, section 73(1) the employer shall ensure that preventive, administrative and technical measures are taken to prevent or reduce contamination of workers and the environment and subsection (7) that shall ensure proper disposal of all chemical containers and residues. The proposed DMDP Phase 2 Project will comply with the provisions of part VIII of this Act by ensuring that all preventive measures are taken against contamination to ensure health and safety as recommended in the Environmental Management Plan and this Act.

The provisions of Part X, section 89(1) requires that there should be posted prescribed abstract of this.

Act at workplace and any other notice and document required by this Act in both Kiswahili and English. Subject to section 103 requires that no employer shall dismiss an employee, reduce rate of his remuneration, alter terms or his employment or position to his advantages by the reason of the factor because he suspects or believes whether or not the suspicion is justified or not, however in subsection (2) the employer may terminate the employment of employee if is unable to work for reasons of health condition.

The proposed DMDP Phase 2 Project will comply with the provisions of part X of this Act by ensuring that all safety rules are posted, safety policy is developed, and employment rights are observed related to Health and Safety as recommended in the Environmental and Social Management Plan and by this Act.

The HIV and AIDS (Prevention and Control) Act No. 28/08 (2008)

The HIV and AIDS Act gives provision of general duties by specifying general responsibilities of every actor, emphasize on provision of public education and programs on HIV and AIDS, testing and counselling, confidentiality, health and support services, stigma and discrimination, rights and obligations of persons living with HIV and offences and penalties.

The provisions of Part II, section 4(1) a) require that Every person, institution and organization living, registered or operating in Tanzania shall, be under the general duty to promote public awareness on the causes, modes of transmission, consequences, prevention and control of HIV and AIDS; Also, subsection (2) a) and b) integrate or priorities on HIV and AIDS in their proceedings and public appearances; and advocate against stigma and discrimination of people living with HIV and AIDS. The proposed DMDP Phase 2 Project will comply with the provisions of this Act by ensuring that HIV and AIDS awareness and education is provided to workers and all people living along the road where the project is taking place.

Subject to the provisions of section 6 (1) that every ministry, department, agency, local government authority, parastatal organization, institution whether public or private, shall design and implement gender and disability responsive HIV and AIDS plans in its respective area and such plans shall be main streamed and implemented within the activities of such sector. Subject to subsection (4) every sector preparing a plan or programme under this section shall, before implementation of such plan or programme, submit them to TACAIDS for coordination and advice.

HIV/AIDS awareness and education to the workers and communities will be provided by the contractor using the Social Specialist. The contractor shall be responsible for the provision of free condoms to construction workers and voluntary HIV testing to both communities and workers.

The Local Government Laws (Miscellaneous Amendments), No. 13 (2006)

The local government Laws (Miscellaneous Amendments) provide amendments of local government (district authorities) Act, an amendment of the local government Act (urban authorities), amendment of local government (elections Act), amendment of the regional administration Act. The law specifies the roles and responsibilities of every authority and related stakeholders.

The provisions of Part II, section 2, of this Act, give instructions that this part shall read as one with the Local Government (District Authorities) Act, in this Part referred to as the "principal Act".

The principal Act is amended in section 54A (a) in Part III, section 20 (h) of this Act requires to provide and secure enabling environment for successful performance of the duties of the urban authority; Paragraph (i) ensure compliance by all persons and urban authorities with appropriate government decisions, guidelines in relation to the promotion of the local government system; and paragraph (j) do such acts and things as shall facilitate or secure the effective, efficient and lawful execution by the urban authorities of the statutory or incidental duties."

The proposed DMDP Phase 2 Project will comply with the provisions of this Act by ensuring consultation with all levels of local government, including Temeke Municipal council, ward

executive officers and Mitaa executive officers to ensure compliance with all levels of authority in relation to the promotion of the local government system.

The Land Act No. 2/04 (2004), Amendment of the Land Act (1999)

This Act provides general amendments of Land Act of 1999 by adding section 2 which identifies a “sale” be used as transfer of interest in or over land on condition attached to a granted right of occupancy. Section 19 requires that a person who is in a cooperative body or company made under company ordinance including a corporate body the majority of whose shareholders or owners are noncitizens, may only obtain be offered the right of occupancy approved by Tanzania Investment Act 1997 to facilitate compliance with development. Section 20 which clarifies that land acquired by non-citizen will have no value except shall be paid compensation on unexhausted improvement. Section 37 explains the sale of right of occupancy and repeal and substitution of part X that gives guidance on mortgage, Mortgage right of occupancy, lease, sublease and subsequent mortgage. And also explains the rights and responsibility of all actors and stakeholders including mortgagor and mortgagee.

The proposed urban roads and drainage channels’ subproject will involve acquisition, destruction of houses and trees, utilities and private properties. Hence, the proposed subproject is required to restore the destructed properties and rectify affected utilities before construction works begins as detailed in the RAP for this project in TMC.

The Antiquities Act (1964)

The 1964 Act, offers general protection to objects or structures, which are of archaeological, paleontological, historic, architectural, artistic, ethnological or scientific interest. Also, responsibilities of different actors and stakeholders of cultural heritage resources have been clarified.

The provisions of section 10(1) requires that any person who, discovers a relic or monument, or any object or site which may reasonably be supposed to be a relic or monument, in Tanganyika, otherwise than in the course of a search or excavation made in accordance with a license granted under section 13, and the occupier of any land who knows of any such discovery on or under such land, shall forthwith report the same to an administrative officer, the Commissioner, the Conservator or the Curator of the Museum. The discoverer of such a relic, monument, object or site shall take such steps as may be reasonable for the protection thereof and shall, where he makes a report concerning a portable relic or object, if so required (and on payment of the cost of delivery if any) deliver such antiquity or object to an administrative officer, the Commissioner, the Conservator or the Curator of the Museum, as the case may be.

The proposed DMDP Phase 2 Project does not fall on any cultural heritage resources. However, the project will ensure compliance with this Act wherever it encounters any related discoveries, through implementation of a Chance Finds Procedure as part of the CESMP.

The Standards Act No. 2 of 2009

The 2009 standard Act has clarified administrative system governing the Tanzania bureau of standards by specifying roles and responsibilities of each actor, financial provision, and establishment of standards and enforcement of provisions.

The provision of Part IV, section 18 subsection (1) states that the Minister may, on the recommendation of the board of the Bureau of Standards, subject to the provisions of subsections (2) and (3), by notice published marks in the Gazette, declare any mark which

has been approved by the Bureau in respect of any standard prescribed or recognized by the Bureau for any commodity or the manufacturing, production, processing or treatment of any commodity, to be a standards mark in respect of it and may, in like manner, cancel or amend that mark.

The provisions of section 19 requires that every person who is required to make a statement in a contract, tender, quotation or other similar document as to the question whether the commodity offered or supplied by him complies with or has been manufactured in accordance with a particular National Standard, shall make such a statement provided compliance therewith has been verified by the Bureau.

Also subject to the provisions of Part V, section 22, subsection (2) requires that every person to whom a license has been issued to offer a calibration service shall be required to submit such samples of any commodity to the Bureau for calibration against the National Measurement Standard of his equipment or instrument.

The proposed urban roads and drainage channels shall ensure all materials involved in the construction and facilities to be installed for the operation of the proposed subprojects are certified by TBS.

The Land Acquisition Act 1967, Revised in 2012

The act offers clarification on the power of the president to acquire land in the public interest or national economy, compensation for land acquired and related conditions, notice and proceedings where the land is withheld and declaration of the right of occupancy.

The provision of part II, section 3 clarify that the President may, subject to the provisions of this Act, acquire any land for any estate or term where such land is required for any public purpose. Subject to paragraph (a) subsection (1) section 5 which clarifies that as seen fit by the president that land in certain locally should be examined for the view to its possible acquisition for public interest then workmen authorized by the minister in his behalf are then allowed to enter the land for survey and paragraph (d) to clear, set out and mark the boundaries of the land proposed to be taken and the intended line of the work proposed.

Subject to subsection (2) that as soon as conveniently may be after any entry made under subsection (1), the Government shall pay for all damage done in consequence of the exercise of any of the powers conferred by subsection (1), and, in the case of a dispute as to the amount to be paid, either the Minister or the person claiming compensation may refer such dispute to the Regional Commissioner for the region in which the land is situate and the decision of the Regional Commissioner shall be final. The provisions of part II (b), section 11 subsection (1) required that, where any land is acquired by the President under section 3 the Minister shall on behalf of the Government pay in respect thereof, out of moneys provided for the purpose by Parliament, such compensation as may be agreed upon or determined in accordance with the provisions of this Act. Section 12(2) whether such land is in an urban area or in a rural area, any compensation awarded shall be limited to the value of the unexhausted improvements of the land.

Also subject to the provisions of paragraph (a-d) section 30 clarifies that it shall be lawful for the President to require any corporation to which land has been declared for use to enter a contract with the Government with regard to payment of compensation cost of acquired land, terms of land use, time of land to be used and terms to which the public will be entitled to use and benefit from the work done by corporation.

The provisions of section 36, subsection (1) requires that the minister will grant development proponent a right of occupancy over the land for proposed project, the provision of section 37(3) requires that the development proponent make full disclosure of all trust and other referred interests on the land in a specified time without which or by falsifying the statement shall be convicted. Section 38(1) and (2) specifies that no fees or stamp duty shall be paid under the land ordinance for such granted right of occupancy on the first registration.

The implementation of sub-projects will entail partial and temporal land need therefore the provisions of the ESS5 as described in the RAP will be complied with in addressing impacts such as restrictions to access to properties and displacements.

The Contractors Registration Act (2011)

This Act provides general provisions on roles and responsibility of the contractor's Board and every other related actor, gives guidance on registration procedures and necessary conditions.

The provisions of section 7 subsection (1) part III, states that the Registrar shall keep and maintain registers of contractors of different types, categories and classes in which the name of every person entitled to have his name in them as a registered contractor. Subject to this subsection (6) in the case of an individual, the qualifications and skills as prescribed by the Board necessary to enable him to discharge in satisfactory manner the obligations which he may reasonably be expected or called upon to undertake as a contractor belonging to the category, type and class in respect of which registration is being sought.

The provision of section 10(3) requires that upon registration, the person shall be issued with a certificate of registration indicating the registration number, type, and category, and class, date of registration and duration of registration. Subject to this provision is section 32b) which gives warning that any fraudulently procures or attempts to procure, whether for himself or for any other person, registration as a contractor or a trading license for a contractor; or commits an offence.

The proposed DMDP Phase 2 Project will ensure to comply with the provisions of this Act by employing contractors that are registered following the procedures underlined by this Act and with relevant certificate of registration.

The Engineers Registration Act 1997 (Amendments 2010)

This Act provides general Amendments of engineers' registration Act of 1997 by deleting and substituting new paragraphs, sections and subsections including redefining engineering project, organizations, institutions, registered engineers and firms. Also, clarify the responsibility of the Board, engineers and firms' registration procedures and conditions as well as adding substitutions to help engineers graduate and technicians to get opportunities of being linked to employers and learning.

The provision of subsection 7; the principal Act is amended by adding immediately after section 12 the new section 12A (1) every professional engineer or consulting engineer who has been registered under this Act, shall in addition to such registration possess a practicing certificate. Subject to subsection (3) a person who practices engineering activities without valid practicing certificate, commits an offence and can be convicted.

Provision of subsection 9; Section 14 of the principal Act is amended in paragraph (a) by deleting subsection (1) and substituting for subsection (1) which requires that a person shall not employ as an engineer any person who is not a professional engineer or consulting

engineer or cause to undertake engineering works or services without employing the services of a professional engineer or consulting engineer. Subject to subsection (5) where an employer employs any person as a trainee engineer or incorporated engineer, this section shall not apply to that employee's employer.

The proposed upgrading of urban roads and drainage channels has copied with the act by employing MHANDISI Consultancy LTD, a registered consulting firm by Engineers' Registration Board.

The Architects and Quantity Surveyor Act, 2010

Part IV of the act states the functions of the board.

Section 4 of the act states that subject to the provisions of this Act and any regulations made under it, the functions of the Board are:

- (i) To maintain a register of architects, a register of quantity surveyors and a register of consulting firms and consider and decide upon applications for registration; registration of architects, quantity surveyors and consulting firms and to prescribe fees for registration and annual subscription.
- (ii) To regulate the activities and conduct of architects, quantity surveyors and consulting firms.
- (iii) To enter and inspect the construction, installation or erection sites for the purpose of verifying and ensuring that the works designed are supervised by registered professionals, and that they comply with all governing regulations and laws of the country.
- (iv) To verify and ensure that, every site for construction, installation, erection, or alteration work, has a signboard which shows the names and addresses of the project, client, consultants and the contractors of the project and to take legal action against defaulters.
- (v) To take disciplinary action against registered architects, quantify surveyors and consulting firms, contravening the provisions of this Act,
- (vi) To offer advisory services to the construction industry:
- (vii) To liaise with both local and international professional boards and associations involved in the construction industry for the purposes of consultations.
- (viii) Exchange of ideas, and experiences

The proponent shall therefore observe the provisions of the Act when executing its activities.

The Employment and Labour Relations Act (2004)

This Act gives provisions for the fundamental rights of employees including child labour, forced labour discrimination and freedom of association; Employment standards including hours, remuneration, leave and unfair termination of employment; Trade unions, employer association and federation; Organizational rights; collective bargaining; strikes and lockouts and dispute resolutions.

The provision of Part II subpart A, section 5 (1) requires that no person shall employ a child under the age of fourteen years, and subsection (2) a child under eighteen should not be employed in a workplace considered hazardous. Also subject to Subpart B section 6(1) which clarifies that any person who procures, demands or imposes forced labour, commits an offence. Subpart C, subsection 7(2) requires that an employer shall register, with the Labour Commissioner, a plan to promote equal opportunity and to eliminate discrimination in the

workplace. And Subpart D, section 9 (1) a) every employee shall have the right to form and join a trade union; and section 10(1) a) every employer shall have the right to form and join an employer's association.

The provisions of Part III, subpart A, section 14(1) require that a contract with an employee shall be of the specified period of time and task. Section 15(1) requires that an employer shall provide the employee with a written statement of particulars and a statement of the employee's right in a prescribed form. Subpart B, section 19(1), (3) and (5) require that an employer shall not require or permit an employee to work more than 12 hours in any day or work overtime unless by agreement and be paid not less than one- and one-half times the employee's basic wage for any overtime worked. Section 20 (2) (a) and (b) requires that pregnant employees should not work night shift 2 months before their due date as well as nursing mothers 2 months after birth; subsection (4) an employer shall pay an employee at least 5% of that employee's basic wage for each hour worked at night as an overtime. Section 21(1) and 24(1) dictates that employees shall be given a 60-minute break in a working day and a day off for rest and 24 hours rest a week. Subpart C section 26(1) and 28(1) a) requires calculation of wage rates applicable hourly, daily, weekly or monthly rate of pay, no deduction shall be made unless agreed by the employee in respect of the debt. Subpart D section 31 (1) and (4) an employee should be given leave with paid remuneration as if he was working. Section 32(1) requires that an employee shall be entitled to sick leave and section 33(1) three months maternity leave. And Subpart E, section 37(1) it shall be unlawful for an unfair termination of an employee.

The provisions of Part IV, section 45 (1) Employer shall register into a trade union or employers' association. Part V, section 61(1) an employer shall deduct dues of a registered trade union from an employee's wages if that employee has authorized the employer to do so in the prescribed form. Section 67(1) recognition as exclusive bargaining agent of employees and section 68(1) an employer or employers Association shall bargain in good faith with a recognized trade union.

The proposed DMDP Phase 2 Project will employ 300 direct employments, notwithstanding the provisions of this Act, the project will comply with the provisions of this Act by ensuring that all the requirements, restriction and the rights of employees are respected and guided as underlined by this Act.

The Urban Planning Act (2007)

This Act provide the provisions of fundamental principles of urban planning, institutional framework and responsibilities of every actor, the planning processes, land acquisition and compensation and supplementary planning power.

The provisions of Part II section 3a) states that with a view to giving effect to the fundamental principles of the National Land Policy and the Human Settlements Development Policy, all persons and authorities exercising powers, applying or interpreting the provisions of this Act shall be under the duty to improve the level of the provision of infrastructure and social services for sustainable human settlements development.

Provision of part IV, section 29(I) requires that no person shall develop any land within a planning area without planning consent granted by the planning authority or otherwise than in accordance with planning consent and any conditions specified. Subject to the provision of subsection (3) that Where in connection with an application for planning consent to develop land and subject to any other relevant law, the planning authority is of the opinion that proposals for industrial location, dumping sites, sewerage treatment, quarries or any other

development activity shall have injurious impact on the environment, the applicant shall be required to submit together with the application of an environmental impact assessment report.

The provisions of Part IV, section 52(1) requires that no person shall carry a development in a conservation area without a consent of the planning authority. Subject to the provision of part V, section 63(2) that in giving planning consent under the provisions of this Act to the temporary development of any land within a planning area, the planning authority concerned may give such planning consent on the condition that the value of such temporary development shall not be taken into account for the purposes of assessing any compensation payable to the landholder of such land and, in such case the value of any temporary development shall not be taken into account for the purpose of assessing compensation payable. Subject to section 64(1), However if land is injuriously affected by the coming into operation of the development project compensation will be done, and section 67 that the compensation under this section shall be paid as provided for under the Land Act and the Village Land Act.

The proposed DMDP Phase 2 Project will ensure to comply with the provisions of this Act by consulting planning authority for the fulfilment of all required procedures, has conducted an Environmental Impact Assessment and the report will be submitted to the authority, will ensure compensation wherever needed as the payable rates required by this Act.

The Worker's Compensation Act (2008)

This Act provides general provisions for rights for workers to compensations for occupational accidents and diseases. It includes worker's compensation funds, board of trustee and its responsibility, right of compensation and protection, claims for compensations and relevant procedures, determination of compensation including medical and rehabilitation benefits and the roles and responsibilities of an employers to ensure workers compensations and settling of disputes.

The provisions of Part I section 3 provide the objectives of this Act including Paragraph (a) to provide for adequate and equitable compensation for employees who suffer occupational injuries or contract occupational diseases arising out of and in the course of their employment and in the case of death, for their dependents.

The provision of Part IV section 19 (1) requires that where an employee has an accident resulting in the employee's disablement or death, the employee or the dependents of the employee shall subject to the provisions of this Act, be entitled to the compensation provided under this Act. Subject to section 20 that any accident during the conveyance of an employee to or from his place of employment for the purpose of his employment by any means of conveyance shall be compensated. Also subject to the provisions of section 22 (1) Where an employee contracts a disease and the disease has arisen out of and in the course of the employee's employment, the employee shall be compensated.

Subject to the provision of Part VI, section 58 (I) the manner on which calculation of compensation shall be done will be through calculating the earnings of an employee in the monthly rate at which the employee was being remunerated by the employer at the time immediately before the accident. The provisions of Part VIII section 71 (1) require that an employer carrying on business in Tanzania within the prescribed period shall register to the Director General in the prescribed form and shall submit prescribed particulars as he may require, and section (4) that failure to do that will be convicted. Subject to the provision of this section 74 that employer will be assessed by Director General according to a tariff of

assessment calculated on the basis of the percentage of annual earnings of the employer's employees as the Board may, with due regard to the requirements of the Fund for the year of assessment deem necessary.

Provision of section 76(1) requires that where a mandatory in the course of or for the purposes of his business enters into an agreement with a contractor for the execution by or under the supervision of the contractor of the whole or any part of any work undertaken by the mandatory, the contractor shall, in respect of the employees of the contractor employed in the execution of the work, register as an employer in accordance with the provisions of this Act and pay the necessary assessment.

The provision of section 78 requires that an employer or the relevant trade union shall notify any employee who is injured in an accident or who contracts an occupational disease of his rights and the procedures to be followed in order to claim compensation under this Act.

The proposed DMDP Phase 2 Project will ensure to comply with the requirements of this Act by ensuring that the contractor for project execution will register as an employer and pay the necessary assessment fees as required by this Act. Also, throughout project execution, employees' rights as regard to compensation in case of occupational accidents or disease will be done according to the provision of this Act.

The Sexual Offenses Act 1998

An Act provides special provisions in regard to sexual and other offences to further safeguard the personal integrity, dignity, liberty and security of women and children.

The provision of Section 138D subsection (3) requires that for the avoidance of doubt, unwelcome sexual advances by words or action used by a person in authority, in a working place or any other place, shall constitute the offence of sexual harassment.

The proposed DMDP Phase 2 Project will ensure to comply with the provisions of this Act by ensuring that sexual harassment offenses are translated at workplace for every employee to know their rights.

Law of Marriage Act, 1971

This Act provides the general provisions of Marriage, marriage registration, annulments and divorces and evidence of property, rights, liabilities and status marriage as well as matrimonial proceedings and offenses.

The proposed DMDP Phase 2 Project will ensure to comply with this Act by respecting marriage, employees will be required to respect their marital status and of others. In addition to the employees and public along the road project will be offered regular HIV and AIDS and gender education and awareness.

Law of the Child Act, 2009

This Act provides general provisions of rights and welfare of the child including care and protection of a child conditions. Also, clarifies responsibilities of different actors including parents in ensuring the rights of a child whether at home, foster home, school, institutionalized care, and workplace or in custody. The provision of Part II section 12 requires that a person shall not employ or engage a child in any activity that may be harmful to his health, education, mental, physical or moral development.

The provisions of Part VII, section 78(1) a person shall not employ or engage a child in any kind of exploitative labour. Subject to the provision of subsection (2) that every employer shall ensure that every child lawfully employed or engaged in accordance with the provisions of this Act is protected against any discrimination or acts which may have a negative effect on him taking into consideration his age and evolving capacities. In addition to section 79(1) the child shall not be employed or engaged in a contract of the service performance which shall require a child to work at night. And subject to provision of section 81 (1) a child has a right to be paid remuneration equal to the value of the work done.

The proposed DMDP Phase 2 Project will comply with the provisions of this Act by ensuring does not employ a child or impose a forced child labour in any phase of project execution.

The Project LMP sets the minimum age for the project workers at 18 years and above, in line with ESS2 and this Act. The Act (Section 77) provides minimum age of 14 years for child work in non-hazardous tasks but in order to align with ESS2, the minimum age in the project is considered 18 years.

The Valuation and Valuers Registration Act, 2016

38.-(1) Subject to this Act, a person shall not offer assistance in inspection, carrying out a valuation or preparation of valuation reports unless the person has been enlisted by the Board.

50.-(1) In the course of undertaking valuation and preparation of the valuation report, a registered valuer shall state the basis and method of valuation adopted and all assumptions used in arriving at values.

51.-(1) In the valuation process, a registered valuer shall apply the appropriate method of valuation and shall include-

- (a) Direct market comparative method.
- (b) Replacement cost or contractor's test method.
- (c) Income approach or investment method.
- (d) Profit method; and
- (e) Residual method

52(2) Notwithstanding subsection (1), valuation conducted together with valuation reports prepared under this Act for purposes of compensation shall be valid for the period of two years commencing from the date of endorsement of the valuation report.

52(3) The endorsement of the valuation report under subsection (2) shall be affected within six months after the valuation of interest in property of the last person.

The valuation of properties of all PAPs in TMC will be guided by the registered valuer but the value to be used will be replacement cost as provided for under ESS5 and described in the RAP.

The Valuation and Valuers Regulations of 2018

Land will be valued by means of the Comparative Method of Valuation, i.e., by determining the market value of a land parcel through an analysis of market prices of similar land parcels sold recently in the same or competing neighbourhoods. Where available current base (indicative) market rates for land will be issued to the Registered Valuer from the Office of the Chief Valuer (Section 53 of the Valuation and Valuers Regulations 2018).

These market base rates for land will be based on consultations (through the Chief Valuer) with District Land Officers and the Regional Valuers and convert indicative rates into specific rates. Specific rates for land will be determined at RAP stage. Any transactional costs associated with acquiring new land will be included in the compensation amount.

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

The basis for assessment of the value of any land and unexhausted improvement for purposes of compensation under the Act shall be the market value of such land. Every assessment of the value of land and unexhausted 'improvement for the purpose of the Act shall be prepared by a qualified valuer. Every assessment of the value of land and unexhausted improvement for the purposes of payment of compensation by the Government or Local Government Authority shall be verified by the Chief Valuer of the Government or his representative.

Compensation for loss of any interest in land shall include the value of the unexhausted improvement disturbance allowance, transport allowance, accommodation allowance and loss of profits.

The project's valuation assessment to the PAPs shall abide by the regulations' requirements.

The Environmental Management (Hazardous Control and Management) Regulation 2009

The Regulations emphasize for proper handling of all types of hazardous materials which are harmful when in contact with humans or the environment. The regulations also require the hazardous waste to be guided by principles of environment. In addition, the regulations place responsibility of the hazardous waste generator for the sound management and disposal of such waste and that shall be liable for damage to the environment and human health arising thereby.

The construction contractor shall abide to all hazardous waste control measures especially during the construction of in water structures. During operation of the project, all ships shall be provided with hazardous waste management guidelines.

The Hazardous Control and Management Regulations contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. Application of the Regulations to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them. The applicability of the Regulations should be tailored to the hazards and risks established for each project on the basis of the results of an environmental assessment in which site-specific variables, such as host country context, assimilative capacity of the environment, and other project factors, are taken into account. Under DMDP Phase 2 project, these guidelines shall be implemented during construction and operation of the urban roads and drainage channels' subprojects.

The Road Management Regulation 2009

The regulation provides for the road authority in whose jurisdiction a road is situated shall be responsible for the control and management of road. Regulation 6 provides for road access whereby it indicates the requirements for road access. In addition, Regulation 7 provides for

prohibitions of activity in the place where it is designated as a road of access. The law prevents obstruction visibility or hinders convenient passage of motor vehicles or trailer along the road.

The proponent will observe this by avoiding constructing roads in prohibited areas.

3.7 Relevant International Conventions Ratified by Tanzania Include: -

- ILO Convention: C138 Minimum Age Convention, 1973 (Ratified by Tanzania (United Republic of) on 16/12/1998) which prohibits Child labour. The contractor under DMDP Phase 2 project shall ensure no child is employed in its activities.
- ILO Convention: C182 Worst Forms of Child Labour Convention, 1999 (Ratified by Tanzania (United Republic of) on 12/09/2001). PO-RALG through contractor shall ensure no child is employed in its activities.
- Discrimination (Employment and Occupation) Convention, 1958

The International Labour Organization having considered the declaration of Philadelphia and the discriminations prohibited by the Universal Declaration of Human Rights, convened at Geneva by the ILO Governing Body in 1958, passed a Convention on Discrimination (Employment and Occupation). The Convention defines discrimination as any distinction, exclusion or preference made on the basis of race, colour, sex, religion, political opinion, national extraction or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation; and that, such other distinction, exclusion or preference which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation as may be determined by the Member concerned after consultation with representative employers' and workers' organizations, where such exist, and with other appropriate bodies.

The Discrimination (Employment and Occupation) Convention of 1958 has been ratified by Tanzania on 26th February 2002. Thus, the contents of this convention are binding Tanzania jurisdictions. Each Member for which this Convention is in force undertakes 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, with a view to eliminating any discrimination in respect thereof.

The Convention further requires member states for which this Convention is in force to undertake, by methods appropriate to national conditions and practice: to seek the co-operation of employers' and workers' organizations and other appropriate bodies in promoting the acceptance and observance of this policy; to enact such legislation and to promote such educational programmes as may be calculated to secure the acceptance and observance of the policy; to repeal any statutory provisions and modify any administrative instructions or practices which are inconsistent with the policy; to pursue the policy in respect of employment under the direct control of a national authority; to ensure observance of the policy in the activities of vocational guidance, vocational training and placement services under the direction of a national authority; to indicate in its annual reports on the application of the Convention the action taken in pursuance of the policy and the results secured by such action.

The Convention further stipulate that, any Member may, after consultation with representative employers' and workers' organizations, where such exist, determine that other special measures designed to meet the particular requirements of persons who, for reasons

such as sex, age, disablement, family responsibilities or social or cultural status, are generally recognized to require special protection or assistance, shall not be deemed to be discrimination.

PO-RALG and associated project implements shall not practice any kind of discrimination of the employees during both construction and operation phases.

Termination of Employment Convention, 1982 (ILO Convention No. 158)

Although this convention may exclude certain categories of employees including probationary workers, the convention is generally applicable to all branches of economic activity and to all employed persons. This provision suggests that member states have been given options to apply or to skip the application of certain contents of this convention when dealing with certain category of employees, but before such neglect certain requirements should be considered.

From the above provision is should be learnt that exclusion of the probationary employees, among others, stated in the Convention is not a compulsive requirement upon the member states. This suggests that some members will opt to apply the stipulated Convention provisions to probationary employees expressly or impliedly.

In conjunction with The Employment and Labour Relations (Code of Good Practice) G.N. No 42, PO-RALG and associate project implements shall comply with the requirements of convention by following proper termination procedures of the employees during both construction and operation phases.

The Universal Declaration of Human Rights, 1948

The declaration proclaims a common standard of achievement for all peoples and all nations, to the end that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and education to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction.⁴¹ The declaration (UDHR) further states clearly that, all human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood. It further declares that “everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. Furthermore, no distinction shall be made on the basis of the political, jurisdictional or international status of the country or territory to which a person belongs, whether it is independent, trust, non-self-governing or under any other limitation of sovereignty.

The declaration (UDHR) has declared universally that “everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment. Everyone, without any discrimination, has the right to equal pay for equal work. Everyone who works has the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection. Everyone has the right to form and to join trade unions for the protection of his interests.”

Even though the Universal Declaration of Human Rights of 1948 not formally by itself legally binding, the Declaration has been adopted in or influenced United Republic of

Tanzania, wherein the government commit itself and its people to progressive measures to secure the universal and effective recognition and observance of the human rights set out in the Declaration.

Thus, the declaration is obviously a fundamental document of the United Nations and a powerful tool when applying diplomatic and moral pressure to governments that violate and of its provisions.

PO-RALG and its associates during the subproject implementation shall observe/comply to the provision of human rights during both phases.

3.8 Administrative Framework

In general, the key authority responsible for environmental protection and natural resources management is the Ministry of Natural Resources and the Environment through Division of Environment (DoE) and National Environment Management Council (NEMC). The Ministry is empowered by legislation which governs the use of the natural resources and environment. The Ministry is aided by other government ministries and local government authorities to safeguard the environment.

Below are relevant Institutions, their Roles and Responsibilities to the proposed upgrading of roads and drainage channels under DMDP Phase 2 project in Kigambomi Municipality.

National Environmental Authorities

The envisaged institutional framework for environmental management in the country includes the following levels of governance:

- The Minister responsible for the environment.
- National Environmental Advisory Committee
- The Office of the Director of Environment (DOE).
- Sector ministries and their environmental sections.
- Regional administrative secretariats (RASs); and Local government authorities (LGAs), they are city, municipal, district, township, ward, village, mtaa and kitongoji.

The Environmental Management Act of 2004 (EMA) contains detailed descriptions of roles and responsibilities. A brief overview is as follows:

I. Minister Responsible for Environment

The Minister is responsible for matters relating to the environment, including giving policy guidelines necessary for the promotion, protection and sustainable management of the environment in Tanzania. The Minister approves an ESIA and may also delegate the power of approval for an ESIA to the DOE, Local Government Authorities or Sector Ministries. The Minister also:

- Prescribes (in the regulations) the qualifications of persons who may conduct an ESIA.
- Reviews NEMC reports on the approval of an ESIA.
- Issues an ESIA certificate for projects subject to an ESIA.
- Suspends an ESIA certificate in case of non-compliance.
- National Environmental Advisory Committee

The National Advisory Environmental Committee is comprised of members with experience in various fields of environmental management in the public and private sector and in civil

society. The committee advises the Minister on any matter related to environmental management. Other functions include:

- Examine any matter that may be referred to it by the Minister or any sector Ministry relating to the protection and management of the environment.
- Review and advise the Minister on any environmental plans, environmental impact assessment of major projects and activities for which an environmental impact review is necessary.
- Review the achievement by the NEMC of objectives, goals and targets set by the Council and advise the Minister accordingly.
- Review and advise the Minister on any environmental standards, guidelines and regulations.
- Receive and deliberate on the reports from Sector Ministries regarding the protection and management of the environment.
- Perform other environmental advisory services to the Minister as may be necessary.

II. Division of Environment (DoE)

The functions of the Division of Environment include:

- Coordination of various environmental management activities undertaken by other agencies.
- Promotion of the integration of environmental considerations into development policies, plans, programmes, strategies, projects.
- Undertaking strategic environmental risk assessments with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of quality of human life in Tanzania.
- Advise the Government on legislative and other measures for the management of the environment or the implementation of the relevant international environmental agreements in the field of environment.
- Monitoring and assessing activities undertaken by relevant Sector Ministries and agencies.
- Preparation and issuing of reports on the state of the environment in Tanzania through relevant agencies.
- Coordination of issues relating to articulation and implementation of environmental management aspects of other sector policies and the National Environment Policy

III. National Environment Management Council (NEMC)

The NEMC's purpose and objective is to undertake enforcement, compliance, review and monitoring of ESIA's and to facilitate public participation in environmental decision making.

According to the Environmental Management Act (2004) the NEMC has the following responsibility pertaining to ESIA in Tanzania:

- Registers experts and firms authorized to conduct ESIA.
- Registers projects subject to ESIA.
- Determines the scope of the ESIA.
- Set-up cross-sectoral Technical Advisory Committee (TAC) to advise on ESIA reviews.
- Requests additional information to complete the ESIA review.

- Assesses and comments on ESIA, in collaboration with other stakeholders. Comments will be received and handled throughout the implementation phase.
- Convenes public hearings to obtain comments on the proposed project.
- Recommends to the Minister to approve, reject, or approve with conditions specific EIS.
- Monitors the effects of activities on the environment.
- Controls the implementation of the Environmental Management Plan (EMP).
- Makes recommendations on whether to revoke ESIA Certificates in case of non-compliance.
- Promotes public environmental awareness.
- Conducts Environmental Audits

IV. Sector Ministries

The existing institutional and legal framework the Sector Ministries are required to establish Sector Environmental Sections headed by the Sector Environmental Coordinator.

The Sector Ministries' Environmental Sections.

- Ensure environmental compliance by the Sector Ministry.
- Ensure all environmental matters falling under the sector ministry are
- Implemented and report of their implementation is submitted to the DOE.
- Liaise with the DOE and the NEMC on matters involving the environment and all matters with respect to which cooperation or shared responsibility is desirable or required.
- Ensure that environmental concerns are integrated into the ministry or department development planning and project implementation in a way which protects the environment.
- Evaluate existing and proposed policies and legislation and recommend measures to ensure that those policies and legislation take adequate account of the effect on the environment.
- Prepare and coordinate the implementation of environmental action plans at national and local levels.
- Promote public awareness of environmental issues through educational programmes and dissemination of information.
- Refer to the NEMC any matter related to the environment.
- Undertake analysis of the environmental impact of sectoral legislation,
- Regulation, policies, plans, strategies and programmes through strategic environmental assessment (SEA).
- Ensure that sectoral standards are environmentally sound.
- Oversee the preparation of and implementation of all ESIA's required for investments in the sector.
- Ensure compliance with the various regulations, guidelines and procedures issued by the Minister responsible for the environment and
- Work closely with the ministry responsible for local government to provide environmental advice and technical support to district level staff working in the sector.

For the road sub-sector, the Po-RALG through TARURA and PIT in which among others its role is to monitor the implementation of policies related to environmental management in road sector.

V. Regional Secretariat

The Regional Secretariat, which is headed by the Regional Environmental Management Expert, is responsible for the co-ordination of all environmental management programmes in their respective regions. The Regional Environmental Expert:

- Advises local authorities on matters relating to the implementation of and enforcement of environmental laws and regulations.
- Creates a link between the region and the DOE and the Director General of the NEMC.

VI. Local Government (Urban Authorities) Act No 8 1982 RE 2000

This law establishes urban Authorities at the City, Municipality and Town Council levels.

The Environmental Management Committee of each jurisdiction:

- Initiates inquiries and investigations regarding any allegation related to the environment and implementation of or violation of the provisions of the Environmental Management Act.
- Requests any person to provide information or explanation about any matter related to the environment.
- Resolves conflicts among individual persons, companies, agencies, non-governmental organizations, government departments or institutions about their respective functions, duties, mandates, obligations or activities.
- Inspects and examines any premises, street, vehicle, aircraft or any other place or article which it believes, or has reasonable cause to believe, that pollutant or other articles or substances believed to be pollutant are kept or transported.
- Requires any person to remove such pollutants at their own cost without causing harm to health and;
- Initiates proceedings of civil or criminal nature against any person, company, agency, department or institution that fails or refuses to comply with any directive issued by any such Committee.

Under the Environmental Management Act (2004), the Municipal Council has Environmental Inspectors who are responsible for environmental matters. The functions of the inspectors are to:

- Ensure enforcement of the Environmental Management Act in their respective areas.
- Advise the Environmental Management Committee on all environmental matters.
- Promote awareness in their areas on the protection of the environment and conservation of natural resources.
- Collect and manage information on the environment and the utilization of natural resources.
- Prepare periodic reports on the state of the local environment.
- Monitor the preparation, review and approval of ESIA's for local investors.
- Review by-laws on environmental management and on sector specific
- Activities related to the environment.

- Report to the DOE and the Director General of the NEMC on the implementation of the Environmental Management Act and
- Perform other functions as may be assigned by the local government authority from time to time.

The road Act 2007 has illustrated the direct link with the Land use planning and resettlement compensation process. Section 14(I) directs that The Minister of Ministry of Works: Transport and Communication (Mock) shall cause a plan or survey to be prepared of all public roads declared under this Act and require that the authenticated plans or survey shall be submitted to the Director of Surveys and Mapping for registration. Section 16 requires following land acquisition procedures and resettlement compensation in accordance with the Land Acquisition Act, Land Act, Village Land Act and any other written law.

Ministry of Lands, Housing and Human Settlement Development

The Ministry of Lands and Human Settlement Development is responsible for policy, regulation and coordination of matters pertaining to land in Tanzania. The Ministry has the following responsibilities. Urban authorities are general land administered under the Land Act no. 4 1999. There is a Commissioner of Lands who has representatives in each Region as Assistant Commissioner for Lands with Authorised Officers in each Municipalities who have mandate for due diligence in land tenure issues. For guidance the RAP will have to be used.

The Surveys and Mapping assists in boundaries issues if land is surveyed.

The Temeke Municipal Council has Land Administration Department that is headed by a Authorised Officer who is mandated in matters related to land tenure for clarity on claims to land rights for compensation especially if the land has a formal land title. Otherwise, Local Government leaders can help in the identification of the Bonafide claimants.

The Chief Valuer is the principal advisor to the Government on all matters relating to valuation, and the Head of the Valuation Department within the Ministry, and has had the following functions:

- To advise the Government on valuation matters and activities, including valuation rates in purchase and dispose of Government properties.
- To carry out the valuation of properties or other assets upon request from the Government, institutions, individuals and members of the public.
- To prepare and maintain a database on property transaction or related data relating to the Government.
- Manage complaints arising out of Government valuation.

Administrative Requirements for the ESIA implementation

This ESIA will be implemented for sub-projects within the Temeke Municipality and therefore the responsibility of ensuring compliance lies under the jurisdiction of the Temeke PIT -under the Municipal Director. The ESIA approval process is done by the National Environmental Management Council and Certificate issued by the Vice President's Office-Environment. The WB also has the mandate of reviewing and approving this report and once cleared the report will be disclosed by the Bank and the implementing entity.

During Construction phase; the contractor will implement the project in compliance with the ESIA requirements as well as prepare a C-ESMP that will be approved by the implementing agency.

4. BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS

4.1 Overview

This section presents an overview of existing environmental and social economic conditions of the proposed project area. The baseline information was collected from primary as well as secondary sources. Primary information was collected through field surveys, consultations and using satellite images while secondary information was collected from published journals, books, authorized website and government reports. The main objectives of describing the environmental and social setting are to assess the existing environmental and social quality as well as study the environmental and social impacts due to the proposed area.

4.2 Project Area of Influence

In order to guide the extent of ESIA and Baseline studies, the subproject's area of influence is determined to define the study boundaries. To assess and analyze the impacts, the project boundaries and impact zones are classified below as primary, secondary and tertiary.

a). Primary (Direct) Impact Zone/ area of influence: This is an immediate area of impacts (footprint) where the construction works will concentrate. This includes mainly the subproject installation/host site/area and its corridor (as applicable).

b). Secondary (Indirect) Impact Zone/ Area: This covers the areas adjacent to the project area and where changes in the E&S conditions may be experienced due to the project activities during the construction and operation phases. The off-site locations are mainly outside the main subproject host-site boundaries, which may be linked to sourcing materials such as gravel, aggregates, sand, water, etc. The neighbouring residents and economic activities surrounding the project sites are also considered to be part of the secondary impact area. This may cover up to a 2km radius from the project centre. Potential for cumulative impacts needs to be considered both in “direct” and “indirect” areas of influence.

c). Tertiary Impact Zone/ Area: This includes the area beyond 2 km and covers the wider geographical areas within or outside the project administrative boundaries, region, or country. This usually includes induced/perceived impacts.

4.3 General Setting of the Project Area

The proposed project is in Temeke District, one of five districts of the Dar es Salaam Region of Tanzania. Temeke is bordered to the south by the Mkuranga District of the Pwani Region, to the north by the Indian Ocean, and to the northwest by the Ilala District. Temeke's eastern boundary is shared by Kigamboni District.

The project will have 44.4 km of road networks and Eight Footbridges, which will be upgraded to bitumen standard. The proposed projects roads are connecting different important location such as commercial centres to one another, pass through less urbanized area, with small number of residential areas and commercial areas. The proposed project roads interconnect to each other and to the present bitumen roads.

Roads in these areas are predominantly earthen. No drainage system was observed along the earthen roads. Most of the roads are of 4-6 meters wide, which are dominated by different types of premises along their sides as shown in the figure 4.1.



Figure 4-1: Premises along the proposed project Temeke roads

4.4 Meteorological Conditions of the Project Area

This section is based on the findings given by Tanzania Meteorological Agency (TMA) from its recent official published statement bears the name as “Statement on the Status of Tanzania Climate in 2021”. The paper stated that Tanzania as the one of the developing countries also suffers the impact of the climatic change such as increasing temperatures, sea level rise, changing precipitation patterns and frequent extreme weather events that might threaten human life and safety, water and pasture availability, food security, and socio-economic development. It also identifies that the extreme temperatures, heavy rainfall, floods, prolonged dry spells, and droughts have significantly caused damage to infrastructures, disruptions of agricultural activities, and even increased habitat suitability for biting insects, pests, and transmission of vector-borne diseases.

Climate of Tanzania

Temperature distribution

Temperatures across the country are normally characterized by relatively less fluctuation throughout the year. The annual long-term average temperature over different stations in the country ranges from 14.4 °C to 26.4 °C. Regions with the highest temperatures are along the coast and western parts of the country. The season with high temperatures starts from October through February or March of the following year, whilst the cold season is from May to August. The annual minimum air temperature (Tmin) and maximum air temperature (Tmax) across the stations in the country ranges from 9.6 °C to 22 °C and 19.1 °C to 30.7 °C respectively.

On average, November and December were the warmest months of the year 2021, November being a record break in historical perspective while December being the third warmest on

record since 1970. In those months the country average air temperature anomaly was 1.3 °C and 1 °C above long term average (1981-2010). In addition, higher maximum temperature anomaly between 1°C and 2 °C above long term average were observed over a large part of the country in November, except northern coast, north-eastern highlands, and southern regions whose temperature anomaly exceeded 2 °C. Likewise, maximum temperature anomaly exceeding 2 °C was observed in southern region extending to south-western highlands during December. On the other hand, September recorded relatively warmer nights, whereby many parts of the country recorded temperature anomalies between 1°C and 2 °C above long term average.

Rainfall distribution

The rainfall distribution and variability are driven by multiple factors including East African Monsoon, El-Niño Southern Oscillation (ENSO), and westerlies from Congo, tropical cyclones, and Inter-Tropical Convergence Zone (ITCZ). The migration of ITCZ north and south across the equator is among the main factors affecting the distribution and variability of rainfall in Tanzania and the entire East African region. The migration of the ITCZ lags the overhead sun by 3-4 weeks over the region. The ITCZ migrates to southern regions of Tanzania in October to December, reaching the southern part of the country in February and reverses northwards in March, April, and May. Due to this movement, some areas experience single and double passages of the ITCZ. The areas that coincide with single passage are known as unimodal areas. These include the southern, south-western, central, and western parts of the country, which receive rainfall from November to April or May (NDJFMA, also known as Msimu). Areas that experience double passage are known as bimodal, and include northern coast, north-eastern highlands, Lake Victoria areas, and the Islands of Zanzibar (Unguja and Pemba). These regions receive two distinct rainfall seasons. The long rainy season (also known as Masika), which starts mainly in March and continues through May (MAM) and the short rainfall season (also called Vuli) which starts in October and continues through December (OND). January and February are the transition period (relatively dry) for bimodal areas while June, July, August, and September are dry months for the entire country.

The country total rainfall for 2021 was 847.2 mm, which is 177.5 mm below the long-term average and equivalent to 82.7% of average. This observation makes 2021 to be the fourth driest year on record since 1970, where 2003, 2012, and 2005 were the first, second, and third driest years respectively. Most parts of the country received normal rainfall ranging between 75% and 100% of average, except for the northern coastline including Zanzibar Islands, which received below normal rainfall ranging between 50% and 75% of average. However, the year 2021 was particularly wet over South-eastern Tanzania, specifically, the eastern part of the Mtwara region which recorded above normal rainfall ranging between 125% and 150%.

Weather and climate related impacts

The extreme weather events had major and adverse impacts on population displacement, destruction of infrastructures (i.e., Railway Line, Roads, Telephone lines etc.) and loss of lives and properties. In addition, due to less rainfall, especially towards the end of the year many areas in the country are normally affected by prolonged dry spells which might impair agricultural activities, pasture, and water availability. Prolonged dry spells coupled with high temperatures during September to December may also cause a severe shortage of water and pastures.

Climatic change scenarios

Tanzania being a member of the UN has signed a number of multilateral agreements to protect the environment and one of it is The Paris Agreement of 2015 which sets out a global framework to limit global warming to well below 2°C, preferably to 1.5°C (degrees Celsius), compared to pre-industrial levels. To achieve this global temperature goal, countries aim to reduce the growth of greenhouse gas emissions as soon as possible and rapid reductions, thereafter, based on the best available science, economic and social feasibility.

The effects of climate change are already well visible by increasing air temperatures, melting glaciers and decreasing polar ice caps, rising sea levels, increasing desertification, as well as by more frequent extreme weather events such as heat waves, droughts, floods and storms. Climate change is not globally uniform and affects some regions more than others. On the Table 4.2 and Figure 4.2, you can see how climate change has already affected Dar es Salaam where the projects located during the past 40 years.

The data source used is ERA5, the fifth generation ECMWF atmospheric reanalysis of the global climate, covering the time range from 1979 to 2021, with a spatial resolution of 30 km.

Table 4-1: climate change scenarios

Region	Climatic change scenario
Dar es Salaam	Figure 4.2 graph shows an estimate of the mean annual temperature for the larger region of Dar es Salaam. The dashed blue line is the linear climate change trend. If the trend line is going up from left to right, the temperature trend is positive, and it is getting warmer in Dar es Salaam due to climate change. If it is horizontal, no clear trend is seen, and if it is going down, conditions in Dar es Salaam are becoming colder over time. In the lower part the graph shows the so-called warming stripes. Each coloured stripe represents the average temperature for a year - blue for colder and red for warmer years. Figure 4.3 shows an estimate of mean total precipitation in the larger region of Dar es Salaam. The dashed blue line is the linear climate change trend. If the trend line is going up from left to right, the precipitation trend is positive, and it is getting wetter in Dar es Salaam due to climate change. If it is horizontal, no clear trend is seen and if it is going down, conditions are becoming drier in Dar es Salaam over time. In the lower part the graph shows the so-called precipitation stripes. Each coloured stripe represents the total precipitation of a year - green for wetter and brown for drier years. <i>From the figures 4.4 and 4.5 it is clear that alternate change in climatic conditions i.e., rainfall and temperature may affect the project life span due to the deterioration of the strictures.</i>

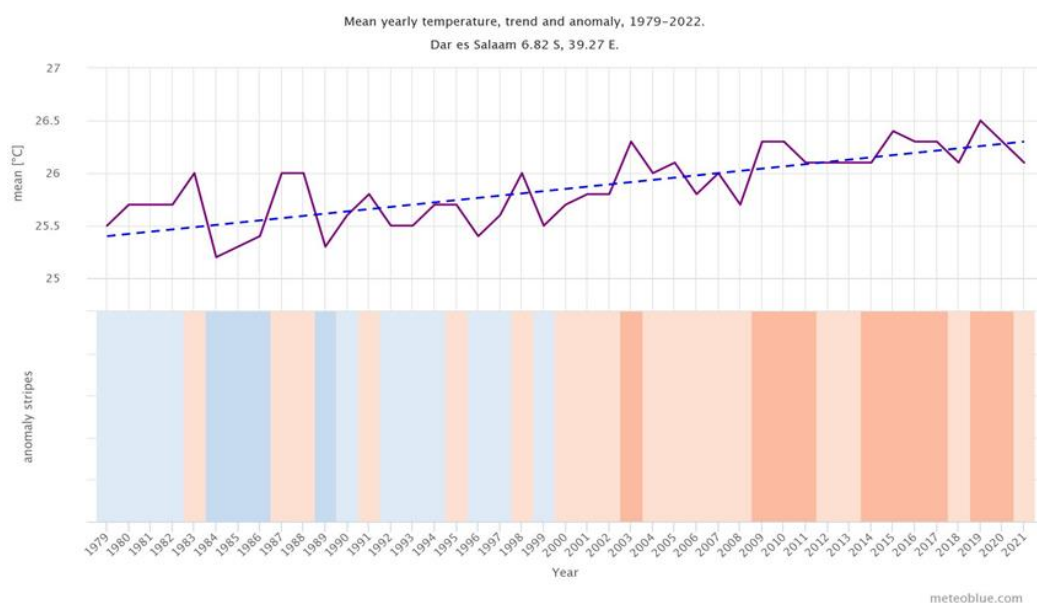


Figure 4-2: Mean yearly temperature trend for Dar es Salaam.

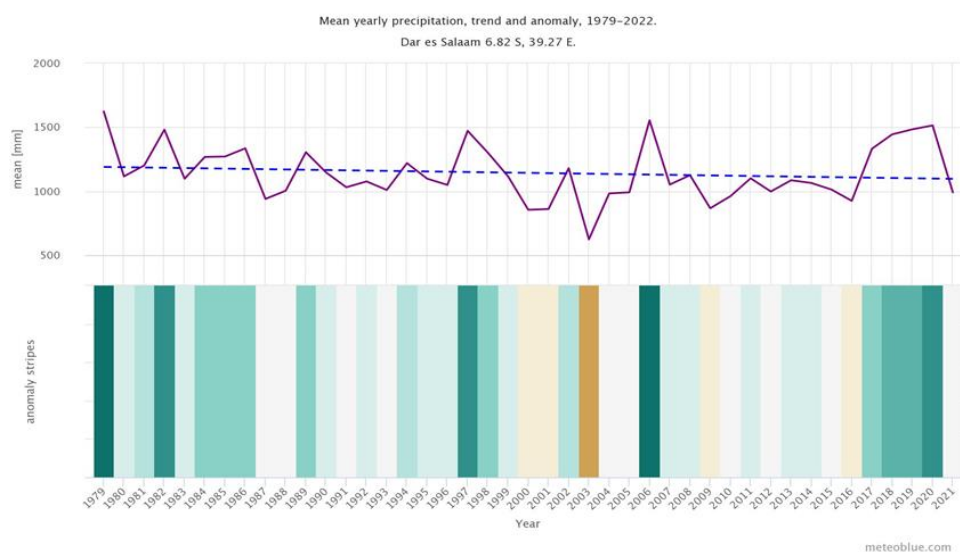


Figure 4-3: Mean yearly precipitation trend for Dar es Salaam.

Wind Distribution

Wind rose diagrams plotted using data recorded during the 1/1/2021 - 00:00 to 1/2/2022 - 02:00 were shown in the Figure 4.4. From the results, it can be clearly stated that each region depicts its own wind pattern at different period of time. Thus, the direction of the pollutant to the particular region could be different as it is explained.

Region	Wind pattern Description
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Region	Wind pattern Description
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Dar es Salaam	The wind rose shows that during this particular sampling period the wind blew from the Southeast - 9.75% of the time, and from the northeast 3.9% of the time see figure 4.4 and 4.5. The longest time with the highest wind speed is observed from southeast direction. Thus, the highest pollutant movement will follow that direction of wind at that particular time of the project phase.
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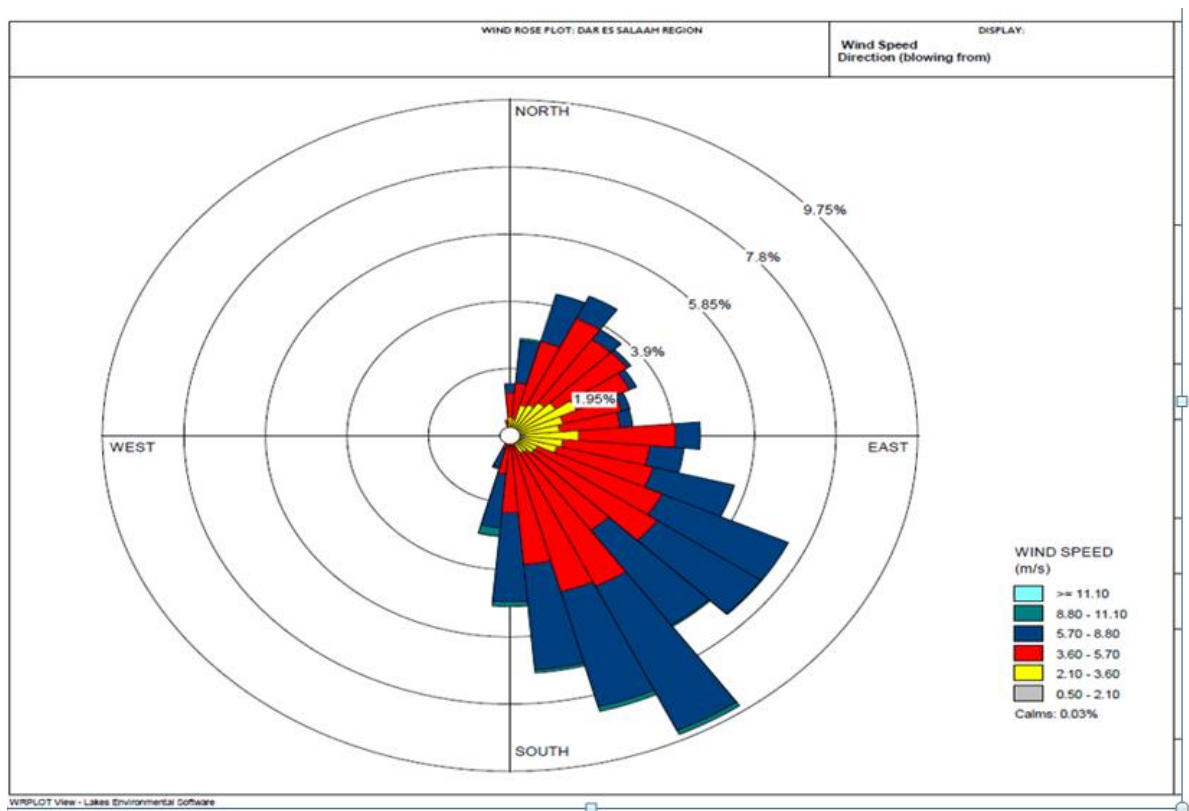


Figure 4-4: Wind Rose for Dar es Salaam Region

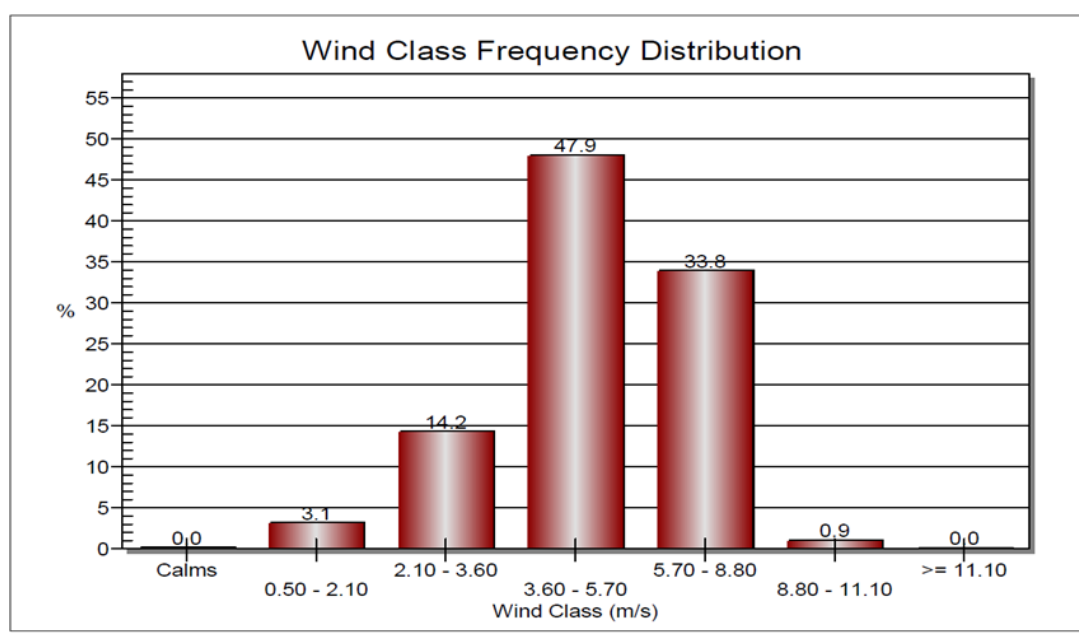


Figure 4-5: Wind Graph for Dar es Salaam Region

Relative Humidity

Humidity refers to the water vapour content in the air at that particular place and time. Relative humidity is the ratio of the air's water vapour content to its water vapour capacity and directly related to the rate of evaporation. Relative humidity of the area ranges from 68-94 % from August to October, increasing to 82 % during the wettest months of April (NDF 2014).

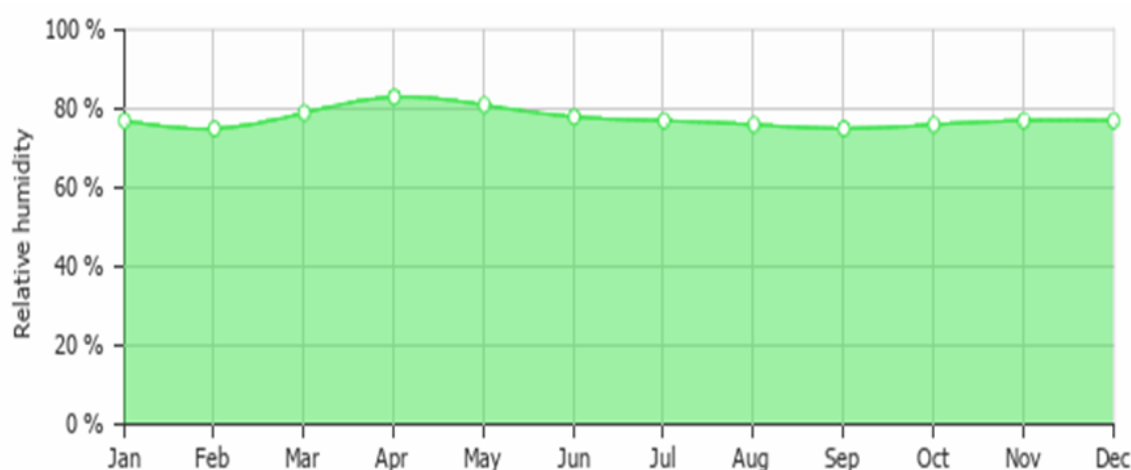


Figure 4-6: Relative Humidity for Dar es Salaam Region

Source: (<https://weather-and-climate.com/Average-Monthly-Rainfall-Temperature-Sunshine, Dar-Es-Salaam, Tanzania>)

4.5 Local and Site-Specific Baseline Information

Physical Environment

Topography

The project in Temeke District is located within a diverse topography that plays a crucial role in shaping the landscape and characteristics. The topography is primarily characterized by a combination of low-lying coastal areas, elevated sections, and a network of water bodies. The coastal areas of Temeke District are defined by relatively flat terrain that gradually slopes towards the Indian Ocean. These low-lying regions are often interspersed with marshes, wetlands, and estuaries, which provide important ecosystems for biodiversity and act as natural buffers against coastal erosion and flooding. The proximity to the ocean also influences the local climate and provides opportunities for economic activities such as fishing and trade. In contrast, some sections of the sub-project area feature slightly elevated terrain, gently rising from the coastal plains. These elevated areas can be found in neighbourhoods like Mbagala and Kijichi. They offer panoramic views of the surrounding landscape and tend to have a somewhat cooler and breezier atmosphere compared to the low-lying coastal regions. Water bodies like rivers, streams, and drainage channels crisscross the project area, affecting its drainage patterns and land use. These water features are integral to Temeke's topography, contributing to its overall hydrology and influencing the development of

settlements and infrastructure. Managing these water bodies effectively is critical for flood control and water resource management in the project area. Overall, the project area topography showcases a blend of coastal plains, elevated sections, and interconnected water bodies. This diverse landscape not only shapes the physical appearance but also influences its environmental dynamics, socio-economic activities, and urban planning considerations. The topography is shown in figure 4.7.

Geology

The geology in Temeke is closely linked to its coastal location and plays a significant role in shaping the natural resources, landforms, and geological characteristics of the area. The area is part of the larger geological context of the East African Rift System, which has played a pivotal role in the formation of the African continent. The coastal areas of area are underlain by a combination of sedimentary rocks, including sandstones, shales, and limestone, which were deposited over millions of years as sea levels rose and fell. These sedimentary rocks often contain fossils that provide insights into the ancient marine environments that once existed in the region. Limestone, in particular, is an important geological feature that can be found in some areas and is used for construction and as a raw material in various industries. The area geological history also includes volcanic activity, which has contributed to the formation of specific landforms. While Temeke is not characterized by active volcanoes, the nearby volcanic landscapes have influenced the availability of certain minerals and the composition of soils. Volcanic ash and debris from past eruptions have been carried by water and wind, leading to the development of fertile soils in some parts of the district. Given its coastal location, Temeke is susceptible to coastal erosion and sediment deposition due to oceanic processes such as wave action and currents. These processes contribute to changes in the coastline and the accumulation of sediment along the shores. Geologically, this interaction between land and sea continually shapes the district's coastline and affects the local ecosystems and communities.

Soil

Temeke is characterized by its diverse and significant soil resources as outlined by the Food and Agriculture Organization (FAO). The soil information pertaining to Temeke highlights various soil types and their characteristics. The area encompasses a range of soil profiles, including sandy soils that are well-draining but may be nutrient-poor, as well as clay-rich soils that tend to retain moisture but might pose challenges for root penetration. These soils are often influenced by the coastal environment and climatic conditions of the region.

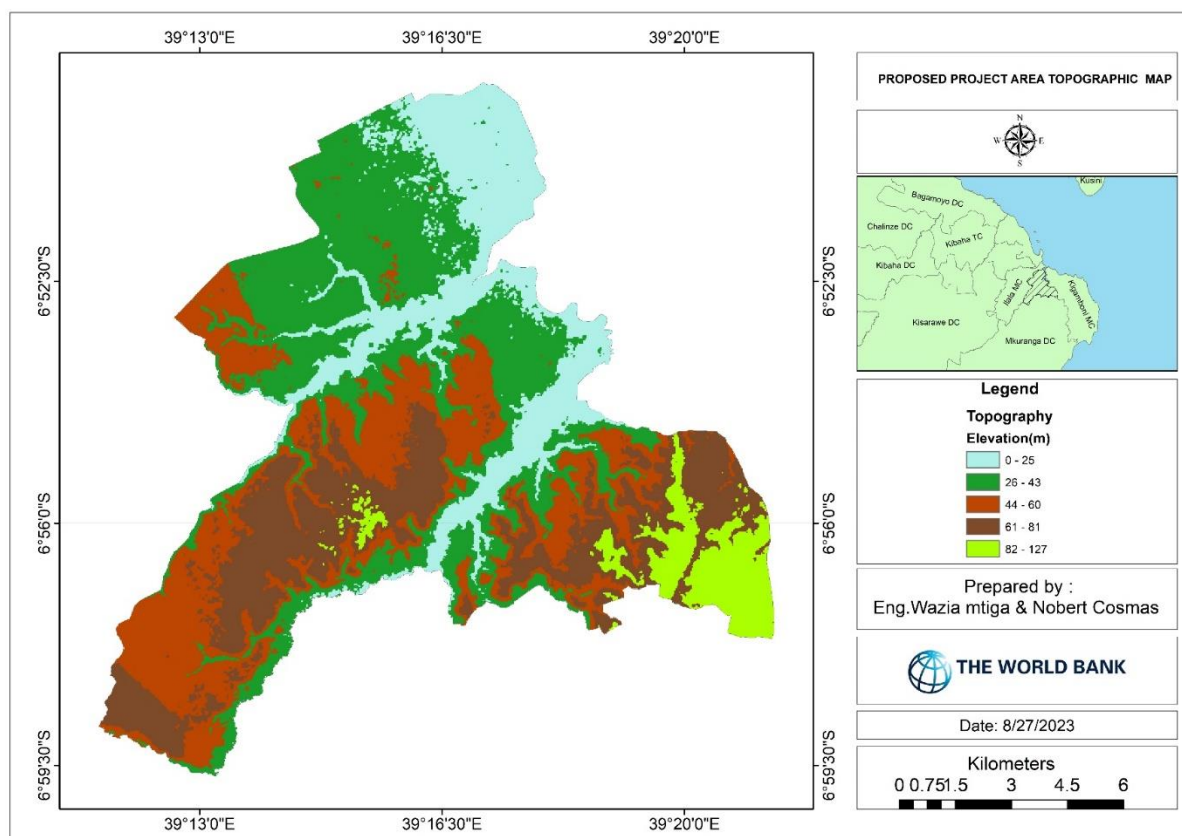


Figure 4-7: Topographic map

The proposed project area hosts two prominent soil types, namely Orthic Acrisols and Cambic Arenosols. These soil classifications offer insights into the region's diverse soil composition and properties. Orthic Acrisols, belonging to the Acrisols soil order, dominate the landscape. They exhibit a range of textures, spanning from sandy to clayey, with a notable prevalence of loamy compositions. The soils' coloration varies between reddish-brown and yellowish-brown, often attributable to the presence of iron oxides resulting from weathering. Characterized by well-developed soil horizons enriched in clay and iron, Orthic Acrisols reflect moderate acidity levels, impacting nutrient availability for plants. Their fertility hinges on factors such as parent material and agricultural practices, making diligent nutrient management pivotal for optimal crop cultivation.

Conversely, Cambic Arenosols, belonging to the Arenosols soil order, are another significant soil type in the Tembeke district. These sandy soils bear unique characteristics, primarily characterized by their sandy texture, facilitating efficient drainage but limiting water retention capacity. Colours ranging from pale yellow to light brown typify Cambic Arenosols, indicative of their relatively lower organic matter content. Unlike Orthic Acrisols, Cambic Arenosols exhibit less-defined soil profiles and minimal horizon differentiation. Leaching processes play a crucial role, causing minerals and nutrients to descend through the soil profile due to rainfall and irrigation. As a result, these soils require consistent fertilization to sustain healthy plant growth, with the incorporation of organic matter proving beneficial to enhance fertility and structure.

The implications of the soil types, Orthic Acrisols and Cambic Arenosols, hold significant relevance for a road construction project within the Tembeke district. These soil characteristics

must be thoughtfully integrated into all phases of the project, from inception to completion. The unique properties of Orthic Acrisols, encompassing variable textures from sandy to loamy, necessitate careful consideration for the road's foundation stability. Adequate compaction becomes vital to counter potential settling issues, while effective drainage systems must be engineered to prevent water accumulation, safeguarding the road's long-term integrity. Furthermore, if the proposed route includes regions with clay-rich horizons within these soils, slope stability and erosion control measures become crucial to mitigate risks associated with erosion and landslides.

Conversely, the distinctive features of Cambic Arenosols introduce their own implications. The sandy composition demands meticulous attention to foundation stability, as sandy soils lack the cohesive properties required for stable construction. The effective management of drainage is essential to prevent erosion and washouts caused by the rapid water infiltration that sandy soils facilitate. Achieving proper compaction during construction takes precedence, as the loose nature of sandy soils necessitates deliberate efforts to establish a sturdy road base. Furthermore, addressing erosion concerns through techniques like vegetation or retaining structures becomes imperative to prevent soil loss along road embankments. The soil map is shown in figure 4.9.

Land Use Land Cover

For the study of LULC of the area, we have taken the LANDSAT image of 2023. Land use of the area is categorized into 5 Categories as shown below in table 4.3.

Table 4-2: Land Use Categorization

S.No.	Land cover category	Percentage
1	Bare land	28.8%
2	Built up	43.7%
3	Grass cover	18.5%
4	Vegetation	5.2%
5	Water	3.8%

The provided data represents the land cover distribution in a particular area, categorized into five distinct types. The largest proportion is comprised of built-up areas at 43.7%, encompassing human-made structures and urban infrastructure. Following this, bare land constitutes 28.8%, indicating exposed surfaces with limited vegetation. Grass cover accounts for 18.5%, signifying areas dominated by grasses and meadows. Vegetation, including a mix of plant types such as shrubs and bushes, covers 5.2% of the region. The smallest category is water, comprising 3.8%, encompassing bodies of water like lakes and rivers. This categorization offers valuable insights into the landscape composition, aiding in urban planning, environmental assessment, and resource management endeavours.

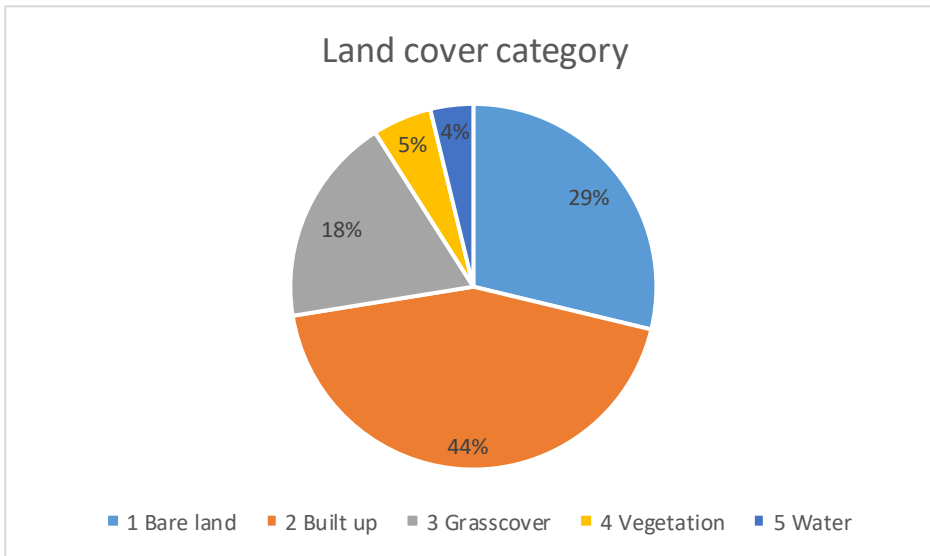


Figure 4-8: Land cover categorization

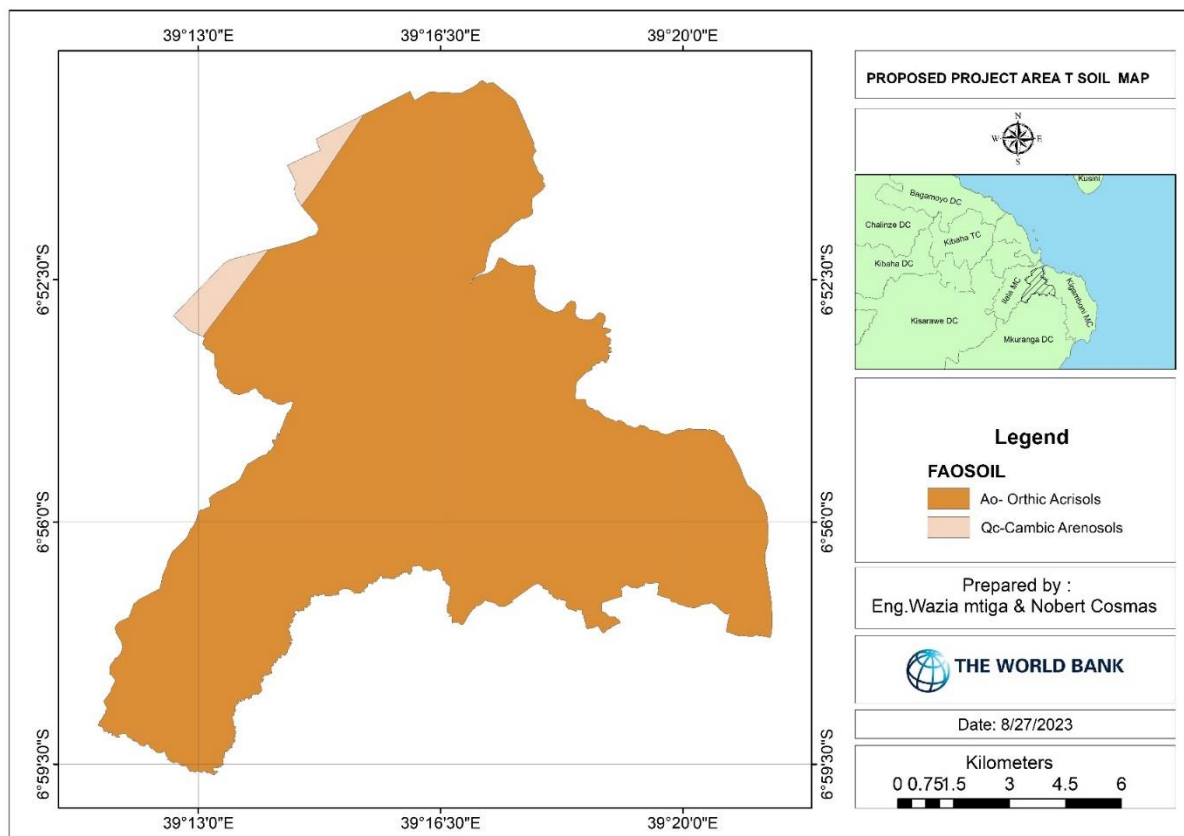


Figure 4-9: Soil map

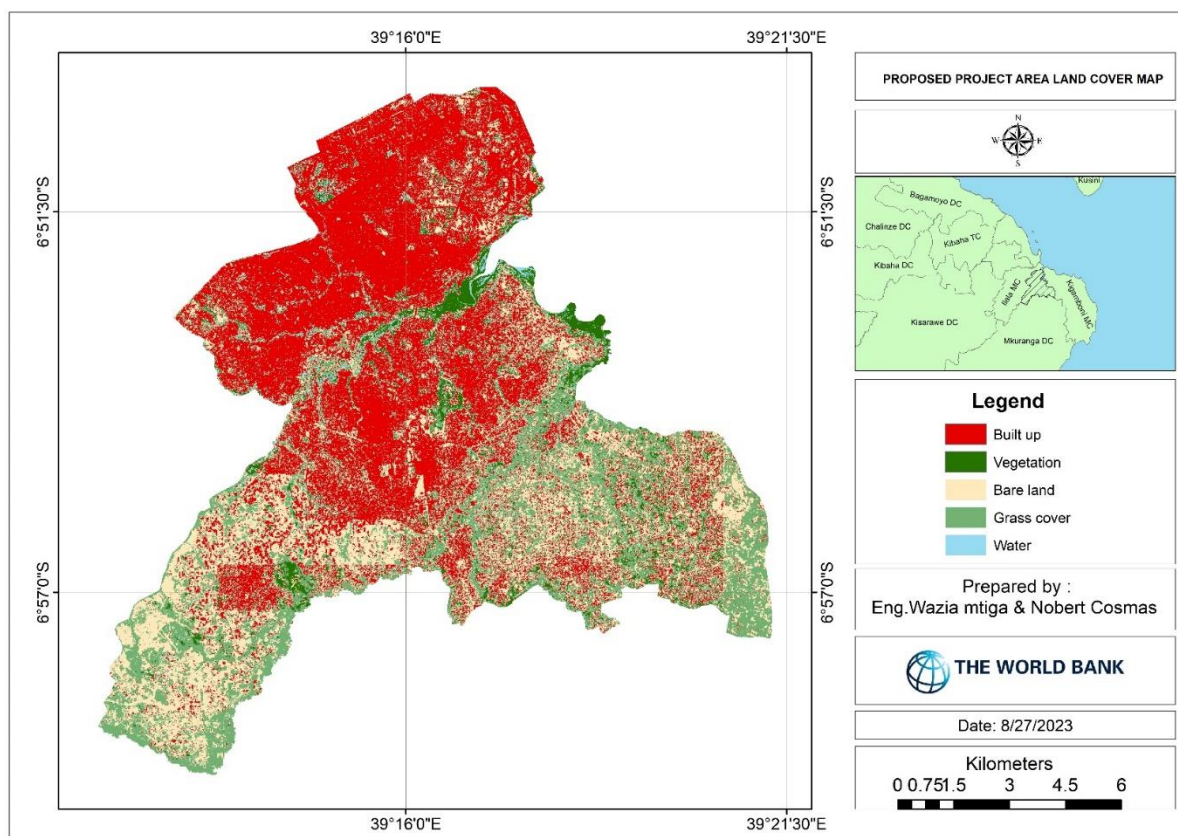


Figure 4-10: Land cover map

Hydrology and Water Resources

The municipality receives moderate rainfall from November to December, and heavy rainfall between March and May. Rainfall patterns are, however, extremely variable and unpredictable. The rainfall ranges over 1000 mm per year. Water distribution system is owned by Dar es Salaam Water and Sewerage Authority (DAWASA) and managed by Dar es Salaam Water and Sanitation Corporation (DAWASA). Further than this, the Temeke Municipal has different water bodies including ocean, streams, rivers, borehole's, wetlands and swamps.

Storm Water Drainage

Like other places of Dar es Salaam, Temeke is suffering poor drainage system for management of storm water. The drainage systems are the responsibility of the municipal council except those along the road that are managed by the road authorities (TANROADS and TARURA).

Solid waste Management

Solid waste generation is at average of 228 tonnages per day, while the capacity of collection and transportation up to dumpsite is approximately 145 tonnes per day which is equivalent to 63% of all solid waste generated in the municipality are collected. Waste separation/diversion and recycling is at an average of 15 tonnes per day which is equivalent

to 6.6% of waste generated in the Municipality (*Temeke Municipality solid waste Management survey report, March 2020*).

Currently, the Municipality is relying on using Pugu Kinyamwezi dump site as a disposal area; it should be noted that this is currently the official dumpsite in Dar es Salaam; however, under DMDP2 a landfill/dumpsite that complies to international standards will be constructed

4.1 Air Quality

An analysis of the ambient air quality was conducted to evaluate the current state of the background air quality within the designated project area and beyond (Indirect Area of Influence). This assessment serves a dual purpose: firstly, to establish a baseline for ongoing monitoring efforts, and secondly, to continuously gauge the extent to which the ambient air quality aligns with the prescribed standards. These evaluations will remain crucial beyond the project's initiation, ensuring a sustained and comprehensive understanding of the air quality's adherence to regulatory benchmarks.

Eighteen (31) Sampling locations were selected within the project area for air quality monitoring during the month of August 2023. Monitoring location details is provided in table 4.6. The monitoring locations were shown in the figure 4.11.

Table 4-3: Ambient Air Quality monitoring stations

Location code	Location Name	Coordinates		Chainage
		Longitude	Latitude	
AM-1	Tambani road			
	Mbande primary school	-6.979656	39.213545	0+200
AM-2	Magengeni road			
	Chamanzi Islamic school	-6.945193	39.218382	1+400km
AM-3	Kent High school			
	Saku road			
AM-4	Chasimba road			
	Oprah health center	-6.930313	39.243685	0+770
AM-5	Msikitini road			
	Masjid Islamic	-6.876677	39.236529	0+300
AM-6	Kilima hewa road			
	Tandem primary school	-6.926124	39.303966	0+600
AM-7	Maandazi road			
	Kizuiani primary school	-6.912341	39.27461	0+400

Location code	Location Name	Coordinates		Chainage
		Longitude	Latitude	
AM-8	Average			
	Kipati Road			
AM-9	Residential	-6.899551	39.272015	0+310km
	Raha road			
AM-10	Residentials	-6.874756	39.271025	0+000km
	Mtongani rc road			
AM-11	Masjid taqiyu	-6.87284	39.27001	0+310km
	Kizota road			
AM-12	FPCT church	-6.86418	39.27514	0+760km
	Kurasini roman Church	-6.854436	39.282028	0+420km
AM-13	Markas road			
	DUCE	-6.85077	39.27146	0+700km
AM-14	Yemen primary school	-6.847975	39.271432	0+900km
AM-15	Igombe road			
	CBA church	-6.846968	39.270202	0+230km
AM-17	Majimaji road			
	Residential	-6.844923	39.270594	0+245km
AM-18	Songambebe Road			
	NHC	-6.844367	39.269521	0+277km
AM-19	Chuma road			
	Commercial area	-6.837938	39.270612	0+600
AM-20	Basra road			
	Residential	-6.844234	39.265121	0+340km
AM-21	Diwani road			

Location code	Location Name	Coordinates		Chainage
		Longitude	Latitude	
	Residential	-6.848441	39.26634	0+500km
AM-22	Mandera road			
	Miburani primary school	-6.859825	39.265402	0+470
AM-23	Chiwanda road			
	Tandika market	-6.867043	39.261645	0+390km
AM-24	Kitunda road			
	Masjid	-6.865365	39.261829	0+500km
AM-25	Mvomero road			
	Masjid	-6.863748	39.258433	0+000km
AM-26	Penda moyo road			
	Temeke secondary school	-6.851242	39.260561	0+750km
AM-27	Pendamoyo road 1			
	Pendamoyo secondary	-6.851266	39.258883	0+115km
AM-28	BOA bank road			
	Residential	-6.871223	39.271876	0+260km
AM-29	Maghorofani road			
	Taifa primary schhool	-6.847586	39.27579	0+700km
AM-30	Zomboko kingugi road			
	Kiburuge & kingugi primary	-6.912359	39.253117	0+850km
AM-31	Agape road			
	Agape primary school	-6.937668	39.281575	0+600km

Selection of sampling locations

The Monitoring Stations in Figure 4-11 were established based on the norms prescribed by local standards (TBS and/or Environmental Management (Standards for the Control of Noise

and Vibrations Pollution) Regulations, 2014) and IFC Environmental, Health, and Safety (EHS) Guidelines for Environmental Noise Management. The norms include:

- Topography of the project influence area.
- Densely populated areas within the Region.
- Wind speed and Direction,
- Air temperature,

Avoidance of construction activity or any other activity which may be temporary in nature.

Other scenarios considered area.

- workers'/operators' positions and nearest local communities as possible receptors,
- The areas where pollution was expected, as well as areas that pollutants from the project activities are likely to disperse to.
- Other criteria include areas that are easily definable and with easy future access in case of need for comparison measurements or another monitoring study,
- Neighbouring activities that may also produce pollution similar to the project area.

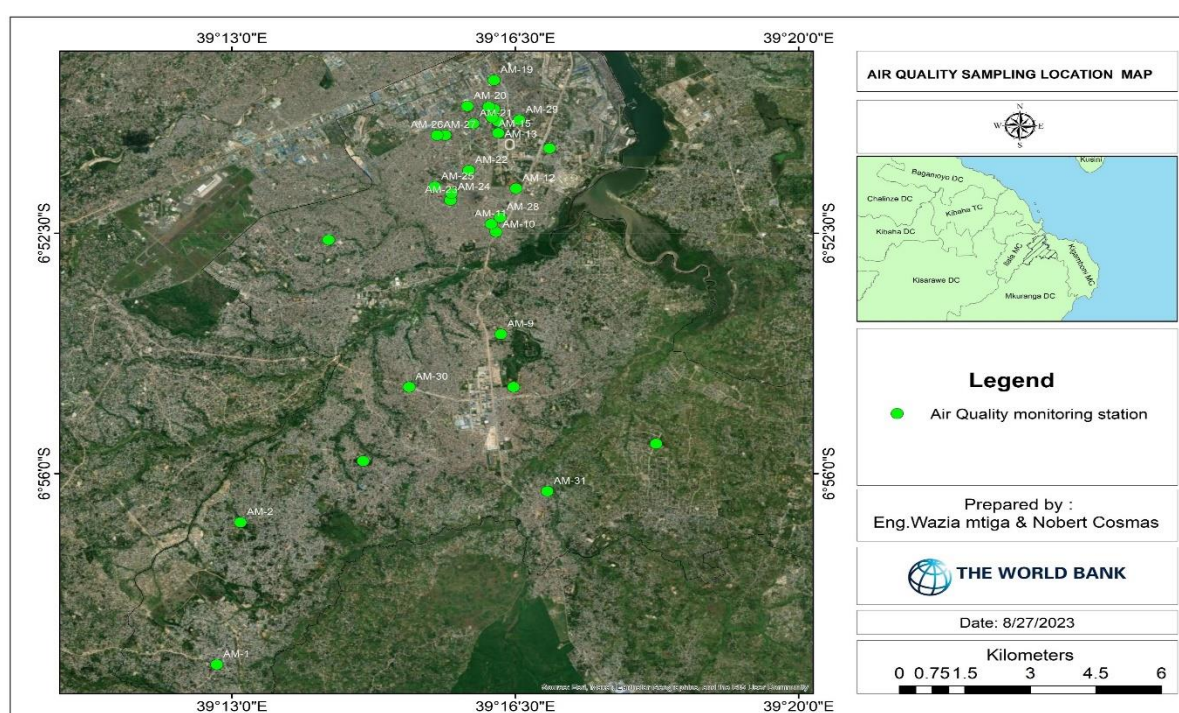


Figure 4-11: Air quality monitoring location

Existing Sources of Air Pollution

This section focuses on the sources of air pollution in the proposed project area, which involves the rehabilitation of roads to bitumen standard. The current condition of the road is thin and not in good shape. Understanding the existing sources of emissions and ambient pollutant concentrations is crucial for assessing potential cumulative impacts and synergistic

effects resulting from the project's operation and associated emissions. We will delve deeper into each source of pollution and its impact.

The proposed project area experiences various sources of air pollution, which can be categorized as follows:

Vehicle Tailpipe Emissions - Primary and Secondary Pollutants

Motor vehicles emit both primary and secondary pollutants. Primary pollutants are released directly, while secondary pollutants form through chemical reactions in the atmosphere. Key primary pollutants emitted by internal combustion engines include CO₂, CO, carbon (C), SO₂, nitrogen oxides (mainly NO), particulate matter (PM), and lead (Pb). Secondary pollutants include nitrogen dioxide (NO₂), photochemical oxidants like ozone, sulphuric acid, sulphates, nitric acid, and nitrate aerosols (PM). Emission rates are influenced by vehicle characteristics (model-year, fuel delivery system), fuel properties (type, oxygen content), operating conditions (vehicle speed, load), and environmental factors (altitude, humidity).

Domestic Fuel Combustion

Domestic households can significantly contribute to poor air quality in residential areas. While individual households emit low volumes of pollutants, their cumulative impact is substantial. Some households in the local communities' likely use paraffin and/or wood for cooking and space heating, especially during winter. The combustion of wood emits harmful pollutants such as fine particulates, CO, SO₂, and trace amounts of carcinogenic polycyclic aromatic hydrocarbons (PAHs), like benzo (a) pyrene and formaldehyde. Paraffin combustion results in emissions of NO₂, particulate matter, carbon monoxide, and polycyclic aromatic hydrocarbons. Currently LPG is available in most parts of the Country including Temeke MC while pipeline gas supply is now available in few parts of Dar es Salaam; Plans are on the way to connect Temeke Municipal into pipeline gas supply.

Biomass Burning

Biomass burning includes the burning of grasslands and agricultural lands. Within the project vicinity, crop residue burning and wildfires, locally known as veld fires, are significant sources of combustion-related emissions. Biomass burning is an incomplete combustion process, leading to the emission of carbon monoxide, and nitrogen dioxide gases. About 40% of the nitrogen in biomass is emitted as nitrogen gas, with 10% remaining in the ashes, and roughly 20% being emitted as higher molecular weight nitrogen compounds. The visibility of smoke plumes is attributed to the aerosol (particulate matter) content. Apart from local impacts, long-range transported emissions from biomass burning can affect air quality between August and October. While controlling this source is challenging, it must be considered as part of the background or baseline condition when evaluating the impacts of other local sources.

Wind Erosion of Open Areas

Emissions from wind erosion depend on the frequency of disturbance of erodible surfaces. Whenever a surface is disturbed, its erosion potential is restored. Emissions from wind erosion are influenced by agricultural and grazing activities, leading to further erodible surfaces in the project area.

Ambient Air Quality Results

Ambient air quality was done between 10am and 14:00 hours at the specific location and their result for PM₁₀, PM_{2.5}, SO₂, NO₂ and CO are tabulated in Table 4-4. These locations were strategically chosen to represent a cross-section of the area under investigation, considering factors such as proximity to potential sources of pollution, land use patterns, and population density.

The primary focus of this air quality assessment was to measure the concentrations of key air pollutants, namely PM₁₀ (particulate matter with a diameter of 10 micrometres or less), PM_{2.5} (particulate matter with a diameter of 2.5 micrometres or less), SO₂ (sulphur dioxide), NO₂ (nitrogen dioxide), and CO (carbon monoxide). These pollutants were selected due to their well-established adverse effects on human health and the environment.

These results serve as a foundational dataset for informed decision-making, and the implementation of effective strategies to mitigate air pollution and its associated risks. Ongoing monitoring and subsequent assessments will be essential to track trends, evaluate the efficacy of pollution control measures, and ensure the well-being of both the local population and the environment.

Table 4-4: Ambient Air Quality Monitoring Values

Name of location	Coordinates			PM2.5($\mu\text{g}/\text{m}^3$)	PM10($\mu\text{g}/\text{m}^3$)	CO2(PPM)	SO2($\mu\text{g}/\text{m}^3$)	NO2($\mu\text{g}/\text{m}^3$)	Co($\mu\text{mg}/\text{m}^3$)
	Longitude	Latitude	Chainage						
Mbande primary school	-6.979656	39.213545	0+200	47.1	90	404.3	1	0.3	0
Magengeni road									
Chamanzi Islamic school	-6.945193	39.218382	1+400km	22.9	31.9	412.7	0.7	0.3	0
Kent High school									
Saku road				34.3	47.4	401	0.2	0.2	0
Chasimba road									
Oprah health center	-6.930313	39.243685	0+770	14.7	42.5	402.3	1.1	0.3	0
Msikitini road									
Masjid Islamic	-6.876677	39.236529	0+300	10.3	21.7	404.7	0.1	0.1	0
Kilima hewa road									
Tandem primary school	-6.926124	39.30396	0+600	7.3	13.3	401.7	1.1	0	0

		6							
Maandazi road									
Kizuiani primary school	-6.912341	39.27461	0+400	13	30.7	409.7	0	0	0
Kipati Road									
Residential	-6.899551	39.27201 5	0+310km	14.3	36.3	403.7	0	0	0
Raha road									
Residential	-6.874756	39.27102 5	0+000km	12	31.3	402	0	0.1	0
Mtongani rc road									
Masjid taqiyu	-6.87284	39.27001	0+310km	12.7	42.3	402	0.4	0.1	0
Kizota road									
FPCT church	-6.86418	39.27514	0+760km	9.7	18.7	401.7	0	0	0
Kurasini roman Church	-6.854436	39.28202 8	0+420km	15.3	39.3	410	1.1	0.3	0
Markas road									
duce	-6.85077	39.27146	0+700km	13.7	30	406	0.9	0.3	0
Yemen primary school	-6.847975	39.27143 2	0+900km	10.7	33.3	407	0.5	0.3	0

Igombe road									
CBA church	-6.846968	39.27020 2	0+230km	14.7	42	401.7	0.3	0.2	0
Majimaji road									
Residential	-6.844923	39.27059 4	0+245km	13.3	28	402.3	1.1	0.1	0
Songambebe Road									
NHC	-6.844367	39.26952 1	0+277km	13	31	403	0.1	0.3	0
Chuma road									
commercial area	-6.837938	39.27061 2	0+600	26	82	424.3	0.1	0.1	0
Basra road									
Residential	-6.844234	39.26512 1	0+340km	10.3	18	415	0	0	0
diwani road									
Residential	-6.848441	39.26634	0+500km	11.3	18.3	408.3	0	0.1	0
Mandera road									
Miburani primary school	-6.859825	39.26540 2	0+470	9.7	13	402.3	0	0	0

Chiwanda road									
Tandika market	-6.867043	39.26164 5	0+390km	28	43	406.7	1.3	0.2	0
Kitunda road									
Masjid	-6.865365	39.26182 9	0+500km	30	44	392	0	0	0
Mvomero road									
Masjid	-6.863748	39.25843 3	0+000km	12.7	22.7	398.3	0	0	0
Penda moyo road									
Temeke secondary school	-6.851242	39.26056 1	0+750km	14.7	31.3	402	0	0	0
Pendamoyo road 1									
Pendamoyo secondary	-6.851266	39.25888 3	0+115km	21.3	43.3	402	0.2	0	0
BOA bank road									
Residential	-6.871223	39.27187 6	0+260km	24.3	47.3	402.3	0	0	0
Maghorofani road									
Taifa primary school	-6.847586	39.27579	0+700km	16	35	402.3	0	0	0

Average									
Zomboko kingugi road									
Kiburuge & kingugi primary	-6.912359	39.253117	0+850km	18.7	27.3	402	0.2	0	0
Agape road									
Agape primary school	-6.937668	39.281575	0+600km	16.3	44.3	402.3	0.1	0	0
TBS standards				25	60-90		500	200	4
WHO standards				25	50		500	200	4

During the study the average value of PM_{2.5} was observed between 7.3-47.1 µg/m³ and for PM₁₀ The average concentration was observed between .13-90 µg/m³. PM_{2.5} concentration at Tambani plot road was slightly higher, exceeding the standard limit due to resuspension of road dust from vehicle movement, at other locations it was within the limits.

Regarding gaseous pollutants, all measured parameters were found to be within permissible limits as stipulated by relevant environmental guidelines. The majority of these pollutants exhibited concentrations lower than the detectable limits of the monitoring equipment employed for this assessment. Continued monitoring and assessment will be vital to track the dynamic nature of air quality, accounting for changes in emissions, weather patterns, and urban development. This ongoing vigilance will contribute to sustaining the achieved air quality standards and identifying any emerging challenges that require proactive solutions

4.6 Noise Quality

Ambient noise monitoring was undertaken to assess the prevailing noise levels in the vicinity of the project area. The primary objective of this monitoring initiative was to capture and document the ambient noise conditions experienced by receptors, particularly within the study area's human settlements. This data collection serves as a valuable resource for future reference and analysis.

The purpose of conducting such noise monitoring was to comprehensively understand the acoustic environment of the area surrounding the project. By gathering information about the noise levels, sources, and potential fluctuations, researchers and stakeholders gain insights into the potential impact of noise on the local community's well-being and overall quality of life.

The major sources of noise were observed from vehicles and road traffics.

Table 4-5: Noise Monitoring Stations

Location code	Location Name	Coordinates		Chainage
		Longitude	Latitude	
NM-1	Tambani road			
	mbande primary school	-6.979656	39.213545	0+200
NM-2	magengeni road			
	chamanzi Islamic school	-6.945193	39.218382	1+400km
NM-3	Kent High school			
	saku road			
NM-4	chasimba road			

Location code	Location Name	Coordinates		Chainage
		Longitude	Latitude	
	Oprah health center	-6.930313	39.243685	0+770
NM-5	msikitini road			
	masjid islamic	-6.876677	39.236529	0+300
NM-6	kilima hewa road			
	Tandem primary school	-6.926124	39.303966	0+600
NM-7	maandazi road			
	kizuiani primary school	-6.912341	39.27461	0+400
NM-8	Average			
	kipati Road			
NM-9	Residential	-6.899551	39.272015	0+310km
	raha road			
NM-10	Residentials	-6.874756	39.271025	0+000km
	mtongani rc road			
NM-11	masjid taqiyu	-6.87284	39.27001	0+310km
	kizota road			
NM-12	FPCT church	-6.86418	39.27514	0+760km
	kurasini roman Church	-6.854436	39.282028	0+420km
NM-13	markas road			
	duce	-6.85077	39.27146	0+700km

Location code	Location Name	Coordinates		Chainage
		Longitude	Latitude	
NM-14	Yemen primary school	-6.847975	39.271432	0+900km
NM-15	Igombe road			
	CBA church	-6.846968	39.270202	0+230km
NM-17	Majimaji road			
	residential	-6.844923	39.270594	0+245km
NM-18	Songambele Road			
	NHC	-6.844367	39.269521	0+277km
NM-19	chuma road			
	commercial area	-6.837938	39.270612	0+600
NM-20	basra road			
	residential	-6.844234	39.265121	0+340km
NM-21	diwani road			
	Residential	-6.848441	39.26634	0+500km
NM-22	Mandera road			
	miburani primary school	-6.859825	39.265402	0+470
NM-23	Chiwanda road			
	Tandika market	-6.867043	39.261645	0+390km
NM-24	kitunda road			
	masjid	-6.865365	39.261829	0+500km

Location code	Location Name	Coordinates		Chainage
		Longitude	Latitude	
NM-25	mvomero road			
	masjid	-6.863748	39.258433	0+000km
NM-26	Penda Moyo road			
	Temeke Secondary School	-6.851242	39.260561	0+750km
NM-27	Pendamoyo road 1			
	Pendamoyo secondary	-6.851266	39.258883	0+115km
NM-28	BOA Bank road			
	Residential	-6.871223	39.271876	0+260km
NM-29	Maghorofani road			
	Taifa Primary school	-6.847586	39.27579	0+700km
NM-30	Zomboko kingugi road			
	Kiburuge+Kingugi primary	-6.912359	39.253117	0+850km
NM-31	Agape road			
	agape primary school	-6.937668	39.281575	0+600km

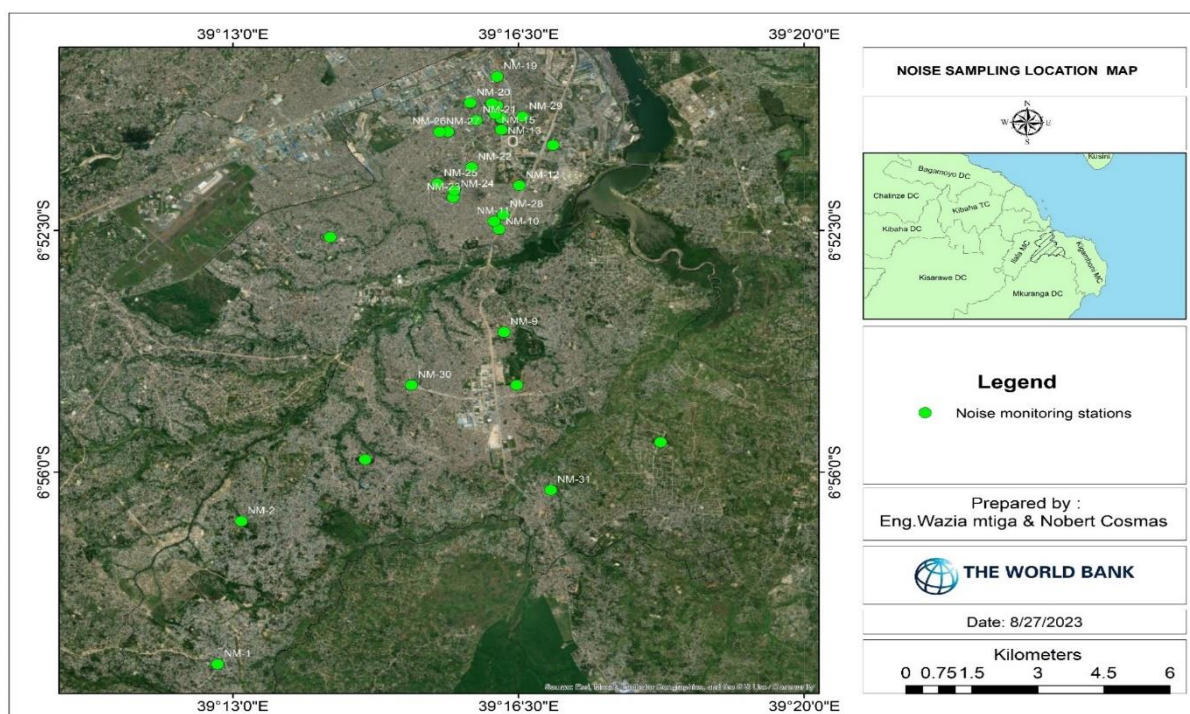


Figure 4-12: Noise monitoring location map

Noise monitoring results

Noise levels during day-time, in the area were observed to be in the range of 35.3 dB (A) to 79.2 dB (A), where ten points are above the limit as per Environmental Management (Standards for the Control of Noise and Vibration Pollution) Regulations, 2011 and IFC standards. Noise levels sources at these locations are due to vehicular movements as well as other human activities in the area.

Table 4-12: Summary of Ambient noise levels monitored

Name	Noise (LAeq,30mins(dBA))	Tanzania standard noise (LAeq, dBA)	IFC standards (LAeq(dBA))
Tambani road			
Mbande Primary school	50.4		
Magengeni road			
Chamanzi Islamic school	57.6		
Saku road			

Name	Noise (LAeq,30mins(dBA)	Tanzania standard dBA)	noise (LAeq, dBA)	IFC standards (LAeq(dBA)
Kent High school	61.3	55	55	55
chasimba road				
Oprah health center	54.3			
msikitini road				
masjid islamic	51.6			
kilima hewa road				
Tandem primary school	35.3			
maandazi road				
kizuiani primary school	47.4			
kipati Road				
Residential	54.9			
raha road				
Residentials	64.2			
mtongani rc road				
masjid taqiyu	55.2			
kizota road				
FPCT church	52.5			
Kurasini roman Church	55.8			
Markas road				
DUCE	60.2			
Yemen primary School	63.8			
Igombe road				

Name	Noise (LAeq,30mins(dBA)	Tanzania standard dBA)	noise (LAeq, dBA)	IFC standards (LAeq(dBA)
CBA church	56.2			
Majimaji road				
Residential	54.2			
Songambebe Road				
NHC	65.5			
Chuma road				
Commercial area	79.2			
Basra road				
Residential	57.5			
Diwani road				
Residential	51.2			
Mandera road				
Miburani primary School	53			
Chiwanda road				
Tandika market	72.5			
Kitunda road				
Masjid	52.1			
Mvomero road				
Masjid	50.3			
Pendamoyo road				
Temeke Secondary school	50.8			
Pendamoyo road 1				
Pendamoyo secondary	48.7			
BOA bank road				

Name	Noise (LAeq,30mins(dBA)	Tanzania standard noise (LAeq, dBA)	IFC standards (LAeq(dBA)
Residential	48.4		
Maghorofani road			
Taifa primary school	52.5		
Zomboko kingugi road			
Kiburuge+kingugi primary	51.8		
Agape road			
Agape primary school	56.9		

Vibration Monitoring

Vibration monitoring in construction involves using specialized equipment with sensors to measure and analyse the levels, frequencies, and durations of vibrations caused by activities like heavy machinery, piling, and blasting. The primary goals are to protect nearby structures, underground utilities, and occupants from potential damage and nuisance, ensuring compliance with regulatory limits, and providing data for risk mitigation and dispute resolution.

Biological Environment

Flora

The project area is characterized by planted shade trees, lawns, hedges, and gardens. Most of the natural vegetation cover has been lost due to urbanization. Different plant species such as Palm trees, peacock flower, Christmas trees, neem (*Azadirachta indica*), yellow cassia and varieties of grass species are available. Also, bougainvillea and governors' plum (mchongoma in Swahili) are available.

The project area is Urban and based on field investigation and literature review, there is neither Endangered nor Vulnerable species of interest.



Figure 4-13: Typical Vegetation covers found in Project area

Fauna

The fauna in the Temeke land area likely consists of a variety of animal species that inhabit its diverse ecosystems, which could include coastal habitats, forests, grasslands, and wetlands. Some common types of fauna that are found in this project area include:

- **Birds:** The project area's varied habitats likely support a variety of bird species. Coastal areas might host seabirds such as gulls, terns, and waders. Forested areas could be home to species like various types of pigeons, hornbills, and sunbirds.
- **Reptiles and Amphibians:** The project area zone is also a home to various reptiles, including different types of snakes and lizards. Wetlands could provide habitat for amphibians such as frogs and toads.
- **Insects and Invertebrates:** Insects and other invertebrates play crucial roles in ecosystems. They are often abundant and diverse in various habitats. Butterflies, beetles, spiders, and various other insects are found in the project zone.

The project area is Urban and based on field investigation and literature review, there is neither Endangered nor Vulnerable species of interest.

4.2 Socio-Economic Environment

Socio-economic and cultural environment

This part presents a description of the social-economic characteristics of the project area Temeke Municipality. Baseline descriptions have been formed through a combination of primary survey data, secondary data and stakeholder consultation. Baseline descriptions of demographic characteristics, access to social infrastructure (such as roads), available healthcare services and prevalent diseases, land tenure, transport, economic activity, gender, communication, access to information, vulnerability, equity issues and literacy levels in the project area is essential to understanding project communities, possible benefits to recipient communities and potential challenges and impacts during project implementation.

Administrative framework

Administratively, the Municipality has 2 divisions with 2 Constituency namely; Temeke and Mbagala Constituencies. Moreover, the Municipal is further sub divided into 23 wards and 142 sub wards (mitaa). The Municipal Council has 35 Councillors of which 4 of them are Members of Parliament.

The Municipal governing body is the Full Council which comprises 44 Councillors out of whom 23 are elected Ward representatives, 12 councillors (women special seats from wards), 4 are members of parliament elected constituencies representatives (MPs) and 4 are Members of Parliament (MPs) (women special seats).

Selection of Household Survey Sample

As explained earlier, a population sample was used to represent the population in order to avoid wastage of time and resources. In selecting survey sample; various factors were considered i.e., confidence level and margin of error or confidence interval. Confidence level is the level of certainty to which an estimate (survey sample) can be trusted. This usually lies between 90-99% whereby the larger the sample, higher the confidence level and the lower margin of error. On the other hand, margin of error (confidence intervals) is the positive and negative deviation to be allowed in the survey results for the sample (deviation between the opinion of survey sample and the opinion of the entire population). This usually ranges between 1 to 5% ($\pm$).

Based on the above factors; survey sample for the selected roads project was selected using purposive sampling method targeting only household located in village and sub-villages which will be affected by the project at a confidence level of 99%, in order to limit the margin of error to $\pm 1\%$. Therefore, sample size for socio-economic survey for this project was 355 households.

Location of the project roads

Temeke Municipality has 23 wards. Out of these 23 wards, DMDPII (30%) covers roads in 11 wards namely Kurasini, Temeke, Azimio, Tandika, Kilungule, Chamazi, Kibondemaji, Toangoma, Mbagala kuu, Yombo vituka, and Miburani ward. The table below show the project roads, their location and short description.

Table 4-6: Summary of Ambient noise levels monitored

Package	Road	Length	Street (Mtaa)	Ward
Keko Taifa Roads	Taifa road	1.31	U-Taifa	miburani
			Bora	Chang'ombe
	Songambele road	0.32	Chang'ombe A	Chang'ombe
	Mwakalinga road	1.07	U-Taifa	Miburani
	Markas Road	0.48	Bora	Chang'ombe

Package	Road	Length	Street (Mtaa)	Ward
	Majimaji Road	0.32	Keko juu	Miburani
	Magorofani Road	1.42	Bora	Chang'ombe
	Igombe	0.85	Chang'ombe B	Chang'ombe
	(Yemen)Raod	0.67	Toroli	Chang'ombe
	Diwani Road	0.71	Chang'ombe B	Chang'ombe
	Chuma Road	0.4		Chang'ombe
	Basra Road	7.55		
	Sub Total			
Kurasini Roads	Konisaga 1 Road	0.29	Minazini	Kurasini
			Minazini	
	Konisaga 3	0.4	Kurasini,Shimo	Kurasini
	Kurasini Road	1.12	la udongo	Kurasini
			Minazini	Kurasini
	Taningira Road	0.42	Minazini	Kurasini
	Uhasibu Road	0.44		kurasini
	Sub Total	2.67		
Temeke Roads	Kizota Road	0.91	Wailles	Miburani
			Miburani	
	Lushoto Road	0.3	Temeke	Miburani
	Pendamoyo Road	0.55	Temeke	Temeke
	Pendamoyo 1 Road	0.2	U-Taifa	Temeke
	Mandera Road	0.85	Miburani	Miburani
	Mkumba – Miburani Road	0.39		Miburani
	Sub Total	3.21		
Tandika Roads	Boa Bank CIUP Road	0.42	Mtongani	Azimio
		0.57	Mtongani	Azimio
	Mtongani RC Church Road	0.34	Mtongani	Azimio
	Raha Road	0.68	Tandika	Tandika
	Kitunda Road	0.6	Tandika	Tandika
	Chiwanda Road	0.83	Tamla	Tandika
	Mvomero Road		Kilimahewa,Tan dika	
	Sub Total	3.44		
Buza Chamazi Roads	Buza Kipera Road	2.4	Sigara	Yombo Vituka
	Chasimba Road	1.72	Majimatitu B	Kilungule

Package	Road	Length	Street (Mtaa)	Ward
	Magengeni (Chamazi) Road	4.68	Msufini	Chamazi
	Saku Road	3.99	Mkondogwa	Chamazi
	Zomboko Kigungi Road	2.51	Zomboko,Kwa mzungu, Kingugi, Kiburugwa, Nzasa A	Kilungule
	Tambani Road	1.88	Magengeni	Chamazi
	Sub Total	17.18		
Mbagala Toangoma Road	Ndunguru – Masaki Road	4.58	Mchikichini Masaki	Kibondemaji, Toangoma
	Masaki Road	3.6	Ponde, Mwapemba, Mikwambe	Toangoma
	Masuliza Road	4.04		Toangoma
	Maandaz Road			
	Kipati Road	1.55	Kibonde maji B	Mbagala kuu
	Sub Total	0.72	Makuka kusini	Mbagala kuu
		14.49		
Yombi Vituka Roads	Msikitini Road	0.45	Mzambarauni	Yombo vituka
	Mwembeni(Nyika)	0.44	Mzambarauni	Yombo vituka
	Malawi west Road	0.28	Mzambarauni	Yombo Vituka
	Sub Total	51.97		

Demographic Characteristics

(i) Population

According to the 2022 census results, Tanzania has a total population of 61,741,120 people whereby 30,053,130 (48.7%) are male and 31,687,990 (51.3%) are women. Dar es Salaam region has the highest population in the country where by there are 5,383,728 people out of which 2,600,018 are male and 2,783,710 are female. Temeke which is the second most populated Municipality after Kinondoni has a total population of 1,346,674 people. Out of this 655,137 are males and 691,537 are females. The sex ratio is 95. The Municipality has 384,046 households with an average household size of 3.5 which is smaller than the national average of 4.3. (Source: NBS 2022)

The average age of household heads the proposed roads is 41 years. The majority (57.2%) of the interviewed household heads are within the age category of 26-45 years, 19.3% are in the age category of 46-55 years, 9.2% (56-65 years), 8.8% (18-25 years), and 5.5% are above 65 years. The findings show that many of the household heads are still within the productive age.

In regard to sex of the household head, the results from the survey showed that 71.7% were headed by males and 28.3% were headed by females.

(ii) Marital Status

As regards marital status of household heads along the proposed roads, the socioeconomic survey findings showed that the majority of the household heads (59.4%) were married, 17.9% were single, 9.8% cohabiting, 9% widowed and 3.8% divorced or separated.

(iii) Ethnic Composition

According to the Temeke Municipal Profile, the dominant ethnic group in the district is the Zaramo who account for about 63% percent of the entire population; another tribe found in Temeke includes Ndengereko and Makonde which accounts for more than 28%. Other ethnic groups from other part of the country accounts for 9%.

(iv) Age Group in Project Area

Age is one of the important factors in socio-economic analysis thus finding out the age groups in the project area of influence is important as it helps to inform development planning and how to mitigate project related impacts in the beneficiary communities. Notably, age can be used to give an indication of the need physiological status and healthcare needs of a given population. Analysis of field baseline data reveals that the majority of household heads are within the age group of 46 and above (26.2%) for male and (56.2%). In the selected household of area Chang'ombe, Tandika, Yombo Vituka, Mbagala Kuu, Azimio, Miburani and Kurasini most of the household were between the age-group of 26-35 years (27.5%), 36-45 years (23.4%) and 15.4%) for male headed households in all the Mitaas of area Chang'ombe, Tandika, Yombo Vituka, Mbagala Kuu, Azimio, Miburani and Kurasini However, there were less female headed households within this age group as only those between 26-35 years were only (5%), 36-45 year (5%) and 46-55 only (3.8%) along the entire area traversed by the road. A slight majority for both male (7.5%) and female (6.2%) respondents were within the age-group of 15-25 years.

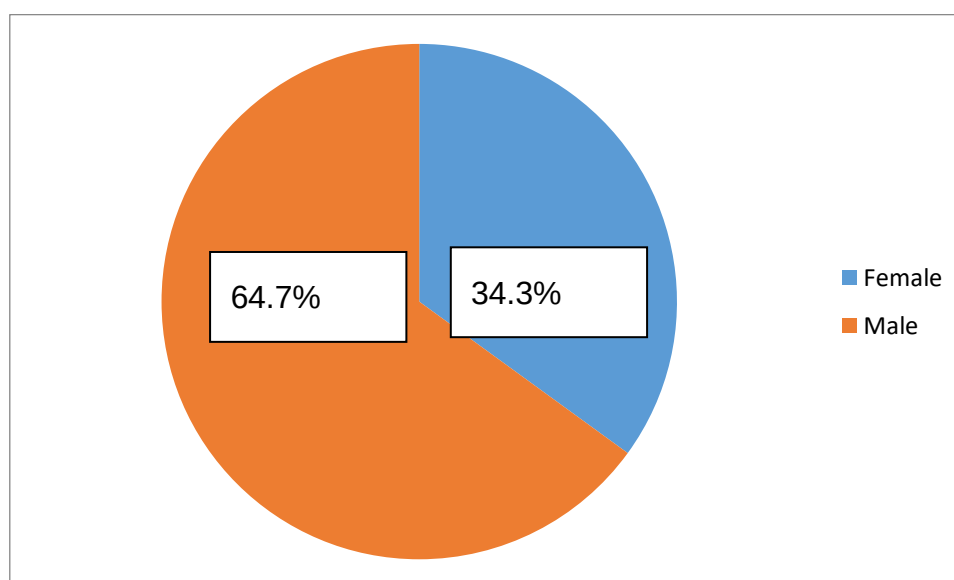


Figure 4-14: Gender distribution

Source: Census survey, August 2023

(v) Level of education for head of household.

Field findings show that most of the consulted households about 52% of total household head has reached standard seven as their primary level of education. It was noted that other

households were still continuing with studies whereby 23.9% of household had students of O-Level secondary schools whereas 7.2%) we're undertaking secondary studies between form 5 and 6 during the socio-economic study. Out of 255 (13.3%) of household reached have reached the level of college education and were engaged in various activities including formal, informal or self-employments. Unfortunately, the study revealed that there were 6.3% of household head who had not attended school at all

Major Economic Activities and Main Sources of Income

Residents in the project areas are engaged in various economic activities through which they earn income for their livelihood. According to the household survey conducted by the ESIA team, most of the activities are urban based and 125 of the respondents (47%) out of the total population (353) are engaged in small scale businesses, 85 (3.2%) are formally employed. Other activities conducted in Temeke residents in the project areas include; agriculture, livestock keeping, handcraft-works, renting out their houses / rooms, etc. Various crops including maize, cassava, sweet potatoes, rice etc are cultivated with varieties of livestock reared for different uses such as cattle, chicken, goats, rabbits, dogs, ducks etc. Livestock keepers constitute 97 (29%) of all respondents. For those engaged in agriculture had their farms located within and outside the project areas, for example, Mkuranga, Tandika, and Kivule etc.

Apart from earnings from their own sources, some 16 residents indicated that they receive support from their relatives as remittances and the amount varied from one person to another.

With regard to gender and economic decision making at household level, although men are still regarded as the family breadwinners, gender relationships reflect the importance of both men and women in the present socio- economic set-up and activities in the area. In regard to access and utilization of production resources, both genders are involved. Both men and women are involved in vending activities, agriculture, retail business, operating food-vending and casual labour. Cooking and general home cleanliness are mainly youth and women activities. Ownership of means of production such as land, labour, basic capital assets and seasonal inputs such as seed is less balanced. However, at the end men are regarded as the owners and final decision makers over the family resources.

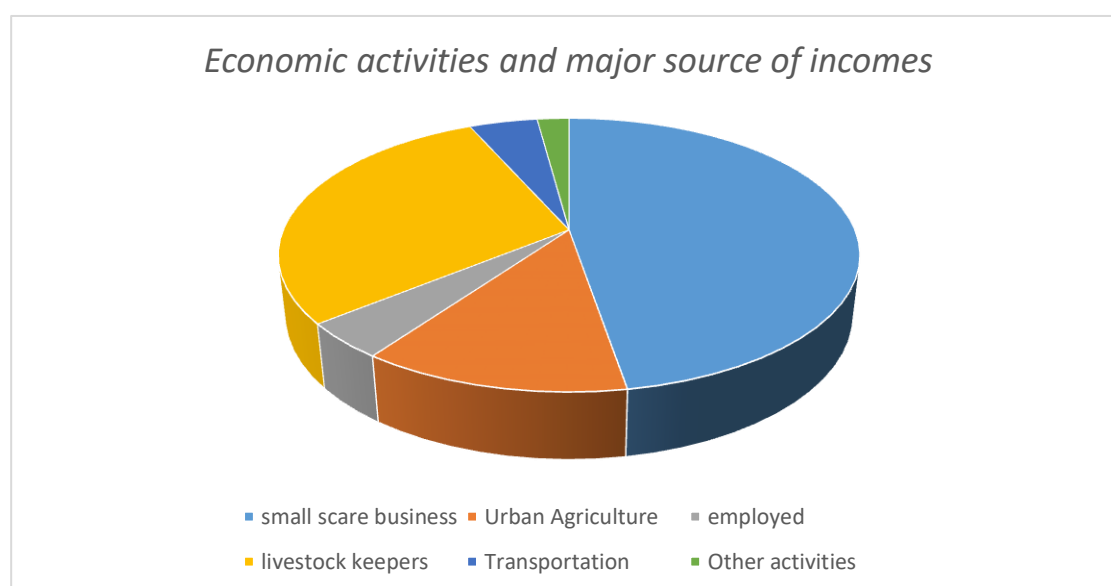


Figure 4-15: Sources of Income

Source: Census survey, August 2023

Annual Expenditure Per Household

Annual Expenditure Per Household reflects earning in incomes, the same trend is observed for expenditures.

Table 4-7 shows the amount of money spent by each household per year, which shows that the majority 211 (63%) spent between Tshs. 1,001, 000/= and 5,000,000/=, an average of Tshs. 417,000/= per month, approximately Tshs 14,000/= per day. Under normal circumstances the amount is small compared to the daily actual expenses (water, food, energy, health, education, transport, clothing, rent for renters, etc) for the whole family members. However, the amount is higher than the government minimum salary of T. Shs. 140,000/ per month. Eight percent (27) spent the lowest amount of up or less than Tshs. 500,000/= per annum which is equivalent to Tshs. 42,000/= per month. This implies that households with low income who will be part of PAPs will need all necessary support including restoration of their income instead of the project making them worse. Other categories of household expenditures are self-explanatory in the table.

Table 4-7: Household Expenditure per Annum

Amount per annum	Frequency of Households	Percent
0 - 500,000	27	8.1
501,000 – 1,000,000	7	2.1
1,001,000 – 5,000,000	211	63.0
5,001,000 – 10,000,000	79	23.6
10,000, 000 - 75,000,000 and above	10	3.0
Total	334	99.7

Source: Census survey, August 2023

Human Settlements

Temeke municipality has the largest residential areas after Kinondoni (URT, 2011). Settlement patterns in the municipality is similar to the rest of the city, whereby it radiates from the city centre and grows linearly along major roads, except in the peri urban areas, where settlements are scattered. Over 70 percent of Dar es Salaam residents live in informal, unplanned settlements that lack adequate infrastructure and services, and over half of them survive on roughly a dollar per day. With a population growth rate of about 8 percent per year, Dar es Salaam is one of the fastest growing cities in sub-Saharan Africa. Temeke municipal authority like the other two municipalities face significant challenges with respect to providing new or even maintaining existing infrastructure and services. Inadequate implementation of the city master plans coupled with poor implementation of existing laws have influenced the existing settlement patterns. Among the major impacts of the unplanned

settlements include the existence of subserviced settlements, encroachment of risk prone areas that are flooded during the rainy seasons and haphazard disposal of waste in water sources.

Education Institution and Access to Education

Temeke Municipal Council like other Councils in the country has a major role of providing quality education to its community. Services provided by the Council in this sector includes the provision of education in various such as pre-primary, primary, secondary, special education for the pupils with special needs, and adult education. The project area has 79 Public primary schools and 68 non-government primary schools. Enrolment in public schools for 2020 is 24,122 pupils; (13,766 Boys and 14,422 Girls). Enrolment and access to pre and primary education has been given priority by the Council prior and since the inception of Fee Free Education of 2015. In each primary school there is pre-primary schools that spread over all the wards which reflect that distance is not a barrier to access education. The following table indicates the registration for pre and primary in the council.

In terms of secondary school, the Municipal has 79 Secondary Schools, 34 are Public secondary schools and 45 owned by the private sector. Secondary schools are spread over the 23 wards of the Municipal, reflecting that distance is not a barrier for accessing educational services.

Student's enrolment into Form I in public secondary schools in Temeke Municipal Council increased from 7,195 (Boys and Girls) in 2014 to 12,694 (Boys and Girls) in 2022. Source: (Temeke Municipal Profile 2022)

Availability of Health facilities and Utilization

The current status on medical facilities Temeke Municipal Council has a total number of 136 health facilities in which 3 are Hospitals, 16 are Health Centers and 102 Dispensaries. However, there are 13 Clinics of different categories and 1 RRH. Source: *Temeke Municipal Investment Profile 2022*. This shows that there is serious shortage of facilities in relation to the national health policy of 2007.

According to the national health policy, Temeke Municipal Council has a long way to go to implement fully the policy of having a health centre per ward and a dispensary per Mtaa. The council still has shortages of health centers and dispensaries which has caused unnecessary loss of peoples' lives through preventable diseases. Available data shows that out of the 24 wards available in the council, only four wards managed to implement the policy of one health centre per ward but no ward had one dispensary for each Mtaa. Wards with health centres are Kijichi, Mbagala, Mbagala Kuu and Yombo Vituka, while 22 out of 24 wards had dispensaries. Temeke has the shortages of both health centres and dispensaries. One general observation in this sector is that, participation of private sector in the provision of health services to the great extent has reduced these shortages.

Water and Sanitation

Access to clean and safe water was still a major problem in most part of Temeke Municipal Council. Temeke Municipal Council had a total of 205 water schemes (sources) in various stages of operation or non-operation. Of these schemes 92 were operating (working) and the remaining 15 schemes were not operating (not working). Temeke Municipal Council has 232 deep boreholes. Out of 232 boreholes, 116 are public owned i.e 69 for Primary schools, 23 for

Health centers, and 24 for Secondary schools. Total number of households connected to DAWASA network is 9,516 out of 368,416 in 13 wards out of 24 wards. Bore holes and shallow wells are scattered in different places in the Municipality (Source: Municipal Investment Profile 2022). However, the available water is inadequate both in terms of quantity and quality.

In terms of sanitation, the situation is still under the expected level of a municipal council. For example, Disposition of Household refuse. It was found that inhabitants in the project area had different methods of disposing their refuse generated from the households. The majority (206 = 61%) replied that the municipal council collected their refuse for disposal followed by 65 (19%) who buried their refuse. Fourteen (4%) respondents said that they threw anywhere in the compound and 6 (2%) have been throwing their house refuse in the farm. Other applied methods were collection by private collectors and burning.

The ways of disposing refuse both solid and liquid wastes have a direct relation with upkeep of roads. Poor disposal of wastes affects the roads condition and drainage system. For example, blockage of drainage causes wastes to destroy roads, haphazard disposal causes dirtiness and spread of transmittable diseases. During the study, improper disposal was observed and wastes were found in many places including hips of wastes in the collection points.

Disposition of solid refuse is a big challenge in Temeke and Dar es Salaam City as a whole compounded by several factors. Drainage as well as sewerage systems for liquid disposal face similar challenges. Apart from causing environmental pollution and endangering health and well-being of people, improper disposal destructs or negatively affects roads in different ways. All these call joint efforts of all stakeholders from household level to the municipal and other higher authorities. It is essential that the project in collaboration with municipal authority and other stakeholders sustainably address this matter. Both individual households and the public have a great role and responsibilities to play. Transformative education programs and enforcement of laws / by-laws are crucial. It is high time that the municipality makes firm decision and stern measures to manage wastes and sanitation spread all over around the houses, public places (markets), bus stops and along the roads. Prevention can be done at a low cost. A special day (e.g., Saturday) could be set aside for all residents to take part in cleaning their surroundings.

Land Tenure and Land Use

Temeke Municipal Council has an area of 245 square kilometres whereby 240 sq.km; 98.0 percent is dry land area and 5 sq.km; 2.0 percent is covered with water.

Land Tenure; Land tenure system consists of a wide range of statutory, customary, and non-formal category. In Temeke municipality like the rest of the city, land tenure consists of formal and informal modes. The formal mode involves getting land by applying to the government and following legal procedures, while the other one is done through land transactions which are done between buyers and sellers in the area without the government notice. In the latter case, which is the most popular in Dar es Salaam city, the local leaders often play an active role in certifying sells among communities and their approvals are used as evidence of legality of ownership when the buyer moves to the formal land office for registration of the land through boundaries surveys.

Land use; Major land use categories in Temeke municipality include residential, commercial, mixed uses, agricultural, industrial and recreational areas

Source of Energy and Power Supply

Major sources of commercial energy in the Municipal are petroleum; hydropower and 1% of the Municipal's households depend on kerosene for lighting in small business and residential sector as well. Power cuts are somehow common due to low water levels in the hydro-electric dams since the Municipal is depending on the power supply from the National Grid. All 23 wards in the Municipal are connected to the electricity services. Some institutions belonging to the religious organizations, government and very few individuals are using solar energy technology.

Access to News and Media

There are more than 15 Radio Stations which can be accessed in the Municipal including Radio Maria, Radio One, TBC1 FM, Radio Free Africa (RFA), TBC Taifa, KISS FM, Clouds FM, Capital radio, Abood FM, Uhuru FM, Mwangaza FM, East Africa radio and Wasafi Radio. Television stations can be accessed via satellites by using antennas, dishes and boosters. Some of the local stations which can be accessed include TBC1, TBC2, ITV, Star TV, Channel 10, Channel 5, TVE, TABIBU TV, ZBC1, ZBC2Clouds TV, Wasafi TV and EATV, depending on the type of the antenna used. Other international worldwide stations such as CNN, BBC, CFI, Al Jazeera, and other more may be accessed.

However, due to advancement of technology most people rely on social media to access current news through their mobile phones.

Awareness and Sources of Information About the Project

According to responses 250 (75%) of those responded to the question were aware of the project while 85 people (25%) claimed to be unaware about the proposed project.

The majority obtained the project information from government officials / leader which is represented by 201 (60%) respondents while 24 (7.2%) heard from Mhandisi and Ruptan Consultants.

Vulnerable Individuals

Land acquisition will lead to physical and economic displacement at the individual, HH and community levels. Due to partial land acquisition for project implementation, communities, some vulnerable may lose sources of livelihoods and other income earning opportunities, land and homestead and forgo social networks with the wider community on whom they might depend. Appropriate long-term mitigation will be devised to eradicate the challenges faced by vulnerable groups or at the minimum ensure that they are at least as well off as before. Vulnerable groups would also include those female food vendors and individuals who (after acquisition of land) would become landless. For detailed guidance RAP will assist in this.

Needs and concerns of the locals including disadvantaged groups like physically challenged individuals will be incorporated in the designs. All remodelled bus stops shall have universal access (ramp) with railing to aid physically challenged persons. Provision of public amenities such as provision of streetlight, road safety during construction particularly at socially sensitive locations such as hospitals, schools, etc. will also be incorporated.

Women Empowerment and Participation in the Project Road Area

Tanzania over the recent years has made steadfast progress in terms of gender equity and creating awareness about gender-specific roles and rights. Information regarding social conditions of women in the project road area also give an encouraging picture, as presented in Table below; which shows that about 80% of sampled HH heads (mostly male) consult their female counterparts on major issues of their children's education and in 72% cases of their children's marriage. In 76% of HHs women are consulted with about purchase of important item like cloths, food and any major household equipment/appliances. Degrees of women participation in other family matters are also quite encouraging, as it appears from the Table 4-8. Monitoring and enforcement on issues of GBV, SEA and SH will be closely monitored and there will be an NGO to cater for any incidents. Anonymity will be enhanced.

Table 4-8: Participation of women in decision making

Issues	HHs responded affirmative (Total sample 355)	
	Number	Percentage
Expenses on cloths, food, household equipment	231	65
Children education, especially for the girls	284	80
Children marriage especially for the girls	337	95
Important purchase and sales	266	75
Seeking treatment from clinic/hospital	319	90
Going for shopping at markets	245	69
Visit to relatives/parents' house	305	86
Access to birth control	302	85
Voting liberty	348	98

Source: Census survey, August 2023



5. STAKEHOLDER CONSULTATION AND PUBLIC PARTICIPATION

5.1 Introduction

Guided by the procedures described in the Stakeholder Engagement Plan(SEP) for this project; the engagement of stakeholders and disclosure of information enable all stakeholders to understand the progress of the implementation of each sub-project in their areas and also how to air their views, concerns and perceptions towards sustainable implementation of the project in this Municipality. The process creates a sense of responsibility, commitment and local ownership for smooth implementation.

Generally, this Chapter presents all the stakeholders identified and consulted, and elaborates on the main issues and concerns raised by these stakeholders during the scoping stage.

Active and ongoing stakeholder engagement ensures the development of the project potential. Impacts management measures are communicated to the public while providing an avenue for stakeholder participation in the decision-making process.

Views from the residents, surrounding institutions, relevant Ministries and Statutory Agencies, Non-Governmental Organizations (NGOs) and development partners who in one way or another would be affected or rather interested in the proposed project were sought through the administering of interviews, focus group discussion and public meetings as mandated by the Environment Management Act, Cap 191 and the WBs ESS 10.

5.2 Objectives of the Public Consultations and Engagement

The objectives of consultations during the Scoping process were to obtain baseline information and disseminate project information to the stakeholders and incorporate their views and concern about the proposed project for both reporting and further reference.

The specific objectives of the consultation process were to:

- To identify the major stakeholders of the project
- To gather opinions and concerns of all major stakeholders involved in the project.
- To identify potential environmental and social impacts of the project
- To identify the physical extent and boundaries of the project
- To integrate the views and opinions of stakeholders to the design process
- To inform surrounding communities' objectives of the project
- To provide the design team expert opinion on the main issues and problems which are necessary during project implementations.
- To disseminate information to the main government institutions which provide services in the area such as TANESCO and DAWASA
- To collect relevant information related to the project area.

5.3 Methods of community participation

The ESIA team employed a range of approaches during the initial stakeholder consultation process. These approaches encompass consultative and participatory meetings, as well as both informal and formal interviews and discussions. Due to the different levels of stakeholders and their roles regarding the project, consultative meetings were carried out on various levels of stakeholders to ensure that there is open and interactive communication between various stakeholders.

During consultation, the stakeholders were informed about the project activities, effects and compensations. They were further informed how they are going to be involved in the preparation of detailed ESIA. Questions and opinions were invited from the participants.

Below are photographs taken during consultation with communities in Temeke Municipal Council.





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5.3.1 Stakeholders Identification

In order to develop an effective consultation, it was necessary to determine exactly who are the stakeholders, basing on the definition that a stakeholder is any individual or group who is potentially affected by a project or can themselves affect the project, the Identification of key stakeholders were based on their role, relevance, influence, nature of the proposed project activities, discussions with the Client as well as Consultant experience.

Stakeholders were also identified through discussions and interviews with other stakeholders. In consideration of this process, the following stakeholders identified.

- **National Levels:**

- ✓ Ministries (Ministry of Lands, Housing, and Human Settlements Development)

- **Municipal Levels:**

- ✓ Temeke Municipality

- **Wards and Mtaa Levels:**

- ✓ Local People and Community Leaders

- **Government Agencies and Departments:**

- ✓ TARURA
- ✓ DART
- ✓ TANROADS HQ
- ✓ TANROADS Regional Office Dar es Salaam
- ✓ RAS Office (Regional Administrative Secretary)
- ✓ TANESCO (Tanzania Electric Supply Company)
- ✓ OSHA (Occupational Safety and Health Authority)
- ✓ TTCL (Tanzania Telecommunications Company Limited)
- ✓ DAWASA Temeke
- ✓ DAWASA Mbagala

- **Non-Government Organizations:**

- ✓ PARALEGAL

The identification process will continue throughout the implementation as the engagement of stakeholders during all phases of the project life cycle is paramount. Hence, new stakeholders will be identified while others will lose their relevance as the project goes forward.

5.3.2 Stakeholders Analysis

After identifying and grouping stakeholders, stakeholder analysis was used to characterize stakeholder groups' interests, how they will be affected by the proposed project and to what degree, and how those groups may influence the project. The stakeholder analysis process revealed important differences among groups, including their concerns and priorities and shape the design of stakeholder consultation events and how to engage them.

Communities and other stakeholders who are affected by the proposed project (DMDP 2) engaged as early as possible during the project design stage in order to avoid, mitigate, or decrease the project's impact.

5.3.3 Consultation with stakeholders

Several methodologies were used during the stakeholder's consultation process. First, the fieldwork was necessary in formalizing and record public opinions about the potential impacts of the project which was undertaken by ESIA team of experts in the project area.

Predominantly dialogues were the main methods used in order to determine the feelings of people who are the main stakeholders of the proposed project. A wide range of stakeholders were met during the public meetings which were carried out from August 12 and end up on 23 of August, Focus Group Discussions with women, youth and disabled individuals were done separately to discuss pertinent issues and any unique concerns that each group may have regarding the road project however, interviews were done with knowledgeable stakeholders including NGOs like PARALEGAL, Local leaders and utility companies such as DAWASA and TANESCO. All ethical considerations were considered, such as consent from the individuals and confidentiality of the information.

Stakeholder's engagement enhances the effectiveness, efficacy and accountability of the ESIA process and the project. When undertaken in a transparent, it can reduce conflicts, strengthen the sense of ownership of a project and hence project's sustainability.

5.3.4 Consultation with Temeke Municipal Council and Local Leaders

Formal interviews were conducted by Municipal Environmental and Sanitation officer, Town Planning officer, Community Development Officer and TARURA (Temeke) District Manager. The interviews were comprehensive, and the attendance was recorded, the main purpose of the consultation was to disseminate project information to the authority and to incorporate their views and Comments concern the proposed project, other agenda includes;

- Presentation about the project /presentation of the proposed roads
- Discussing the previous experience along the road corridor with respect to compensation eligibility criteria

- Obtaining socio-economic concerns from the authorities and perceptions regarding the proposed roads
- Discussions on the role of the authorities in public information dissemination, monitoring and management plan

Moreover, brief interviews were held with various local leaders in all wards in their respective offices before community meetings; first a brief description of the project was explained by the Environmental and Social team before opening the floor for questions, comments and concerns.

5.3.5 Consultation with Utility Companies

Views, concerns and general comments raised by utility companies were comprehensively captured through different consultations at different time, the aim of consulting Utility Companies was to introduce the project and to make them aware about the proposed project and to gain experiences in the procedure of relocating their infrastructures (power lines and water pipes) which are within the proposed project areas. Utility companies consulted are Tanzania Electric Supply Company Limited (TANESCO), Dar es Salaam Water and Sewerage Authority (DAWASA) and Tanzania Telecommunication Corporation (TTCL).

5.3.6 Community Consultation

Consultants carried out public meetings in 11 wards of Temeke Municipal Council. Through public meetings it was noted that the majority members of the community were quite aware of the proposed project. Most of them were glad and appreciated the coming of the project as it will bring along numerous benefits including employment opportunities, Improvement of transportation and increased businesses. Some comments received during the consultations were related to the difficulties being faced by the people due to poor road conditions especially during rainy season. However, the communities appreciated the Government's efforts to prioritize in improving the Municipal Infrastructures. Public consultations are an ongoing process and inputs from the stakeholders were taken throughout the life of the project as part of the project information sharing. The community consultations were conducted with the intention of;

- Provide clear and accurate information about the Project to the communities
- Gaining their views, concerns/comments and remarks
- Inform the communities about the Project schedule
- Gather environmental and social concerns and perceptions regarding the proposed project
- Receive opinions and suggestions directly from the communities on their preferred mitigation measures

Table 5-1 shows the list of Mitaa/Roads consulted, Consultant focused on introducing the project to the public and allowing discussion and their opinion on the design and the implementation of the project.

Table 5-1: Wards / Roads Consulted

Ward	Roads	Mtaa
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Ward	Roads	Mtaa
Temeke	Pendamoyo Road Pendamoyo Road 1	Temeke Temeke
Azimio	Boa Bank CIUP Road Mtongani RC Church Raha Road	Mtongani Mtongani Mtongani
Toangoma	Ndunguru Masaki Masaki Masuliza	Mchikichini Masaki Ponde/Mwapemba
Mbagala Kuu	Kipati Road Maandazi Road	Makuka Kusini Kibonde Maji B
Kilungule	Zomboko Kigungi Road Chasimba Road	Zomboko/kwa mzungu/Kingugi/Kiburugwa Majimatitu B
Tandika	Kitunda Road Chiwanda Road Mvomelo Road	Tandika Tandika Tamla
Chang'ombe	Majimaji Road Songambe Road Igombe (Yemen) Road Mwakalinga Road Diwani Road Basri Road	Bora Bora Toroli Chang'ombe A Chang'ombe B Chang'ombe B
Miburani	Markas Road Magorofani Road Kizota Road Lushoto Road Mandera Road Mkumba -Miburani Road	U – Taifa Keko Juu Wailes Miburani U-Taifa Miburani
Kurasini	Uhasibu Road Taningira Road Konisaga 1 Road Konisaga 3 Road Kurasini Road	Mianzini Mianzini Mianzini Mianzini Kurasini/shimo la udongo
Chamanzi	Saku Road Magengeni Chamanzi Road Tambani Road	Mkondogwa Msufini Magengeni

Ward	Roads	Mtaa
Yombo/Buza	Msikitini Road Mwembeni (Nyika) Road Malawi west Road Buza Kipera Road	Mzambarauni Mzambarauni Mzambarauni Sigara

Source: Field Notes, 2023

5.4 Project Reception and Acceptance

The communities living in the project area are eagerly waiting for the roads to be improved. They believe that the roads shall bring numerous benefits to their localities in terms of economic and social growth and even improved health and education status. However, the stakeholders consulted are worried about the land expropriation, destruction of properties and poor arrangements of compensation issues. The stakeholders identified both positive and negative anticipated impacts from the project, but they stated the positive impacts outweighed the negative impacts as long as mitigation measures are implemented. A summary of issues/concerns raised by various stakeholders are as presented the in the following section.

5.4.1 Key Issues Emerging from Consultations

Stakeholders' views and main issues arose during consultation sessions with various institutions and Government leaders are presented in Table 5-2:

Table 5-2: Stakeholders Concern from consultations

Institution	Stakeholders consulted	Position	Issues/ Concerns
Ministry of Lands, Housing and Human Settlements Development	Consulted	Assistant Commissioner for Lands	✓ The office appreciated the Government's efforts in the implementation of the project; the project will increase Government revenue and value of properties along the project corridors.
Regional Administrative Secretary (RAS) Office	Consulted	Assistant RAS	✓ Government has no objection with the project; it will help the community to upgrade their local roads and improve the environment. They expect in November the project to be 30% completely. ✓ The project information is well communicated in all levels; Community leaders in all levels are well informed.
Temeke Municipal	Consulted	Environmental Officer	✓ Municipal office is happy to see

Institution	Stakeholders consulted	Position	Issues/ Concerns
office		CDO	the implementation of the project ✓ Ensure community engagement in all phases of the project.
TARURA	Consulted	District Manager Quantity Surveyor High way Engineer Valuer	✓ TARURA will work closely with consultants during feasibility study to ensure the development of the project ✓ Expecting to receive a comprehensive ESIA Report from consultants and standard Road designs from Engineers ✓ Valuation of properties should be done accordingly and unforeseen budget shall be available for compensation e.g. Vibration effects during construction which cause faults on people's house ✓ Ensure community engagement in all phases of the project ✓ Consider pedestrian walkways and greening space areas in project design drawings
DART	Consulted	Engineer	✓ DART will collaborate with the proponent to make sure the project is well developed ✓ The proponent should consider bus base in all feeder roads which are close to BRT Stations. ✓ Next time the proponent should Consider DART advice, views and opinions before the selection of the roads ✓ If possible, the proponent has to include Charambe road to be in the project, Charambe road is very strategic road which link with BRT Station in Mbagala Mwisho
TANROADS	Consulted	Project Manager BRT	✓ Provision of education to the

Institution	Stakeholders consulted	Position	Issues/ Concerns
HEADQUARTER			community on road sustainability. The citizens should be responsible to take care of their infrastructures. ✓ There should be a proper way of handling waste. Most of the people use storm water drainage as a dumping place which block water and cause flood during heavy rain seasons.
TANROADS REGIONAL OFFICE DSM	Consulted	Regional Manager	✓ The project will stimulate the development of social services activities and simplify transportation activates within the area ✓ Flood is the big challenge; the roads design has to consider a standard and quality storm water drainage structure. ✓ Utility tunnel for different facilities such as Fiber shall be considered.
TANESCO	Consulted	Principal Engineer	✓ TANESCO encourage the Proponent to continue maintaining the cooperation ✓ Geographical map of the proposed project areas shall be submitted to TANESCO before construction phase ✓ Since TANESCO has its infrastructure along the Project areas, costs of relocation should be considered during pre-construction phase to pave way for smooth construction work.
DAWASA (TEMEKE)	Consulted	Planning and construction Engineer	✓ Experience shows that most of the project proponents do not communicate with DAWASA in advance, there is a tendency of contractors to continue with construction activities without

Institution	Stakeholders consulted	Position	Issues/ Concerns
			informing DAWASA ✓ The proponent should send a letter to DAWASA office for site visit before the construction activities started ✓ Assure DAWASA engagement in all phases of the project
DAWASA (MBAGALA)	Consulted	Technician	✓ DAWASA Mbagala will work closely with the proponent to ensure the proper development of the project ✓ The proponent should send a letter to DAWASA office for site visit before the construction activities started
OSHA	Consulted	Industrial Inspector Hygiene	✓ Ensure all Occupational Health and Safety requirements are in place on construction sites ✓ First aid training shall be provided as required to site workers with basic first aid services to be provided by Contractor ✓ Project site shall be inspected by Occupational Health and Safety Authority (OSHA) and be given compliance certificate ✓ Install lights and cautionary signs in hazardous areas. Enhance safety and inspection procedures. ✓ PPE shall be provided to all workers (supply safety equipment based on a worker's responsibilities) ✓ On working environment: there shall be adequate sanitation, portable water, and rest areas. ✓ Health and safety trainings shall be given high priority and ensure availability of trained safety

Institution	Stakeholders consulted	Position	Issues/ Concerns
			personnel who will be available at all time
TTCL HEADQUARTER	Consulted	Senior Engineer	✓ TTCL and the proponent shall collaborate to find out proper way of reallocation the fibers before construction. ✓ Request for meeting with high way engineers of the project during pre-construction stage of the project ✓ Duct space shall be considered and if possible, at every 100m ✓ Encourage the Proponent to continue maintaining the cooperation
Local Government	Consulted	Ward Counsellor WEO MEO Mitaa /streets Chairman	✓ When the design is completed, it will be better to involve staffs from Municipal office so that before the construction, the local government can collaborate with TARURA, for the implementation. ✓ In order to gain support from the community, the local community should be given priority during construction phase especially for casual laborer and equal opportunity should be given to women and men ✓ Consider pedestrian walkways in project design drawings ✓ Appreciate the government efforts to give its priority in improvement of Municipal Infrastructure ✓ Ensure proper arrangement of compensation to the affected properties ✓ Assure community participation in all phases of the project.

Institution	Stakeholders consulted	Position	Issues/ Concerns
PARALEGAL	Consulted	Manager	✓ The organization is grateful for the stakeholder's engagement conducted to their office ✓ The organization help in provide legal assistance to women in Temeke Municipal Council ✓ Equal provision of employment opportunities during construction phase of the project ✓ The proposed project of upgrading the road to bitumen will simplify the movement of goods and services in the project area

5.5 Stakeholders Concern from Community Consultation

Consultation with communities was conducted between 12 of August and end up on 23 of September 2023. Major issues, concerns and comments arose during the consultation presented in Table 5.3

Table 5-3: Summary of Public consultation results

S/N	Aspect	Major Concern	Response
1.	About the Project	Improved roads will enable comfortability to the road users The Project will reduce transport cost and time The project will stimulate the development of social services such as dispensaries and schools The communities are eagerly waiting for the roads to be improved The project will bring numerous benefits to the areas in terms of economic and social growth When will the project start?	Noted 2025
2.	Design drawings	Since Dar es Salaam has high traffic, it is important for the road design to consider special areas for car parking and bodaboda to avoid unnecessary accidents caused by	Depend on the road size to be constructed

S/N	Aspect	Major Concern	Response
		improper packing of the vehicles and bodaboda The design should consider corner areas, elevated areas, Road junctions, pedestrian walkways, covered storm water drainage in order to reduce flood accident during rain sessions especially for children and road signs in schools, hospitals and in populated areas.	Traffic calming measures such as road humps, zebra, and warning signs will be installed in all populated areas, developed areas and school areas.
3.	Construction of roads below standards	The communities are concerned about the quality of construction work, requesting for integrity and commitment by contractors to ensure the sustainability of roads constructed. Furthermore, the community request for cement concrete roads in areas with high water table instead of asphalt concrete roads.	Quality of construction work will be adhered to
4.	Nature of the areas	Some areas have a high-water table; Flood occurrence is one of the most common Phenomena in the project areas during the rainy season Consider Slopes in the drainage design to let water flow	The designs of the drainage structures will consider the project maximum flood events and potential changes in future flow regimes.
5.	Land acquisition	Unfair compensation of affected properties. This was echoed at every Mtaa meeting. Inability of the proponent to mark out the Right of way (ROW) in advance and people are worried about government officials" who may embezzle compensation funds. The eligibility and compensation packages shall be made transparent to the PAPs. The PAPs should be educated and counselled in implementing resettlement and Valuation of properties should be done accordingly with an unforeseen budget for compensation	The government will follow the resettlement policy as well as good resettlement practice will be adhered to.
6.	Employment Opportunities	Youth surrounding the Project areas should be given priority for Employment Opportunities during the construction phase Women should also be considered in employment and other opportunities such as food vending etc.	Priority will be given to the local residents and communities. Women will be considered in employment and other opportunities such as food vending etc.
7.	Increase of road accidents	Accidents will increase during operations therefore precautions such as installation of bumps, zebra crossing shall be included in the road design especially in schools' areas. It is also important to educate communities on road uses and road act.	Road signs and speed bumps should be considered in the constructed roads by a contractor.
8.	Temporary road diversions during road	During roads construction temporary routes shall be established so that vehicles/buses continue passing along the roads, this will	During the construction phase, contractors will consider

S/N	Aspect	Major Concern	Response
	construction	help to reduce traffic congestion. Also, there should be temporary diversion roads for students' walkways around schools' areas.	temporary diversions
9.	Dust pollution from construction activities	The public expressed concern over the possibility of generating large amounts of dust within the project site and surrounding areas as a result of excavation works and transportation of construction materials.	Enforcement of routine maintenance checks and servicing for motorized construction machinery will be considered. Dust suppression measures will be implemented during project construction.
10.	Utility Companies	Involvement of utility companies such as DAWASA and TANESCO in the early stage of the project so as to have an integrated plan.	TANESCO and DAWASA shall be involved from the early stages of this project so as to have an integrated plan. Early notice shall be given to the community before any service interruption The funds for the relocation of this infrastructure shall be part and parcel of the project.
11.	Noise Pollution	There was concern over the possibility of high noise and vibration levels in the project area especially in roads with public services such as schools, as a result of excavation and construction works.	All vehicles and construction machinery will be kept in good condition at all times to avoid excessive noise generation.
12.	Increase the spread of HIV/AIDS	The project will contribute to the increase of immigrants in the area with consequential HIV/AIDS implications.	Routine awareness-creation campaigns for HIV/AIDS and other sexual transmitted diseases for the construction workers and communities in the project area.
13.	Community Engagement	Ensure community engagement in all phases of the project Advance note should be given to the small traders along the project areas in order to relocate their business	The project will involve the community in the whole phases.
14.	Business Opportunities	The community was optimistic that there will be an increase in business opportunities during the construction and operation of the proposed project. Small scale businesspeople such as food vendors and kiosk owners will benefit greatly during the construction phase.	Indirect employment opportunities will be provided through service providers

5.5.1 Focus Group Discussions

These discussions were held with a specific and targeted group in the society including elderly, women, youth and disabled individuals. Guiding questions were prepared to facilitate the discussions which help them to focus on the discussion. Dynamics of focus group discussions were observed to ensure fruitful discussions under the leadership of the sociologist and the expressed views and comments during consultation were recorded.

Table 5-4: Vulnerable Group Concerns

Stakeholders groups consulted	Issues/ Concerns	How issues have been addressed in the project
Focus Group Discussion with: - Elderly people (60+ years) Male - Disabled people - Women (35 to 60 years)	The Community is very much interested to see that the road is developed as it shall provide a better environment for the movement of people and goods thus lead to economic and social growth	Noted
	Provision of employment opportunities to local people during road construction	Locals will be given opportunities for employment
	The views raised by community during consultations should be incorporated in project implementation otherwise the consultations become meaningless.	Views raised by the community will be included for reference during project implementation
	Involvement of utilities company such as DAWASA and TANESCO in the early stage of the project	TANESCO and DAWASA shall be involved from the early stages of this project so as to have an integrated planning.
	Flood occurrence is one of the most common Problem in the areas especially during rainy season	Drainage will be built to allow free flow of water from other side of the road, instead of flowing on top of the road surface especially during rainy season
	Design Drawings has to consider safety features such as road signs, zebra crossings, Sharp corners and pedestrians walk ways especially for Elders, children and disabled	Traffic calming measures (zebras crossings,) will be placed in strategic areas to warn recklessly drivers
	Will the compensation done before or after the construction?	Compensation is always done before construction

Stakeholders groups consulted	Issues/ Concerns	How issues have been addressed in the project
	Incorporate road safety sensitizations in schools areas	Traffic calming measures such as road humps, zebra, warning signs will be installed in all schools areas
Primary and Secondary School pupils- female / Male	There is need for the contractor to engage with the community and all stakeholders during the construction phase and update them about progress, as well as inform the community when they intend to start work in sensitive area, diversions and other works that may interfere with community activities	The contractor shall develop and implement a stakeholder engagement plan, with the help of TMC to ensure that progress and changes are shared with relevant stakeholders
	Students fail to attend classes during rainy Seasons due to poor condition of the road	Constructions of the roads will help to reduce the problem during rainy season

Stakeholder consultations and public involvement were successfully conducted and intended objectives were met and collected information will be incorporated into the project document for further improvement, the main remark was for the Government to ensure that the projects are timely implemented. Communities appreciate their involvement as a fundamental and recommend the proponent to continue with this approach. The project was accepted by the stakeholders as beneficial to their socio-economic development and the country as a whole.

Engagement with communities and public in general were mainly through public meeting and Key Informant Interviews. All ethical considerations were considered, such as consent from the individuals and confidentiality of the information, the communities were able to raise questions and challenges that are associated with development projects based on the past experiences, Consultation also addressed topics such as GBV, HIV-AIDS, construction-related risks, environmental risks and their mitigation/management.

5.6 Grievance Redress Mechanism

5.6.1 Introduction

Grievance redress mechanism (GRM) involves a formal process for receiving, evaluating and redressing program-related grievances from affected communities and the public

The Implementation Team will recognize the vulnerability of the people who will be affected by the project such as road users, community members, workers and other beneficiaries who need a well-coordinated GRM while ensuring them the use and understanding of the system in order to develop and achieve the project effectiveness. To protect victims' emphasis on confidentiality regarding the GRM will be emphasized. GBV/SEA/SH will be handled using the dedicated NGO that will be engaged at the TMC so as to move around and collect information by emphasizing the issues of confidentiality on information provided.

A grievance mechanism will be developed for potential use by all communities. The aim of the grievance mechanism is to achieve mutually agreed resolution of grievances raised by stakeholders and the community at large. The grievance mechanism will ensure that complaints and grievances are addressed in good faith through a transparent and impartial process and culturally acceptable, the grievance mechanism will be appropriate to the scale of impacts and risks presented by a project. The types of grievances will include:

- i. Negative impacts on communities, which may include, but not be limited to financial loss (PAPs), physical harm and nuisance from construction or operational activities
- ii. Health and safety risks
- iii. Negative impacts on the environment such as pollution of waterways, soil, and air
- iv. Relocation of utilities, and
- v. Unacceptable behaviour by staff or employees.

Potential grievances that might arise from project activities will be identified and grouped, all grievances will be lodged, regardless of the project phase and mechanism. There will be a specific logbook which will capture different grievances associated with the project.

Grievance Redress Process

The GRM Committees at Mtaa, Ward and Municipal council level will be established and adequately capacitated to ensure effectiveness and efficiency of the project, the procedures for handling grievance will be simple and administered by Mtaa Offices and the project implementing team. The Mtaa Offices and project implementing team shall maintain records of grievances and complaints, including minutes of discussions, recommendations and solutions. At Ward and Municipal Council level, the Grievance Committee will comprise of Project Coordinator, Environmental Officer, Valuer, and Community Development Officer and Community representatives among others. The committees will be trained in handling grievance system and the communities will be informed of the grievance management process, however targeted communities and other beneficiaries will be notified about the grievance mechanism through sensitization programs and posters placed in Mtaa, ward and Municipal council office.

Procedures for Grievances handling from Communities will include Registration of a Complaint, a recording of a Complaint, Preliminary Assessment of the complaint, resolving the complaint and agreement or appeal if need be. An Electronic Data Management Systems (EDMS) will be established to manage and monitor grievances. The grievance storage will be kept up to date showing currently received grievances, resolved and those which still undergoing the process to resolution

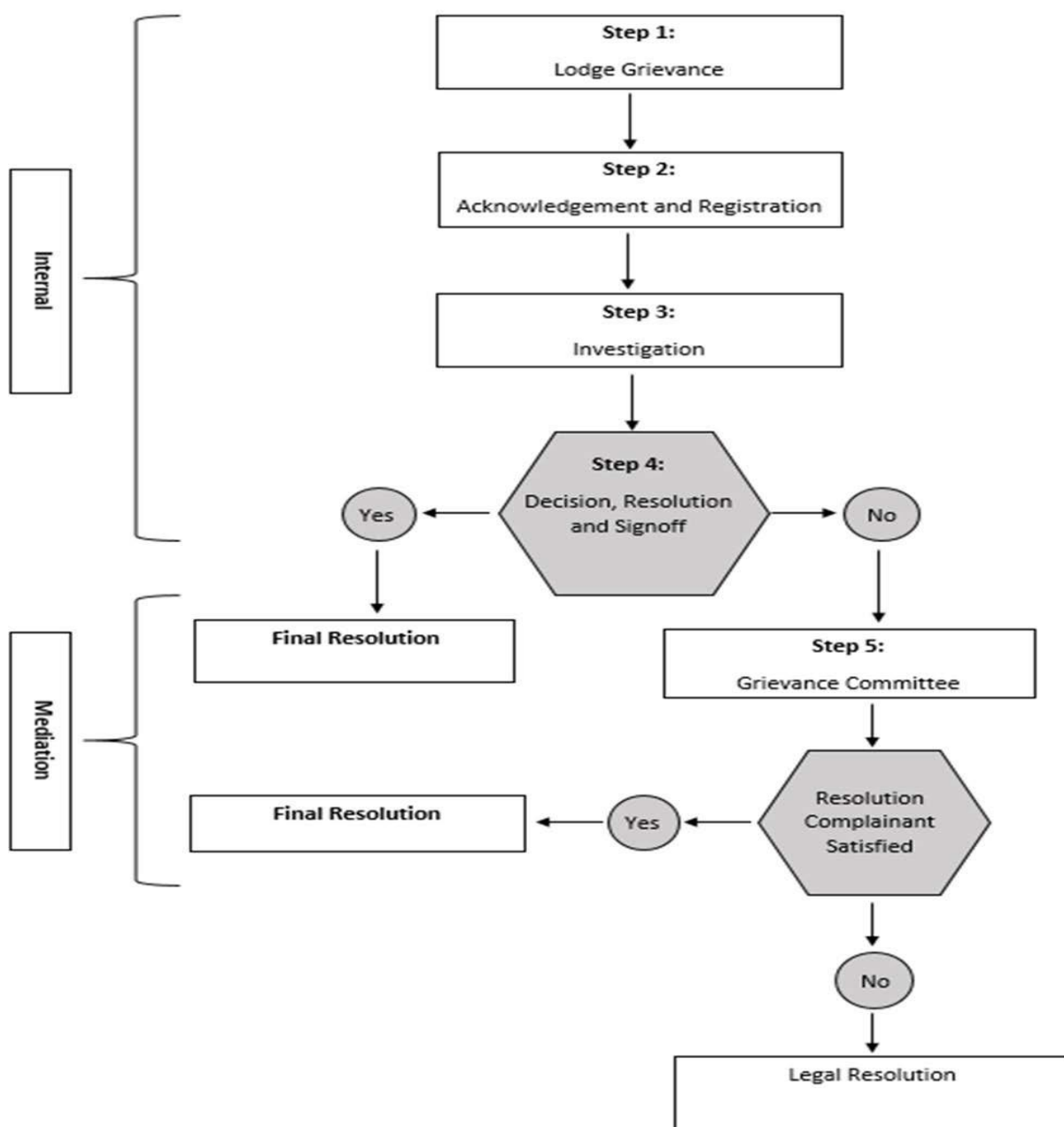


Figure 5-1: Grievance Mechanism Procedure

GRM for Labour and Workers

For workers hired by contractors, the contractors will be required to produce their GRM procedure as a prerequisite for tender. The GRM procedures have to be transparent. contractor will be required to prove that each employee agreed and signed the procedure. Under the W-GRM, Project workers will be able to raise all workplace-related concerns, including regarding unfair treatment, problems with payment of wages or benefits and unsafe or unhealthy working situations, contractors must report status of issues raised through regular reporting. Where a worker wants a higher-level review, an issue raised may be appealed through the Project level GRM at the PIT. Multiple uptake channels will be provided by the Contractor/Subcontractor, such as complaint form, suggestion boxes, email or a telephone number. A confidential procedure for workers to submit anonymous grievances in writing or otherwise will be made available. The W-GRM will not preclude

any Project worker's ability to access any other judicial or administrative remedies that might be available under national law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements. The community representative from each ward shall be included in the GRM.

Typically, Worker's GRC will consist of the following and will be updated based on the actual requirements:

- i. Engineer's representatives (Safeguard team),
- ii. Contractor's representatives (Safeguard team),
- iii. Workers from different sections with gender consideration.

Under Worker -GRM, Project workers will be able to raise all workplace concerns including unfair treatment, problems with the payment of wages or benefits as well as unsafe or unhealthy working situations including workplace sexual harassment. Contractors must report raised issues through regular reporting.

Specific responsibilities of project implementers for worker grievances Contractors/Subcontractors

- Project construction contractors will prepare their labour management procedures, which will also include a detailed description of the W-GRM, before the beginning of project implementation. The W-GRMs will be proportionate to the nature and scale of the potential risks and impacts of the subproject.
- The contractor/subcontractor will also inform their respective project workers verbally and in writing at the time of recruitment, that no reprisals shall be taken against any project worker for using the W-GRM.
- The contractor/subcontractor will provide information both orally and in writing to project workers in English and Kiswahili about the purpose and means to access the W-GRM, through regular worker trainings, worker handbooks, on notice boards and other communications media.

PIT - PO-RALG /Temeke Municipal Council (TARURA)

- PIT will require all project contractors to develop and implement a W-GRM for their workforces, including subcontractors, prior to implementation of project activities.
- The PIT shall ensure that all contractors/subcontractors inform every Project worker employed/engaged of the terms of the W-GRM at the time of the worker's recruitment.
- PIT will record and monitor all worker grievances
- PIT will include a responsible person to record and track resolution of grievances.
- PIT will ensure that all persons involved in project will be trained in understanding and implementing the project W-GRM

6. IMPACTS IDENTIFICATION AND ASSESSMENT OF PROJECT ALTERNATIVES

6.1 Overview

This chapter outlines the potential negative and positive impacts that will be associated with the project. The impacts are related to activities to be carried out during construction and operation phases of the project. In addition, closure and decommissioning phase impacts of the project have been highlighted.

The impacts of the project during each of its life cycle stages (construction, operation and decommissioning) have been categorized into impacts on the biophysical environment, health and safety impacts and socio-economic impacts.

6.2 Methodologies for Identification of Impacts

Matrix

For identification of environmental and social impacts, the Consultants team used the matrix method (screening matrix), which is based on identifying and qualifying actions of the Project comparing them to natural and social environmental conditions. This gave a list of anthropomorphic actions with impacts to the environment including health and safety to the project's communities. The latter was carried out through the use of a cause-effect relationship matrix.

Experts Knowledge

Expert or knowledge-based system was used to assist diagnosis, problem solving and decision-making.

6.3 Identification of Impacts

Susceptible Impacts' Generating Actions

Definition of actions in each stage of the project was done, which were considered as actions caused by a simple, concrete, well-defined and located cause of the impact.

Table 6-1: Concrete Actions on the Project Phases

Phase	Action
Planning	Evaluation of Properties and compensations
Mobilization	Permitting and/Licensing
	Development of Contractor/s – Environmental and Social Management Plan (C-ESMP)
	Delimitation of working zones
	Land clearing, Setup of contractor's camp/s including provisional facilities (building offices, machinery and equipment warehouses, concrete plant, crusher and screens)
	Transportation of consumables, equipment, materials and Staff
	Storage of materials, equipment and machinery

Construction	Construction/Maintenance of access road
	Sourcing/preparation and transport of construction materials, including stone quarrying, gravel, sand and stone borrowing, preparation of cement, timber, reinforcement bars, asphalt, casting of pre-cast materials such as concrete culverts etc.
	Construction & Maintenance of Diversions
	Site clearing works, including cutting of trees
	Earth works including removal of topsoils, cutting/filling, and compaction
	Demolition/relocation of existing structures
	Bitumen processing and tarmacking activities
	Construction of bridges, which will include such activities as welding works, concrete works, metal works, bridge protection works
	Creation of storm water drainage channels, relief culverts on bridge approaches
	Collection and disposal of dredges, spoilt materials removed from excavation of existing road
Operation & Maintenance	Transportation of people and goods
	Land restoration in provisional roads and temporarily disturbed areas
	Road maintenance
Site Abandonment/Decommissioning	Dismantling and demolition of construction phase infrastructure
	Cleaning and rehabilitation

Impacts' Generating Actions

In this section, key biological, physical, and social receptors were selected from the baseline data. The impacts of the Project activities on each of these “Valued Ecosystem Components” were evaluated using a significance ranking process.

The environment complexity and its systemic nature were broken down into several levels to obtain simple and concrete factors:

Table 6-2: Components and Factors of the Environment

Environment	Component	Factor (Nature of Impact)
Abiotic	Climate	Microclimate
	Atmosphere	Air Quality
		Noise
	Land	Structure
		Quality
		Relief
	Surface water	Surface drainage (run-off patterns)
		Quality

	Groundwater		Aquifer's recharge
			Quality
Biotic	Flora	Terrestrial	Habitat
			Distribution
			Species within any category
	Ecosystem		Biodiversity
Socioeconomic	Economic		Change of land use
			Jobs
			Local and Regional Development
	Services Demand		Water
			Energy
			Communication
			Waste management and disposal

Identification Methodologies for Project Impacts

Matrices (Activities-Environment Interactions)

Interactions between the project activities and the environment were identified for each stage of the project, by using a matrix presented below on *table 6-3* below. Further information on how significance of the impacts is identified under this ESIA is provided under section/table 6.5 of this report.

Table 6-3: Environmental and Social Impacts Matrix for the Proposed Project

		Impact Rating Criteria					Impact Significance Rating			
		Spatial Scale	Temporal Scale	Reversibility	Cumulative Impacts	Residual Impact	Mobilization Phase	Construction Phase	Demobilization Phase	Operation and Maintenance
S/N	Environmental parameters/Impacts									
	Negative Impacts									
1.	Impact on Current Land and Resources Use	L	ST	R			0	-2	0	0
2.	Disruption of the existing Environment and alteration of the existing land use and zoning	L	ST	R			0	-2	0	0
3.	Displacement of Communities	L	ST	IR			0	-2	-1	-1
4.	Cultural Heritage	L	ST	R			0	-1	-1	0
5.	Impacts on Atmospheric Environment	L	ST	R			-1	-2	-1	0
6.	Impacts on Acoustic Environment	L	ST	R	✓		-1	-2	-1	0
7.	Labour Condition and Occupational Health & Safety Impacts	L	MT	R			-1	-2	0	-1
8.	Soil Erosion and Change of Landscaping	L	ST	R	✓		-1	-2	-1	-1
9.	Water Quality Impact	L	ST	R			-1	-2	-1	-1
10.	Risk of Water and Land Pollution	L	ST	R			-1	-2	-1	-1
11.	Mismanagement of Wastes	R	MT	R		✓	-1	-2	-1	-1
12.	Spillage of hazardous materials	L	ST	R		✓	-1	-2	-1	0
13.	Possible escalation of HIV/AIDS and other STD's spread	R	LT	IR		✓	0	-3	-1	-1
14.	Risks of Sexual Exploitation and Abuse/Sexual Harassment	R	ST	IR		✓	-1	-2	0	-1
15.	Risks of Gender Based Violence in Communities	L	ST	IR	✓	✓	0	-1	0	0
16.	Roads and Traffic condition	L	MT	R	✓	✓	0	-2	-1	-1
	Positive Impacts									
1.	Impacts on Labour and Economy	R	LT		✓		+2	+3	+1	+2
2.	Visual and Aesthetic Impact	R	LT				0	0	0	+3
3.	Impact on Local & Regional Development	R	LT		✓		0	0	0	+3
4.	Climate & Microclimate Enhancement	R	LT							+3

S/N	Environmental parameters/Impacts	Impact Rating Criteria					Impact Significance Rating			
		Spatial Scale	Temporal Scale	Reversibility	Cumulative Impacts	Residual Impact	Mobilization Phase	Construction Phase	Demobilization Phase	Operation and Maintenance
5.	Improved accessibility and connectivity of the project areas	R	LT		✓		0	0	0	+1
7.	Tree planting (Greening) and cooling	R	LT				0	0	0	+3
8.	Increased health and safety	L	LT				0	0	0	+3

Key: Spatial Scale: Local (L), Regional (R), National (N)

Temporal Scale: Short Term (ST), Medium Term (MT), Long Term (LT)

Reversibility: Reversible (R), Irreversible (IR) Significance: Highly Adverse (-3); Adverse (-2); Mild Adverse (-1); No impact (0); Mild Beneficial (+1); Beneficial (+2); highly Beneficial (+3)

6.4 Impacts Prediction & Evaluation

After identification of impacts as a result of the proposed project's activities, their significance was determined, that is, whether they are acceptable or unacceptable and thus require mitigation. The significance of an impact was determined by considering the impact characteristics and the importance (or value) attached to them by the consultant team.

Information provided by the consultant's team of experts was used to calculate an overall impact score by multiplying the product of the nature, magnitude and the significance of the impact by the sum of the extent, duration and probability based on the following equation:

$$\text{Overall Score} = (N \times M \times S) \times (E + D + P)$$

Where:

N = Nature

E = Extent

M = Magnitude

D = Duration

P = Probability

S = Significance

Table 6-4: Impacts Methodology Table

Nature				
Negative		Neutral		Positive
-1	0		+1	
Extent				
Site	Local	Regional	National	International
1	2	3	4	5
Magnitude				
Low		Medium		High
1	2		3	
Duration				
Short Term (0-5yrs)		Medium Term (5-11yrs)		Long Term
1	2		3	4
Probability				
Rare/Remote	Unlikely	Moderate	Likely	Almost Certain
1	2	3	4	5
Significance				
No Impact/None	No Impact After Mitigation/Low		Residual Impact After Mitigation/Medium	Impact Cannot be Mitigated/High
0	1		2	3

The analysis was conducted on a quantitative basis with regard to the nature, extent, magnitude, duration, probability and significance of the impacts. The following definitions and scoring system applied:

Nature (/Status)

The project could have a positive, negative or neutral impact on the environment.

Extent

- Site – impact within the project site.
- Local – extend to the site and its immediate surroundings.
- Regional – impact on the region but within the districts.
- National – impact on an interregional scale.
- International – impact outside of Tanzania.

Magnitude

Degree to which impact may cause irreplaceable loss of resources.

- Low – natural and social functions and processes are not affected or minimally affected.
- Medium – affected environment is notably altered; natural and social functions and processes continue although in a modified way.
- High – natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.

Duration

Short term – 0-5 years.

- Medium term – 5-11 years.
- Long term – impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.
- Permanent – mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient

Probability

Almost certain – the event is expected to occur in most circumstances.

- Likely – the event will probably occur in most circumstances.
- Moderate – the event should occur at some time.
- Unlikely – the event could occur at some time.
- Rare/Remote – the event may occur only in exceptional circumstances.

Significance

Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range of significance ratings is as follows.

- 0 – Impact will not affect the environment. No mitigation necessary.
- 1 – No impact after mitigation.
- 2 – Residual impact after mitigation.
- 3 – Impact cannot be mitigated.

On the other hand, if the nature of an impact is 0 (neutral or no change) or the significance is 0 (no impact), then the impact is 0.

Table 6.5: Criteria for assessment of the significance of potential impacts of the project

Significance category		Description
Major negative Impact (-3 Very high negative impacts)	Major positive Impact (+3 Very high positive impacts)	The high magnitude with a local extent and medium-term duration
		The high magnitude with a regional extent and short-term period or a site-specific extent and long-term duration
		The high magnitude with either a local extent and short-term period duration or a site-specific extent and medium-term duration
		The medium magnitude with any combination of extent and duration except site-specific and construction period or national/international and long-term
Moderate negative impact (-2 High negative impacts)	Moderate positive Impact (+2 Minor positive impact)	The low magnitude with the regional extent and long-term duration
		The high magnitude with a site-specific extent and short-term period duration
		The medium magnitude with a site-specific extent and short-term period duration
		The low magnitude with any combination of extent and duration except site-specific and short-term period or regional and long-term
		The very low magnitude with a regional extent and long-term duration
Minor negative Impact (-1 Minor negative impact)	Minor positive Impact (+1 Minor positive impact)	The low magnitude with a site-specific extent and short-term period duration
		The very low magnitude with any combination of extent and duration except regional and long-term
No impact (0)		Zero magnitudes with any combination of extent and duration

The consultant's team focused on significant positive and negative impacts that were rated +2, +3, -2, -3 and develop mitigation. In the next sections, significant impacts (positive and negative) associated with each phase of the project are discussed.

6.5 Impacts' Description

The environmental impacts associated with the Dar es Salaam Metropolitan Development Project - Phase 2 are systematically detailed, with a focus on specific packages and lots. The impacts are categorized based on the Planning, construction, operational and Mobilization phases, providing a comprehensive understanding of the project's potential effects on the surrounding environment.

Each package and lot are individually assessed for their unique characteristics, considering factors such as air quality, noise levels, traffic impact during construction, and sustained influences on air and water quality as well as social and economic aspects during the operational phase. This section serves as a crucial component of the Environmental and Social Impact Assessment (ESIA), offering a clear insight into the potential environmental repercussions of the project and laying the groundwork for subsequent sections, including mitigation measures and cumulative impacts analysis.

The systematic breakdown allows for a detailed examination of the diverse impacts associated with project components.

Package 01

Package 1 entails the upgrade of the Mbagala Tuangoma Roads within the Temeke Municipality. The project is strategically divided into two lots, each addressing specific road sections

Package 1 - Lot 1

This focuses on the redevelopment and improvement of Nduguru, Masaki, Maandazi, and Kipati Roads.

Package 1 - Lot 2

This focuses on the redevelopment and improvement of Masuliza and Kilimahewa - Tuangoma Roads.

Planning/Pre-construction Phase

Impact on Current Land and Resources Use

Upgrading of proposed roads and drainage systems shall be done within existing routes. The roads are within Municipal Roads' Reserves while drainage systems' way leaves/buffer zones are governed by Water Resource Management Act, 2019. Therefore, the proposed upgrading of urban infrastructure is expected to cause of resettlement impact as further detailed in the DMDP2 RAP for Temeke Municipality. .

The economic impacts of resettlement such as loss of farms, land, houses or business, or loss of business income, either temporary or permanent are not expected under DMDP II which will be established at Temeke Municipality.

Most of the resources materials for road construction are natural soils, aggregates; binder such as lime, asphalt, concrete shall be obtained within Tanzania except bitumen which shall be imported. Its use shall be sustainable which will not affect the surrounding communities within the Municipality. This impact is negative, short term and of low significance.

Cultural Heritage

The inhabitants of the areas in the vicinity of the proposed project were Zaramo and Ndengereko. However, due to urbanization, many people of different ethnicity have migrated and made heterogonous tribal composition in the areas, whereby no single ethnic group accounts for more than 25% of the total population.

At or near the proposed project site, there are no cultural heritage sites that has been identified or reported, however; in case any of the cultural resource is encountered during construction, chance find procedures shall be adhered to. This impact is negative, short term and of low significance.

The civil and excavation earthworks may uncover unknown cultural resources, and therefore the project ESMF contains a Chance Finds Procedure which will be used in such cases to secure and manage such incidents. The Contractors shall be required to include the Chance Finds Procedure in their CESMP as one of the sub-management plans.

Construction Phase

Impacts on Atmospheric Environment

During construction, site clearance, and excavation, always dust and air pollution. Dust will arise from construction site due to excavation work, the movement of vehicles, stockpiling of materials, operation of crusher and asphalt plants, and general earthworks at the site. There will be increased vehicle and construction equipment's emissions which are carbon dioxide CO₂, small number of noxious gases such as sulphur dioxides SO_x, nitrogen oxides (NO_x), hydrocarbons and particulate matters (PM) associated with transport, excavation and construction and also exhaust fumes from construction plant, machinery and vehicle. These Green House Gases (GHGs) are known to interfere with temperature regime and cause climate change effects. Dust and fumes will have major direct but short-term impacts during the project construction phase. Since the area will be relatively open without impediment to air movement, hence enhance dilution of air pollutants. For more adjacent areas along the construction zones leafy vegetation should be able to filter out a considerable content of low-level air borne pollutants. Apart from ventilation and vegetation, sprinkling of the road with water during construction work will further lessen the generation of the dust, and consequently reducing the air pollution problem. These impacts are negative, short to medium term and of medium significance.

4.2.1.1.1 Impacts on Acoustic Environment

During construction, site clearance, and excavation, always generate noise, Noise and vibration will be produced from vehicles and construction machinery during the construction phase while delivery of materials, processing of materials and actual construction work may be significant. Since there will be an increase in the number of activities and number of operational vehicles, the impact of noise and vibration will cause disturbance to humans. These impacts are negative, short to medium term and of medium significance.

4.2.1.1.2 Impacts on Terrestrial Environment

This presentation is based on the indicator species known to be present in each of the habitats identified along the road. The sensitivity of species was evaluated in accordance with their level of threat and, therefore, considered of low value.

With regards to species associated with aquatic media, the construction works will cause destruction of streams' banks and beds. This will result in a direct kill of living organisms in these streams and rivers. The impact of the project on the terrestrial and aquatic fauna is considered to be low and short term and hence low significance.

Labour Condition and Occupational Health & Safety Impacts

During the construction phase sources of occupational accidents at the workplace may be construction machinery and equipment if not operated properly and if personal protecting gears are not used at all times. Also, along the road while constructing the road traffic management plan is not there then road accidents might occur frequently. This impact is negative, short term and of high significance.

Labours and public may be exposed to bronchial and other respiratory track diseases due to dusts. Also, poor use of safety gears will lead to loss of lives or injuries to labours during construction. The incident rate of diseases like Cholera and diarrhoea which are waterborne diseases will increase if no proper sanitation practices at the sites and campsites. There might be traffic hazards during construction phase of the road resulting from placement of materials on the road, and from temporary road closure which will lead to complications to pedestrians and the public in general. This impact is considered as long term with high significance.

Impacts on Labour and Economy

During the construction phase, the proposed project development will benefit nearby communities in terms of employment and creating linkages with local economy by supplying of food and other merchandise during construction phase to the construction workforce and hence raise their economic status and even local will acquire experience and knowledge from skilled workers and open the door to the possibility of acquiring employment in similar construction works elsewhere.

The use of raw materials which are locally available during the construction phase of the project from local industries and designated areas. The project will contribute towards the growth of the economy by contributing to the gross domestic product. The consumption of these materials will attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of these raw materials will be payable directly to the producers. This impact is positive, short term and of high significance.

Risk of Water and Land Pollution

The accumulation of solid wastes in the construction camp site is likely to result in environmental pollution. Likewise, uncontrolled discharge of liquid wastes will result in pollution of surface and ground water, especially to surface water sources around the Contractor's campsite. For example, improper location of pit latrines may result in contamination of both ground and surface water sources.

Another source of surface water pollution could be from the deliberate washing of construction equipment and vehicles in the river/ streams. The leakage of construction equipment / machinery and trucks near the riverbanks could result in pollution of water sources.

Improper storage of materials, fuels and poor waste oil disposal methods as well as spillage of fuels, oils, grease and paints may lead into the land / soil contamination. Soil contamination can also occur from leakage from asphalt plant operations, poor handling of petroleum products and oils. This is considered as a short-term negative impact of medium significance.

Soil Erosion and Change of Landscaping

The construction activities introduce significant challenges in the form of soil erosion and changes in landscaping. Excavation, grading, and the removal of vegetation expose the soil to erosion risks by wind and water, leading to potential loss of fertile topsoil and disruptions in soil ecosystems. Simultaneously, alterations in the landscape, driven by construction needs, result in changes to the visual character of the area, potentially diminishing its natural charm and biodiversity. The combined effects extend to sedimentation in nearby water bodies, impacting aquatic ecosystems. These environmental consequences highlight the need for robust mitigation strategies, including erosion control measures and responsible landscaping practices, to preserve soil integrity, sustain biodiversity, and minimize the lasting visual and ecological impacts on the affected areas. This impact is negative, short term and of low significance.

Water Quality Impact

During construction the activities exert a notable impact on water quality in the surrounding environment. Excavation, grading, and other construction-related processes may introduce sedimentation, pollutants, and alterations to water chemistry. Runoff from construction sites, carrying sediment and construction-related materials, poses a risk of contaminating nearby water bodies. Sedimentation can cloud water, impacting clarity and light penetration, potentially disrupting aquatic ecosystems. Moreover, the introduction of construction-related pollutants, such as concrete runoff, chemicals, and debris, can compromise water quality. Changes in water temperature and oxygen levels may also occur, influencing the habitat suitability for aquatic organisms. Effective mitigation measures, including sediment control measures, stormwater management systems, and best practices for material handling, are crucial to minimize these water quality impacts and ensure the preservation of aquatic ecosystems during the construction phase. This impact is negative, short term and of low significance.

Visual and Aesthetic Impact

The construction phase brings about significant visual and aesthetic changes to the landscape, influencing the overall perception and character of the affected area. Excavation, the introduction of construction equipment, and alterations to natural topography contribute to a transformation that may deviate from the existing visual harmony. Clearing of vegetation and the presence of temporary structures can disrupt the natural aesthetics, potentially altering the scenic beauty of the surroundings. The introduction of construction-related elements, such as scaffolding and machinery, may create a temporary visual dissonance. Local communities may experience a shift in the familiar landscape, influencing their visual experience and

attachment to the environment. Strategic landscaping efforts and temporary visual barriers can be employed to mitigate these impacts, ensuring a thoughtful integration of construction activities with the existing aesthetics and preserving the overall visual quality of the area. This impact is negative, short term and of low significance.

Mismanagement of Wastes

A considerable volume of wastes will be generated due to construction activities which will be reliable for the generation of wastes from human and machinery activities at the construction sites and campsites (if any). These wastes include solid and liquid waste; solid waste includes spoil, tree logs, rubbles, metals, papers, woods, etc. While the liquid wastes include sewage, silage, oils etc. Additionally, construction of the temporary camps for materials and few staffs during the construction phase will lead to generation of domestic wastes.

These wastes will negatively impact the aesthetic value of the site and surrounding environment if not properly managed and disposed of at an approved dumpsite. Solid wastes, if left and allowed to spread around will because waste related diseases like eye saw, odour, dysentery and diarrhoea. This improper management of construction waste constitutes a short-term negative impact.

Spillage of Hazardous Materials

All motorized equipment, from small vehicle to concrete mixer trucks, requiring fuel, sharp instruments from tower parts, lubrication and maintenance will be used at the construction site. Spillage of hazardous materials on the ground surface has a potential of contaminating the land, surface and ground water. This impact represents direct short term and reversible impact to the land.

Possible Escalation of HIV/AIDS and other STD's spread

During the construction phase, there will be a mixture of people from all around the vicinity including migrant workers. Increased interactions will be encountered due to human behaviour and increase of disposable income including other activities such as commerce and businesses. This increase in mixture of immigrants and local communities will pose a risk of new cases of HIV/AIDS and the spread of STDs. This impact is negative and will hence be of long term and of medium significance.

Climate & Microclimate Change

The construction of infrastructures has many impacts on the environment and contributes enormously to climate change. Although construction practices/related activities (i.e., Clearing of vegetation) typically do not produce large quantities of GHGs compared to the operations of many other sectors. During construction of the proposed road section, the input of steel, cement and asphalt, and management of excavated materials are the largest contributors to material-related greenhouse gas emissions.

Impacts on the microclimate and meteorology of the local area will be negligible since there will be minor changes in surface reflection and no aerodynamic disturbances.

Impact on Local & Regional Development

The proposed road sections at Temeke Municipal Council connects road not only to the people along the road but is also the connecting road that is being used every day by people who travel between various areas between among Municipalities in Dar es Salaam Region, for various social activities. The road also serves as the connecting link for schoolchildren who attend schools located along the road. The construction period will moderately impact the aforementioned activities significantly since some alternative routes can be used alongside the options of undertaking works in a sectional manner.

Risks of Sexual Exploitation and Abuse/Sexual Harassment

These include risks both to women and girls in the local communities along the proposed road project, as well those in the project-affected area such as those living in or providing services to the contractor's/workers construction camp. Women and girls might be exposed to sexual harassment. The impact is expected to be short term with high significance.

Risks of Gender Based Violence in Communities

This refers to other GBV-related risks incurred as a result of project implementation that do not adequately consult women and adolescent girls in the community about safety and security issues related to the delivery of project activities. The impact is expected to be short term with high significance.

Roads and Traffic condition

Construction with live traffic represents great impact to the traffic. Roads shall be impacted by traffic jams during construction phase of the proposed projects. Some of the roads will be closed and hence the traffic diverted to other local roads. Due to this, traffic will significantly be affected in the local roads near the project. Further, due to reduced traffic carriageway the traffic congestion will be intense at Municipal area if proper traffic management is not implemented.

Operation Phase

Impacts on Public Health, Safety and Security

The upgrading of the road will provide security and safety measures, including pedestrian walkways, road lights, and pedestrian lights and other signage. These road facilities will improve road safety status of the regions. This is positive, long term and of high significance.

Impacts on Labour and Economy

The project will likely create employment to labourers who will be required for doing different activities such as maintenance during the operation phase. There will be short term employment in the maintenance of the roads and storm drains works which is anticipated to occur. These employments will contribute to poverty reduction for skilled and low-income people in the project areas. This impact is positive, long term and of high significance.

Enhancement of Aesthetic Value of the Project Area

The aesthetic value of the project areas will be momentarily affected by dust deposition on surfaces, stagnant surface runoffs, snags in cleaning an unpaved road etc. These factors reduce the comfort of the project sites. The recuperation of the existing road to bitumen standard taking into account this upgrading will enhance the aesthetic value of the project area, also reduce the prevalence of dust related health problems and attract investment due to the project existence. This is positive, long term and of high significance.

In addition, trees and general vegetation planting will be part of the project and therefore will improve greening of project areas. The greening component will have the following benefits:

- ❖ Air Quality Improvement,
- ❖ Urban Climate Improvement,
- ❖ Flood control,
- ❖ Erosion control, and
- ❖ Aesthetics.

Improved Accessibility and Connectivity of the Project Areas

The functioning of the road in operation phase will help the interactions between production facilities and markets, easy movements of the community and easy business flow due to availability of the road and will make economic growth. The upgrading of the proposed roads from their existing conditions will facilitate easy transportation within the surroundings areas and increase interconnectivity of within Temeke Municipal. The upgrading of the project Road will increase the efficiency of road and decreasing traffic congestion within the Municipality and in the nearby areas. Among others, improvement of the road will provide a catalytic impact in reducing poverty through socio - economic growth and exogenous benefits to Tanzania and neighbouring countries also will reduce travel time and reduce travel costs and contribute to a reduction of price of the products. Finally, the lowering of the transport cost can stimulate businesses, which will benefit consumers who are the community along the project areas. This is positive, long term and of high significance. Where possible the design of the road will people with vulnerability example by providing signage.

Improvements to Individual and Community Welfare

The consider road development enhances transport, which has indisputable socio-economic benefits, which are often undervalued indifferent to its negative impacts. Improved access to external markets for agricultural produce from villages traversed by the road sections, hence stimulation of local economic growth. Consequently, the road network makes and stimulates positive synergy and enhances social interconnection and incorporation by giving citizens access to the opportunities. Also, more local who will be living along the road will improve their housing conditions and will make more scenic of the areas. This is positive, long term and of high significance.

Loss of Employment

After construction works number of people employed by the project will be re-trenched. The booming business near the construction site will decline or phase out due to reduced number

of customers. Hence, there will be loss of income to some individuals. The results may bring some unwanted social conflicts, theft, crimes, psychological stresses etc. The impact is considered as medium term with high significance.

Construction Demobilization Phase

Impacts on Labour and Economy

Demobilization works shall involve a number of people to be employed by the project. Hence, there will be gain of income to some individuals. The impact is considered as medium term with high significance.

Solid Waste Generation

Demolition of the road network will result in large quantities of solid waste. The waste will contain materials that were used during the construction such as concrete, metal and stones. Although demolition waste is generally considered less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment.

Noise and Vibration pollution

During demobilization and decommissioning phase, noise and vibration will be experienced as a result of demolition of the proposed project and related components such as campsites and other utilities. The demolition machine will create noise and vibrations, and hence the residents will be affected by these pollutions.

Dust Emissions

Large quantities of dust will be generated during demolition works. There is a possibility of suspended particles affecting the site workers' health. Exhaust emissions are likely to be generated during the demolition period by the various machinery and equipment used as well as motor vehicles used for the exercise.

Occupational Hazards and Community Safety and Health Risks

Demolition works will expose both workers and community to occupational health and safety risks. The workers and community are also likely to be exposed to risk of accidents and injuries resulting from dust inhalation and from injuries from hand tools and other equipment.

Package 02

Package 02 focuses upgrade of Upgrading of Yombo Vituka, Keko Taifa, Kurasini and Temeke Roads in Temeke Municipality:

- Package 2 - Lot 1
 - This focuses on the redevelopment and improvement of Yombo Vituka Roads (Msikitini, Mwembeni/Nyika & Malawi West), Keko Taifa Roads (Songambebe, Mwakalinga, Markas, Majimaji, Magorofani, Igome/Yemen,

Diwani, Keko Machungwa & Basri) and Footbridges (Chaurembo 1 & Chaurembo 2).

- Package 2 - Lot 2
 - This focuses on the redevelopment and improvement of Kurasini Roads (Konisaga 1, Konisaga 3, Kurasini, Taningra & Uhasibu), Temeke Roads (Temeke, Lushoto, Pendamoyo, Pendamoyo 1, Mandra & Mkumba Miburani) and Footbridges (Mdeda, Mpeta, Baajun, Msalaka Mashine ya Maji, Shehe Muckhi & Azimio Msalaka)

Planning/Pre-Construction Phase

Impact on Current Land and Resources Use

Upgrading of proposed roads and drainage systems shall be done within existing routes. The roads are within Municipal Roads' Reserves while drainage systems' way leaves/buffer zones are governed by Water Resource Management Act, 2019. Though these are existing roads but there are scenarios of encroachment, change of alignment or increase of width of road that will lead to resettlement impact

Therefore, impacts of resettlement such as loss of farms, land, houses or business, or loss of business income, either temporary or permanent have been established under DMDP II for Temeke Municipality and therefore a RAP has been prepared for implementation as per the requirements of ESS5 and those of the Tanzanian Government

Impacts on Public Infrastructure and Utilities

The project roads are within well-developed settlements and therefore their improvements will cause services interruption due to relocation of utilities. These utilities include



TANESCO power lines, DAWASA water supply network, AIRTEL underground cables and private water supply networks (Figure 6-1).

Figure 6-1: Typical Electricity Utilities to be relocated along Taifa Road

Cultural Heritage

The inhabitants of the areas in the vicinity of the proposed project were Zaramo and Ndengereko. However, due to urbanization, many people of different ethnicity have migrated and made

heterogeneous tribal composition in the areas, whereby no single ethnic group accounts for more than 25% of the total population.

At or near the proposed project site, there are no cultural heritage sites that has been identified or reported, however; in case any of the cultural resource is encountered during construction, chance find procedures shall be adhered to.

Construction Phase

Impacts on Atmospheric Environment

During construction, site clearance, and excavation, always dust and air pollution. Dust will arise from construction site due to excavation work, the movement of vehicles, stockpiling of materials, operation of crusher and asphalt plants, and general earthworks at the site. There will be increased vehicle and construction equipment's emissions which are carbon dioxide CO₂, small number of noxious gases such as sulphur dioxides SO_x, nitrogen oxides (NO_x), hydrocarbons and particulate matters (PM) associated with transport, excavation and construction and also exhaust fumes from construction plant, machinery and vehicle. These Green House Gases (GHGs) are known to interfere with temperature regime and cause climate change effects. Dust and fumes will have major direct but short-term impacts during the project construction phase. Since the area will be relatively open without impediment to air movement, hence enhance dilution of air pollutants. For more adjacent areas along the construction zones leafy vegetation should be able to filter out a considerable content of low-level air borne pollutants. Apart from ventilation and vegetation, sprinkling of the road with water during construction work will further lessen the generation of the dust, and consequently reducing the air pollution problem.

Impacts on Acoustic Environment

During construction, site clearance, and excavation, always generate noise, Noise and vibration will be produced from vehicles and construction machinery during the construction phase while delivery of materials, processing of materials and actual construction work may be significant. Since there will be an increase in the number of activities and number of operational vehicles, the impact of noise and vibration will cause disturbance to humans. These impacts are negative, short to medium term and of medium significance.

Impacts on Terrestrial Environment

This presentation is based on the indicator species known to be present in each of the habitats identified along the road. The sensitivity of species was evaluated in accordance with their level of threat and, therefore, considered of low value.

With regards to species associated with aquatic media, the construction works will cause destruction on streams' banks and beds. This will result in a direct kill of living organisms in these streams and rivers. The impact of the project on the terrestrial and aquatic fauna is considered to be low and short term.

Impacts on Public Health, Safety and Security

During the construction phase sources of occupational accidents at the workplace will be construction machinery and equipment if not operated properly and if personal protecting gears are not used at all times. Also, along the road while constructing the road traffic

management plan is not there then road accidents might occur frequently. This impact is negative, short term and of high significance.

Labours and public will be exposed to bronchial and other respiratory track diseases due to dusts. Also, poor use of safety gears will lead to loss of lives or injuries to labours during construction. The incident rate of diseases like Cholera and diarrhoea which are waterborne diseases may increase if no proper sanitation practices at the sites and campsites. There might be traffic hazards during construction phase of the road resulting from placement of materials on the road, and from temporary road closure which will lead to complications to pedestrians and the public in general. This impact is considered as long term with high significance.

Impacts on Transportation

The project will involve movement of heavy trucks, vehicles to and from the construction sites during transportation of construction materials from borrow pits/quarry sites. It may also involve transportation of spoil/soil materials from the construction site to the dumping site. The frequent movement of heavy trucks to and from the construction sites while passing in populated settlements is likely to result into risk of traffic accidents. This risk was expressed by many stakeholders during the consultative process. See Chapter 5.0, Stakeholder Consultation.

Aggregates escaping from uncovered truckloads will likely damage the wind screens of other vehicles and may cause bodily harm to other road users. Additionally, Boda-boda operators have been portrayed by stakeholders as reckless lacking with regard to other road users, hence requiring a special approach. Urban residents expressed concern about risk of project interference with access to homes and services during construction as follows;

- ❖ Blocking of access to and from their residences due to excavation of roadbed and trenches for roadside storm water drainages,
- ❖ Disruption of traffic flow along the construction road during construction of road pavement and associated storm water drainages. Narrow roads and dense settlements are a common feature in the project sites.

The impact (accidents) is considered direct and Negative with Moderate Significance; and is expected to be Long-term and temporary as it occurs during construction and operational phases. Its effects may be irreversible (disability, fatal) in the absence of mitigation measures. However, interference to home access short-term impact confined within construction phase is a temporary impact.

4.2.1.2 Impacts on Labour and Economy

During the construction phase, the proposed project development will benefit nearby communities in terms of employment and creating linkages with local economy by supplying of food and other merchandise during construction phase to the construction workforce and hence raise their economic status and even local will acquire experience and knowledge from skilled workers and open the door to the possibility of acquiring employment in similar construction works elsewhere.

The use of raw materials which are locally available during the construction phase of the project from local industries and designated areas. The project will contribute towards the growth of the economy by contributing to the gross domestic product. The consumption of these materials will attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of these raw materials will be payable directly to the producers. This impact is positive, short term and of high significance.

4.2.1.3 Impacts on Historical and Cultural Resources

No Cultural/historical receptors identified to be impacted by the project; neither cemeteries nor worshipping areas located within the proposed construction corridor. The magnitude of the impact on the burial ceremonies is expected to low.

4.2.1.4 Soil Erosion and Change of Landscaping

During the construction phase there will be some activities that may result into the soil and landscape modification. This is considered as a short-term negative impact of low significance.

4.2.1.5 Risk of Water and Land Pollution

The accumulation of solid wastes in the construction camp site is likely to result in environmental pollution. Likewise, uncontrolled discharge of liquid wastes will result in pollution of surface and ground water, especially to surface water sources around the Contractor's campsite. For example, improper location of pit latrines may result in contamination of both ground and surface water sources.

Another source of surface water pollution could be from the deliberate washing of construction equipment and vehicles in the river/ streams. The leakage of construction equipment / machinery and trucks near the riverbanks could result in pollution of water sources.

Improper storage of materials, fuels and poor waste oil disposal methods as well as spillage of fuels, oils, grease and paints may lead into the land / soil contamination. Soil contamination can also occur from leakage from asphalt plant operations, poor handling of petroleum products and oils. This is considered as a short-term negative impact of medium significance.

4.2.1.6 Mismanagement of Wastes

A considerable volume of wastes will be generated due to construction activities which will be reliable for the generation of wastes from human and machinery activities at the construction sites and campsites (if any). These wastes include solid and liquid waste; solid waste includes spoil, tree logs, rubbles, metals, papers, woods, etc. While the liquid wastes include sewage, silage, oils etc. Additionally, construction of the temporary camps for materials and few staffs during the construction phase will lead to generation of domestic wastes.

These wastes will negatively impact the aesthetic value of the site and surrounding environment if not properly managed and disposed of at an approved dumpsite. Solid wastes, if left and allowed to spread around will because waste related diseases like eye saw, odour, dysentery and diarrhoea. This improper management of construction waste constitutes a short-term negative impact.

4.2.1.7 Spillage of Hazardous Materials

All motorized equipment, from small vehicle to concrete mixer trucks, requiring fuel, sharp instruments from tower parts, lubrication and maintenance will be used at the construction site. Spillage of hazardous materials on the ground surface has a potential of contaminating the land, surface and ground water. This impact represents direct short term and reversible impact to the land.

4.2.1.8 Possible escalation of HIV/AIDS and other STD's spread

During the construction phase, there will be a mixture of people from all around the vicinity including migrant workers. Increased interactions will be encountered due to human behaviour and increase of disposable income including other activities such as commerce and businesses. This increase in mixture of immigrants and local communities will pose a risk of new cases of HIV/AIDS and the spread of STDs. This impact is negative and will hence be of long term and of medium significance.

4.2.1.9 Climate & Microclimate Change

The construction of infrastructures has many impacts on the environment and contributes enormously to climate change. Although construction practices/related activities (i.e., Clearing of vegetation) typically do not produce large quantities of GHGs compared to the operations of many other sectors. During construction of the proposed road section, the input of steel, cement and asphalt, and management of excavated materials are the largest contributors to material-related greenhouse gas emissions.

Impacts on the microclimate and meteorology of the local area will be negligible since there will be minor changes in surface reflection and no aerodynamic disturbances.

4.2.1.10 Impact on Local & Regional Development

The proposed road sections at Temeke Municipal Council connects road not only to the people along the road but is also the connecting road that is being used every day by people who travel between various areas between among Municipalities in Dar es Salaam Region, for various social activities. The road also serves as the connecting link for schoolchildren who attend schools located along the road. The construction period will affect the aforementioned activities greatly.

4.2.1.11 Risks of Sexual Exploitation and Abuse/Sexual Harassment

These include risks both to women and girls in the local communities along the proposed road project, as well those in the project-affected area such as those living in or providing services to the contractor's/workers construction camp. Women and girls might be exposed to sexual harassment i.e., Rape. The impact is expected to be short term with high significance.

4.2.1.12 Risks of Gender Based Violence in Communities

This refers to other GBV-related risks incurred as a result of project implementation that do not adequately consult women and adolescent girls in the community about safety and security issues related to the delivery of project activities. The impact is expected to be short term with high significance.

4.2.1.13 Disruption of Traffic Flow During Construction and Creation of Road Safety Risks Along Diversion Roads

The project will involve movement of heavy trucks, vehicles to and from the construction sites during transportation of construction materials from borrow pits/quarry sites. It may also involve transportation of spoil/soil materials from the construction site to the dumping site. The frequent movement of heavy trucks to and from the construction sites while passing in

populated settlements is likely to result into risk of traffic accidents. This risk was expressed by many stakeholders during the consultative process. See Chapter 5.0, Stakeholder Consultation.

Aggregates escaping from uncovered truckloads will likely damage the wind screens of other vehicles and may cause bodily harm to other road users. Additionally, Boda-boda operators have been portrayed by stakeholders as reckless lacking with regard to other road users, hence requiring a special approach. Urban residents expressed concern about risk of project interference with access to homes and services during construction as follows;

- ❖ Blocking of access to and from their residences due to excavation of roadbed and trenches for roadside storm water drainages,
- ❖ Disruption of traffic flow along the construction road during construction of road pavement and associated storm water drainages. Narrow roads and dense settlements are a common feature in the project sites.

The impact (accidents) is considered direct and Negative with Moderate Significance; and is expected to be Long-term and Temporary as it occurs during construction and operational phases. Its effects may be irreversible (disability, fatal) in the absence of mitigation measures. However, interference with home access short-term impact confined within construction phase. Is a temporary impact.

Operation Phase

Impacts on Public Health, Safety and Security

The upgrading of the road will provide security and safety measures, including pedestrian walkways, road lights, and pedestrian lights and other signage. These road facilities will improve road safety status of the regions. This is positive, long term and of high significance.

Impacts on Labour and Economy

The project will likely create employment to labourers who will be required for doing different activities such as maintenance during the operation phase. There will be short term employment in the maintenance of the roads and storm drains works which is anticipated to occur. These employments will contribute to poverty reduction for skilled and low-income people in the project areas. This impact is positive, long term and of high significance.

Enhancement of Aesthetic Value of the Project Area

The aesthetic value of the project areas will be momentarily affected by dust deposition on surfaces, stagnant surface runoffs, snags in cleaning an unpaved road etc. These factors reduce the comfort of the project sites. The recuperation of the existing road to bitumen standard taking into account this upgrading will enhance the aesthetic value of the project area, also reduce the prevalence of dust related health problems and attract investment due to the project existence. This is positive, long term and of high significance.

Improved Accessibility and Connectivity of the Project Areas

The functioning of the road in operation phase will help the interactions between production facilities and markets, easy movements of the community and easy business flow due to availability of the road and will make economic growth. The upgrading of the proposed roads from their existing conditions will facilitate easy transportation within the surroundings areas and increase interconnectivity of within Temeke Municipal. The upgrading of the project Road will increase the efficiency of road and decreasing traffic congestion within the

Municipality and in the nearby areas. Among others, improvement of the road will provide a catalytic impact in reducing poverty through socio - economic growth and exogenous benefits to Tanzania and neighbouring countries also will reduce travel time and reduce travel costs and contribute to a reduction of price of the products. Finally, the lowering of the transport cost can stimulate businesses, which will benefit consumers who are the community along the project areas. This is positive, long term and of high significance.

Improvements to Individual and Community Welfare

The road development enhances transport, which has indisputable socio-economic benefits, which are often undervalued indifferent to its negative impacts. Improved access to external markets for agricultural produce from villages traversed by the road sections, hence stimulation of local economic growth. Consequently, the road network makes and stimulates positive synergy and enhances social interconnection and incorporation by giving citizens access to the opportunities. Also, more local who will be living along the road will improve their housing conditions and will make more scenic of the areas. This is positive, long term and of high significance.

Trees Planting (Greening)

Trees and general vegetation planting will be part of the project and therefore will improve greening of project areas. The greening component will have the following benefits:

- ❖ Air Quality Improvement,
- ❖ Urban Climate Improvement,
- ❖ Flood control,
- ❖ Erosion control, and
- ❖ Aesthetics.

Increased in Number of Roads Accidents

This will be a result of good weather of the rehabilitated road and makes drivers to become more excited and make increase in traffic and over speeding, and lead to accelerate the rate of road accident. The more impacted group in the community will be children, disabled; elderly people and even without forgetting livestock. The impact is considered as medium term with high significance.

Loss of Employment

After construction works number of people employed by the project will be re-trenched. The booming business near the construction site will decline or phase out due to reduced number of customers. Hence, there will be loss of income to some individuals. The results may bring some unwanted social conflicts, theft, crimes, psychological stresses etc. The impact is considered as medium term with high significance.

Cumulative Impact Assessment

These are the combined, long-term effects of multiple activities or developments that may seem insignificant individually but can have substantial effects when considered together. These include DMDP 2 roads under Kigamboni Municipal roads constructed by Government

agencies such as TARURA and TANROADs, Water utilities projects and a number of bonded warehouse projects. For the proposed road construction project under the Dar es Salaam Metropolitan Development Project II (DMDP II), a comprehensive assessment of cumulative impacts is crucial to fully understand the broader environmental, social, and economic consequences of the development within the region.

Based on the cumulative impacts assessment, the following potential issues may arise:

- ❖ **Traffic Congestion:** Increased traffic volumes as a result of the road construction combined with the expansion of other road networks and development projects in Dar es Salaam could exacerbate congestion.
- ❖ **Air Quality and Noise:** Cumulative emissions from multiple ongoing construction activities and increased vehicular traffic could degrade air quality and increase noise pollution, especially in residential areas near the road corridor.
- ❖ **Social Displacement:** The road construction project may displace local populations, and when combined with other urban development projects, the scale of displacement could create additional pressure on social services.
- ❖ **Overburdening of Infrastructure:** Local infrastructure such as water supply, waste disposal, and healthcare may become overwhelmed due to increased population density, which could be a result of both the road project and concurrent urban developments.

Analysis of Alternatives

The aim of the EIA process is to come up with the most sustainable project considerations, which shall ensure optimal benefits, are obtained from the project. Therefore, it was important to evaluate the proposed road based on its anticipated impacts thereafter come up with alternatives which include a consideration of without the project alternative.

In the EIA process, it is important to consider different alternatives, or options, which will achieve the project's objectives. It is also important to include a consideration of what would happen without the project – that is the no project alternative. A range of systematic methods was used for comparing and evaluating various alternatives. These include simple checklists, overlay maps, complex matrices, mathematical models, description of the main impacts and the reasons for their rejection. The following types of alternatives are presented for consideration:

'No Project' Alternative

The no project alternative entails retaining the current status without developing the proposed project. Adopting this option would mean avoiding most of the negative impacts associated with the project and missing all the positive benefits such as employment opportunities and improved livelihoods, enhancement of aesthetic value of the project, improved accessibility and connectivity of the project areas, improvements to individual and community welfare, enhancement of security and safety status of the project areas, and improvements in collection of road surface runoffs. Therefore, adopting a no project alternative would mean failure to implement the investment and poverty alleviation policies.

So, the zero option will deny the economic gains through improved economic and social activities especially in investment and employment during all stages of implementation. In

other words, the “Zero Option” is not in line with the Government policies, plans and strategies. Hence, this is not the right option since its social costs are higher than the benefits.

Project Alternative

The project alternative means developing the proposed project and implement it and will result into higher increased productivity due to reduced travel time, and less fuel consumption, less vehicle operation and maintenance costs, hence low transportation cost due to the improvement of the road condition. The environmental impacts will be of short term as analysed in Table 6.4 above as they occur only during construction and can be minimized through implementation of appropriate mitigation measures. The improvement of the road condition into bitumen standards will result into more comfortable travel and improved aesthetic value of the along the road 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.

Alternative Routes

Up to this time of the project, the team observed the project corridor can have different alternative routes however the actual routes and alternative routes shall be demarcated during the implementation phase through Contractor Traffic Management Plan (C-TMP). The current approach is to select a route that will have minimizing negative impacts, specifically the one with less resettlement impact.

Labour Intensive Alternative Versus Machine Intensive Alternatives

The use of labour-intensive method will be more likely to have less environmental impacts compared to machine-intensive method, such as dust emission, oil spills, exhaust emissions, etc. Apart from that labour intensive method unlikely to cause construction related accidents, less cost of operation, not many local have experience to use machines which will lead to skilled labour employment, labour intensive makes use of manual labour which will lead to creation of employment opportunities but due to nature of this project and limitation of the labour-intensive method, the combination of the two methods should be more favourable. Since there will be works which are manually conducted and those due to manual labour limitation will employ the use of the machinery intensive method.

Alternative Design for Different Sections of the Roads

The DMDP2 roads will consider various designs in order to accommodate safety requirements or as mechanisms to minimise resettlement impacts (e.g covered drains), type and quantity of traffic example options of rigid pavement in sections with heavy traffic.

7. IMPACTS MITIGATION AND ENHANCEMENT MEASURES

7.1 General Considerations

This chapter is devoted to describing measures or actions that shall be implemented so as to minimize any of the potential impacts and enhance positive impacts identified in the preceding chapter. Many of the mitigation measures put forward are nothing more than good engineering practice that shall be adhered to during the design and construction phases. The developer is committed to the implementation of mitigation measures contained in this report.

The methodologies used in developing the Impacts mitigation and enhancement measures are; revising the project life cycle Environmental and Social Impacts, developing better project alternatives, taking into account the impact mitigation framework (i.e. Impacts avoidance, minimization, and compensation) as well as ensuring that the residual impacts are within the acceptable levels.

7.2 Enhancement Measures

The summary of positive measures is presented in Table 7-1 together with their enhancement measures.

Table 7-1: Enhancement Measures

Positive Impacts	Enhancement Measures
Creation of temporary employment to local people during construction and operation phase.	The contractor will give employment priority to local people, especially for unskilled labour during construction. The contractor will give equal employment opportunity to both women and men. Contract will provide descent employment according to the requirement of ILO and Labour laws in Tanzania. This will be achieved by enquiring the contractor to work closely with the local leaders as well as this information will continue to be shared during stakeholder engagements.
Improvement of Storm water management (reduction of flood extent and frequencies)	Combining SuDS and conventional drainage systems for all project roads including optimization of rainwater harvesting.
Climate & Microclimate Enhancement	Lower-carbon transport system: The design should consider walking and cycling infrastructure and upgrade the road to the bitumen standard to become more attractive for users and minimize travel time and distance. Incorporation of Climate Change Adaptation Measures into Design of the Road ✓ The type, strength, and protection of subsurface conditions and materials may have to be increased to control and prevent soil saturation from damaging the road infrastructure. The composition of the subsurface materials can be adjusted to account for changing climatic conditions. ✓ The strength of construction materials may have to be increased to withstand increased or decreased moisture contents. The protection of these materials (e.g., Against increased moisture and salinity) may have to be enhanced to preserve the expected lifetime of the road structure, or other materials may need to be used. ✓ Provide a road maintenance budget for supervision and monitoring of the vulnerable areas. This can reduce road closures and more serious consequences of disasters.
Improved transportation and trade/commercial activities	Temeke will see improved transportation efficiency and trade and will encourage local and foreign investors to invest more in blue and other economic opportunities.
Increased income generation activities due to local people selling food and other items to construction workforce.	The contractor will provide shelter (“Vibanda”) for food, water supply and sanitary facilities to the food vendors to ensure that they sell food to construction workforce in a clean and hygienic environment.
Expansion of commercial activities and trade within the project area	Business growth and increase in agricultural and fishery activities.
Increased streetlights and traffic	Road users will realize increased security and reduced risk of accidents

Positive Impacts	Enhancement Measures
signals	as a result of the new installation of streetlights and traffic signals
Tree planting (greening) and increased drainage along roads	Integrate Greening in Geometric Design of Roads and comprehensive stakeholder engagement through public outreach and education so as to maintain sustainability of Urban greening.
Increased health and safety	Temeke residents will experience reduced Noise and dust due to paved roads and greening of the streets which will improve cooling effect and carbon sink. The designs will create improved safety for pedestrians and expected lower incidents, e.g. through better cross pedestrian walkways, side walks etc.

7.3 Mitigation Measures for Projects' Package 1 Impacts

Planning /Pre-Construction Phase.

Cultural Heritage

- Once a find is made, work should be stopped in the area to avoid damaging the discovery.
- The appropriate cultural heritage or archaeological authorities should be notified to assess the find.
- Experts may be called to investigate and possibly excavate the site or items further to understand their significance.
- If the find is deemed significant, conservation efforts might be implemented, and the item shall be preserved in a museum or another secure location

Construction Phase.

Impacts on Atmospheric Environment.

- Emission Control Technologies: Equip construction equipment and vehicles with modern emission control technologies such as particulate filters and catalytic converters to reduce air pollutant emissions.
- Dust Control Measures: Employ effective dust control measures, including water spraying, dust suppressants, and covering exposed areas to minimize airborne dust during construction activities.
- Construction Material Management: Storing and handling of construction materials carefully to prevent dust generation. Utilize enclosed systems for material handling.
- Air Quality Monitoring: Establishment of air quality monitoring program during construction to regularly assess air quality in and around construction sites, allowing for timely identification and response to potential issues.

Impacts on Acoustic Environment

- Construction Equipment Maintenance: Regularly maintain and tune construction equipment to minimize noise emissions.
- Noise Barriers: Installation of temporary noise barriers around construction sites to contain and reduce the spread of construction-related noise.
- Community Liaison Officer: Appoint a community liaison officer to address noise-related concerns and facilitate communication between the construction team and the local community.

Impacts on Terrestrial Environment

- Erosion Control Measures: The contractor shall implement erosion control measures, such as silt fences, sediment basins, and erosion control blankets, to prevent soil erosion and sedimentation in nearby water bodies.
- Sedimentation Ponds: The contractor shall construct sedimentation ponds to capture and settle suspended sediments from construction site runoff before the water is discharged.
- Construction Site Runoff Management: The contractor shall implement effective stormwater management practices to control runoff and prevent the transport of pollutants into nearby rivers or streams.
- Soil Stabilization Techniques: Use soil stabilization techniques, such as mulching and matting, to protect exposed soil surfaces and minimize soil erosion.

Labour Condition and Occupational Health & Safety Impacts (-ve)

- Traffic Management: the contractor shall implement efficient traffic management plans to minimize congestion and ensure the safety of both motorists and pedestrians.
- Signage and Communication: Installation of clear and visible signage to provide information about construction zones, detours, and potential hazards. Use electronic message boards for real-time updates.
- Work Zone Barrier Implementation: Installation barriers and barricades to separate construction areas from active traffic lanes, protecting both workers and the public.
- Safety Training for Workers: Provide comprehensive safety training for construction workers, emphasizing the importance of following safety protocols and procedures.
- Public Awareness Campaigns: Conduct public awareness campaigns to inform the community about construction activities, potential hazards, and safety measures.

Impacts on Labour and Economy

- Employment and Labour Practices: formed and implement Labour Management Plan that outlines targets for hiring local labour and provides training to ensure that workers have the necessary skills.
- Gender Inclusion: Establish gender-sensitive recruitment policies, promote a non-discriminatory workplace, and provide gender-focused training and mentorship programs.
- Health and Safety of the Workers: Establish clear health and safety standards and provide personal protective equipment (PPE) to all workers. Ensure that emergency medical services are available and that workers undergo regular health checks.

Soil Erosion and Change of Landscaping

- **Erosion Control Measures:** The contractor shall implement erosion control practices, such as silt fences, sediment basins, and erosion control blankets, to prevent soil erosion and sedimentation.
- **Vegetative Cover:** The contractor shall establish vegetative cover using native plants and grasses to stabilize soil and reduce the risk of erosion.
- **Soil Stabilization Techniques:** Use of soil stabilization techniques, such as mulching and matting, to protect exposed soil surfaces and minimize soil erosion.
- **Construction Site Runoff Management:** The contractor shall implement effective storm water management practices to control runoff and prevent the transport of pollutants into nearby water bodies.
- **Retaining Walls:** Use of retaining walls to prevent soil movement on steep slopes, reducing the risk of erosion.
- **Soil Erosion Monitoring:** Implementation of regular monitoring of soil erosion to detect potential issues early and take corrective actions.

Visual and Aesthetic Impact

- **Visual Screening:** The contractor shall implement temporary visual screens, such as construction fences or landscaping, to shield construction site activities from public view.
- **Construction Equipment Storage:** Designate specific areas for construction equipment storage to prevent the visual clutter of equipment scattered throughout the construction site.

Water Quality Impact

- **Regulatory Compliance:** Adhere to local and national regulations related to water quality protection, obtaining necessary permits and approvals.
- **Pollution Prevention Plan:** The contractor shall Develop and implement a pollution prevention plan that outlines specific measures to protect water quality during construction.
- **Water Quality Monitoring:** The contractor shall Implement a water quality monitoring program to regularly assess the impact of construction activities on nearby water bodies.

Risk of Water and Land Pollution

- **Erosion and Sediment Control:** Install silt fences, sediment traps, and barriers around construction sites to prevent sediment runoff into nearby water bodies.
- **Stormwater Management:** Design and implement proper stormwater drainage systems to direct runoff away from construction zones and ensure that it does not enter nearby water bodies.
- **Spill Prevention and Management:** Store fuel, oils, and other hazardous materials in properly contained areas (e.g., bunded areas) to prevent spills from spreading into the environment.

Mismanagement of Wastes

- **Waste Segregation:** Implement a waste segregation system to separate different types of waste at the source, facilitating proper disposal and recycling.
- **Designated Waste Collection Points:** The contractor shall Establish designated waste collection points within construction sites for the systematic disposal of different waste streams.
- **Hazardous Waste Management:** Handling of hazardous waste materials with strict adherence to disposal regulations, ensuring proper containment and disposal methods.
- **Construction Waste Management Plan:** Development and implement a comprehensive construction waste management plan outlining procedures for waste handling, recycling, and disposal.
- **Educational Programs for Workers:** The contractor shall Conduct educational programs for construction workers to raise awareness about the importance of proper waste management and the specific waste handling procedures on-site.
- **Waste Audits:** The contractor shall Conduct regular waste audits to assess the types and quantities of waste generated, allowing for continuous improvement in waste management practices.
- **Monitoring and Enforcement:** Regularly monitoring of waste management practices and enforce compliance with waste disposal regulations to prevent illegal dumping and mismanagement.

Spillage of Hazardous Materials

- **Spill Response Plan:** The contractor shall Develop and implement a comprehensive spill response plan that outlines immediate actions to be taken in the event of a hazardous material spill.
- **Emergency Spill Kits:** The contractor shall Provide emergency spill kits equipped with absorbents, containment materials, and personal protective equipment at strategic locations throughout the construction site.
- **Proper Storage and Labelling:** Ensuring proper storage of hazardous materials in designated areas, clearly labelled with appropriate hazard warnings, to minimize the risk of spills.
- **Secondary Containment Measures:** Implementation of a secondary containment measures, such as bunding or double-walled storage units, to contain potential spills and prevent them from reaching the environment.

Possible Escalation of HIV/AIDS and other STD's Spread

- **Education and Awareness Programs:** Implementation of comprehensive education and awareness programs on HIV/AIDS and STDs for construction workers, emphasizing prevention, transmission, and safe practices.
- **Distribution of Educational Materials:** Distribution informative materials, pamphlets, and posters on HIV/AIDS and STD prevention in languages accessible to all workers on the construction site.

- Voluntary Counselling and Testing (VCT) Services: Establishment of voluntary counselling and testing services on or near the construction site to encourage regular testing and early detection of HIV/AIDS.
- Community Outreach Programs: Conduct community outreach programs to engage local residents, promoting awareness of HIV/AIDS and STD prevention in the broader community.

Climate & Microclimate Change

- Water Management: Implement sustainable water management practices, including the capture and reuse of rainwater, to address both water scarcity and excessive rainfall issues.
- Energy-Efficient Construction Practices: Utilize energy-efficient construction practices, materials, and equipment to reduce greenhouse gas emissions associated with construction activities
- Erosion Control and Soil Conservation: implement erosion control and soil conservation measures to mitigate the impact of extreme weather events on the stability of construction sites.

Risks of Sexual Exploitation and Abuse/Sexual Harassment

- Clear Policies and Codes of Conduct: Development and communication of clear policies and codes of conduct explicitly prohibiting sexual exploitation, abuse, and harassment shall be placed on the construction site;
- Training and Sensitization: The contractor shall Conduct mandatory training and sensitization programs for all construction personnel, including workers, supervisors, and management, on recognizing, preventing, and reporting SEA and harassment;
- Anonymous Reporting Mechanisms: The contractor shall establish anonymous reporting mechanisms to encourage individuals to report incidents of sexual exploitation, abuse, or harassment without fear of retaliation;
- Visible Reporting Points: Clearly mark and make visible reporting points on the construction site where individuals can confidentially report incidents;
- Collaboration with Local Authorities: Collaboration with local law enforcement and relevant authorities to ensure that legal measures are taken against perpetrators of sexual exploitation, abuse, or harassment.

Risks of Gender Based Violence in Communities

- Community Engagement and Awareness: The contractor shall conduct community engagement sessions to raise awareness about gender-based violence, its consequences, and the importance of prevention.
- Collaboration with Local Organizations: Collaboration with local organizations and NGOs specializing in gender-based violence prevention to leverage their expertise and community networks.

- **Community Liaison Officers:** The contractor shall appoint community liaison officers who serve as points of contact between the construction project and the local community, addressing concerns related to gender-based violence.
- **Safe Reporting Mechanisms:** The contractor shall establish safe and confidential reporting mechanisms for community members to report incidents of gender-based violence related to the construction project.

Operation Phase.

Traffic Accidents

- Ensure awareness and education shall be provided to drivers and the general public on the road uses the awareness will be provided as per the SEP guidance;
- Establishment of appropriate and understandable signage to the road's prone areas

Improved Economy

- Periodic and routine maintenance of the approach roads and its facility should be properly streamlined.
-

7.4 Mitigation Measures for Projects' Package 2 Impacts

Planning/Pre-construction Phase.

Impact on Current Land Uses

- **Resource Assessment:** Conduct a thorough assessment of natural resources before construction begins to identify and protect areas of ecological significance, ensuring minimal disturbance to habitats, water bodies, and agricultural lands.
- **Environmental and Social Impact Assessment (ESIA)** evaluate potential impacts on land and resources and Implementation of recommendations from the EIA to minimize adverse effects and protect sensitive ecosystems.
- **Alternative Routes and Designs:** Explore alternative road routes and designs with lesser impact on current land use and engage in community consultations to gather insights on preferred routes that balance transportation needs with the preservation of vital lands and resources.
- **Land Rehabilitation and Compensation:** Develop a land rehabilitation plan to restore areas affected during construction and provide fair compensation to landowners for temporary land use during construction, safeguarding their economic interests.
- **Community Participation:** Involve local communities in decision-making processes related to land and resource use and Establish community advisory groups to provide input on project design, ensuring alignment with community needs and minimizing disruptions.
- **Seasonal Construction Planning:** Plan construction activities to minimize interference with critical agricultural seasons and Schedule construction during periods that have

minimal impact on farming activities, allowing communities to utilize their land effectively.

Displacement of Communities.

- Resettlement Planning: Development of a comprehensive resettlement plan in consultation with affected communities.
- Land for Land Compensation: Offer land-for-land compensation whenever feasible.

Cultural Heritage

- Once a find is made, work should be stopped in the area to avoid damaging the discovery.
- The appropriate cultural heritage or archaeological authorities should be notified to assess the find.
- Experts may be called to investigate and possibly excavate the site or items further to understand their significance.
- If the find is deemed significant, conservation efforts might be implemented, and the item shall be preserved in a museum or another secure location

Construction Phase.

Impacts on Atmospheric Environment.

- Emission Control Technologies: Equip construction equipment and vehicles with modern emission control technologies such as particulate filters and catalytic converters to reduce air pollutant emissions.
- Dust Control Measures: Employ effective dust control measures, including water spraying, dust suppressants, and covering exposed areas to minimize airborne dust during construction activities.
- Construction Material Management: Storing and handling of construction materials carefully to prevent dust generation. Utilize enclosed systems for material handling.
- Air Quality Monitoring: Establishment of air quality monitoring program during construction to regularly assess air quality in and around construction sites, allowing for timely identification and response to potential issues.

Impacts on Acoustic Environment

- Construction Equipment Maintenance: Regularly maintain and tune construction equipment to minimize noise emissions.
- Noise Barriers: Installation of temporary noise barriers around construction sites to contain and reduce the spread of construction-related noise.
- Community Liaison Officer: Appoint a community liaison officer to address noise-related concerns and facilitate communication between the construction team and the local community.

Impacts on Terrestrial Environment

- Erosion Control Measures: The contractor shall Implement erosion control measures, such as silt fences, sediment basins, and erosion control blankets, to prevent soil erosion and sedimentation in nearby water bodies.
- Sedimentation Ponds: The contractor shall Construct sedimentation ponds to capture and settle suspended sediments from construction site runoff before the water is discharged.
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- Soil Stabilization Techniques: Use soil stabilization techniques, such as mulching and matting, to protect exposed soil surfaces and minimize soil erosion.

Impacts on Public Health, Safety and Security

- Traffic Management: the contractor shall Implement efficient traffic management plans to minimize congestion and ensure the safety of both motorists and pedestrians.
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- Public Awareness Campaigns: Conduct public awareness campaigns to inform the community about construction activities, potential hazards, and safety measures.

Impacts on Labour and Economy

- Employment and Labour Practices: Implement the Project Labour Management Procedures that outlines targets for hiring local labor and provides training to ensure that workers have the necessary skills.
- Gender Inclusion: Establish gender-sensitive recruitment policies, promote a non-discriminatory workplace, and provide gender-focused training and mentorship programs.
- Health and Safety of the Workers: Establish clear health and safety standards and provide personal protective equipment (PPE) to all workers. Ensure that emergency medical services are available and that workers undergo regular health checks.

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- **Education and Awareness Programs:** Implementation of comprehensive education and awareness programs on HIV/AIDS and STDs for construction workers, emphasizing prevention, transmission, and safe practices.
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Climate & Microclimate Change

- **Water Management:** Implement sustainable water management practices, including the capture and reuse of rainwater, to address both water scarcity and excessive rainfall issues.
- **Energy-Efficient Construction Practices:** Utilize energy-efficient construction practices, materials, and equipment to reduce greenhouse gas emissions associated with construction activities
- **Erosion Control and Soil Conservation:** implement erosion control and soil conservation measures to mitigate the impact of extreme weather events on the stability of construction sites.

Risks of Sexual Exploitation and Abuse/Sexual Harassment

- **Clear Policies and contractor's Codes of Conduct:** Development and communication of clear policies and codes of conduct explicitly prohibiting sexual exploitation, abuse, and harassment on the construction site.
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- **Anonymous Reporting Mechanisms:** The contractor shall establish anonymous reporting mechanisms to encourage individuals to report incidents of sexual exploitation, abuse, or harassment without fear of retaliation.
- **Visible Reporting Points:** Clearly mark and make visible reporting points on the construction site where individuals can confidentially report incidents.
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Risks of Gender Based Violence in Communities

- **Community Engagement and Awareness:** The contractor shall Conduct community engagement sessions to raise awareness about gender-based violence, its consequences, and the importance of prevention.
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Operation Phase.

Traffic Accidents

- Ensure awareness and education shall be provided to drivers and the general public on the road uses;
- Establishment of appropriate and understandable signage to the road's prone areas

Improved Economy

- Periodic and routine maintenance of the approach roads and its facility should be properly streamlined.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) presents the implementation schedule of the proposed mitigation measures to both environmental and social impacts as well as planning for long-term monitoring activities. For the construction works, the ESMP is given in Table 8.1. The ESMP also includes the associated environmental costs needed to implement the recommended mitigation measures. The engineering designs have already included some of the mitigation measures recommended in this report. Additional recommendations are provided in the ESMP to enable the road facility to be more environmentally friendly. The implementation steps will involve the contractor, the Resident Engineer, Municipal Council, Road Agency (TARURA), road users and the local communities at large.

8.2 Objective and Components of the ESMP

The basic objectives of the EMSP are to:

- ✓ To ensure that all mitigation measures and monitoring requirements will actually be carried out at different stages of project implementation and operation - pre-construction, construction, and operation and maintenance;
- ✓ Recommend a plan of action and a means of testing the plan to meet existing and projected environmental and social problems;
- ✓ Establish the roles and responsibilities of all parties involved in the project's environmental and social management;
- ✓ Describe mitigation measures that shall be implemented to avoid or mitigate adverse environmental and social impacts and maximizing the positive ones;
- ✓ Ensure implementation of recommended actions aimed at environmental and social management and its enhancement;
- ✓ Ensure that the environment and its surrounding areas are protected and developed to meet the needs of the local people, other stakeholders and safeguard the interests of the common people.
- ✓ Ensure sufficient stakeholder engagement activities to mitigate communities and project itself against the various risks

8.3 Environmental Monitoring

The national EIA guidelines require the developer to prepare and undertake monitoring plan and regular auditing. Monitoring is needed to check if and to what extent the impacts are mitigated, benefits enhanced, and new problems addressed. Recommendations for monitoring have been included in the ESMP (Table 8.2). The ESMP also assigns responsibilities for monitoring activities.

However, the divisional/ward/village environmental committees and municipal environmental committee will participate in the long-term daily monitoring of the Upgrading of the Road to Bitumen Standard.

8.4 Environmental Audit

It is recommended that environmental and social audits determine the long-term effects of adopted mitigation measures. It is recommended that environmental audits be carried out annually on the project as part of the on-going maintenance programme. The audits will unveil the actual performance of mitigation measures and will allow effective measures to be

included in future projects based on the audit results. As per operative ESIA documents in Tanzania, environmental audits would be a responsibility of the developer (TARURA). In addition, at the completion of each subproject implementation, a Completion Environmental and Social Audit will be undertaken to document the overall implementation of the mitigation measures with a view to identifying any residual issues which need to be handled in order to avoid creating legacy issues.

8.5 Implementation of the ESMP

TARURA as the proponent shall be the Implementer of the ESMP through other organs. The environmental and social measures incorporated in the detailed engineering design will be attached to the Contract Documents. The Contractor shall take stock of the contents of the Environmental and Social Impact Assessment Statement of the Project.

Environmental and social experts should be appointed to assist the resident engineer, in order to make sure that the environmental and social measures recommended in this report are effectively complied with and timely adjusted whenever necessary. The experts will be familiar with the scientific measurement of environmental impacts and remedies and social aspects of road infrastructure developments in urban areas. They will work on a part-time basis and may be selected, by the firm in-charge of supervision works, from the roster of national environmental experts. He will liaise with the relevant public agencies and will carry out the training scheme associated with his assignment.

Contractor(s)

The Contractor is primarily responsible for implementing environmental and social control measures recommended in the ESMP. Therefore, this ESMP is to be included in the Contractor's bidding documents, where the Contractor is to develop a more specific Contractor ESMP (C-ESMP) for construction activities, adjusting the bill of quantities as needed to mitigate impacts. This shall apply to the Contractor as well as to all sub-contractors concerned by this sub-project. The Contractor(s) is/are advised to have Social Development Officer, Community Liaison Officer, a Health & Safety Officer and Environment Officer or procure a qualified consultant firm to oversee the implementation of the ESMP during construction.

TARURA

The overall implementation of the ESMP is the responsibility of the proponent of the ESIA. Their current responsibilities are more on the development, implementation and monitoring of environmental management procedures and ensuring compliance to legislative and international requirements on environment. Furthermore, different aspects of environmental management are managed in different departments. The Civil Engineering Department manages waste management at the sites, while the site's Occupational Safety, Health and Environment (OSHE) Committee oversee Occupational Health and Safety (OHS) issues.

TARURA-OSHE committee is to be custodian of this ESMP and will be responsible for:

- Ensuring that recommendations in the ESMP to be implemented during construction are incorporated into the Contractor tendering process.
- Procuring a supervising ESMP consultant to assist them in monitoring the Contractor to ensure that the mitigation measures are implemented and revise the ESMP to improve effectiveness where necessary. An EMS officer would also be relevant TARURA staff to monitor the implementation of the ESMP. However, it is not known if this shall be done before commencement of Phase 1 activities.
- Preparing monthly reports and
- Liaising with other institutions with respect to obtaining licenses, complying with standards and reporting on environmental and social issues identified in the ESMP.

Members of this OSHE committee are to include representatives from (but not limited to) the following departments:

- Civil Engineering - Sanitary Section
- Fire and Safety Department
- Medical Department

Municipal Council

OSHE sub-committee is to coordinate with responsible Municipal Council with regard to:

- Ensuring that the Contractors use licensed quarries as advised by the Municipal Council to extract raw materials for construction.
- The collection of solid waste to the designated waste disposal site and
- HIV/AIDS awareness and counselling services in collaboration with existing NGOs that currently works with the Port.

Resident Engineer (RE)

The Resident Engineer (RE) plays a critical role in overseeing the day-to-day activities on a construction site, ensuring that the project is executed in accordance with the design, specifications, quality standards, and safety regulations. The role of the Resident Engineer is multifaceted, encompassing technical, managerial, and supervisory responsibilities. Below is a detailed breakdown of the key roles and responsibilities of a Resident Engineer during the construction phase of a project:

- The Resident Engineer shall be responsible for the daily supervision of construction activities to ensure they adhere to the approved designs, specifications, and timelines
- The RE serves as the primary point of contact between the contractor, project owner, consultants, and other stakeholders. This includes coordinating activities and ensuring smooth communication between all parties.
- The RE ensures that work is progressing according to the approved schedule and identifies any potential delays or issues that may arise.
- The RE prepares regular reports documenting construction progress, issues encountered, actions taken, and other critical project details including E&S compliance. These reports shall be submitted to the client or project owner for review.
- Once the project is completed, the RE is responsible for conducting a final inspection to verify that all work is finished according to the specifications and contract.

Ward/Mtaa

OSHE sub-committee is to coordinate with responsible Ward/Mtaa with regard to:

- HIV/AIDS awareness and counselling services in collaboration with the existing NGOs that currently work with the project area
- Coordinating with environmental committee at ward level for all activities related to protection of environment in the project area

OSHA

The OSHE sub-committee is to coordinate with OSHA for the implementation of the ESMP with a view to:

- Ensuring that the Contractor complies with OHS standards and receives registration of the construction site.

NEMC

- NEMC has a responsibility of following up on implementation of the Permit Conditions continued in the ESIA Certificate of Approval.

8.6 Personnel and Training

One of the most important mechanisms for the enhancement of the Project's E&S performance will be the continued implementation of a training programme for all Project personnel, including all Contractor staff, subcontractors and third parties. An Environmental and Social Training Plan shall be developed as part of the CESMP. This Plan will provide a framework for responsibilities with respect to training, identify (at a high-level) E&S training needs, and the process of maintaining a record of training given.

The Training Plan will be formulated in such a way that it includes the following key components of training requirements:

- a) Stakeholder mapping and engagement;
- b) Specific aspects of environmental and social assessment and monitoring of the ESIA/ ESMP and ESMF implementation;
- c) Occupational health and safety;
- d) Community Health and Safety;
- e) Codes of conduct for project workers;
- f) Traffic Management Plan
- g) Waste Management
- h) Emergency preparedness and response;
- i) Gender mainstreaming in construction works;
- j) Combatting, and monitoring of HIV/AIDS
- k) Combat pandemic diseases such as COVID 19
- l) Contractor and Operator management on environment and social risks;
- m) Grievances management implementation and monitoring;
- n) Land acquisition and resettlement;

Gender-based violence/Sexual Exploitation and Abuse (SEA).

Labor and Working Conditions, including employer compliance with national labour laws, and combatting of child labour and forced/trafficked labour.

Resettlement and Livelihood Restoration;

These requirements should be understood by all Project personnel, including all Contractors, subcontractors and third parties. Accordingly, training should take the form of the following approaches:

- a) Induction training for all staff;
- b) Thematic and refresher Training;
- c) Toolbox training for specific topics and tasks at work fronts;

Task-specific training for individuals involved in tasks with specific responsibilities, such as drivers, security personnel, etc.

8.7 Environmental and Social Management Plan

The negative impacts as well as their mitigation measures have already been discussed in the ESIA. This section now highlights the various mitigation measures, the party responsible for implementing it and the costs, this data makes up the Environmental and Social Management Plan (ESMP) which is presented in **Table 8-1** below. The costs of the proposed mitigation measures some of which will have already been included in the main engineering Bills of Quantities and therefore need not be included in the Environmental and social mitigation costs, should be included in the Bill of Quantities as the Environmental and Social Mitigation Costs. The principal environmental cost includes the cost of implementing the mitigation measures proposed and that of carrying out monitoring of specific environmental parameters.

Table 8-1: Environmental and Social Management Plan (ESMP) for Project Packages 1&2

PACKAGE 01					
Phase	Impact (Negative & Positive)	Mitigation ref Code	Mitigation Measures	Responsibility	Cost (TShs)
Planning /Pre construction Phase.	Impact on Current Land and Resources Use	MP1-1	- Land Use Planning: Engage with local authorities and community stakeholders and collaborate with urban planners and zoning authorities to identify areas suitable for road expansion while preserving critical community spaces. - Resource Assessment: Conduct a thorough assessment of natural resources before construction begins to Identify and protect areas of ecological significance, ensuring minimal disturbance to habitats, water bodies, and agricultural lands. - Alternative Routes and Designs: Explore alternative road routes and designs with lesser impact on current land use and engage in community consultations to gather insights on preferred routes that balance transportation needs with the preservation of vital lands and resources. - Land Rehabilitation and Compensation: Develop a land rehabilitation plan to restore areas affected during construction and provide fair compensation to landowners for temporary land use during construction, safeguarding their economic interests. - Community Participation: Involve local communities in decision-making processes related to land and resource use and Establish community advisory groups to provide input on project design, ensuring alignment with community needs and minimizing disruptions. - Seasonal Construction Planning: Plan construction activities to minimize interference with critical agricultural seasons and Schedule construction during periods that have minimal impact on farming and early morning schedule activities.	PO-RALG/ TARURA/ Consultant	35,000,000.00
	Disruption of the existing Environment	MP1-2	Zoning Compatibility Analysis: Analysis of existing zoning regulations to ensure project alignment and Work closely with local zoning authorities to adapt project plans within	PO-RALG/ TARURA/ Consultant &	30,000,000.00

	and alteration of the existing land use and zoning.		existing zoning frameworks, minimizing conflicts and alterations. • Buffer Zones: Establishment of buffer zones around environmentally sensitive areas and implement strict controls within buffer zones to prevent excessive alterations to natural habitats and protect the existing environment. • Landscaping and Rehabilitation: Incorporation of landscaping and rehabilitation plans into the project design and restore disturbed areas promptly, using native vegetation to rehabilitate landscapes and minimize long-term alterations to the existing environment.	Contractor	
	Displacement of Communities.	MP1-3	• Resettlement Planning: Development of a comprehensive RAP in consultation with affected communities. • Land for Land Compensation: Offer land-for-land compensation whenever feasible.	PO-RALG/ TARURA/ Consultant	120,000,000.00
	Cultural Heritage	MP1-4	• Stop: Once a find is made, work should be stopped in the area to avoid damaging the discovery. • Notice: The appropriate cultural heritage or archaeological authorities should be notified to assess the find. • Investigate: Experts may be called to investigate and possibly excavate the site or items further to understand their significance. • Manage: If the find is deemed significant, conservation efforts might be implemented, and the item shall be preserved in a museum or another secure location	PO-RALG/ TARURA/ Consultant & Contractor	10,000,000.00
	Impacts on Atmospheric Environment	MP1-5	• Emission Control Technologies: Equip construction equipment and vehicles with modern emission control technologies such as particulate filters and catalytic converters to reduce air pollutant emissions. • Dust Control Measures: Employ effective dust control measures, including water spraying, dust suppressants, use of speed humps to minimise dust emission by speeding	PO-RALG/ TARURA/ Consultant & Contractor	65,000,000.00

			vehicles, and covering exposed areas to minimize airborne dust during construction activities. • Construction Material Management: Storing and handling of construction materials carefully to prevent dust generation. Utilize enclosed systems for material handling. • Air Quality Monitoring: Establishment of air quality monitoring program during construction to regularly assess air quality in and around construction sites, allowing for timely identification and response to potential issues.		
	Impacts on Acoustic Environment	MP1-6	• Construction Equipment Maintenance: Regularly maintain and tune construction equipment to minimize noise emissions. • Noise Barriers: Installation of temporary noise barriers around construction sites to contain and reduce the spread of construction-related noise. • Community Liaison Officer: Appoint a community liaison officer to address noise-related concerns and facilitate communication between the construction team and the local community. • <i>Nineth work</i>: Restricting noisy construction activities to daytime only. Any night works must be approved by the RE and statutory body (if any) before undertaking.	PO-RALG/ TARURA/ Consultant & Contractor	50,000,000. 00
	Impacts on Terrestrial Environment	MP1-7	• Erosion Control Measures: The contractor shall Implement erosion control measures, such as silt fences, sediment basins, and erosion control blankets, to prevent soil erosion and sedimentation in nearby water bodies. • Sedimentation Ponds: The contractor shall Construct sedimentation ponds to capture and settle suspended sediments from construction site runoff before the water is discharged. • Construction Site Runoff Management: The contractor shall Implement effective stormwater management practices to control runoff and prevent the transport of pollutants into nearby rivers or streams. • Soil Stabilization Techniques: Use soil stabilization	PO-RALG/ TARURA/ Consultant & Contractor	100,000,000 .00

			techniques, such as mulching and matting, to protect exposed soil surfaces and minimize soil erosion.		
	Occupational Health & Safety Impacts (-ve)	MP1-8	• <i>Local Labour</i>: prioritize hiring local labour and provides training to ensure that workers have the necessary skills. • <i>Gender Inclusion</i>: Establish gender-sensitive recruitment policies, promote a non-discriminatory workplace, and provide gender-focused training and mentorship programs • <i>Traffic Management</i>: the contractor shall Implement efficient traffic management plan which is part of ESMP to minimize congestion and ensure the safety of both motorists and pedestrians. • <i>HSE Signage and Communication</i>: Installation of clear and visible signage to provide information about construction zones, detours, and potential hazards. Use electronic message boards for real-time updates. • <i>Work Zone Barrier Implementation</i>: Installation barriers and barricades to separate construction areas from active traffic lanes, protecting both workers and the public. • <i>Safety Training for Workers</i>: Provide comprehensive safety training for construction workers, emphasizing the importance of following safety protocols and procedures. • <i>Public Awareness Campaigns</i>: Conduct public awareness campaigns to inform the community about construction activities, potential hazards, and safety measures. • <i>Safety work procedures</i>: Establish clear health and safety work procedures, including method statements, accompanied with risk assessment, for all Hazardous Tasks, such as work at heights, work in confined spaces, hot/welding works, electrical works, etc. • <i>Code of Conduct</i>: Make use of workers code of conduct to ensure acceptable and safe work behaviour. • <i>Personal Protective Equipment</i>: provide task specific and appropriate personal protective equipment (PPE) to all workers. • <i>First Aid</i>: Ensure that first aid and emergency medical services are available and that workers undergo regular	Consultant & Contractor	100,000,000.00

			health checks. • <i>Incidents Reporting Protocol:</i> The Contractor shall develop as part of the Emergency Response Plan, an Incidents/ Accidents Reporting Protocol in line with the guidance provided in the DMDP-2 LMP. • <i>Incidents/ Accidents Reporting:</i> Open and maintain Incidents/ Accidents Register and report all Reportable Incidents to the PIU and World Bank within 24 hours of occurrence. • <i>Root Cause Analysis of Incidents:</i> Undertake RCA and development and implement Safeguards Corrective Action Plan for all incidents.		
	Impacts on Labour and Working Conditions	MP1-9	• . • <i>Terms and Conditions of Employment:</i> Provide all workers with work contracts before commencement of work, including a signed code of conduct. The information and documentation will set out their rights under national labor and employment law (which will include any applicable collective agreements), including their rights related to hours of work, wages, overtime, compensation and benefits, • <i>Work Amenities:</i> Provide workers with work amenities such as drinking water, changing rooms, rest shades, gender segregated toilets, including providing clean mobile toilets at isolated work fronts. • <i>Leave:</i> Project workers will be provided with adequate periods of rest per week, annual holiday and sick, maternity and family leave. • <i>Child Labour:</i> A child under the minimum age established in accordance with this paragraph will not be employed or engaged in connection with the project. • <i>Forced Labour:</i> Forced labor, which consists of any work or service not voluntarily¹⁴ performed that is exacted from an individual under threat of force or penalty, will not be used in connection with the project. • <i>Workers GRM:</i> Institute Workers' Grievance Redress Committee and empower them to receive and process workers complaints in a timely manner.	Consultant & Contractor	70,000,000.00

	Soil Erosion and Change of Landscaping	MP1-10	• Erosion Control Measures: The contractor shall implement erosion control practices, such as silt fences, sediment basins, and erosion control blankets, to prevent soil erosion and sedimentation. • Vegetative Cover: The contractor shall Establish vegetative cover using native plants and grasses to stabilize soil and reduce the risk of erosion. • Soil Stabilization Techniques: Use of soil stabilization techniques, such as mulching and matting, to protect exposed soil surfaces and minimize soil erosion. • Construction Site Runoff Management: The contractor shall Implement effective stormwater management practices to control runoff and prevent the transport of pollutants into nearby water bodies. • Retaining Walls: Use of retaining walls to prevent soil movement on steep slopes, reducing the risk of erosion. • Soil Erosion Monitoring: Implementation of regular monitoring of soil erosion to detect potential issues early and take corrective actions.	PO-RALG/ TARURA/ Consultant & Contractor	20,000,000. 00
	Visual and Aesthetic Impact	MP1-11	• Visual Screening: The contractor shall Implement temporary visual screens, such as construction fences or landscaping, to shield construction activities from public view. • Construction Equipment Storage: Designate specific areas for construction equipment storage to prevent the visual clutter of equipment scattered throughout the construction site.	PO-RALG/ TARURA/ Consultant & Contractor	20,000,000. 00
	Water Quality Impact	MP1-12	• Regulatory Compliance: Adhere to local and national regulations related to water quality protection, obtaining necessary permits and approvals. • Pollution Prevention Plan: The contractor shall Develop and implement a pollution prevention plan that outlines specific measures to protect water quality during construction. • Water Quality Monitoring: The contractor shall Implement a water quality monitoring program to regularly assess the impact of construction activities on nearby water bodies.	PO-RALG/ TARURA/ Consultant & Contractor	20,000,000. 00
	Risk of Water and	MP1-13	• Erosion and Sediment Control: Install silt fences, sediment traps, and barriers around construction sites to prevent	PO-RALG/ TARURA/	45,000,000.

	Land Pollution		sediment runoff into nearby water bodies. • Stormwater Management: Design and implement proper stormwater drainage systems to direct runoff away from construction zones and ensure that it does not enter nearby water bodies. • Spill Prevention and Management: Store fuel, oils, and other hazardous materials in properly contained areas (e.g., bunded areas) to prevent spills from spreading into the environment.	Consultant & Contractor	00
	Mismanagement of Wastes	MP1-14	• Waste Segregation: Implement a waste segregation system to separate different types of waste at the source, facilitating proper disposal and recycling. • Designated Waste Collection Points: The contractor shall Establish designated waste collection points within construction sites for the systematic disposal of different waste streams. • Hazardous Waste Management: Handling of hazardous waste materials with strict adherence to disposal regulations, ensuring proper containment and disposal methods. • Construction Waste Management Plan: Development and implement a comprehensive construction waste management plan outlining procedures for waste handling, recycling, and disposal. • Educational Programs for Workers: The contractor shall Conduct educational programs for construction workers to raise awareness about the importance of proper waste management and the specific waste handling procedures on-site. • Waste Audits: The contractor shall Conduct regular waste audits to assess the types and quantities of waste generated, allowing for continuous improvement in waste management practices. • Monitoring and Enforcement: Regularly monitoring of waste management practices and enforce compliance with waste disposal regulations to prevent illegal dumping and mismanagement.	PO-RALG/ TARURA/ Consultant & Contractor	25,000,000. 00

	Spillage of hazardous materials	MP1-15	• Spill Response Plan: The contractor shall Develop and implement a comprehensive spill response plan that outlines immediate actions to be taken in the event of a hazardous material spill. • Emergency Spill Kits: The contractor shall Provide emergency spill kits equipped with absorbents, containment materials, and personal protective equipment at strategic locations throughout the construction site. • Proper Storage and Labelling: Ensuring proper storage of hazardous materials in designated areas, clearly labelled with appropriate hazard warnings, to minimize the risk of spills. • Secondary Containment Measures: Implementation of a secondary containment measures, such as bunding or double-walled storage units, to contain potential spills and prevent them from reaching the environment.	PO-RALG/ TARURA/ Consultant & Contractor	25,000,000. 00
	Possible escalation of HIV/AIDS and other STD's spread	MP1-16	• Education and Awareness Programs: Implementation of comprehensive education and awareness programs on HIV/AIDS and STDs for construction workers, emphasizing prevention, transmission, and safe practices. • Distribution of Educational Materials: Distribution informative materials, pamphlets, and posters on HIV/AIDS and STD prevention in languages accessible to all workers on the construction site. • Voluntary Counselling and Testing (VCT) Services: Establishment of voluntary counselling and testing services on or near the construction site to encourage regular testing and early detection of HIV/AIDS. • Community Outreach Programs: Conduct community outreach programs to engage local residents, promoting awareness of HIV/AIDS and STD prevention in the broader community.	PO-RALG/ TARURA/ Consultant & Contractor	50,000,000. 00
	Climate & Microclimate Change	MP1-17	• Water Management: Implement sustainable water management practices, including the capture and reuse of rainwater, to address both water scarcity and excessive rainfall issues. • Energy-Efficient Construction Practices: Utilize energy-	PO-RALG/ TARURA/ Consultant & Contractor	20,000,000. 00

			efficient construction practices, materials, and equipment to reduce greenhouse gas emissions associated with construction activities Erosion Control and Soil Conservation: implement erosion control and soil conservation measures to mitigate the impact of extreme weather events on the stability of construction sites.		
	Risks of Sexual Exploitation and Abuse/Sexual Harassment	MP1-18	- Clear Policies and Codes of Conduct: Development and communication of clear policies and codes of conduct explicitly prohibiting sexual exploitation, abuse, and harassment on the construction site. - Training and Sensitization: The contractor shall Conduct mandatory training and sensitization programs for all construction personnel, including workers, supervisors, and management, on recognizing, preventing, and reporting SEA and harassment. - Anonymous Reporting Mechanisms: The contractor shall establish anonymous reporting mechanisms to encourage individuals to report incidents of sexual exploitation, abuse, or harassment without fear of retaliation. - Visible Reporting Points: Clearly mark and make visible reporting points on the construction site where individuals can confidentially report incidents. - Collaboration with Local Authorities: Collaboration with local law enforcement and relevant authorities to ensure that legal measures are taken against perpetrators of sexual exploitation, abuse, or harassment.	PO-RALG/ TARURA/ Consultant & Contractor	20,000,000. 00
	Risks of Gender Based Violence in Communities	MP1-19	- Community Engagement and Awareness: The contractor shall Conduct community engagement sessions to raise awareness about gender-based violence, its consequences, and the importance of prevention. - Collaboration with Local Organizations: Collaboration with local organizations and NGOs specializing in gender-based violence prevention to leverage their expertise and community networks. - Community Liaison Officers: The contractor shall appoint community liaison officers who serve as points of contact	PO-RALG/ TARURA/ Consultant & Contractor	35,000,000. 00

			between the construction project and the local community, addressing concerns related to gender-based violence. • Safe Reporting Mechanisms: The contractor shall Establish safe and confidential reporting mechanisms for community members to report incidents of gender-based violence related to the construction project.		
	Roads and Traffic condition	MP1-20	• <i>Road closures and diversion:</i> The contractor shall provide prior notice on the closure of the road section is provided through most read or listened media • Traffic Signage: Proper signage shall be provided to guide the traffic especially when one side of the road and bridge is under construction • Traffic Police: The contractor shall ensure involvement of traffic police to assist in controlling traffic including provision of proper signage as well as traffic signals. • <i>Defensive driving:</i> Ensure all vehicle drivers and machine operators have defensive driving qualification and undergo periodic refresher trainings on safe operation of vehicles and machines.	PO-RALG/ TARURA/ Consultant & Contractor	40,000,000.00
PACKAGE 02					
Phase	Impact (Negative & Positive)	Mitigation ref Code	Mitigation Measures	Responsibility	Cost (TShs)
Planning/pre-construction phase	Impact on Current Land and Resources Use	MP2-1	• All feasible alternative project designs should be explored to avoid or at least minimize physical and/or economic displacement. • All land acquisition, economic and/or physical displacement will be conducted in line with the approved project's RAP. • The Project shall comply with and implement RAP and ensure all affected owners / users of land	PO-RALG/ TARURA/ Consultant	30,000,000.00

			d (including those who are using land informally) are appropriately informed, consulted and compensated for their assets and any losses: ✓ Primarily through negotiated settlements; ✓ At full replacement cost; ✓ Additional assistance to be provided to the people who will be resettled for restoring their standards of living and further improve them; ✓ People who have not vacated their houses which were previously expropriated (if any) should be advised in good time about the Project and the risk of remaining nearby the line so they can move out; ✓ Prior to displacement; and ✓ With any additional resettlement assistance needed ✓ Any grievances are resolved on a timely basis, with evidence of formal and informal communication retained. • Resettlement Action Plan to be prepared by a suitably qualified specialist approved by Architects & Quantity Surveyors Registration Board (AQRB) for each section based on Expropriation Studies, socio-economic surveys and a census. The RAP is to be compliant with Tanzanian requirements and approved by Tanzania Government Chief Valuer in advance of any land acquisition. • Affected persons shall be given the opportunity to participate in the negotiation of the compensation packages, eligibility requirements, resettlement assistance, suitability of proposed resettlement sites, if any, and the proposed timing. The Socio-economic survey needs to be undertaken in order to recognize the real situation for all project affected people, taking into consideration those without legal rights over properties and belongings. This survey should take into consideration the previous Expropriation Study (if any).		
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			- Census to be conducted in line with government requirements in order to facilitate the process and successful outcomes of resettlement and/or livelihood restoration. - Compensation completion note must be obtained to proceed with the commencement of construction on site - Conduct public awareness on compensation matters		
	Impact on Public Utilities relocations	MP2-2	- TANESCO, TTCL and DAWASA shall be involved from the early stages of the project so as to have an integrated plan. - Early notice must be given to the community before any service interruption - Funds for relocation of infrastructure must be part and parcel of the project.	PO-RALG/ TARURA/ Consultant & Contractor/ Service providers	35,000,000. 00
	Cultural Heritage	MP2-3	- Once a find is made, work should be stopped in the area to avoid damaging the discovery. - The appropriate cultural heritage or archaeological authorities should be notified to assess the find. - Experts may be called to investigate and possibly excavate the site or items further to understand their significance. - If the find is deemed significant, conservation efforts might be implemented, and the item shall be preserved in a museum or another secure location	PO-RALG/ TARURA/ Consultant & Contractor/ Service providers	25,000,000. 00
Construction phase	Impact on Atmospheric Environment	MP2-4	- Water sprays must be implemented during construction activities. - Dust generating activities must be slowed down in days of strong wind. - Truck dumpers carrying spoil or other dusty materials must be covered with tarps. - Vehicles and construction machinery must be properly maintained and to comply with relevant emission standards. - Monitoring of Atmospheric Environment	PO-RALG/ TARURA/ Consultant & Contractor	65,000,000. 00

	Impact on Acoustic Environment	MP2-5	• Reduce the risk from noise and vibration impacts by ensuring that the newly constructed road is at a distance of at least 10 meters from the residences. • Methods and equipment which minimize noise during execution of foundation works must be utilized, especially when working in centres/populated areas, schools, health facilities and worshiping areas. Methods to minimize the noise level include using fewer machines at the same time for the work. • The construction work should not be permitted during the nights ; the operations on site shall be restricted to 07.00hrs -19.00hrs. • The vehicles that are excessively noisy due to a poor engine adjustment or damage of noise abatement equipment shall not be operated until corrective measures have been taken. • The local residents will be kept informed of the planned works and advised in advance of noisy works • The location of noisy equipment will be chosen as far as possible away from sensitive receptors (houses, workplaces, schools, mosques, churches and hospitals). • The workers will be provided with ear protective devices (earmuffs and/or ear plugs). • Monitoring of Acoustic Environment	PO-RALG/ TARURA/ Consultant & Contractor	50,000,000.00
	Impact on Terrestrial Environment	MP2-6	• Erosion Control Measures: The contractor shall Implement erosion control measures, such as silt fences, sediment basins, and erosion control blankets, to prevent soil erosion and sedimentation in nearby water bodies. • Sedimentation Ponds: The contractor shall Construct sedimentation ponds to capture and settle suspended sediments from construction site runoff before the water is discharged. • Construction Site Runoff Management: The contractor shall Implement effective stormwater management practices to control runoff and prevent the transport of pollutants into nearby rivers	PO-RALG/ TARURA/ Consultant & Contractor	20,000,000.00

			or streams. • Soil Stabilization Techniques: Use soil stabilization techniques, such as mulching and matting, to protect exposed soil surfaces and minimize soil erosion.		
	Public Health, Safety and Security	MP2-7	• All workers must receive appropriate ESHS training in the required languages (Kiswahili/English). This will form part of the site/project induction process. • The contractor must provide onsite first aid kit/s. • Any lifting operations carried out on site must be properly planned, assessing the ground conditions and above the ground obstruction in the immediate area. • The equipment must not exceed the safe working load and be operated by a suitable competent operator. • All loads will be secured and the lift control by a competent person at all times in direct communication with the crane operator at all times. • Any working at heights which can't be avoided must be carried out using suitable working platforms with adequate guard rails to prevent falls. • Where a risk of falling may still be possible, all workers must be provided with, and trained in the use of suitable safety harnesses / fall arrest equipment to mitigate the consequences if a fall should occur. • All construction traffic on the site must be restricted to a maximum speed of 10-30km/hr at all times on site. • Regular awareness campaigns on Health and Safety. • Contractor to develop and implement Emergency Response Procedures.	PO-RALG/ TARURA/ Consultant & Contractor	100,000,00 0.00

	Impacts on Labour and - Working Conditions – Non Discrimination	MP2-8	- Gender balance shall be observed during the provision of employment - Remuneration for all employees shall be not less than the minimum Tanzanian Government Scale - Skilled and unskilled job opportunities arising from project activities should be given to affected people as a first priority. This will also reduce influx of job seekers and speculators from outside the project area. - Women food vendors shall be promoted in place so as to uplift their income flow. Hygiene of the service providers should be emphasized - Community engagement and public awareness - The contractor to undertake the construction activities during worshipping hours - Maintain/Observe any burial ceremonies especially at project areas' cemeteries (If any)	PO-RALG/ TARURA/ Consultant & Contractor	75,000,000. 00
	Soil Erosion and Change of Landscaping	MP2-9	- Areas which are prone to erosion must be left undisturbed and undeveloped if possible. Entrance and exit points for runoff must be protected from erosion and equipped with sediment control devices. - Minimize the extent of the disturbed area and the duration of exposure and stabilize disturbed areas as soon as possible. - The use of heavy equipment and techniques that will result in excessive soil disturbances or compaction of soils must be minimized, especially on unstable slopes. - The drainage and runoff controls must be established before starting the site clearance and earthworks. The existing vegetation must be retained as much as possible. - Where water would need to be removed from excavations, it will be transferred at the minimum practical distance to be	PO-RALG/ TARURA/ Consultant & Contractor	55,000,000. 00

			discharged. - The most effective erosion control devices must be implemented: i) temporary seeds; ii) temporary mulching; iii) temporary or permanent erosion control blankets; v) permanent vegetative buffer strips - Sediment control devices to be implemented must include: i) site fencing; ii) sediment basins or traps; iii) storm inlet traps; iv) interception berms. - After construction is completed, the decompaction and restoration of the disturbed areas that are not going to be occupied by road structures must be carried out by tilling the land before proceeding to the vegetation reinstatement. - Revegetate 15m Width of Riparian zones at least 200m Upstream and 100m Downstream of the Rivers and Streams Crossing the Road		
	Visual and Aesthetic Impact	MP2-10	- Visual Screening: The contractor shall Implement temporary visual screens, such as construction fences or landscaping, to shield construction activities from public view. - Construction Equipment Storage: Designate specific areas for construction equipment storage to prevent the visual clutter of equipment scattered throughout the construction site.	PO-RALG/ TARURA/ Consultant & Contractor	25,000,000. 00
	Water Quality Impact	MP2-11	- Regulatory Compliance: Adhere to local and national regulations related to water quality protection, obtaining necessary permits and approvals. - Pollution Prevention Plan: The contractor shall Develop and implement a pollution prevention plan that outlines specific measures to protect water quality during construction. - Water Quality Monitoring: The contractor shall Implement a water quality monitoring program to regularly assess the impact of construction activities on nearby water bodies.	PO-RALG/ TARURA/ Consultant & Contractor	35,000,000. 00
	Risk of Water and Land	MP2-12	Each river or large stream must have a specific Management	PO-RALG/	20,000,000.

	Pollution		Plan defining the risks and mitigation measures to be applied • The construction of drainage structures and bridges in watercourses must be carried out during the dry season. • The design of the drainage structures must take account of projected maximum flood events and potential changes in future flow regimes due to climate change. • The extension of the construction area next to water courses must be only that strictly necessary to adequately perform the construction works. The perimeter of the area will be marked with signaling ribbons that neither vehicles and machinery nor workers will trespass. No occupation of the streambed or the banks will be allowed, unless there is no other reasonable alternative to carry out the construction work. • Domestic type wastewater generated in the construction camps must not be allowed to be discharged untreated into natural water courses.	TARURA/ Consultant & Contractor	00
	Mismanagement of Wastes	MP2-13	• Vegetation's (Trees, Grasses) and remnants of timber shall be given to residents near the project road to be used as a Source of energy. • Food remains, Cardboards and papers (Degradable waste) shall be collected in a large skip bucket at the campsite then to be composted and used as manure for the gardens at the campsite/office • Top soil shall be used as backfilling material in the borrow pits, fill the diversions. • Plastic and Scrap Metals shall be sold to certified recyclers • Tin, Glasses and other inert materials taken to the Authorized dumpsite to be selected and approved during construction • Sewage shall be directed Septic Tank-Soak away system at the campsite/office and mobile toilets along the route. The authorized contractor shall be deployed for emptying when full. • Hazardous wastes shall be collected by the licensed hazardous	PO-RALG/ TARURA/ Consultant & Contractor	30,000,000. 00

			waste collector to the required disposal / treatment facility/yes • Solid waste shall be collected for disposal by licensed waste collector.		
	Spillage of hazardous materials	MP2-14	• The proper handling and storage of lubricants, solvents must be organized as well proper usage of construction equipment. • The storage of substances that are harmful to soils and waters (e.g., fuels for construction machinery) on the construction site will be minimized. All hazardous substances, either products to be used or waste, shall be stored in adequate places, far from sensitive areas (e.g., water courses, habitats with a rich biodiversity) and adequately equipped to prevent any soil, surface water or groundwater contamination). • Vehicles and construction machinery must be subject to regular preventive maintenance so as to reduce leakages of lubricants, motor oil and fuel.	PO-RALG/ TARURA/ Consultant & Contractor	25,000,000. 00
	Possible escalation of HIV/AIDS and other STD's spread	MP2-15	• Organizing workshops in each project road to raise awareness of the importance of HIV/AIDS prevention and control among construction companies, entertainment facilities, medical groups, communities and the district health department • Prepare an HIV/AIDS information campaign to be implemented upon commissioning of the Road Project; • Organizing social marketing toward the target groups (construction workers, commercial sex workers [CSWs], and local population) to increase awareness and responsibilities for HIV/AIDS prevention and control, safe sex, early diagnosis and treatment of STIs, use of condoms, anti-drug abuse, and human trafficking; • Condoms to be distributed to construction workers and CSWs in the first year; • Identifying, in consultation with Municipal'/Regional department of health, adequate procedures to ensure distribution	PO-RALG/ TARURA/ Consultant & Contractor	100,000,00 0.00

			of STI treatment drugs and HIV testing kits to worksite medical units and local health centers;		
	Climate & Microclimate Change	MP2-16	• Reduce Vehicles' Journeys where possible by, sourcing localized products, internet shopping, restructuring freight logistics systems, and utilizing advanced information and communication technologies (ICT); • Modal shift to lower-carbon transport systems encouraged by increasing investment in public transport, walking and cycling infrastructure, and modifying roads to become more attractive for users and minimize travel time and distance; • Lowering the energy intensity (MJ/passenger km or MJ/tonne km) —by enhancing vehicle and engine performance, using lightweight materials, increasing freight load factors and passenger occupancy rates, deploying new technologies such as electric vehicles; • Reducing the carbon intensity of fuels (CO₂eq/MJ) by substituting oil-based products with natural gas, bio-methane, or biofuels, electricity or hydrogen produced from low GHG sources	PO-RALG/ TARURA/ Consultant & Contractor	20,000,000. 00
	Sexual Exploitation and Abuse/Sexual Harassment	MP2-17	• To develop policies to promote nondiscrimination and equal treatment and to prevent harassment (including sexual harassment) and bullying in the workplace, and make sure that they are clearly communicated and accessible to management, supervisors and workers.	PO-RALG/ TARURA/ Consultant & Contractor	20,000,000. 00
	Gender Based Violence in Communities	MP2-18	• Mandatory and regular training for workers on required lawful conduct in the host community and legal consequences for failure to comply with laws; • Commitment / policy to cooperate with law enforcement agencies investigating the perpetrators of gender-based violence; • Creation of partnership with local NGOs to report workers' misconduct and complaints/reports on gender-based violence or harassment through the grievance redress mechanism (GRM);	PO-RALG/ TARURA/ Consultant & Contractor	35,000,000. 00

Operation phase	Traffic Accidents	MP2-19	• Ensure awareness and education shall be provided to drivers and the general public on the road uses; • Establishment of appropriate and understandable signage to the road's prone areas. • Installation of safety structures, especially rubble strips and humps at risky areas prone to speeding vehicles and blind spots.	PO-RALG/ TARURA/ Consultant & Contractor	45,000,000. 00
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ESMP Sub-Plans for the Project

The Contractor shall prepare specific E&S Sub-Management Plans/ Management Strategies and Implementation Plans (MSIP) as part of the Contractor's ESMP, which among others should include the following: Occupational Health and Safety Management Plan (HSMP), HIV/AIDS Management Plan, Traffic Management Plan (TMP), Community Health and Safety Management Plan, Waste Management Plan, GBV/SEA/SH/VAC Management Plan, Soil erosion and vegetation management Plan, Air Quality Management Plan, Labour Management Plan, Stakeholder Engagement Plan, Campsite Management Plan, Sites Closure/ Rehabilitation and Decommissioning Plan.

Specific plans will be prepared by civil work contractor based on the latest design, and its consultation.

Health and Safety Management Plan (HSMP)

The plan should detail the measures taken by the project Contractor to manage the hygiene conditions and medical care in each of the worker's camps. It should also address occupational health & safety in alignment with Labour law of Tanzania, ILO recommendations, Good Industry Practices. This plan should include (but not limited to) the following topics: (i) Health and safety policy and commitment from management, (ii) Description of the organization; Human resources, definition of roles and responsibilities, (iii) workers accommodation, hygiene facilities and food supply, (iv) Description of material resources including Personal Protective Equipment (PPE) to be used by workers, (v) Health and safety procedures, (vi) Risk assessment, (vii) Pollution prevention and protection, (viii) Health and safety training, (ix) Monitoring of health and safety performance, and (x) Medical checks.

Gender Based Violence (GBV) Action Plan

Gender-based violence (GBV) undermines the health, dignity, security and autonomy of its victims, yet it remains shrouded in a culture of silence. Victims of violence can suffer sexual and reproductive health consequences, including forced and unwanted pregnancies, unsafe abortions, traumatic fistula, sexually transmitted infections and HIV, and even death.

(<https://tanzania.unfpa.org/en/topics/gender-based-violence-10>)

The Gender Based Violence Action Plan should form part of the CESMP for the project objectives to provide guidance to mitigate, prevent and respond to gender based violence during the project's construction and post construction phases. The action plan should include but not limited to communities' participation in ending GBV, healthcare for GBV survivors, mental health & psychosocial support to GBV survivors, safety and security of GBV survivors, justice and legal aid, social, economic empowerment and referral systems.

Air Quality Management Plan

A detailed Air Emissions and Dust Control Management Plan should be prepared and implemented as part of the construction ESMP. The plan should detail all site-specific measures; the project Contractor will implement during the construction period to identify and manage and reduce all nuisances caused by air emissions and dust production resulting from the construction

activities including from the project's traffic along the access roads. The plan should also include specific measures for the reduction of the greenhouse gas emissions in compliance with the national standards and proportionate to the potential impacts referring to greenhouse gas emissions.

Noise & Vibration Management Plan

A detailed Noise & Vibration Control Plan should be prepared and implemented as part of the construction ESMP. The plan should describe how the project Contractor will minimize and manage noise and vibration impacts during construction.

Effluent Management Plan

Effluents consist of liquid discharges from Worksite, transporting a pollutant (dissolved, colloidal or particles). A detailed Effluent Management Plan should be prepared and implemented as part of the construction ESMP. The plan should detail all site-specific measures, the project Contractor will implement during the construction period to identify, drain and treat all effluents generated on site from the construction activities.

Waste Management Plan

A detailed Waste Management Plan should be prepared and implemented as part of the construction ESMP. The plan should detail all site-specific measures, the project Contractor will implement during the construction phase to identify, collect, transport and treat all waste produced on the Worksites by its personnel. The plan should reflect consultations and agreements achieved with the local authorities.

Hazardous Materials Management Plan

A detailed Hazardous Materials Handling and Storage Management Plan should be prepared and implemented as part of the construction ESMP. The plan should detail all site-specific measures the Contractor will implement during the construction phase to identify and manage hazardous materials planned for use on the Worksite and their disposal.

Soil Erosion & Vegetation Management Plan

A detailed Soil Erosion & Vegetation Management Plan should be prepared and implemented as part of the construction ESMP. The plan should detail all site-specific measures; the project Contractor will implement during the construction phase to minimize vegetation clearing and prevent an increase in sediment loads being exported from the site.

Materials Management and Spoil Disposal Plan

The project Contractor should prepare and submit a Materials Management Plan that documents how excavated soils and materials are to be handled.

Traffic Management Plan

A detailed Traffic Management Plan should be prepared and implemented as part of the construction ESMP. The plan should (i) define the characteristics of the construction fleet of

vehicles and site machinery, (ii) describe the expected Project's traffic (frequency of trips between Worksites, working hours, convoys) and (ii) detail all site-specific measures the project Contractor will implement during the construction period to minimize the nuisances to neighbourhood generated by its fleet and reduce the risk of accident.

Site Rehabilitation Plan

A detailed Site Decommissioning and Rehabilitation Plan should be prepared and implemented as part of the C-ESMP. The plan should detail all site-specific measures; the project Contractor will implement at the end of the construction period to rehabilitate all temporary areas disturbed by the works.

Site rehabilitation should be considered as an integral part of the road project by incorporation throughout the planning, design, construction and maintenance phases. It is equally important that the rehabilitation process be budgeted for in each of these phases.

Issues that need to be addressed during the restoration phase should include:

- ✓ Identification of safety issues – this involves the application of road requirements and standards to landscape plans to ensure that proposed treatments will not impede safety.
- ✓ Selection of appropriate species - species mixes need to be formulated with regard to the aim of the restoration program and the intrinsic environmental values of adjacent areas.
- ✓ Development of an appropriate established technique – this could include seeding, seedling planting etc.

Community Safety Plan

The project contractor should prepare and implement a Community Safety Plan, which includes regular community meetings on safety & construction hazards, announcement in advance of heavy construction activities, restriction of access to working sites, awareness campaigns on traffic related risks, including school children.

Recruitment and Local Labour Management Plan

A detailed Recruitment and Labour Management Plan should be prepared and implemented as part of the construction ESMP and Labour Management Procedures. The plan will detail the manpower needs for the entire construction period, the local recruitment process and the approach planned to maximize local employment and local content opportunities.

Environmental Permitting

The project Contractor should conduct the environmental and social investigations required to obtain the environmental permit and any other authorizations as required by the authorities for the Project components that might not be covered by the ESIA or the construction permit.

Emergency Preparedness Plan

A detailed Emergency Preparedness Plan will be prepared and implemented as part of the construction ESMP. The EPP for Common Hazards and Emergency Situations during construction should be structured as such but not limited to:

- ✓ Identification of potential emergencies based on hazard assessment;
- ✓ Procedures to respond to the identified emergency situations; shut down equipment; contain and limit pollution; decontamination; for rescue and evacuation, including a designated meeting place outside the construction camps;
- ✓ Location of alarms and schedule of maintenance;
- ✓ List and location of equipment and facilities for employees responsible for responding to the emergency (fire-fighting equipment, spill response equipment, personal protection equipment for the emergency response teams, first aid kits and stations);
- ✓ Protocols for the use of the emergency equipment and facilities;
- ✓ Schedule for periodic inspection, testing and maintenance of emergency equipment;
- ✓ Clear identification of evacuation routes and meeting points;
- ✓ Schedule of trainings (drills), including with local emergency response services (e.g., firefighters);
- ✓ Procedures for emergency drills;
- ✓ Emergency contacts and communication protocols, including with affected communities when necessary, and procedures for interaction with the government authorities;
- ✓ Procedures for periodic review and update of emergency response plans.

Communication Strategy

The plan shall provide a communication direction for the project team and the contractor to ensure a steady flow of accurate and timely information, engagement of stakeholders and to reduce incorrect information from other sources. The aim will be to minimize negative issues and enhance communities' support for the project.

The plan should be prepared to at least contain but not limited to the; list of stakeholders, communication methods and responsibilities of each stakeholder

9 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

9.1 Implementation of Monitoring Plan

Monitoring of the anticipated environmental and social impacts in the receiving environments is important. It helps in determining the effects of the project activities on the environments enhancing understanding of cause effect relationships between human activities and environmental changes and verifies the accuracy of prediction about the environmental impacts. It ensures compliance with regulatory measures and understanding the degree of implementation of ESMP and its effectiveness. The monitoring results are also used extensively during the environmental auditing.

The EIA regulations require the developer/ Contractor to prepare and undertake monitoring plan and Annual auditing. Monitoring is needed to check if and to what extent the impacts are mitigated, benefits enhanced, and new problems addressed. Recommendations for monitoring have been included in the E&S Monitoring Plan (Table 9.1). The ESMP also assigns responsibilities for monitoring activities. However, the divisional/ward/village environmental committees and district environmental committee will participate in the long-term daily monitoring of the project site.

9.2 Objectives of Environmental and Social Monitoring

The overall objectives of the monitoring activities are to:

- ✓ Ensure regulatory requirements are met;
- ✓ Check that impacts do not exceed national environmental standards
- ✓ Verify predictions made in the ESIA by obtaining real time measurements;
- ✓ Verify that mitigation measures are effective and implemented in the manner described in Chapter 7;
- ✓ Provide early warning of potential environmental impacts; and
- ✓ Inform future operations and contribute to continuous improvement in the management of environmental and social issues related to the project.

Monitoring of indicators of progress will be done by the Construction Supervision Consultants through the Resident Engineer on contractual obligations to undertake inspections, monitoring and reporting.

9.3 Environmental and Social Audit

It is recommended that quarterly and annual environmental and social audits be undertaken by PO-RALG and TARURA ESHS Specialists to determine the long-term effects of adopted mitigation measures. It is recommended that environmental audits be carried out on the project as part of the on-going implementation supervision and monitoring programme. The audits will unveil the actual performance of mitigation measures and will allow effective corrective measures to be included for implementation. As per operative ESIA documents in Tanzania, compliance environmental and social audits would be a responsibility of the developer (TARURA) and the National Environment Management Council (NEMC).

9.4 Monitoring Parameters

The selection of the parameters to be monitored is based on the high likelihood of occurrences of the selected parameters. Monitoring of these parameters will be done in various stages of the project as follows;

- *Pre-construction stage* – Monitoring of the parameters at this stage is meant to establish the baseline information of the target parameters in the project area.
- *Construction stage* - Monitoring at this stage is meant to establish the pollution levels that arise from the construction activities.
- *Operation stage* - Monitoring at this stage is meant to check on the impacts that might arise as the result of normal use of the infrastructure.
- *Decommissioning*- Decommissioning is not anticipated in the foreseeable future. However, if this will happen, may entail a change of use (functional changes) or demolition triggered by change of land use.

9.4.1 Project's Inspections and Monitoring

The following four types of inspections and monitoring must be employed.

Inspections planned and conducted on a regular basis to ensure that mitigation measures and commitments are properly maintained and implemented, and that specific management procedures are followed.

Receptor monitoring undertaken to verify predictions made in the ESIA and to confirm that the activities at the site are not resulting in an unacceptable deterioration i.e., Monitoring disturbance to affected residents through a grievance mechanism).

Compliance monitoring involving periodic sampling or continuous recording of specific environmental quality indicators or discharge levels to ensure compliance of discharges and emissions with project standards.

Auditing (internal and external) to assess compliance of the site activities with both regulatory and site management system requirements.

Monitoring results will be presented in regular reports and reviewed at monthly and quarterly site meetings. The results of the inspection and monitoring activities will be reported to TARURA.

9.5 Reporting Procedure

The Contractor will be required to report on any progress performance, compliance reporting on environmental and/or social incidents to Resident Engineer who in turn will address the matter and report to the Project Implementation Team (PIT) that composes Experts from TMC and TARURA. PIT Coordinator through Residence Engineer will advise the contractor about appropriate mitigation measures to take. If there are complaints from the public during the construction phase, the TARURA Manager is to be notified immediately. The following information should be recorded by the Project Engineer/Consultant.

- ✓ Time, date and nature of the incident / report;
- ✓ Type of communication (e.g., telephone, personal meeting);

- ✓ Contact details with telephone number of the person making the complaint. If this person wishes to remain anonymous, then “not identified” is to be recorded;
- ✓ Details of response and investigation undertaken as a result of the incident / complaint;
- ✓ Name of the person undertaking an investigation of the incident / complaint;
- ✓ Corrective action taken as a result of the incident / complaint.

The Project Engineer/Consultant will prepare and submit weekly, monthly and quarterly monitoring reports to the TARURA Manager.

Table 9-1: Environmental and Social Monitoring Plan for the proposed project

Parameters		Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimate (TSH)
Pre-Construction and Construction Phase								
Atmospheric Environment	Dust	Once before the construction starts	Project Site	µg/m ³	Micro Dust Pro	<0.01	Contractor/ Env. Supervisor	20,000,000
Acoustic Environment	Noise level	Once before the construction starts	Project Site	dBA	Noise Level Meter	<110	Contractor/ Env. Supervisor	15,000,000
Risk of Water Pollution	Turbidity	Once Per week during dry season Every day during rainy season	Project Site	NTU	Spectrophotometer	<50	Contractor/ Env. Supervisor	20,000,000
Risk of Soil pollution	Soil quality along the road	Once in three Months	Project Site	Level of erosions	Site inspection	No pollution	Env. Supervisor/ Contractor/ Municipal Env. officer	10,000,000
Terrestrial Environment	Biomass	Once in three months for construction period	Project Site	-	Inspection	Clearance confined in CoI	Env. Supervisor/ Contractor/ Forests Officer	20,000,000
	Biodiversity	Once a year	Project Site	type and number of living and organisms	Inspection	Clearance confined in CoI	Env. Supervisor/ Contractor/ Forests Officer	10,000,000
Vibration	Vibration levels	Once per Month	Project Site	No per time	Records	No Vibrations	Contractor/ Env. Supervisor	15,000,000
Impacts on Air Pollution/Dust	Water sprinkling	Everyday	Project Site and nearby residents	Frequency of water sprinkling	Inquiries and observation	Minimum dust emission	Contractor/ Environmental Supervisor	10,000,000
Frequency of illness of construction	Illness of construction workers	Once in a month for the construction period	Project Site	Number of cases	Health records	No Illness	Municipal Health officers/ Contractor	20,000,000

Parameters		Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimate (TSH)
workers								
Impacts on Labour and Economy	Percentage of local construction labourers	Three times a year	Project Site	Number of local people employed in the project	Records, inquiries and observation	More than 150 people have contracts	Municipal council/ Contractor/ TARURA	60,000,000
Public Health, Safety and Security	Number and type of safety equipment such as mask, helmet, gloves and ear plugs. Health and sanitation facilities in camps.	Once in three months	Project Site	Number of safety measures provided	Actual injuries and illness statistics	All employees have Protective gears	Contractor/ OSHA	35,000,000
Operation stage								
Traffic Accidents	Road Accidents & Road signs	Quarterly	Along the Project Road	Number of Accidents & Road Signs	Records/Inquiries	Zero Road accidents/Sufficient Road Signs	TARURA	30,000,000

9.6 Institutional Arrangements

TARURA, assisted by environment and social specialists, will be responsible for reviewing civil works contracts in accordance with the ESIA report; coordinating the implementation of the ESMP among the contractors, local environmental authorities (e.g., Municipal Council) monitoring the implementation of the ESMP and the civil works contracts in collaboration with NEMC, OSHA and PO-RALG and, preparing annual environmental progress reports.

The purpose of environmental and social monitoring is to quantitatively measure the environmental and social effects of the upgrade roads. The environmental monitoring program will operate through the preconstruction, construction, and operation phases. It will consist of a number of activities, each with a specific purpose, key indicators, and significance criteria.

The monitoring of mitigation measures during design and construction will be carried out by Project Team guided by the Resident Engineers. He/she will conduct mitigation monitoring as part of the regular works inspections. The responsibility for mitigation monitoring during the operation phase will lie with the Environmental Section in TARURA and Temeke Municipality.

Temeke Municipality and TARURA will provide PO- RALG and NEMC with reports on environmental compliance during implementation as part of their annual progress reports and annual environmental monitoring reports. Depending on the implementation status of environmentally sensitive areas of the project, NEMC will perform annual environmental reviews in which environmental concerns raised by the project will be reviewed alongside project implementation.

10 DECOMMISSIONING

10.1 Decommissioning

As decommissioning is not anticipated to take place in the remote future, the specific conditions for mitigation are generally inherently uncertain. In view of this, specific mitigation measures pertaining to environmental impacts of decommissioning works cannot be proposed at the moment with a reasonable degree of certainty.

A detailed decommissioning plan that takes environmental and social issues into consideration shall be prepared by the developer prior to the decommissioning works. Should it be done, decommissioning may entail a change of use (functional changes), or demolition triggered by change of land use. Therefore, what is presented here is just a Preliminary Decommissioning Plan which gives light to what shall be done if the need for decommissioning arises.

10.2 Preliminary Decommissioning Plan

This Section provides a brief outline of the works required to demolish the proposed infrastructures on the site in case it happens. This Plan will be used as a reference document that provides the framework to ensure that demolition activities on the site do not adversely affect the health, safety, traffic or the environment of the public and neighbouring properties.

The Contractor will be required to prepare a detailed Demolition Plan and Construction Management Plan to the satisfaction of the Proponent and relevant Authorities prior to the commencement of works on site.

10.3 Demolition Methods

It is anticipated that the Contractor will prepare a detailed Demolition Plan prior to the commencement of work on site; however, the indicative demolition methodology will be as follows:

- ✓ The strip out and removal of non-structural elements will be undertaken utilizing manual labour and small plant including – excavators, tipper trucks, metal cutters e.tc.
- ✓ The materials will be removed from the site using small to medium sized trucks.
- ✓ The structures will be demolished using larger plant and equipment including hydraulic excavators equipped with rock breakers,
- ✓ During the demolition process, erosion control measures will be established. These will include treatment of dust and potential discharges into rivers/streams crossing the road.

10.4 Demolition Activities

The following are the typical of activities for proposed roads under DMDP II decommissioning activities;

- ✓ Creating an alternative route for service during decommission
- ✓ Block entrance. Put signs and blockage to the areas of the road that is decommissioned.
- ✓ Removal of road furniture.
- ✓ Remove all culverts and associated fill. All culverts and associated fill material be removed from stream crossings, swales, and at ditch relief culverts.
- ✓ All remaining materials and hazardous waste will be removed
- ✓ Reshape and stabilize stream crossings. Excavated slopes are shaped back to a stable angle, generally attempting to mimic the slope of adjacent undisturbed slopes
- ✓ Scarify the roadbed and compacted area. In some cases, structural elements are added to the excavated stream bottom (rocks, woody debris, etc.) to improve stability and add diversity to the channel.
- ✓ The entire road surface is then scarified or de-compacted (using an excavator) to encourage water infiltration and re-establish vegetation on the road surface.
- ✓ Water bar the roadbed. Waterbeds are constructed on the scarified roadbed to drain any surface water that does accumulate on the road surface.
- ✓ Excavate and stabilize unstable fills. Fill material is excavated and placed against the cut slope of the road or hauled to a more stable location.
- ✓ All waste will be disposed of in an appropriate manner; and reusable materials will be resold or recycled
- ✓ Re-vegetate the road surface, crossings, and disturbed areas. The road is then re-vegetated with local native grasses, tree seedlings are planted at stream crossings, and a physical closure is constructed at the entrance to the road.
- ✓ Install and implement a road closure both physical and legal. The closure usually includes a large berm backed up by a ditch to prevent vehicles from driving over it. Legal closure of a road, because many people will still try to drive on it.

10.5 Impacts Associated with Decommissioning Activities

Below are the impacts that are anticipated during the decommissioning phase

- ✓ Potential impacts on site geology and soils may occur from the excavation, storage, reuse and disposal of soils
- ✓ There is the potential for personal injury and significant damage to machinery and equipment if inappropriate levels of consideration are given to health and safety issues,
- ✓ The noise impacts of the decommissioning activities

- ✓ Impact on air quality due to dust during cutting and filling and removal of tarmac.
- ✓ Waste materials on site during decommissioning with potential to be classified as hazardous i.e., oils and lubricants, that are disposed of inappropriately, have the potential to represent a significant risk to health and contamination of the local environment.

10.6 Mitigation Measures for Anticipated Impacts

- ✓ All disturbed areas shall be rehabilitated and re-vegetated;
- ✓ Native flora shall be used to re-vegetate the rehabilitated sites;
- ✓ The roadway will be scarified; and natural drainage patterns will be reinstated where practical
- ✓ The soils and materials excavated during the decommissioning phases of the proposed development will be stored in accordance with Good Practice Guidelines
- ✓ Wastes arising will be used wherever possible in the reinstatement of the site such as concrete, gravel and sand. Any excess stored material will be disposed of off-site in full accordance with Environment Agency guidance to minimize the risk of pollution and degradation of habitats
- ✓ All health and safety regulations and best practice guidelines will be followed during the decommissioning of the proposed road development to ensure that risks to personal safety and equipment on site are minimized.
- ✓ Any substances classified by regulation as hazardous which are used or removed during decommission phase will be used and disposed of responsibly off site in accordance with manufacturer's guidance and regulations governing use of the material. Materials with potential to be classified as hazardous are most likely to be tarmac, oils, fuels.
- ✓ Obtaining all necessary permits and/or authorizations to gain access to sites and to conduct work
- ✓ Consultation with representatives and communities to inform and get opinions to ensure safety measures.
- ✓ Trained personnel from facility operations will be used where possible; and additional rehabilitation crews shall be hired

10.7 Decommissioning Cost

The cost for undertaking Mitigation measures during decommissioning is estimated to be 20% of the total project cost.

11 SUMMARY AND CONCLUSION

The construction of proposed road projects under DMDP II at the Temeke Municipal Council will reduce transport cost and facilitate the transportation services within the Municipal areas as well as to the other surrounding Municipalities.

The proposed project has undergone ESIA study as a legal requirement under the National Environmental Management Act, 2004 as well as EIA and Audit Regulations, 2005 read together with amendments of 2018.

Environmental and Social Impact Assessment study was conducted in 2023 which involved the collection of baseline information including secondary data, focused approach impacts mapping, engagement of communities along the proposed roads and footbridges, impacts identification, impacts evaluation and preparation of Environmental and Social Management Plan.

Impacts identified include various categories; physical, biological, social, economic and climate change risks. Evaluation of impacts indicates low magnitude on physical and biological negative impacts. Positive economic impacts are anticipated to be of medium magnitude. Most of Social negative impacts scored low magnitude with no impacts to resettlement and Road Users Safety.

The identified adverse impacts should be managed through the proposed mitigation measures and monitoring schedules outlined in chapters 8 and 9 of this report.

It is, therefore, concluded that, implementation of the proposed project will not cause significant negative environmental and social impacts provided that the recommended mitigation measures are adequately and timely put in place.

REFERENCES

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LIST OF ANNEXES

Annex 1: Minutes of the Meeting and Signatures of Consulted Stakeholder

MEETINGS SUMMARY:

PLACE: DOVYA

DATE OF THE MEETING: 23/8/2013

The chairman opened the meeting at 13:05 hrs. in the afternoon with introductions before presenting the main agenda to the community. He welcomed the ESIA expert team to introduce themselves and explain their role in the project. The community then shared their views on the proposed project. The community emphasized the importance of including effective and high-quality drainage designs in the project, as flooding is a common issue in the area, particularly during the rainy season. However, the citizens expressed their appreciation for the government's efforts, particularly under President Dr. Samia Suluhu Hassan, in bringing this project to the area.

PLACE: CHAMANZI MAGENGANI

DATE OF THE MEETING: 22/08/2013

Chairman opened the meeting and introduced the whole team of ESIA expert, the sociologist Ms. Amina Shamte introduced the project to the community although the community were aware about the project. The community already had an idea about the Project from their councilors, the citizens in turn presented their concerns. One of their concerns was the installation of road humps around Secondary school while insist the road design should consider drainage structures with potential changes in future flow regimes. Moreover, Temeke Municipal council's community development officer Mrs. Agness Soso explained resettlement and compensations issues since there was a question concerning the matter.

PLACE: MTONGANI

DATE OF THE MEETING: 13/08/2023

The chairman opened the meeting at 9:30 am in the morning and the introduction followed, the consultants introduce the project and allow the citizen to express their concerns and need about the project, the project discussion were based on 3 roads which are BOA Bank CIUP road, Mtongani RC Church road, Raha Road, the following issues was raised:

- Provision of awareness to the community concern the project
- Graves compensation in Raha Road
- Employment Opportunities during construction phase should be given to the residents surrounding the Project especially low wages
- Quality of construction work should be considered
- The roads should have enough space for pedestrian walkways

PLACE: TANDIKA (KITUNDA AND CHIWANDA ROAD)

DATE: 12/08/2023

The chairman opened the meeting and welcomed the consultants to introduce the project, the residents present their concern on the poor standard of the road which had already being constructed in the area by TARURA and insist DMDP 2 Roads to have good standard. Also,

they proposed that the design drawings for drainage system have to be covered and consider maximum flood events of water during rainy season which comes from Kitunda road to Chiwanda road.

PLACE: TEMEKE (PENDAMOYO ROAD)

DATE: 13/08/2023

The chairman opened the meeting and the consultants introduced themselves as well the project. The community were very happy and ready to receive the project in their areas. The project area is surrounded by three schools, during construction stage temporary road diversions should be considered to help the movement of primary and secondary school students. Also, the community request for road bumps around Pendamoyo secondary school.

PLACE: MASAKI TOANGOMA

DATE: 12/08/2023

The meeting started at 12:08 am and followed with the introduction of the project and as well as ESIA experts, the issues raised was:

- Presence of culvert between kibondemaji ward and Toangoma (Goroka)
- The area has high water table; the drainage design structures have to consider the project maximum flood events.
- Traffic calming measures such as road humps, zebra, and warning signs should be installed in all populated areas.
- The roads should have enough space for pedestrian walkways (especially for disability people).

PLACE: CHANG'OMBE

DATE: 13/08/2023

The chairman opened the meeting at 11:00 am and the introduction followed, the consultants introduced and explained everything concerning the project to the residents. Views, concerns and general comments raised by the community were comprehensively captured include, high water table of the area so the drawing design have to consider proper and quality drainage design. Furthermore, the community raised compensation issues and make it clear that in Chuma road the PAP's had already compensated however they declared that due to geography condition of the area the engineers have to come up with the best drawing design in order to reduce flood during rain seasons. Also, they requested if possible Ngorongoro road to be added in the coming DMDP2 project.

PLACE: MAKUKA KUSINI

DATE: 12/08/2023

The meeting started at 10:00 am, chairman opened the meeting and followed by the introduction of consultants. Consultants presented formally the project to the residents; the community insisted on their engagement in the coming phases of the project as well as advance note should be given to the small traders along the project areas in order to reallocate their business before the construction started. However, the community proposed for the

proper drainage design, road bumps, signs, and suggests that Kipati jeshini road should be included in the project also Involvement of Utilities Company such as DAWASCO and TANESCO in the early stage of the project should also be taken in consideration.

PLACE: KINGUGI

DATE: 12/08/2023

The chairman opened the meeting at 13:45 hrs. and started by the introduction and later the consultants introduced the project to the community. The following issues were raised:

- Currently the area is like an island, the road can't be connected to Buza, the community depend on one road (Zakhem road), and once the road is completed 100% will act as a main connector between Kiburugwa and Buza through Bondeni area.
- Due to high water table in the area, cement concrete road is preferred than asphalt concrete
- The project will stimulate the development of social services activities such as dispensary and schools (primary and secondary) which are located along the project area
- During rainy Season, students fail to attend classes due to poor condition of the road.
- Temporary road diversions during road construction should be available since the constructed road have two primary schools
- In order to reduce flood, the storm water drainage should be channeled to the river

PLACE: MIBURANI

DATE: 20/08/2023

The village executive officer opened the meeting on behalf of the chairman, and then the consultants introduced themselves as well as the project and the discussion started. The community raised their concern such as Flood occurrence is one of the most common Phenomena in the project area during rainy season and claims that the water comes from Mkumba road. Moreover, the community request for road signs and speed bumps around schools' areas in order to avoid accidents.

PLACE: KURASINI

DATE: 21/08/2023

The chairman opened the meeting at 15:56 hrs. and the introduction followed; consultants introduced the project to the community. The major concern of community was to remove the chosen roads from the project, claiming that the chosen roads are in industries areas, the community priorities the roads which are in peoples' residents.

PLACE: WAILES

DATE: 21/08/2013

Chairman opened the meeting and introduced the whole team of ESIA experts, the experts introduced the project and provide a chance for the community to express their concern, the community were concerned about the quality of construction work, requesting for integrity and commitment by contractors to ensure the sustainability of roads constructed. Furthermore, the community request for cement concrete road around Wastara Street because the area have high water table.

PLACE: KEKO JUU
DATE: 21/08/2023

The chairman opened the meeting around 11:30 pm and the introduction followed, consultants introduced the project to the community, the major concern of community was to replace the chosen road (Twiga Road) with DIT CCM Road. Since DIT CCM is very potential and stand as main road in the area. Also, the community propose that PAPs should be educated and counseled in implementing resettlement and Valuation of properties should be done accordingly along with the design should consider traffic calming measures such as road humps, zebra, and warning signs.

PLACE: MASAKI
DATE: 23/08/2023

The meeting started at 13:07 hrs, the chairman of the meeting opened the meeting and introduced the team. The consultants introduced the project and received the suggestions and comments from stakeholders. The stakeholders requested for culvert around Kwa Zebedayo area. Moreover, in Kamlete area the bridge which is available is very small and temporary, since the road will be constructed there is a need of replacing by upgrading the current bridge. However, the road design has to consider road humps, zebra, and warning signs in order to minimize accidents.

PLACE: PONDE
DATE: 23/08/2023

The chairman opened the meeting at 14:20 hrs, after the introduction of consultants and the project. Different issues were raised such as the area has high water table, the drainage design structures have to consider the project maximum flood events especially at Frem tatu, Njia panda Kwa Mdosu, Kwa Bedui and Ambonile Street. In addition to that they insisted for traffic claiming measures to be considered such as road humps, zebra, and warning signs.

PLACE: SAKU
DATE: 22/08/2023

The chairman opened the meeting, then introduction followed, the main agenda of the meeting was to introduce the project to the community. The chairman welcomed ESIA expert team to introduce themselves as well as the project. The community living in the project area were eagerly waiting for the roads to be improved. They believe that the roads shall bring numerous benefits in terms of economic and social growth. They were also worried on unfair compensation of affected properties and Inability of the proponent to mark out the Right of way.

PLACE: TAMLA
DATE: 12/08/2023

The chairman opened the meeting and the introduction followed; consultants introduced the project to the community. Through the public meeting it was noted that the majority members of the community were quite aware of the proposed project. Most of them were glad and

appreciated the coming of the project and propose for proper, well advanced and covered Storm water drainage in order to avoid possible accidents to children.

PLACE: MZAMBARAUNI

DATE: 22/08/2023

The meeting started at 10:00am, the chairman opened the meeting and followed by the introduction of consultants. Consultants presented formally the project to the residents, the community proposed that the drainage design should consider slope to let water flow as well as they rise compensation issues, and mention all the areas were compensation already done.

PLACE : MAJI MATITU “B”

DATE : 23/08/2023

The Ward councilor opened the meeting and the consultants introduced themselves and the project, the community appreciated the Government’s efforts in the implementation of the project and propose that the road design should consider enough space for pedestrian walkways and drainage design structures have to consider the project maximum flood events.

Annex 2: Pictures Illustrations



Figure 1: Existing Vegetations and Utilities along Taifa road



Figure 2: Consultation at Chasimba road



Figure 3: Consultation at Chamazi Magengeni road



Figure 4: Existing Industrial and commercial activities along Mwakalinga road



Figure 4: Existing residential buildings along Basri Road

