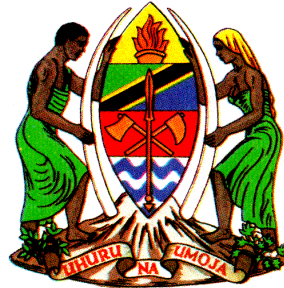


**THE UNITED REPUBLIC OF TANZANIA  
PRIME MINISTER'S OFFICE, REGIONAL ADMINISTRATION  
AND LOCAL GOVERNMENTS**



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**CONTRACT No. ME/022/2012/2013/CR/11  
FOR  
FEASIBILITY STUDY AND DETAILED ENGINEERING DESIGN OF DAR ES  
SALAAM LOCAL ROADS FOR MUNICIPAL COUNCILS OF KINONDONI,  
ILALA AND TEMEKE IN SUPPORT OF PREPARATION OF THE PROPOSED  
DAR ES SALAAM METROPOLITAN DEVELOPMENT PROJECT(DMDP)**

**THE ENVIRONMENTAL AND SOCIAL IMPACT  
ASSESSMENT REPORT (ESIA) OF THE PROPOSED  
LOCAL ROADS SUBPROJECTS IN TEMEKE  
MUNICIPALITY (23.2 KM)**

**DECEMBER 2014**

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## EXECUTIVE SUMMARY

### **Environmental and Social Impact Assessment Report for the proposed Local Roads Subproject in Temeke Municipality (23.2 Km) Under the Dar Es Salaam Metropolitan Development Project (DMDP)**

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### **Project Background and Rationale**

The Government of the United Republic of Tanzania through the Prime Minister's Office, Regional Administration and Local Government (PMO-RALG), intends to improve road networks in the Dar es Salaam Metropolitan area covering all the three municipalities of Kinondoni, Temeke and Temeke. In Temeke Municipality, 8 roads covering a total of 23.2km, were assessed for upgrading from gravel/earth to bitumen standard or by improving the existing tarmac roads. The local roads improvement aims to provide safe and efficient access to social and economic activities by removing transport flow constraints, supporting the present and projected economic and social development in Dar es Salaam. Out of these 8 roads, 5 segments (14.51km) were selected for financing by the first phase of the Dar es Salaam Metropolitan Development Project (DMDP) with financial assistance from the World Bank.

The PMO-RALG has awarded Ms. Crown TECH-Consult Ltd of Dar es Salaam to provide consultancy services for carrying out the feasibility study, Detailed Engineering Design and preparation of Tender documents for the Local Roads subproject. The consultancy also includes carrying out Environmental and Social Impact Assessment (ESIA) for the proposed local roads investments.

### **Brief Description of Project Environment**

The subproject roads are located in Temeke Municipal Council (TMC). The TMC is one of the three councils in the Dar es Salaam Metropolitan area: Dar es Salaam lies in the tropical coastal belt of Tanzania. The municipal has a total area of 786.5km<sup>2</sup>. Administratively the municipal is divided into 3 divisions, 30 wards and 180 sub-wards. According to the nation population census results of 2012 Temeke municipal council had a total population of about 1,368,881 and average household size of 3.9. The total population in the project wards makes about 67.37% of the total population in Temeke. The city experiences relatively high rainfall (800-1200mm per year), and high temperature (25-35°C) and humidity. The land relief ranges from hilly, relatively flat terminating to the Indian Ocean. The hilly areas include Pugu, Ukonga and Chanika.

The soil found in Dar es Salaam City is often clayey and partly sandy. The vegetation of Temeke like the rest of Dar es Salaam is constituted of various species of disturbed bushland and woodland species comprising of coastal shrubs along the beach areas and Miombo woodland, vegetation in coastal swamps and mangrove trees. Tree species found in the project area include Neem trees and Ashoka trees (which are among the most commonly planted trees in Tanzania) and a few African teaks. There are limited wildlife resources in Dar es Salaam City due to its high demand for land for settlements and industrial development. The population particularly of larger animals has been significantly reduced. The only place where large animals can be found is in the Dar es Salaam Zoo located in Kigamboni, in Temeke municipality. Also a diverse assemblage of seabirds is found in the Dar es Salaam Marine Reserves System (DMRS), including both seasonal migratory and local birds. The common bird species sighted include the White reef heron, and little egret, Whimbrel and Sanderling.

Noise pollution is gradually increasing in Tanzania. Passenger vehicles contribute more significantly to the problem compared to other vehicles. Noise pollution is more significant during day time, with peaks in morning and evening hours. During night times, noise levels decrease to values below 60 dBA. It has been reported that roads construction noise and vibration pollution in Dar es Salaam City varies between 60 dBA and 70 dBA and this surpasses Tanzania environmental noise standards for residential areas. The main rivers include River Msimbazi and River Kizinga. These water sources are heavily contaminated by disposal of different types of waste from small industries, domestic and institutional sanitation systems and solid waste from residential areas. The waters in these sources have high levels of BOD, COD, color, nitrates and turbidity.

The prevailing of diseases in the project area reflects some of the reported top ten diseases for the 2009 in the municipality which are Malaria, ARI, Diarrhea diseases, Intestinal worms, Eye Infections, UTI, Pneumonia, Skin Infections, Minor surgical conditions and Anaemia. Most of these diseases are communicable and indeed preventable. With the implementation of the project, it is possible for rate of some of these diseases to increase and spread to more people due to various factors as discussed under the negative impact and mitigation measures. The HIV infection prevalence rate in Dar Es Salaam region is 6.9% in 2012 while sources from Temeke VTCs and PMTCTs indicated the prevalence rate of 4.5% for Temeke Municipality.

### **Project Stakeholders and their involvement in the ESIA Process**

Stakeholders included government agencies, beneficiaries, commercial companies, and all other formal or informal groups associated with a project. Interviews and Community meetings were used in the process of stakeholder involvement. From one stakeholder, the team was connected to another and another stakeholder, in chain like or network process. The following is a short list of both institutional and individual stakeholders that were consulted;

- Temeke Municipal Council,
- TANESCO zone manager,
- DAWASCO

- TANROADS Regional offices.
- Meetings at Mbagala Kuu, Temeke, Mibulani, Azimio, Mtoni, Chang'ombe, Keko, Charambe, Buza, Kiburugwa and Sandali wards

### **Results of Public Consultations**

The following issues were raised by stakeholders;

- The project to ensure that the road is watered during construction to avoid dust / air pollution
- They should involve the indigenous as laborers in their respective wards/mitaa where the project is allocated
- Compensation for land, buildings, trees, commercial activities and social services should be done at a specified period of time in a current market price.
- Ensure that people along the road are well informed so that they can make necessary arrangements for their properties before commencement of the project
- Safety while crossing the road especially students/pupils is needed. They need road humps, bus-bays and road signs in areas with concentrated settlements

### **Potential Significant Environmental And Social Impacts**

The development of infrastructure in unplanned settlements 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;

- Job creation and increased income
- Land expropriation , loss of property and resettlement
- Loss of employment and income

Impacts during construction phase;

- Job creation and increased income
- Destruction of public utilities
- Soil erosion and instability of slopes
- Risk Water and Land Pollution
- Increased noise, vibration and air pollution
- Occupational Safety and health risks
- Increase road accidents
- Increased Waste
- Loss of Scenic Quality
- Loss of Vegetation

Impacts during operational phase;

- Improved Transport in Dar es Salaam suburbs

- Decongestion of Dar es Salaam main Roads
- Reduced Vehicle operation costs
- Increase road accidents
- Interference to local hydrology (Flooding)

Impacts during Demobilization Phase phase;

- Increased noise, vibration and dust
- Occupational Safety and health risks
- Increased Waste

### **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.

### **Recommendations and plan for Mitigation**

Many of the mitigation measures put forward are nothing more than good engineering practice that shall be adhered to during all the project phases. The major mitigation measures to be observed include;

- Compensation shall be done according to World Bank/ Tanzania laws governing resettlement before commencement of the construction activities.
- Resettlement Action Plan (RAP) have been prepared and shall be observed
- The TANESCO, DAWASA and TTCL shall be involved from the early stages of these project so as to have an integrated planning.
- Early notice shall be given to the community before any service interruption
- Unnecessary ground clearance and sensitive re-alignments shall be avoided.
- Lined drainage channels at sensitive terrains shall be provided to control speed and volumes of storm-water. The discharge points shall be carefully chosen to avoid erosion of arable land and creation of gullies.
- Refueling of plant or transfer of materials should not be carried out near water bodies, and any local spillage to soil should immediately be remedied.
- Good house keeping shall be practiced within material storage compounds or vehicle maintenance yards where the possibility of spillage is great. This can easily be done by provision of Spill tanks and Secondary containment at vehicle maintenance yards.
- The nuisance of noise, vibration and dust will be transient and good work practice can minimize them. In addition, these impacts are already being experienced due to the existing road segments.
- Watering should be practiced regularly at all active work sections along the road and at all quarries and borrow sites for the protection of workers. In

addition, sections of road heavily traversed by construction vehicles should also be regularly watted.

- Appropriate working gear (such as nose, ear mask and clothing) and good camp management shall be provided.
- The road design shall take account of safety concerns especially at human habitation crossings e.g. installation of bus stops at settlement centres.
- Traffic management plan shall be incorporated in the designs to include for example details of signs, markings, intersection layouts, access restrictions, bus stops, crossings, footpaths etc.
- Adequate number of waste bins shall be provided at the constructio sites site
- Close supervision of earthworks shall be observed in order to confine land clearance within the proposed new corridor of impact boundaries.
- The road design shall try as practicable to offset the route so as to avoid felling all big trees that take many years to grow or other flora of outstanding importance.
- Consultation with the Temeke Municipal Natural Resources Officer shall be made
- Installation of proper road signs and regular inspections for their presence
- Installation of speed control devices like humps
- Installation of pedestrian lanes at human settlement crossings

### **Environmental and Social Impact Management Plan**

The options to minimize or prevent the identified adverse social and environmental impacts as well as a monitoring plan have been suggested in this report and are contained in the ESMP. Many of them are based on good engineering practices. The Environmental and Social Management Plan (ESMP) presents the implementation schedule for the proposed mitigation measures to both environmental and social impacts as well as planning for long-term monitoring activities. 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 proposed facilities become more environmental friendly. The implementation steps will involve the PMO-RALG, Temeke Municipal Council, Contractor, the Resident Engineer, NEMC, some utilities provides such as DAWASCO and TANESCO, and the local communities at large.

### **Proposed Monitoring and Auditing**

Recommendations for monitoring have been included in the report. The monitoring plan also assigns responsibilities for monitoring activities. However, the divisional/ward/mate environmental committees and district environmental committee will participate in the long-term daily monitoring of the project. It is recommended that environmental audits be carried out 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 legislation in force. As per operative ESIA documents in Tanzania, environmental audits would be a responsibility of the developer (PMO-RALG) and the National Environment Management Council (NEMC).

## Cost Benefit analysis

Economic evaluation as conducted to ascertain socio-economic benefits anticipated due to the implementation of the local roads project. The Alternatives employed in the analysis consisted of ALT0, ALT1, ALT2 and ALT3 as follows

- ALT0: Base Alternative
- ALT1: Engineered gravel road rehabilitation of unpaved roads and paved roads rehabilitation by overlay, widening and provision/rehabilitation of drainage structures
- ALT2: Construction to DBST surface of unpaved roads and Reconstruction to DBST surface of paved roads including widening and lanes addition and
- ALT3: Construction to AC surface of unpaved roads and Reconstruction to AC surface of paved roads including widening and lanes addition

The results of the economic analysis are shown in the tables below. These results relate to project alternatives ALT1, ALT2 and ALT3 as compared to Base alternative ALT0. The economic indices are Internal Rate of Return (IRR %), Net Present Value (NPV) and NPV/Cost ratio at 12% discount rate.

Engineered Gravel road rehabilitation (ALT1) was finally not evaluated. Paved road rehabilitation by overlay options (also under ALT1) was also not evaluated.

Upgrading to Asphaltic Concreted (AC) surface (ALT3) options yielded high and attractive economic benefits. IRR's were generally by far greater than the 12% cut off point. Resulting NPV's at 12% discount rate were also high and positive which ranged from US\$ 0.1 to 135million. NPV/Cost ratios also at 12% discount rate were also high and positive which ranged from 0.1 to 38.

## 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 issues into consideration shall be prepared by the developer prior to the decommissioning works. Should it be done, decommissioning may entail change of use (functional changes) or demolition triggered by change of land use.



## ACKNOWLEDGEMENT

The PMO-RALG and the EIA Team wishes to convey heartfelt thanks and appreciation to all stakeholders who in one way or other supported the completion of this work. Thanks very much all of you. Special thanks to the Temeke Municipal Council officials for provision of relevant information and for their prompt assistance during the fieldwork. Last but not least we thank the streets and wards leaders for their cooperation and assistance.

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## ABBREVIATIONS AND ACRONYMS

AADT	Average Annual Daily Traffic
AAS	Atomic Absorption Spectrophotometer
AIDS	Acquired Immune Deficiency Syndrome
A.M.S.L	Above Mean Sea Level
BATNEEC	Best Available Technology Not Entailing Excess Cost
CBD	Convention on Biological Diversity
CBO	Community Based Organization
CITES	Convention on International Trade in Endangered Species
CRB	Contractors Registration Board
CTC	Care and Treatment Clinic
CoI	Corridor of Impact
DAWASCO	Dar es Salaam Water and Sewerage Company Ltd
DAWASA	Dar es Salaam Water and Sewerage Authority
DMDP	Dar es Salaam Metropolitan Development Project
DoE	Division of Environment
EAMGRS	Environmental Assessment and Management Guidelines for Road Sector
EIA	Environmental Impacts Assessment
EIS	Environmental Impacts Statement
EMA	Environmental Management Act
EMP	Environmental Management Plan
ERB	Engineering Registration Board
ESIA	Environmental and Social Impacts Assessment
ESMP	Environmental and Social Management Plan
EWURA	Energy, Water Utilities Regulation Authority
GoT	Government of the United Republic of Tanzania
HBC	Home Based Care
HIV/AIDS Deficiency	Human Immunodeficiency Virus/ Acquired Immune Syndrome
NACP	National AIDS Control Programme
NEMC	National Environment Management Council
NGO	Non-Governmental Organization
NSGRP	National Strategy for Growth and Reduction of Poverty
OP	Operational Policy
PAs	Protected Areas
PEDP	Primary Education Development Programme
PLHAS	People Living with HIV/AIDS
PMTCT	Prevention of Mother to Child Transmission
PMO-RALG	Prime Minister's Office, Regional Administration and Local Government
RoW	Right of Way
SACCOS	Credit Co-operative Societies
SIA	Social Impacts Assessment
STD	Sexually Transmitted Diseases
STI	Sexual Transmitted Infections
TAC	Technical Advisory Committee
TACAIDS	Tanzania Commission for Aids
TANESCO	Tanzania Electric Supply Company Ltd
TANROADS	Tanzania National Roads Agency

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TMC	Temeke Municipal Council
TTCL	Tanzania Telecommunication Company Ltd
ToR	Terms of Reference
WB	World Bank
VCT	Voluntary Counselling Treatment
WHO-GPA	World Health Organization Global Programme on AIDS

## 1.0 INTRODUCTION

### 1.1 Project Background and Justification

The Government of the United Republic of Tanzania through the Prime Minister's Office, Regional Administration and Local Government (PMO-RALG), intends to improve road networks in the Dar es Salaam Metropolitan area covering all the three municipalities of Kinondoni, Ilala and Temeke. In Temeke Municipality, 8 roads covering a total of 23.2km will be upgraded from gravel/earth to bitumen standard or by improving the existing tarmac roads. The local roads improvement aims to provide safe and efficient access to social and economic activities by removing transport flow constraints, supporting the present and projected economic and social development in Dar es Salaam. The Dar es Salaam Metropolitan Development Project (DMDP) will be implemented with financial assistance from the World Bank.

The PMO-RALG has awarded Ms. Crown TECH-Consult Ltd of Dar es Salaam to provide consultancy services for carrying out the feasibility study, Detailed Engineering Design and preparation of Tender documents for the Local Roads subproject. The consultancy also includes carrying out Environmental and Social Impact Assessment (ESIA) for the proposed local roads investments.

The objective of ESIA is to assess the environmental and social impacts of the local roads sub-projects in Temeke Municipality to be implemented under DMDP and recommend mitigation measures to address the negative and positive impacts. In accordance with the World Bank's environmental and social safeguard policies, the DMDP projects has been classified as a Category "B" which triggers three safeguard policies namely Environmental Assessment, Involuntary Resettlement and Physical Cultural Resources. The ESIA will also address these policies apart from subscribing to the national environmental policies and guidelines.

The Environmental and Social Impact Assessment has been conducted in accordance with the requirements of the Environment Management Act No.20 of 2004 and Environmental Impact Assessment and Audit Regulations (2005) of Tanzania with full cognizance with the Guidelines of the World Bank's Environmental and Social Safeguard Policies. Other important legal provisions providing guidance on environmental issues pertaining to road sector such as the Road Act (2007), Environmental Code of Practice for Road works (2008), and Environmental Assessment and Management Guidelines in the Road Sector (2004) have also been used in the undertaking Environmental and Social Impact Assessment. This study was conducted between February 2013 and April 2014.

### 1.2 Project Development Objectives

The road network improvement measures aims to provide safe and efficient access to social and economic activities by removing flow constraints, supporting the present and projected economic and social development in Dar es Salaam. The Measures shall include; (i) development and upgrading of connecting roads between existing main roads. The aim is to improve the road density and enable the better distribution of traffic which could relieve traffic stress on the currently choked arterial and other main roads; (ii) constructing selected new roads connecting emerging settlements with

the existing roads nearby and facilitating access to socio economic services; and (iii) scaling-up rehabilitation and improving roads maintenance systems.

### **1.3 Objectives of this ESIA Study**

The purpose of this ESIA study is to foresee all environmental, social and economic effects of the proposed project design before the project come into the actual implementation. The study therefore has addressed the social, economic, and environmental issues associated with the project and provided relevant mitigation plan to prevent or minimize adverse impacts and enhance the positive ones.

The study has determined the environmental consequences of the proposed project. In undertaking the ESIA study, the consultant collected baseline data on physical, biological and socio-cultural environment of the area. The information was used to predict the potential impacts of the proposed activities as well as to develop appropriate mitigation and enhancement measures and to plan programs to monitor any changes that may result after construction and use of the proposed infrastructure.

### **1.4 Scope of Work**

The scope of this work is outlined in the ToR (Appendix I) and includes;

- To identify, predict, evaluate and mitigate the significant environmental impacts (positive and negative)
- To identify key social issues relevant to the project objectives, and specify the project's social development outcomes
- To determine magnitude of adverse environmental and social impacts and identify the safeguards instruments as per World Bank's Operational policies, Country laws and regulations
- To assess the Impacts on any cultural resources to ensure that investments designs meet the guidelines set out in the World Bank's OP 4.11 Physical and Cultural Resources.
- To predict and assess in quantitative terms as far as possible, the impacts from changes brought about by the project on the baseline environmental conditions.
- To establish the mitigation measures that are necessary to avoid, minimize or offset predicted adverse impacts and, where appropriate incorporate these into Environmental and Social Management Plan (ESMP)
- To identify stakeholders who are directly affected and carry out stakeholder analysis to determine their role in achieving social development outcomes.
- To inform, consult and carry out dialogues with stakeholders on matters regarding project design alternatives, implementation of environmental and social mitigation measures and to provide recommendations on project design that may require adjustments in project design
- To provide an environmental and socio economic profile of the population and available infrastructure facilities for services and community resources.
- To assess the capacity of the implementing agencies and the mechanisms for implementing safeguard instruments, and recommend capacity building where appropriate

- To develop monitoring and evaluation mechanism to assess effectiveness of mitigation measures including, resettlement outcomes during and after project completion.

## **1.5 Rationale of the ESIA**

To ensure that no segment of the population is adversely affected and the physical cultural resources are given the due attention, this ESIA study was carried out to identify constraints, risks and mitigation measures on the project affected communities. The ESIA provides input to the feasibility study and design proposals of the investments. The ESIA findings and recommendations contained in this report will be incorporated in the overall project design, specifically assist in the development of mitigation and enhancement measures of the identified risks, opportunities and impacts.

Since this project will be funded by the World Bank, Environmental and Social Impact Assessment Reports are needed before lending procedures are finalized. However, it is also a World Bank's policy for lenders to adhere to national environmental requirements. In this case, it is a legal obligation of any developer to conduct an ESIA of his/her envisaged development proposal meant to be implemented in Tanzania. The principal legislation guiding ESIA undertakings in Tanzania is the Environmental Management Act (EMA), Act No.20 of 2004 (Cap. 191). For matters pertaining to EIA, the EMA is operationalized through the EIA and Audit Regulations of 2005. According to these regulations, the National Environment Management Council (NEMC) manages the EIA process (screening and review of statements), which culminates by an award of an Environmental Certificate to the proponent by the Minister responsible for Environment. The Council (i.e. NEMC) determines the level of the EIA study after the project has been registered by the proponent. This procedure has been followed in the execution of this ESIA study.

## **1.6 Approach and Methodology**

### **1.6.1 Study Team**

In order to properly address the environmental issues, a team of experts participated in undertaking the ESIA Study. The experts were Environmentalist, Environmental Engineer and Sociologists.

### **1.6.2 Social Survey**

#### **1.6.2.1 Field study**

The Social Impact Assessment team visited the project area from 4<sup>th</sup> to 14<sup>th</sup> February 2013 with objective of carrying out a comprehensive social study. The Consultant applied a number of methods which included structured questionnaires, checklists (these are tools for collecting data), face to face interviews and observations. The purpose of which was to get an overview of the study area to compliment information gathered during the meetings with stakeholders.

During the actual detailed SIA undertaking, the SIA team took advantage of the knowledge of the local people to gather specific knowledge about the project site, such as presence and location of burial and cultural, and archaeological sites,

concealed public services/utilities etc, which are likely to be affected by the road project. In the project area, the information was gathered from various sources including TANROADS' Dar es Salaam Regional office, Dar es Salaam city Council and Temeke Municipal council. Other sources of information included; divisions, wards, hamlets ("mtaa" as known in Kiswahili language) and communities along the project roads.

### **1.6.2.2 Public Participation and consultation**

Public participation is considered as one among the most important element for fostering sustainable development process in any intervention. During the SIA study, various stakeholders participated in providing information related to the implementation of the proposed roads project. Consultations carried out involve communities through public meetings, dialogues, government officials, municipal council, TANESCO and TANROADS officers responsible for road development and maintenance in the project area

In public meetings, people consulted were eager to hear that the roads will be rehabilitated and upgraded. They acknowledged that roads improvements will promote economic development and transportation. The rehabilitation and upgrading of the Temeke roads to bitumen standards will therefore increase the interconnectivity of the project area with neighbouring municipals and neighbouring regions and improve social and economical interaction between people of Temeke, Kinondoni, and Ilala.

### **1.6.2.3 Consultation with Government Leaders**

Consultations were held with Municipal Authorities as well as TANROAD Staff. On the part of Municipal Authorities, this included; Municipal Director, Planning Officers, Community Development Officers, Municipal Natural Resource Officers, Health Officers, HIV/AIDS Coordinators, Road Engineers, Water Engineers, Municipal Valuer etc. Local leaders (ward and division levels) including members of committees related to road construction were also involved. The discussion touched on the existing socio-economic situation in the area and the need to identify possibilities of people likely to be affected during the project implementation as well as the community assets and properties expected to be affected.

The Temeke Municipal Council Authority in consultation with the Consultant, prepared official introductory letters to the Ward Executive Officers (WEOs) with two chief purposes: First to officially inform about the Dar es Salaam Metropolitan Development Project (DMDP) and second to introduce the ESIA team and urging their offices to provide necessary support required to make the assignment a success. Apart from introducing the DMDP in brief, letters were equally requesting the above named government leaders to inform their respective Mitaa Executive Officers and other relevant leaders at the lower levels about the coming up of the ESIA assignment as well as soliciting their logistical support. Then the ESIA team visited various relevant offices (project affected ones) and carried out participatory consultations related public meetings, household questionnaires, Focused Group Discussions and other activities. The ward and mitaa leaders actively participated in the study.

### **1.6.2.4 Community consultations**

The public meetings were intended to disseminate information to people about the proposed rehabilitation and upgrading project as well as giving them an opportunity to raise their concerns on the proposed project. Community consultations were conducted through focus group discussions using checklists for guiding interviews. Different groups were identified for consultation, which included ward leaders, youth, mama lishe, mitaa governments and individual women and men. Stakeholders concerns are discussed in details in chapter five of this report.

During the respective meetings, attendees were informed about the anticipated household interviews. Besides, two types of special questionnaires were distributed to Ward Executive Officers (WEOs) of the leading wards affected by the sub-projects and key informants representing government agencies and institutions, services providers, industries / private companies, and religious institutions. These questionnaires were used to get concerns from the community leadership and institutions on expected potential impacts during implementation and after completion of the subproject roads in their area.

### 1.6.2.5 Household questionnaires and sampling techniques

The Consultant strongly feels that communities have rich information about the project. This information can only be gleaned by interviewing individual households. Individual household information plus focus group discussions enhanced each other to allow the production of a comprehensive SIA report. Through the household questionnaires the respondents had opportunity to give their concerns about the proposed roads upgrading in Temeke Municipality.

The household survey was carried out in 11 wards along Temeke roads subproject. The number of interviewed households differed from one ward to another due to the different number of population in each ward. The consultant adopted purposive random sampling, whereby every household had an equal chance to be included in the survey but focused along the expected *mitaa* to be affected by the project. The major criterion used to decide on the number of questionnaires to be administered in each *mtaa* was population, that means, *mtaa* which had big number of people were given more questionnaires. Every ward had a representative *mitaa* included in the study. A total of 345 households heads or representatives were interviewed (Table 1.1).

**Table 1.1: Total Number of Households Interviewed**

Proposed Rd	Ward	Estimated No. of Households	No. of Interviewed Households	Population
Mbagala Industrial Area Rd	Mbagala Kuu	4,709	40	
Temeke - Mbagala	Temeke	5,177	55	20,809
	Mibulani	9,302		40,260
	Azimio	15,881		60,934
	Mtoni	14,051		
Chang'ombe	Chang'ombe	4,870	60	
	Keko			

Nsasa – Kilungule -Buza	Charambe	11,129	80	
	Buza		50	
Mwanamtoti	Kiburugwa	650	25	3,250
Mchicha Rd	Sandali	2,606	20	
Kijichi – Tuangoma Bridge		3,802	15	
Total	-		345	

### 1.6.2.6 Recruitment of Enumerators

In making sure that the assignment is well undertaken, three enumerators, two female and one male were recruited and trained for half a day to carry out the exercise so as to ensure gender balance and reduce biasness on information gathered. The objective was to create understanding on the importance of the survey, provide training on interviewing techniques and build common understanding on the study tools.

The interviewer's guide and household questionnaires were discussed during the training and followed by pre-testing in the field. The exercise proved to be useful and the tools were revised in areas where it was felt necessary. Due to the sensitivity of some of the questions for instance, those which imply the possibility for relocation and compensation of residents, the following precautions were taken;

- The interviewee was a grown up family member (preferably the head of the household or the spouse)
- The respondent were known by the local leaders particularly *mtaa* chairman and the *mtaa* executive officer.

Each enumerator interviewed a minimum of 25 households per day. One supervisor was assigned the responsibility of quality assurance of the completed questionnaires on daily basis. This is a quality control measure undertaken to ensure compliance with the interview guidelines and completeness of the questionnaire.

### 1.6.3 Project Impact Assessment

Superimposing project elements/activities onto the existing social and environmental natural conditions has identified the potential environmental impacts of the proposed road development. The checklist method has been used to identify the impacts. Further, the environmental impact correlation matrix method has been adopted to predict impacts of major concern. A key guiding assumption in this study is that the project will be designed, constructed, operated and maintained with due care for safety and environmental matters using current and practical engineering practice and/or Best Available Technology Not Entailing Excess Cost (BATNEEC). The implementation schedule of the mitigation measures is summarized in the Environmental Management Plan (EMP).

The environmental assessment has been undertaken in close interaction with the engineering, planning and design team. In this process environmental impacts have been evaluated for various alternatives. Several project alternatives were considered including that of not implementing the project. The fundamental environmental protection strategy and environmental considerations influencing engineering design



were incorporated. However, reasonable regard to technological feasibility and economic capability were taken into account. *Inter alia*, the assessment entailed the following:

#### *Collection of Baseline Data*

The collection of baseline data was conducted subsequent to defining the scope of the EIA. These data allows the study team to determine whether more detailed information on environmental conditions at the development site and its surroundings are needed and where such information can be obtained and how.

Both primary and secondary data were collected. Primary data were collected by direct measurement, observations and using semi-structured interviews with respective and targeted parties (as explained in the previous section). Secondary data were obtained from various relevant sources of information such as Municipal profiles, wards and streets reports, education and health reports and many other official and non official documents.

#### *Review of Policies, Legal and Institutional Framework for Environmental Management*

This allowed the study team to update and enhance their understanding of World Bank's Operational Policies, national policies, legislation and institutional arrangements for environmental management in Tanzania and relevant international procedures to ascertain the optimal management of impacts.

#### *Impact Identification and Evaluation*

The Upgrading of Infrastructure cause a wide range of environmental and social impacts on a number of receptors. The ESIA identify these impacts for the purposes of mitigating the adverse ones or enhancing the benefits. Impact *identification* is a process designed to ensure that all potentially significant impacts are identified and taken into account in the EIA process. A number of 'tools' are available to assist in impact identification. The simplest, and most frequently used, are *checklists* of impacts, although *matrices*, *network diagrams* and *map overlays* are also commonly used. In this EIA a *matrix* were used.

The matrix consists of a horizontal list of development activities against a vertical list of environmental factors. Thus it identifies impacts by methodically checking each development activity against each environmental consideration to ascertain whether an impact is likely to occur.

Taking a step further, the ranking in all phases (mobilization, construction and demobilization/decommissioning) signified the magnitude of each and combined phases. As a result the more the score illustrated the severity the impact the road project or section has. The following factors were used to ascertain the significance of the impacts;

##### **1. General**

- Magnitude
- Extent
- Non-conformity with environmental standards

- Level of public concern
- Social impacts resulting from environmental change
- Scientific and professional evidence concerning:
  - resource loss/ecological damage
  - negative social impacts
  - foreclosure of land and resource use options
- Environmental loss and deterioration
- Probability and acceptability of risk
- Environmental sensitivity

## 2. Ecological

- Reduction in species diversity
- Habitat loss, degradation or fragmentation
- Affecting threatened, rare and endangered species
- Impairment of ecological functions

## 3. Social

- Displacement of people
- Human health and safety
- Decline in important local resource
- Loss/gain of valued area
- Disruption of community livelihoods
- Demands on services and infrastructure
- Public concern
- Political concern

The above factors were used to create six criteria which were used to determine the significance of the impacts in the Matrix these include;

- **Spatial Scale-** The spatial dimension encompasses the geographical spread of the impacts regardless of whether they are short term or long term. Table 1.2 describes the ratings used in the Simple Matrix as far as spatial scale is concerned.

**Table 1.2: Spatial Rating**

International (I)	Trans-boundary
National (N)	Within country
Regional (R)	Within Region
Local (L)	On and adjacent to site

- **Temporal Scale-** Temporal boundaries refer to the lifespan of impacts. Table 1.3 describes the ratings used in the Simple Matrix.

**Table 1.3: Temporal Rating**

Short-Term (ST)	During construction
Medium-Term (MT)	Life of project
Long –Term (LT)	Residual impacts beyond life of project

- **Reversibility of the impact-** Every impact was checked if its effect can be reversed or not. Letter R was used to denote reversible impacts while IR was used to denote Irreversible impacts
- **Cumulative Impacts-** These are Impacts that cause changes to the environment that are caused by an action in combination with other past, present and future human actions. Table 1.4 show types of cumulative impacts;

**Table 1.4: Types and Characteristics of Cumulative Impacts**

Type	Characteristic	Example
Time crowding	Frequent and repetitive effects	Forest harvesting exceeds rate of re-growth
Time lags	Delayed effects	Bioaccumulation of mercury
Space crowding	High spatial density of effects	Numerous small mining enterprises on river
Cross-boundary	Effects occur away from the source	Atmospheric pollution and acid rain
Fragmentation	Change in landscape pattern	Fragmentation of habitat by agriculture
Compounding effects	Effects arising from a multiple sources or pathways	Synergistic effect of POPS in humans and rivers
Indirect effects	Secondary effects	Forest areas opened up as a result of new highway
Triggers and thresholds	Fundamental changes in system functioning	Climate change

- **Residual Impacts-** These are long term impacts which go beyond the lifetime of the project in other words Residual impacts refer to those environmental effects predicted to remain after the application of mitigation suggested by the ESIA i.e. they are non-mitigable.

- **Timing-** During which phase of the construction is the impact likely to occur. The phases included Mobilization, Construction, Demobilization and Operation.

### *Identifying Mitigation and Management Options*

The options for dealing with identified and predicted impacts were considered after comprehensive evaluation. This enabled the study team to analyze proposed mitigation measures. A wide range of measures have been proposed to prevent, reduce, remedy or compensate for each of the adverse impacts evaluated as being significant. Analysis of the implications of adopting different alternatives was done to assist in clear decision-making.

### **1.7 Limitations of the study**

- Some of information found in the municipal profile was outdated; as a result other sources of information were used.
- Some of the Ward officials like Ward Executive Officers were not available for interview during the study because they had other commitments, these contributed to miss some of important information required for the study at the time.
- Attendance of people to consultative meetings was relatively poor in some areas, particularly women.
- Majority of households were not able to provide reliable information about household income and expenditure. Unfortunately, this is a common challenging question in Tanzania.

### **1.8 Report Structure**

This report is divided into Twelve (12) chapters:

- Chapter one** contains the introduction on the background information of the proposed project, its development objectives, rationale and the proposed project implementation arrangements.
- 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 are the relevant Tanzanian environmental 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).

- vii. **Chapter seven** gives the mitigation measure for the potential negative impact of the project.
- viii. **Chapter eight** presents the Environmental and Social Management Plan (ESMP).
- ix. **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.
- x. **Chapter ten** gives the cost benefit analysis of the project.
- xi. **Chapter eleven** provides the decommissioning plan for the proposed project however the decommissioning is not anticipated in the foreseeable future.
- xii. **Chapter twelve** gives the summary and conclusions of the study.

The appendices, containing some key primary information collected during the study are attached at the end of this report. Generally, the report structure flows in conformity with that specified in the World Bank's Guidelines for Conducting ESIA.

## 2.0 PROJECT BACKGROUND AND DESCRIPTION

The Government of the United Republic of Tanzania with financial support from World Bank, through Prime Minister's Office, Regional Administration and Local Government (PMO-RALG) commissioned Crown TECH-Consult Ltd to carry out Feasibility Study and Detailed Design of Local Roads for Municipal Councils of Kinondoni, Ilala and Temeke in Dar es Salaam. All these were done to prepare the Proposed Dar Es Salaam Metropolitan Development Project (DMDP). Expectedly, the DMDP will be implemented in five (05) years (2015-2020). The total estimate cost of the Project to be funded by the World Bank is US\$300 million.

The Development Objective of the Dar es Salaam Metropolitan Development Project is to improve urban services and institutional capacity in the Dar es Salaam Metropolitan Area. This will be implemented by the Government of Tanzania (GoT) covering all the three Municipal Councils of Dar es Salaam, that is, Ilala, Kinondoni and Temeke and partly the Dar es Salaam City Council.

DMDP will have four (04) interrelated components and subcomponents as outlined below:

**Component 1: Priority Infrastructure.**

- Sub-Component 1a - Priority roads supporting public transit, mobility, and connectivity to low income communities.
- Component 1b: Flood Control and Storm Water Drainage
- Component 1c: Emergency Response.

**Component 2: Upgrading in Low-Income Communities.**

**Component 3: Institutional Strengthening, Capacity Building, and Urban Analytics.**

- Component 3a: Improving Metropolitan Governance Arrangement and Systems
- Component 3b: Improving Own Source Revenue Collection Systems and Mainstreaming Geographic Information Systems
- Component 3c: Support for Integrated Transport and Land-use Planning.
- Component 3d: Strengthening Operations and Maintenance Systems
- Component 3e: Urban Analytics

**Component 4: Implementation Support and Monitoring & Evaluation.**

This ESIA concerns infrastructure works under Sub-Component 1a - Priority roads supporting public transit, mobility, and connectivity to low income communities. This sub-component will finance improvements and constructions of priority sections of the existing local and feeder roads in the urban core, totaling approximately 34 km, to reduce congestion hotspots, and improve accessibility to the Bus Rapid Transit (BRT) system by low income communities. The portions connecting to the BRT will incorporate transit and pedestrian oriented design principles, and help establish the standards for the BRT's future expansion.

## 2.1 Location

Dar es Salaam is located in the eastern part of the Tanzanian mainland at 6°51'S latitude and 39°18'E longitude. The region has an area of 1,350 (km<sup>2</sup>, which is about 0.19 percent of the Tanzanian mainland. The Dar es salaam Region stretches about 100 km between the Mpiji River to the north and beyond the Mzinga River in the south. The Indian Ocean borders the region to the eastern side. The whole of Dar es salaam mainland is surrounded by the Coast Region.

Administratively, Dar es Salaam Region is divided into three districts, namely Kinondoni, Temeke and Ilala. The Temeke Municipality is the southernmost of three districts whereas Kinondoni is located to the far northern side of the city, and Ilala is sandwiched by the two districts which also harbours the Dar es Salaam metropolitan area as seen in figure 2.1 below. While figure 2.2 shows a map of Temeke municipal local roads network including the subprojects routes to be upgraded under the DMDP.



Figure 2.1: Map of Dar es Salaam showing Project Area



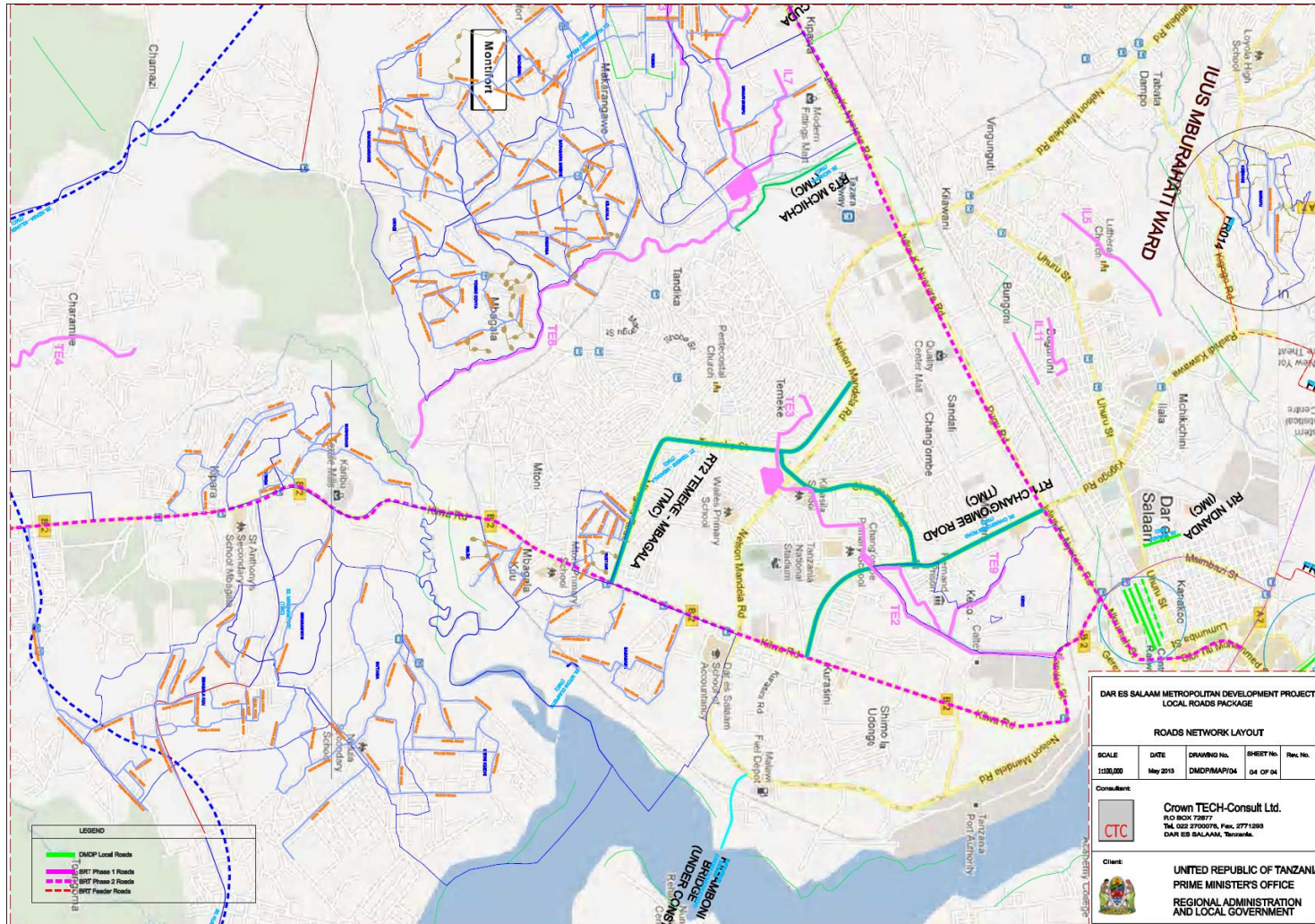


Figure 2.2: Map showing Temeke Municipal local subprojects roads marked in green

## 2.2 Project Components and Design

### 2.2.1 Project Components

There are 8 stretches of subproject roads within the Temeke Municipality that were originally assessed for inclusion in the DMDP. The project will involve construction of 2 bridges, Upgrading from gravel to tarmac level of 5 roads and rehabilitation (widening) of the formerly tarmac roads for the remaining 3 roads. Table 2.1 provides descriptions of the suprojects roads.

**Table 2.1: Temeke Local Roads to be Upgraded/ Rehabilitated**

SN	Road Name	Length (km)	Proposed Treatment	Road Network
<b>1</b>	<b>Chang'ombe road</b>	<b>4.6</b>	Widening the existing tarmac road by two lane	De-congesting Kawawa, Nyerere Road and Chang'ombe junction
<b>2</b>	<b>Temeke-Mbagala</b>	<b>3.5</b>	Widening the existing tarmac road by two lane	De- congesting Mandela and Kilwa Road
3	Nzasa-Kilungule- Buza	6.0	Construction o 1km kilungule bridge and upgrading of 5km road to Tarmac road	De- congesting Kilwa, Mandela and Nyerere Road
<b>4</b>	<b>Mchicha Road (sandali)</b>	<b>1.58</b>	Upgrading to tarmac level	De- congesting Mandela and Nyerere road Junction
<b>5</b>	<b>Kijichi-Tuangoma-Bridge</b>	<b>3.0</b>	Upgrading to tarmac level	De- congesting Kilwa road- and Kongowe-Kigamboni Road
6	Mbagala Industrial road	2.5	Upgrading to tarmac level	De- congesting Kilwa road at Mbagala Rang'i tatu
<b>7</b>	<b>Mwanamtoti Road</b>	<b>1.8</b>	Upgrading to tarmac level	Alternative route to Kilwa and Mission- Kijichi- Zakhem Road
8	Access road to Mtoni Closed dump site	0.3	Upgrading to tarmac level	Upgrading missing link to Mtoni Closed dumpsite

The five segments indicated in bold were selected for inclusion in Phase 1 of DMDP, for a total of 14.51 km of road upgrading (#'s 1, 2, 4, 5, and 7).

This ESIA was conducted for all 8 road segments, and can be applied to those extra roads in case of additional financing for DMDP at a later stage or if roads are financed by outside sources.

The rehabilitation works will consist mainly of:

- Exploitation of material sources for fill, sub-grade, sub-base, base and surfacing
- Construction of longitudinal and cross drainage structures and systems
- Construction of Tuangoma Bridge

- Asphaltic concrete overlay
- Partial reconstruction involving the removal and possible re-use of some existing pavement layers
- Total reconstruction involving the removal of the existing pavement and its replacement
- Provision of Bus Bays along the roads
- Provision of temporary crossings and traffic diversions;
- Construction of road furniture and other incidental and appurtenant works;

The rehabilitations will also change vertical and horizontal profile to meet the relevant geometric standards for this class of road.

### **2.2.2 Project Design**

This ESIA study runs parallel with the preliminary design work. In broad terms, improvement will involve a combination of overlaying the existing road, partial reconstruction and/or total reconstruction of road sections as necessary. The rehabilitation and/or replacement of existing drainage structures and the construction of new, additional drainage structures are also important features of the proposed works. Pertinent features of the road design include:

- The width of the bitumen carriageway will be 7m (Asphalt Concrete)
- The width of the (paved) shoulders will be 1.5m
- The width of the walkways will be 1m
- The width of the cycle track will be 1m
- Provision of 60 passengers capacity bus bays for all roads except Mbagala Industrial Road and Tuangoma Bridge
- Cross-drainage structures, intersections and ancillary road works
- Installation of street lights along the proposed roads which shall use solar energy to minimize electricity costs and easy operations
- corridor will be negotiated with the communities. However, a mandatory construction corridor of 15m will be acquired.
- The road will still continue to have another 20-year design life

The design speed of the road will be adjusted as necessary through streets and areas with a high concentration of people.

## **2.3 Project Activities**

### **2.3.1 Mobilization or pre-construction phase**

#### **Activities**

This phase entails mobilization of labour force, equipment and construction of offices/camps as well as acquisition of various permits as required by the law. Other activities during this phase include Topographical Survey, Geo-technical Investigation, Soils and Construction Materials Investigation, Land acquisition, material storage and material preparation, Identification sources of material including and source of water.

#### **Duration**

The duration of this phase will be four (4) months.

**Types, Amounts and Sources of Project requirements**

Types, amounts and sources of project requirements during the pre-construction phase are shown in Table 2.2:

**Table 2.2: Types, amounts and sources of project requirements during the pre-construction phase**

Requirements	Type	Source	Quantity required
Raw Materials	Gravel	Section 2.4.1	186,760m <sup>3</sup>
	Hard Stone	Section 2.4.2	108,080m <sup>3</sup>
	Sand	Section 2.4.3	250,000m <sup>3</sup>
	Water	Section 2.4.4	300,000ltrs
	Cement	Wazo Hill, Dar es Salaam	32tonnes
	Reinforcement bars	Dar es Salaam	8tonnes
	Timber	Local vendors (Dar es Salaam)	350m
Energy	Electricity	TANESCO (National Grid)/ Generators	220kV
	Fuel	Local vending stations	
Manpower	Skilled	Contractor	10
	Unskilled	Local People along the road	40
Equipments	Dump Truck	• Contractor	2
	Graders	• Contractor	1
	Dozer	• Contractor	1
	Water Boozers	• Contractor	1
	Vibrators	• Contractor	1
	Excavator	• Contractor	3

Source: Consultant Analysis

**Note:** The figures for raw materials are estimates and were established by quantity surveyor using past experiences for projects of the same nature (Cost/Km)

### **Transportation**

Materials (fine and course aggregates) from quarries will be transported by trucks to the construction site. Water will be moved by water boozers. Other materials like cement, timber and reinforcement bars will be transported by Lorries to the construction site.

### **Storage**

Some of the 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 backyard of the camp site/office ready for use. Cement and reinforcement bars will be stored in special storage rooms. Timber will directly be used at the required areas and consequently there will be no stockpiling of timber at the camp sites/offices. Fuel/oils will be stored in drums which shall be stored in bunds (well paved areas which do not allow fluids to come into contact with the soil).

### **Types, Amounts and treatment/disposal of Wastes**

Types, amounts and treatment/disposal of wastes during the pre-construction phase are shown in Table 2.3:

**Table 2.3: Types, amounts and treatment/disposal of wastes during the pre-construction phase**

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Garbage: Food remains, cardboards and papers	5kg/day (based on generation rate of 0.1kg/day/ person and 50 workers)	Collected in a large skip bucket at the campsite/site office then to be composted and used as manure for the gardens at the camp site/site office
Solid Waste (Non-Degradable)	Scrap metals	2kg per day	Sold to Recyclers
	Tins, glasses and plastics	3 kg per day	Taken to the Authorised dumpsite at Pugu Kinyamwezi
Liquid waste	Sewage	1.6 m <sup>3</sup> (Based on 50 people, 40l/capita/day water consumption and 80% becomes wastewater)	Septic tank – Soakaway system at the campsites/ office
	Oils and greases	Non	Car maintenance will be done at proper garages

### 2.3.2 Construction phase

#### Activities

The major construction activities include;

- Extraction and transportation of materials (gravel, sand, hard stones, aggregates, water and bitumen)
- Clearing the Corridor of Impact (CoI).
- Formation of the road embankment, establishment of sub-base and base, road surfacing
- Construction of drainage structures including the Tuangoma Bridge.
- Construction of Bus Bays for major roads
- Installation of road furniture
- Pedestrian Crossings, Speed Humps and Rumble Strips shall be provided in all built up areas, near schools and trading centres
- The landscaping of areas covered by the project roads and establishment of vegetation for functional and aesthetic purposes on cut and fill slopes
- The final finishing and cleaning up of the roads after construction, treating of old roads and temporary diversion

#### Duration

The duration of this phase will be three (3) years.

### **Types, Amounts and Sources of Project requirements**

Types, amounts and sources of project requirements during the construction phase are shown in Table 2.4:

**Table 2.4: Types, amounts and sources of project requirements during the construction phase**

<b>Requirements</b>	<b>Type</b>	<b>Source</b>	<b>Quantity required</b>
Raw Materials	Gravel	Section 2.4.1	933,800m <sup>3</sup>
	Hard Stone	Section 2.4.2	612,480m <sup>3</sup>
	Sand	Section 2.4.3	800,000m <sup>3</sup>
	Water	Section 2.4.4	700,000ltrs
	Bitumen	South Africa/Saudi Arabia	6,133.6tonnes
	Cement	Dar es Salaam	16,645tonnes
	Reinforcement bars	Dar es Salaam	218tonnes
Manpower	Skilled	• Contractor	20
	Unskilled	• Local People	80
Equipment	Dozer	• Contractor	2
	Grader	• Contractor	3
	Pay Loader	• Contractor	3
	Excavator	• Contractor	4
	Vibro Roller	• Contractor	4
	Tandem Roller	• Contractor	1
	Macadam Roller	• Contractor	1
	Tire Roller	• Contractor	2
	Dump Truck	• Contractor	10
	Mixer Truck	• Contractor	2
	Water Truck	• Contractor	3
	Tractor w/Trailer	• Contractor	4
	Tire crane	• Contractor	2
	Cargo Crane Truck	• Contractor	1
	Cargo Truck	• Contractor	2
	Crusher Plant	• Contractor	1
	Screen Unit	• Contractor	1
	Concrete Batch Plant	• Contractor	1
	Asphalt Plant	• Contractor	1
	Asphalt Finisher	• Contractor	1
	Asphalt Distributor	• Contractor	1
	Air Compressor	• Contractor	3
	Generator	• Contractor	6
Fuel Truck	• Contractor	1	
Light Vehicle	• Contractor	12	

Source: Consultant Analysis

**Note:** The figures for raw materials are estimates and were established by quantity surveyor using past experiences for projects of the same nature (Cost/Km)

### **Transportation**

Materials (fine and course aggregates) from quarries will be transported by trucks to the construction site. Water will be moved by water boozers. Other materials like asphalts, cement, timber and reinforcement bars will be transported by lorries to the construction site.

### **Storage**

Some of the 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 backyard of the camp site ready for use. Cement and reinforcement bars will be stored in special storage rooms. Timber will directly be used at the required areas and consequently there will be no stockpiling of timber at the camp sites. The asphalt, fuels and oils will be stored in their respective containers which will be kept in the special storage rooms (bunds).

### **Types, Amounts and treatment/disposal of Wastes**

Types, amounts and treatment/disposal of wastes during the construction phase are shown in Table 2.5:

**Table 2.5: Types, amounts and treatment/disposal of wastes during the construction phase**

<b>Waste</b>	<b>Types</b>	<b>Amount</b>	<b>Treatment/ Disposal</b>
Solid Waste (Degradable)	Vegetations (Trees, Grasses) and remnants of timber.	About 300m <sup>3</sup> of biomass	Source of energy for cooking for residents near the project roads
	Food remains, cardboards and papers	10kg/day (based on generation rate of 0.1kg/day/ person for 100 people)	Collected in a large skip bucket at the campsite then to be composted and used as manure for the gardens at the camp site/office
Solid Waste (Non-Degradable)	Topsoils	13 m <sup>3</sup> (Based on removal of 10cm topsoil from the (5x25.25)m <sup>2</sup> area on both sides of the roads	Backfilling material in the borrow pits, fill the diversions.
	Scrap metals, drums	15 kg per day	Sold to Recyclers
	Tins, glasses and plastics	6 kg per day	Taken to the Authorised dumpsite at Pugu Kinyamwezi
Liquid waste	Sewage	4m <sup>3</sup> /day (Based on 100 people, 40l/capita/day water consumption and 80% becomes wastewater)	Septic tank –Soak away system at the camp site/office and mobile toilets along the route.
	Oils and greases	Non	Car maintenance will be



Waste	Types	Amount	Treatment/ Disposal
			done at proper garages

### 2.3.3 Demobilization phase

#### Activities

- Demobilization of temporary structures will be done for proper restoration of the site (e.g. removing/spreading top-soils piled along the road, removing all temporary structures, campsites/offices may be left to the local governments depending on agreements that will be reached during the mobilization phase.
- Other activities include rehabilitation of the workshop and stockpile yard, rehabilitation of campsite at least to the original condition, clearance of all sorts of wastes including used oil, sewage, sewage, solid wastes (plastics, wood, metal, papers, etc).
- Deposit all wastes to the authorised dumpsite.
- Termination of temporary employment.

#### Duration

Demobilization stage will last for a period of three (3) months.

#### Types, Amounts and Sources of Project requirements

Types, amounts and sources of project requirements during the demobilization phase are shown in Table 2.6:

**Table 2.6: Types, amounts and sources of project requirements during the demobilization phase**

Requirements	Type	Source	Quantity required
Manpower	Skilled	Contractor	5
	Unskilled	Local People along the road	15
Equipments	Bull dozer	Contractor	1
	Motor grader	Contractor	1
	Roller Compactor	Contractor	1
	Plate compactor	Contractor	1
	Tippers	Contractor	1

#### Types treatment/disposal of Wastes

The demobilization of the temporary structures will result mainly into solid wastes such as timber, iron sheets and rubbles from demolitions. Timber and iron sheets will be sold to people in the nearby communities for reuse while the rubbles will be sent to the authorised dumpsite for disposal.

### 2.3.4 Operation phase

#### Activities

The actual usage of the road is expected to commence after the construction works. The project roads are under “district road” category and therefore will be directly managed by Temeke Municipal Council (TMC). The design period is 20 years, after

which re-surfacing will be needed. During this time, TMC will carry out routine maintenance by attending to pot holes, clearance of vegetation within the CoI (Corridor of Impact) and monitoring.

Other activities includes installation of road signs, thermo-plastic road marking, reinforcement and replacement of road furniture, control of litter accumulation on road sides, awareness rising on proper road use and road 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.

### **Duration**

The duration of this phase will be twenty years (20) years.

### **Types, Amounts and Sources of Project requirements**

Types, amounts and sources of project requirements during the operational phase are shown in Table 2.7:

**Table 2.7: Types, amounts and sources of project requirements during the operational phase (Maintenance)**

<b>Requirements</b>	<b>Type</b>	<b>Source</b>	<b>Quantity required</b>
Raw Materials	Gravel	Section 2.4.1	46,690m <sup>3</sup>
	Hard Stone	Section 2.4.2	76,560m <sup>3</sup>
	Sand	Section 2.4.3	100,000m <sup>3</sup>
	Water	Section 2.4.4	250,000ltrs
	Asphalt	Saudi Arabia	15,312m <sup>3</sup>
	Cement	Dar es Salaam	66.45tonnes
Manpower	Skilled	Contractor	2
	Unskilled	Local People along the road	18
Equipments	Excavator	TMC/Contractor	1
	Wheel loader	TMC /Contractor	1
	Water Boozer	TMC /Contractor	1
	Bull dozer	TMC /Contractor	1
	Motor grader	TMC /Contractor	1
	Roller Compactor	TMC /Contractor	1
	Plate compactor	TMC /Contractor	1
	Crasher	TMC /Contractor	1
	Tippers	TMC /Contractor	1

Source: Consultant Analysis

**Note:** The figures for raw materials are estimates and were established by quantity surveyor using past experiences for projects of the same nature (Cost/Km)

### **Transportation**

Materials (fine and course aggregates) from quarries will be transported by trucks to the construction site. Water will be carried by water boozers. Other materials like asphalts, cement, timber and reinforcement bars will be transported by Lorries to the maintenance site.

**Storage**

Most of Materials like Aggregates, Sand, and Water will be used directly after delivery and as such no piling up is expected. Cement and reinforcement bars will be stored in special storage rooms at the Municipal store or other designated areas. The asphalt will be stored in their respective containers which will be kept in the storage rooms/yards.

**Types, Amounts and treatment/disposal of Wastes**

Types, amounts and treatment/disposal of wastes during the construction phase are shown in Table 2.8:

**Table 2.8: Types, amounts and treatment/disposal of wastes during the operational phase**

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Vegetations (Trees and Grasses)	About 5m <sup>3</sup> /month	Source of energy for cooking for residents near the project roads
Solid Waste (Non-Degradable)	Scrap metals, drums	5kg per Month	Sold to Recyclers
	Asphalt concrete, Tins, glasses and plastics	3 kg per Month	Taken to the dumpsite at Pugu Kinyamwezi
Liquid waste	Oils and greases	Non	Car maintenance will be done at proper garages

**2.4 Construction materials**

The main construction materials for the road include sand, gravel, hard stones (aggregates), reinforcement iron bars, water and bitumen. Most of the materials will be obtained locally (within Tanzania) except bitumen which shall be imported. Material investigations have been made with the aim of identifying sources for suitable construction materials including borrow pits, sand pits, construction water sources and quarry sites. All materials will be sourced from existing sources by using certified suppliers (No new quarry site or borrow pit shall be opened for this project).

**2.4.1 Borrow Areas**

The Mji Mwema borrow Pit is the source of Gravel materials for pavement layers construction. The borrow pit is located in Kigamboni ward about 20km from Mbagala centre. The pit is privately owned and has an estimated area of about 25 Ha and average depth of 4m. The borrow pit is estimated to contain a total of 735,000m<sup>3</sup> of gravel material.

Prices for purchase of gravel material are as follows,

- Gravel materials for one trip of 15m<sup>3</sup> is Tshs. 10,000/- (excavation, loading and hauling contractor's expense)
- Gravel materials for one trip of 45m<sup>3</sup> is Tshs. 30,000/- (excavation and loading at owner's expense)

## 2.4.2 Hard Stones

The aggregates produced at Mji mwema quarry site has been found to be not suitable for road construction works. The alternative source the Lugoba Quarry, about 20km from Chalinze Town (or 120km from Dar es Salaam). The quarry produces various sizes of aggregates. The quarry is privately owned by several companies including Ms. Estim Contractor, Ms. Kerai, and Ms. Tembo Quarry etc. For instance, available quantities of materials under Ms. Estim Contractors are estimated to be 300,000m<sup>3</sup>.

## 2.4.3 Sand for Concrete

Sand for concrete and other construction works will be collected from Mwananditu Pit offset 3km left hand side along Mbangala - Mbande - Chanika road, 15km from Mbagala Rangi Tatu junction. The site is being used for other ongoing projects i.e. building and road construction works. About 200,000m<sup>3</sup> of sand is estimated to be available at the site.

Other sources of sand include Kibada area, along the Kongowe – Mji mwema road on the left hand side (but the road is very difficult to pass during rainy season). The Mbondole sand pit is another alternative. The pit is located within Ilala Municipality; about 18km from Pugu Road (at Banana junction) left hand side and has an estimated quantity of 122,500m<sup>3</sup>.

## 2.4.4 Water Sources

Water from the city water reticulation system operated by DAWASCO shall be used.

## 2.4.5 Sources of industrial materials for road construction

Traditional road construction materials that will be used in this project, generally have been tested by Approved Laboratories for compliance. These include;

### **Cement**

The Cement is easily available in the mainland, packed in 50kg bags and sourced from the factories in Dar es Salaam. The nearest industries include Wazo Cement (located in Tegeta, Kinondoni Municipality) and Mbagala (located in Temeke Municipality).

### **Reinforcement Steel**

Reinforcing steel for structural works is also available in the mainland from various factories in Dar es Salaam, including the MMM steel industry located in Mikocheni light industrial area. Their strength and other properties of reinforcing steel will be confirmed by testing of samples in approved testing laboratories before use.

### **Bitumen**

Bitumen for road works is generally readily available from either TPDC or external suppliers. Bitumen properties will be checked by testing representative samples in approved laboratories.

### **Lime**

Industrial hydrated Lime can be obtained from Pugu Kaolin industry and other sources. The material is available in Tanzania. However, before the material is purchased for use in this project, its properties will be checked by testing representative samples in approved laboratories.

## 2.5 Resettlement and Compensation Issues

The project shall entail expropriation of properties such as buildings/houses, business premises, land, crops, trees etc. in four of the five DMDP subprojects in Temeke. Resettlement Action Plan (RAP) and valuation of affected properties was conducted to establish the affected properties and value of the affected properties. Table 2.9 below shows the estimated number of affected properties, households, and compensation value for a in Temeke Municipality. A summary of the RAP is provided in Appendix V.

**Table 2.9: Project affected persons and properties**

Road Segment	Affected properties	Partially affected households	Cost of partially affected households (USD)	Fully affected households	Cost of Fully affected households (USD)	Other compensation costs (USD)	Total Compensation Costs (USD)
Chang'ombe Road	92	9	\$ 257,089	14	\$ 399,916	\$ 824	\$ 657,830
Mchicha road	108	8	\$ 123,782	19	\$ 293,983	\$ 665	\$ 418,430
Mwanamtoti Road	200	24	\$ 510,315	26	\$ 552,842	\$ 2,866	\$ 1,066,023
Temeke – Mbagala	160	24	\$ 696,686	16	\$ 464,457	\$ 1,942	\$ 1,163,086
<b>Total</b>	<b>560</b>	<b>65</b>	<b>\$ 1,587,873</b>	<b>75</b>	<b>\$ 1,711,198</b>	<b>\$ 6,297</b>	<b>\$ 3,305,368</b>

### 3.0 POLICY, ADMINISTRATIVE AND LEGAL FRAMEWORK

#### 3.1 World Bank's Environmental and Social Safeguard Policies

The World Bank's environmental and social safeguard policies are cornerstone of its support to sustainable poverty reduction. The main objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. These policies provide guidelines for the Bank and borrower staffs in the identification, preparation, and implementation of programs and projects. These Policies includes;

- i. OP 4.01 - Environment Assessment
- ii. OP 4.12 - Involuntary Resettlement
- iii. OP 4.11 - Physical Cultural Resources
- iv. OP 4.10 - Indigenous Peoples
- v. OP 7.50 - Projects on International Waterways
- vi. OP 7.60 - Projects in Disputed Areas
- vii. OP 4.37 -Safety on Dams
- viii. OP 4.36- Forests
- ix. OP 4.04-Vegetations

This ESIA has reviewed the first four policies because they are relevant to the Project as shown in the following sub sections;

##### 3.1.1 OP 4.01 - Environment Assessment

The World Bank's Operational Directive 4.01 on Environmental Assessment (now referred to as Operational Policy and Bank Procedure 4.01) requires that environmental assessments be undertaken in those categories of projects that have or are likely to have potentially significant impacts on the environment. Under this policy, projects are categorized as category A, B, or C according to type, scale, location and anticipated severity of environmental impacts. The category indicates the scope and detail required for the EIA. These categories are presented in Table 3.1.

**Table 3.1: Categories for Environmental Assessment**

Category	Requirement
A	A full (comprehensive) EIA is normally required as the project may have significant adverse impacts that may be sensitive, irreversible and diverse. These are mainly new construction projects
B	More limited environmental analysis is appropriate, as the project may have specific environmental impacts and mitigation measures can be more easily designed. Projects under this category entails rehabilitation, maintenance or rehabilitation rather than new construction
C	Environmental analysis is normally unnecessary. Projects focus on education, family planning, health and human resources development

The subprojects in Tememeke Municipality are essentially of the upgrading or rehabilitation type. As per the World Bank guidelines, the projects can be rated as **Category B** in which limited environmental analysis is needed, since the project may

have specific environmental impacts and mitigation measures can be more easily designed.

### **3.1.2 OP 4.12 - Involuntary Resettlement**

Regarding resettlement, the Bank guidelines prescribe measures to minimize the negative impacts and ensure that the displaced communities benefits from the project. Therefore the Policy requires that displaced person should be:

- Compensated for their losses at full replacement cost prior to the actual move;
- Assisted with the move and supported during the transition period in the resettlement site;
- Assisted in their effort to improve their former living standards, income earning capacity, and production levels, or at least restore them
- Integrated socially and economically in to host communities so that adverse impacts on host communities are minimized. The best way of archiving this integration is for resettlement to be planned through consultation involving affected people and future hosts and affected people

In addition, land, housing, infrastructure, and other compensation should be provided to the adversely affected population, indigenous groups, ethnic minorities, and pastoralists who may have customary right to the land and other resources taken for the project. The absence of legal title to land by such groups should not be a bar to compensation.

This Policy is triggered by the project however the extent of resettlement has not been determined since RAP and Valuation are still on progress.

### **3.1.3 OP4.11 - Physical Cultural Resources**

This policy addresses physical cultural resources, which are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above or below ground, or under water. Their cultural interest may be at the local, provincial or national level, or within the international community.

Cultural resources are important as sources of valuable historical and scientific information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The loss of such resources is irreversible, but fortunately, it is often avoidable. The objective of OP 4.11 on Physical Cultural Resources is to avoid, or mitigate, adverse impacts on cultural resources from development projects that the World Bank finances.

This policy is has been triggered as, the the Nsasa – Kilungule – Buza has got graves very close to the road, however, the actual number to be affected shall be known upon completion of design works.

## 3.2 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 respective sectors so that they are not undertaken at the expense of the environment. The national policies that address environmental management as far as this project is concerned and which form the corner stone of the present study include the following:

### 3.2.1 National Environmental Policy (NEP) of 1997

Tanzania currently aims to achieve sustainable development through the rational and sustainable use of natural resources and to incorporate measures that safeguard the environment in any development activities. The environmental policy document seeks to provide the framework for making the fundamental changes that are needed to bring consideration of the environment into the mainstream of the decision making processes in the country.

The National Environmental Policy, 1997 stresses that for a framework law to be effective, environmental standards and procedures have to be in place. For example, Chapter 4 of the policy (Instruments for Environmental; Policy), Section 61, states that *“As part of the (National Environmental Policy) strategy in the implementation of the National Environmental Guidelines, specific criteria for EIA conduct will be formulated”*.

The National Environmental Policy as a national framework for environmental management emphasized that the transport sector shall focus on the following environmental objectives:

- Ensuring sustainability, security and the equitable use of resources for meeting the basic needs of the present and future generations without degrading the environment or risking health or safety.
- To prevent and control degradation of land, water, vegetation and air which constitute our life support system.
- To conserve and enhance our natural and man-made heritage, including the biological diversity of the unique ecosystem of Tanzania.
- To improve the condition and productivity of degraded areas including rural and urban settlement in order that all Tanzanians may live in safe, healthful, productive and aesthetically pleasing surroundings.
- To raise public awareness and understanding of the essential linkages between environment and development and to promote individual and community participation in the environmental action.
- To promote international co-operation on the environment and expand our participation and contribution to relevant bilateral, sub-regional, regional, and global organizations and programs, including implementation of treaties.

With specific regard to the transport sector, the National Environmental Policy (in Section 51) focuses on the following



- Improvement in mass transport systems to reduce fuel consumption, traffic congestion and pollution;
- Control and minimization of transport emission gases, noise, dust and particulates;
- Disaster/spills prevention and response plans and standards shall be formulated for transportation of hazardous/dangerous materials.

Critically, the National Environmental Policy emphasize the following aspects of natural resources management taking into account that the project proposal has impacts on natural resources:

- Wildlife resources should be protected and utilized in a sustainable manner; and on the basis of careful assessment of natural heritage in flora and fauna, fragile ecosystem, site under pressure and endangered species, with participation of, and benefits to, the local communities. Environmentally adverse impacts of development project in wildlife conservation area e.g. (tourist hotels, road construction) will be minimized by Environmental Impact Assessment studies.
- It encourages the development of sustainable regimes for soil conservation and forest protection, taking into consideration the links between desertification, deforestation, freshwater availability, climatic change and biological diversity.

On addressing the issues of poverty alleviation, the policy recognizes its impact to the environment. The policy focuses on the satisfaction of basic needs of citizens with due cognizance to protecting the environment. This project will ensure that the above policy objectives are met.

The NEP advocates the adoption of Environmental Impact Assessment (EIA) as a tool for screening development projects which are likely to cause adverse environmental impacts.

### **3.2.2 National Transport Policy (2003)**

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

In transport, the main objective of the policy is to improve infrastructure whilst minimizing wasteful exploitation of natural resources and enhancing environmental protection. Improving infrastructure assists in poverty reduction and eradication which is a major goal in Tanzania. Most activities in the project area depend in one way or another on the environment and therefore protection of the environment is vital.

In order to promote environmental protection whilst reducing poverty in rural areas, the policy direction is to:

- Influence use of alternative energy sources such as biogas and solar available at the residential localities instead of travelling long distances in search of firewood as a source of power; and
- Raise environmental awareness.

Sections 5.9 of Road Transport and Environment it give policy directions towards enhancing environmental protection through environmentally friendly and sustainable transport infrastructure both in the rural and urban areas. This project is the Implementation of this policy since the Project roads shall provide a reliable means of transporting people for good social welfare.

### **3.2.3 National Construction Industry Policy (2003)**

The road sector is among the key areas covered by this policy. Among the major objectives of the policy, which supports a sustainable road development sector, include the promotion and application of cost effective and innovative technologies and practices to support socio-economic development activities such as road-works, water supply, sanitation, shelter delivery and income generating activities and to ensure application of practices, technologies and products which are not harmful to either the environment or human health. This Project shall be designed in such a way it is in line with this policy.

### **3.2.4 National Land Policy (1995)**

The National Land Policy states that, *“the overall aim of a National Land Policy is to promote and ensure a secure land tenure system, to encourage the optimal use of land resources, and to facilitate broad - based social and economic development without upsetting or endangering the ecological balance of the environment”*. This EIA has been conducted to ensure the project is not conducted at the expense of the Environment which is the aim of the National Land Policy.

### **3.2.5 National Energy Policy (2003)**

The first energy policy for Tanzania was formulated in April 1992. Since then, the energy sector has undergone a number of changes, necessitating adjustments to this initial policy. These changes include changes in the role of the government from a service provider to a facilitator, liberalization of the market and encouragement of private sector investment. The overall objective of the National Energy Policy of 2003 is to contribute to the development process by establishing efficient energy production, procurement, transportation, distribution and end-user systems in an environmentally sound manner and with due regard to gender issues.

The continuing decline in industrial and agricultural production during the period between 1980 and 1985 led to increased inflation and a decline in the standard of living. In order to arrest this decline, the government gave priority to the rehabilitation of basic economic infrastructure, especially communication, so that they can fully support the production sector. The energy policy considers the condition of roads as a determinant factor in vehicle energy use. Rough and pothole filled roads necessitate frequent braking and acceleration, leading to wasteful use of fuel. The Project road shall provide smooth, well-surfaced and well maintained road which lead to energy savings.

### **3.2.6 National Human Settlements Development Policy (2000)**

Among the objectives of this policy that touch the road sector are to improve the level of the provision of infrastructure and social services for the development of sustainable human settlements and to make serviced land available for shelter to all sections of the community. Such infrastructure and services constitute the backbone of urban economic activities. All weather roads (Project Roads) and a reliable and efficient transport system are essential to increase productivity and the establishment of manufacturing industries.

### **3.2.7 National Gender Policy (2002)**

The key objective of this policy is to provide guidelines that will ensure that gender sensitive plans and strategies are developed in all sectors and institutions. While the policy aims at establishing strategies to eradicate poverty, it puts emphasis on gender quality and equal opportunity of both men and women to participate in development undertakings and to value the role-played by each member of society.

The PMO-RALG has adopted the policy through the provision of equal opportunities to both men and women in road works and related activities. This project will also ensure that women, who are the main users of the infrastructure, will be adequately involved at all levels of project planning to implementation.

### **3.2.8 National Community Development Policy (1996)**

The main objectives of the Community Development Policy is to enable the Tanzanian individuals and the community as a whole to contribute more to the government objects of self reliance and therefore bring about development at all levels and finally the nation as a whole. The policy provides directions to ensure there is sustainable cooperation between authorities in planning and implementing development plans, that there is transparency and sharing of information during the preparation and control of budgets for development projects, that the concerned community is well informed and educated in order to maximize their participation in their own development and so forth. The policy also recognise and emphasize that family households is the basis for community development.

The Local roads project has taken on board the directives of the development policy in many ways. The Project is in line with this policy as the improvement of local roads shall be lead to community development.

### **3.2.9 National Policy on HIV/AIDS (2001)**

The National Policy on HIV/AIDS (2001) was formulated by the Government of Tanzania (GOT) under technical support from the World Health Organization Global Programme on AIDS (WHO-GPA) that led to the establishment of National HIV/AIDS Control Programme (NACP) under the Ministry of Health. However, due to its multi-sectoral nature there was a need to involve all sectors and community participation was found to be crucial. One of the government strategic initiatives is to establish Tanzania Commission for AIDS (TACAIDS) under the Prime Minister's Office. The Commission provides leadership and coordination of national multi-

sectoral response to the HIV/AIDS epidemic. The management functions, institutional and organizational arrangement of TACAIDS are outlined in the National Policy.

The policy identifies HIV/AIDS as a global disaster, hence requiring concerted and unprecedented initiative at national and global levels. It recognizes HIV/AIDS as an impediment to development in all sectors, in terms of social and economic development with serious and direct implication on social services and welfare. Thus, the policy recognizes the linkage between poverty and HIV/AIDS, as the poor section of the society are the most vulnerable.

The main policy objective is reflected well in the establishment of TACAIDS. However, the policy has also set a number of strategic objectives to deal with specific HIV/AIDS problems:

- Prevention of transmission of HIV/AIDS;
- HIV Testing;
- Care for People Living with HIV/AIDS (PLHAS);
- Enhance Sectorial roles through participation and financial support;
- Promote and participate in research on HIV/AIDS-including dissemination of scientific information and development of HIV vaccine;
- Creating a legal framework through enactment of laws on HIV/AIDS-governing ethical issues and legal status of HIV/AIDS affected families;

Other objectives:

- monitoring and safeguarding rights of infected or affected people;
- prevent human rights abuse, discrimination and social injustice;
- provide effective treatment for opportunistic diseases;
- promote fight against drug substance abuse;
- Prohibit misleading advertisements of drugs and other products for HIV/AIDS prevention, treatment and care.

This project can be a precursor of Incidents of HIV/AIDS due to the influx of people into the areas including construction workers. This would result in an increase in the incidence of diseases including STI, and HIV/AIDS.

### **3.3 Legal Framework**

#### **3.3.1 Environmental Management Act No. 20 of (2004), Cap. 191**

The Environmental Management Act (EMA) is a piece of legislation that forms an umbrella law on environmental management in Tanzania. Its enactment has repealed the National Environment Management Council Act. 19 of (1983) while providing for the continued existence of the National Environment Management Council (NEMC).

Among the major purposes of the EMA are to provide the legal and institutional framework for sustainable management of the environment in Tanzania; to outline principles for management, impact and risk assessment, the prevention and control of pollution, waste management, environmental quality standards, public participation, compliance and enforcement; to provide the basis for implementation of international instruments on the environment; to provide for implementation of the National Environmental Policy; to provide for establishment of the National Environmental Fund and to provide for other related matters.

Part VI of the EMA deals with Environmental Impact Assessments (EIA) and other Assessments and directs that an EIA is mandatory for all development projects. Section 81(2) states that “*An Environmental Impact Assessment study shall be carried out prior to the commencement or financing of a project or undertaking*”, while Section 81(3) states “*a permit or license for the carrying out of any project or undertaking in accordance with any written law shall not entitle the proponent or developer to undertake or to cause to be undertaken a project or activity without an environmental impact assessment certificate issued under this Act*”. This EIA is conducted for this project in order to abide to this law.

The Act imposes the following obligations to developer which for this case Temeke Municipal Council shall abide;

- i. As land user and occupier To protect, improve and nourish the land and using it in an environmentally sustainable manner, (Section 72)
- ii. To abstain from discharging any hazardous substances, chemicals, oils or their mixture into waters or into any segment of the environment (Section 110)
- iii. To comply with environmental quality standards (Section 141)
- iv. As a corporate body to comply with license conditions including the EIA certificate (Section 201)
- v. To control, manage and dispose in a sound manner waste including litter, liquid, gaseous and hazardous wastes (Part IX)

### **3.3.2 The Land Act No. 4 of 1999**

These laws declare all land in Tanzania to be “Public land” to be held by the state for public purposes. The Acts empower the President of the United Republic of Tanzania, to revoke the “Right of Occupancy” of any landholder for the “public/national interest” should the need arise. The laws also declare the value attached to land.

#### **Land tenure system**

The existing land ownership system has a history of more than forty years. At present the Land Act (1999) provides guidance to land ownership in Tanzania. The law vest all land in the President and grant occupancy rights to individuals, legal persons and territorial communities. The President holds *land in trust* for all citizens and can acquire land for public use and benefit, for instance, to resettle people from densely populated areas to sparsely populated areas, settle refugees and so forth. The President can also acquire land for other national projects, like road construction.

#### **Compensation rules**

Under the Government Standing Order on expropriation for public utility, the holder of a Right of Occupancy is guaranteed a free enjoyment of the land and is entitled to compensation if dispossessed by the Government for public use. In many cases whilst the holders agree to leave their land they are not happy with the amount and delay of the compensation. Often, for example, improvements that they have made to the land are omitted or underrated. The expropriation should match the price that

improvements can fetch if sold in the open market. Replacement value (defined as the cost of putting up a structure equivalent to the evaluated one) makes allowance for age, state of repair and economic obsolescence.

The compensation must therefore include:-

- The replacement value of the un-exhausted improvements
- Disturbance and transport allowance
- Loss of income
- Cost of acquiring or getting an equivalent land
- Actual value of the present property/utility available in the land and
- Any other immediate costs or capital expenditure incurred in the development of the land.

This project shall involve resettlement of people and their properties, this law shall govern the whole process of valuation and compensation.

### **3.3.3 The Water Resources Management Act No. 11 of 2009**

This is a new legislation that has repealed the Water Utilization (Control and Regulation) Act (1974). The Act provides for institutional and legal framework for sustainable management and development of water resources; outlines principles for water resources management; for prevention and control of water pollution; and provides for participation of stakeholders and general public in implementation of the National Water Policy. Its main objective is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways that among others meets the basic human needs of present and future generations, prevents and controls pollution of water resources and protects biological diversity especially the aquatic ecosystems.

In accordance with this law, all water resources in Mainland Tanzania shall continue to be public water and vested in the President as the trustee for and on behalf of the citizens. The power to confer a right to the use of water from any water resource is vested in the Minister responsible for water. A number of Seasonal Rivers cross the project roads. These rivers are governed by Wami Ruvu River Basin. This basin authority will be consulted before starting working in the Rivers and before abstraction of water from the water bodies in the project areas.

### **3.3.4 The Road Act, 2007**

For purposes of this project, the Road Act 2007 serves as a guide to the use of the road reserve. Contrary to previous informal understanding, the reserve is exclusive to road related activities that do not include other utilities. However clause 29 (2) does give provision for the request and terms of approval for use of the road reserve by utilities such as power lines and water pipes.

On land acquisition the Act clearly states in part III, Section 16 that *'where it becomes necessary for the road authority to acquire a land owned by any person, the owner of such land shall be entitled to compensation for any development on such land in accordance with the Land Act and any other written law'*. PMO-RALG shall observe this law for the conservation of the Road Reserve and Compensation of the PAPs.

### 3.3.5 Public Health Act 2009

An Act provide for the promotion, preservation and maintenance of public health with the view to ensuring the provision of comprehensive, functional and sustainable public health services to the general public and to provide for other related matters. Section 54 of this law states that " *A person shall not cause or suffer from nuisance, likely to be injurious or dangerous to health, existing on land, premises, air or water*". Therefore PMO-RALG shall develop this project road so that nobody suffers from nuisance or cause danger to people's life.

### 3.3.6 Land Use Planning Act (2007)

The Act provides for the procedures for the preparation, administration and enforcement of land use plans; to repeal the National Land Use Planning Commissioning Act and to provide for related matters. Among the objectives of the Act as given in Section 4 are to facilitate the orderly management of land use and to promote sustainable land use practices. This Project is expected to affect land use and livelihood therefore shall comply with the provisions of this Act. Any infringement on existing land use shall need consultation with land use planning authorities.

### 3.3.7 Occupation Safety and Health Act (2003)

The law requires employers to provide a good working environment to workers in order to safeguard their health. The employers need to perform medical examinations to determine fitness before engaging employees. Employers must also ensure that the equipment used by employees is safe and shall also provide proper working gear as appropriate. PMO-RALG and Contractor shall observe this law during construction.

### 3.3.8 The Standards Act No. 2 of 2009

An Act to provide for the promotion of the standardization of specifications of commodities and services, to re-establish the Tanzania Bureau of Standards (TBS) and to provide better provisions for the functions, management and control of the Bureau, to repeal the standards Act, Cap.130 and to provide for other related matters. This act is relevant to this project as the quality of the Bitumen/Asphalt, and other products to be imported by Contractor during construction will have to abide to the standards set by TBS.

### 3.3.9 Regional and District Act No 9, 1997

The Act provides for Regional Commissioners to oversee Regional Secretariats, with District Commissioners directly supervising the District Councils. Local authorities oversee the local planning processes, including establishing local environmental policies.

The National Environmental Policy establishes a policy committee on Environment at Regional level chaired by the Regional Commissioner, mirrored by environmental committee at all lower levels, i.e. at the District, Division, Ward and Village or Mtaa Councils.

Under the EMA 2004, the Regional Secretariat is responsible for coordination for all advice on environmental management in their respective region and in liaison with the

Director of Environment. At Local Government level, an Environmental Management Officer should be designated or appointed by each City, Municipal, District or Town Council. In each City or Municipality or District Environmental Committees should be established to promote and enhance sustainable management of the Environment. The Village Development Committee is responsible for proper management of the environment in their respective areas. The District Council designates for each administrative area as township, ward, village, sub-street and Environmental Management Officer to coordinate all functions and activities related to protection of environmental in their area. PMO-RALG and Contractor shall observe all local environmental bylaws set by Temeke Municipal Council.

### **3.3.10 The Land Acquisition Act 1967**

Under the Land Acquisition Act, 1967, 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.

Land shall be deemed to be acquired for a public purpose where it is required, for example, for exclusive Government use, for general public use, for any Government scheme, for the development of agricultural land or for the provision of sites for industrial, agricultural or commercial development, social services, or housing or; where the President is satisfied that a corporation requires any land for the purposes of construction of any work which in his opinion would be of public utility or in the public interest or in the interest of the national economy, he may, with the approval, to be signified by resolution of the National Assembly and by order published in the Gazette, declare the purpose for which such land is required to be a public purpose and upon such order being made such purpose shall be deemed to be a public purpose; or in connection with the laying out of any new city, municipality, township or minor settlement or the extension or improvement of any existing city, municipality, township or minor settlement; etc.

Upon such acquisition of any Land the President is compelled on behalf of the Government to 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 the Land Acquisition Act, 1967.

The President may also revoke a right of occupancy if in his opinion it is in public interest to do so. Accordingly, the land for which a right of occupancy has been revoked reverts back to the Government for re-allocation pursuant to the existing need (s). It should also be noted here that, though the land belong to the government some changes on the land act has taken place. Land has value to the owner; therefore any land taken from the user has to be compensated. Based on this act the villagers affected by the project are claiming that they should be compensated for the lost farms and land used for residential purposes. Any land acquisition that shall be done during the implementation of this project shall be guided by this law.

### **3.3.11 Employment and Labour Relations Act No. 6 Of 2004**

The Act makes provisions for core labour rights; establishes basic employment standards, provides a framework for collective bargaining; and provides for the



prevention and settlement of disputes. PMO-RALG shall see to it that the Contractor adheres to employment standards as provided for by the law.

### **3.3.12 Engineers Registration Act and its Amendments 1997 and 2007**

The Acts regulate the engineering practice in Tanzania by registering engineers and monitoring their conduct. It establishes the Engineering Registration Board (ERB). Laws require any foreigner engineer to register with ERB before practicing in the country. Foreign engineers working with this project shall abide to the law requirement.

### **3.3.13 The Contractors Registration Act (1997)**

The Contractors Registration Act requires contractors to be registered by the Contractors Board (CRB) before engaging in practice. It requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. PMO-RALG shall comply with the law requirement during the recruitment of contractors for project implementation.

### **3.3.14 The HIV and AIDS (Prevention and Control) Act of 2008**

The law provides for public education and programmes on HIV and AIDS. Section 8(1) of the law states that “The Ministry (Health), health practitioners, workers in the public and private sectors and NGOs shall for the purpose of providing HIV and AIDS education to the public, disseminate information regarding HIV and AIDS to the public”. Furthermore, Section 9 states that “Every employer in consultation with the Ministry (Health) shall establish and coordinate a workplace programme on HIV and AIDS for employees under his control and such programmes shall include provision of gender responsive HIV and AIDS education...”. This project shall abide to HIV/AIDS Act in the fight against the disease.

### **3.3.15 The Industrial and Consumer Chemical (Management and Control) Act, 2002**

The Act provides for among other issues, importation, transportation, storage, use and disposal of chemicals in Tanzania. Road Contractor is required by law to have a certificate from the Chief Government Chemist for importation, storage or disposal of any chemicals (Asphalt, Lime etc). Furthermore, Road Contractor as any other individual dealing with chemical is required to comply with all provisions/regulations regarding packaging, handling, storage, use and disposal of chemicals, as set by the this Act. The minister appoints an inspector from time to time to ensure compliance. Failure to compliance might lead to revocation of the certificate. This law shall guide the contractor and PMO-RALG on importation of construction materials such as Asphalt.

### **3.3.16 The workers Compensation Act no 20 of 2008**

The law provides for compensation to employees for disablement or death caused by or resulting from injuries or diseases sustained or contracted in the course of employment; to establish the Fund for administration and regulation of workers compensation and to provide for related matter. This act is very relevant to this

project as workers will be exposed to various hazards during construction of the facilities.

### **3.3.17 The Urban Planning Act (2007)**

The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. Under Section 3, among others the law seeks to improve level of the provision of infrastructure and social services for sustainable human settlement development. Therefore the upgrading of the proposed roads is in line with the objectives of this law.

### **3.3.18 Energy and Water Utilities Regulatory Authority Act, 2001**

The Energy, Water Utilities Regulation Authority (EWURA) was established under the EWURA Act, 2001, with responsibility *inter alia* for regulation of the energy, water and sewerage services. EWURA derives its powers from Cap 414. Being a multi-sectoral regulatory authority, EWURA's powers also emanate from sector legislations. In terms of principal legislation in the electricity sector, it derives its powers from the Electricity Act, Cap 131; in the petroleum sector, from the Petroleum (Conservation) Act, Cap 392; in the water and sewerage sectors, from the Water (Utilisation and Control) Act, Cap 331, the Waterworks Act, Cap 272 and the Dar es Salaam Water Supply and Sewerage Authority Act, Cap 273.

EWURA is mandated by the law to monitor petroleum industry in the country including setting out of prices. Section 31 of the Petroleum Act 2008 states that "*The prices for the petroleum and Petroleum products throughout the supply chain shall be governed by the rules of the supply and demand subject to the provisions of the Energy and Water Utilities Regulatory Authority act and Fair Competition Act*". The proponent and contractor for these roads shall be strictly abide to this law because EWURA regulate all issues of petroleum products including Asphalt.

### **3.3.19 The Petroleum Act, 2001**

This act make provisions for Importation, Exportation, Transportation, Transformation, Storage and wholesale and retail distribution of petroleum products in a liberalized market and to provide for related matters. Section 7 of the act restricts persons/Institutions from performing petroleum supply operations without having obtained a licence in accordance with the provision of this act. Section 8 (1) states that "*Prior to the issuance of the licence, the applicant must comply with all necessary Environmental requirements as provided for under the Environmental Management Act.*" PMO-RALG has conducted this EIA to conform to this Law.

This Law also provides for construction works of petroleum Installations. Sections 13 (1) and 13(4) of this law states that "*Any Person Intending to construct a petroleum installation or petroleum carriage facility shall, apply in writing to the Authority for an approval. The approval shall be subject to conditions as May be prescribed by the Authority*". The contractor shall apply for this approval before in respect to storage of Asphalt and Oils.

### 3.3.20 Mining Act (2010)

This Act states that “building material” includes all forms of rock, stones, gravel, sand, clay, volcanic ash or cinder, or other minerals being used for the construction of buildings, roads, dams, aerodromes, or similar works but does not include gypsum, limestone being burned for the production of lime, or material used for the manufacture of cement.

This act make sure minerals are well controlled and Section 6(1) states that "*no person shall, on or in any land to which this act refers, prospect for minerals or carry on mining operations except under the authority of Mineral Right granted, or deemed to have been granted under this Act.*" This means that extraction of building materials from unauthorized/unlicensed sites is strictly prohibited. For this Project the Contractor shall apply for buy construction materials from authorised/ licenced quarries operators.

## 3.4 Relevant Regulations and Guidelines, International treaties and conventions

### 3.4.1 The Tanzania 2025 Development Vision

The Tanzania Vision 2025 aims at achieving a high quality livelihood for its people attain good governance through the rule of law and develop a strong and competitive economy. Specific targets include:

- A high quality livelihood characterized by sustainable and shared growth (equity), and freedom from abject poverty in a democratic environment. Specifically the Vision aims at: food self-sufficiency and security, universal primary education and extension of tertiary education, gender equality, universal access to primary health care, 75% reduction in infant and maternal mortality rates, universal access to safe water, increased life expectancy, absence of abject poverty, a well educated and learning society.
- Good governance and the rule of law moral and cultural uprightness, adherence to the rule of law, elimination of corruption.
- A strong and competitive economy capable of producing sustainable growth and shared benefits a diversified and semi-industrialized economy, macro-economic stability, a growth rate of 8% per annum, adequate level of physical infrastructure, an active and competitive player in regional and global markets.

Good roads are one of the most important agents to enable Tanzania achieve its Development Vision objectives (both social and economic), such as eradicating poverty, attaining food security, sustaining biodiversity and sensitive ecosystems. Upgrading of the Project roads through this project contributes to the attainment of the 2025 Vision.

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

These regulations provide criteria for the assessment of compensation on land, as per market value for real property; disturbance allowance is calculated as a percentage of market value of the acquired assets over twelve months; and transport allowance calculated at the cost of 12 tons hauled over a distance not exceeding 20 km.

The other criteria includes loss of profit on accommodation based on business audited accounts and accommodation allowance equivalent to the rent of the acquired property per month over a 36 month period. These regulations shall guide the compensation exercise in this project.

### 3.4.3 Environmental Impact Assessment and Auditing Regulations (2005)

These regulations set procedures for conducting EIA and environmental audit in the country. The regulations also require registration of EIA experts. This EIA has been conducted following the above stated regulations.

### 3.4.4 National Strategy for Growth and Reduction of Poverty (2005)

One of NSGRP objective is to improve the quality of life and social well being. This can be achieved through improving passable (good/fair condition) rural roads from 50% in 2003 to at least 75% in 2010. The strategy will also ensure that the health facilities are improved and accessible and drugs are made available throughout the year (NSGRP, 2003). Construction of the Project roads shall contribute to Poverty Reduction within the project area.

### 3.4.5 Environmental Assessment and Management Guidelines for the Road Sector (2011)

The Environmental Assessment and Management Guidelines for the Road Sector (EAMGRS) were developed in December 2004 (Signed in 2011), just after EMA (2004) was enacted. The guidelines give procedures for the EIA process as briefly explained in Table 3.2.

**Table 3.2: Developed EIA Procedures in the Road Sector**

**EIA PROCEDURES IN THE ROAD SECTOR (as per EAMGRS 2011)**

**Administrative Procedures:**

EIA administrative procedures vary based on the significance of the environmental impacts. The Minister for Environment is responsible for projects with potential major environmental impacts. The EIA of projects with potential non-major environmental impacts are carried out under the Ministry responsible for the road sector and the Road Sector-Environmental Section (RS-ES).

**Environment Application and Screening Process:**

EA procedures in the road sector are initiated when the Road Implementing Agency (RIA) submits an Environment Application Form to the RS-ES during the Project Identification or Project Planning/Feasibility Study Phase. An environmental screening of the proposed project will determine whether the project will require: An Initial Environmental Examination (IEE); a Limited Environmental Analysis (LEA); or a detailed Environmental Impact Assessment (EIA).

Environmental Screening is done based on the information presented in the Environmental Application Form. The RS-ES is responsible for screening projects and this may acquire a reconnaissance study by an environmental specialist, especially if the project traverses sensitive areas or when there is potential for complex environmental issues.

All road projects with non-major environmental impacts shall be subject to an Initial Environmental Examination (IEE) or a Limited Environmental Analysis (LEA). Projects with major environmental

impacts are subject to EIA. The RS-ES will register non-major-impact-projects. For major-impact-projects, the registration is done by NEMC.

### 3.4.6 Standard Specifications for Road Works (2000)

These specifications were officially released in 2002. The main aim is to provide the specifications which should be adhered by contractor construction of roads. This document is usually part and parcel of the contract documents. Section 1700 of these specifications is dedicated to Environmental Protection and Waste disposal. This section contains the following Sub-sections;

- 1703 Landscape Preservation
- 1704 Temporary Soil Erosion Control
- 1705 Preservation of Trees and Shrubbery
- 1706 Prevention of Water Pollution
- 1707 Abatement of Air Pollution
- 1708 Dust Abatement
- 1709 Noise Abatement
- 1710 Light Abatement
- 1710 Preservation of Historical and Archeological Data
- 1711 Pesticides, Toxic Waste and Hazardous Substances
- 1712 Clean up and Disposal of waste materials
- 1713 Measurements and Payments

This Section of standard specification shall be part and parcel of the ESMP for this project.

### 3.5 International Treaties and Agreements

Tanzania has ratified a number of Multilateral Environmental Agreements (MEAs) and consequently is bound by obligations under these agreements. The most relevant MEAs to this particular project is the **African Convention on the Conservation of Nature and Natural Resources**. Like the CBD, this Convention alerts nations on the conservation the African nature and natural resources in their widest sense. Infrastructure upgrading project is likely to interfere with the normal lives of nature such population and some habitats.

### 3.6 Institutional Framework

Institutionally, Temeke Municipal Council (under PMO\_RALG) and have the mandate to develop and maintain the urban infrastructures in the Kinondoni Municipality including roads. Its primary function includes the maintenance and development of the infrastructures to support the economic and social development of in the Municipality. They will also be responsible for addressing the environmental issues posed by the subprojects. The proposed roads will be under the municipal engineer who reports to the Municipal Director. The ward and Mtaa leaders where the project shall take place shall be the TMC representatives on daily bases especially for issues which involve community.

From the central government line of administration, by virtue of their location, the urban infrastructures to be developed by this project in Dar es Salaam region is under the jurisdiction of the Regional Commissioner for the Dar es Salaam region.

## **4.0 BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS**

### **4.1 Temeke Municipality Synopsis**

#### **4.1.1 Climate**

Temeke Municipal Council lies in the tropical coastal belt of Tanzania and therefore is influenced by two major climatic conditions, namely rainfall and temperature. Rainfall pattern is that of bimodal type with erratic conventional rains. The monsoon rains occurring almost throughout the Municipality between December and February. While the long heavy rains in the period from March to June. The amount of rainfall received ranges from 800 – 1200mm per annum. Temperature just like rainfall is also influenced by ocean. High temperature prevails throughout the year ranging from 25<sup>0</sup>c during the period of June to August up to 35<sup>0</sup>c in the period of January to March.

#### **4.1.2 Landscape Features**

In the hilly ridges, such as Pugu, Ukonga and Chanika the soil is steadily being degraded due to continuous cultivation. This is the area from which woodlands are found and seasonal streams originate from, and farming activities and informal residential development are also taking place. The relative upper land is largely the area where urbanization process is continuing rapidly. This part of the landscape is being transformed into various uses such as residential, industrial, and commercial and infrastructure development. The low lying land found along flood plains of Msimbazi River and the low lying lands of Kiwalani are suitable for urban farming activities, including gardening (URT, 2011).

#### **4.1.3 Soil and Geologic formation**

The soil found in Dar es Salaam City is often clayey and partly sandy, and therefore relatively unproductive regarding agricultural use (Dongus, 2001). In the river valleys, which are recent floodplains and subject to flooding, alluvial soils (mainly Eutric Fluvisols and Eutric Gleysols) are dominant (Muster, 1997). Soil erosion in the urban area occurs primarily at the slopes of river valleys, where no vegetation is left to hold the soil in place, and is intensified by human activities such as extraction of construction materials.

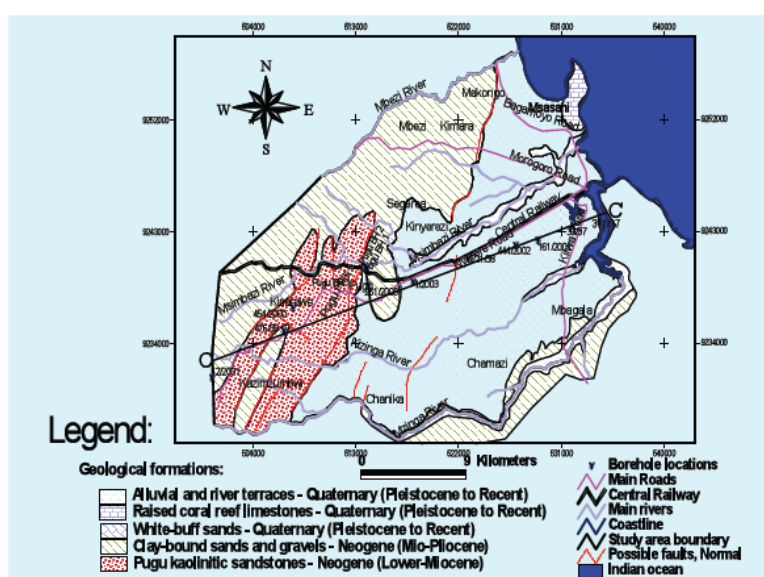
The geology of Dar es Salaam has two major geological units

- I. the underlying substratum of (semi-)consolidated formations and outcropping rocks, and
- II. superficial mainly loose sediments.

The underlying (semi-)consolidated formations and outcropping rocks in Dar es Salaam region consist of Neogene clay-bound sands to hard sandstones. The far less consolidated terrace sands and sandstones of the Quaternary System are more extensive in the central and southern parts of Dar es Salaam Region. In general the three main terraces in the eastern central coastal sedimentary plain are the Mtoni, Tanga and Sakura terraces. The Quaternary deposits also comprise coral reef limestones, especially near the ocean. This reefal limestone crops out near the

coastline. Neogene sandstone formations interbedded with siltstones and mudstones occupy the upland area south and west of the City Centre (Mtoni *et al.*, 2012).

The outcropping sediments in the study area vary from the semi-consolidated clay-bound sands and gravel of Mio-Pliocene age in the uplands in the northwest and to the southeast, to the far more unconsolidated suite of recent times, consisting of less consolidated terrace sands and sandstones and recent alluvium. Coarse grained soils are dominant and are situated on the coastal terraces. An alternation of fine and coarse grained sands occurs within the valleys, creeks, deltas and mangrove sites. The mouths of Kizinga, Mzinga and Msimbazi rivers form the main deltas. In the river valleys, recent alluvial deposits are covering the terrace sediments. Upland soils are situated on uplands and are the result of weathering of upland sandstone and siltstone of varying lithological composition (Mtoni *et al.*, 2012).



**Figure 4.1:** Map showing geological formation of Dar es Salaam (Mjemah, 2013)

#### 4.1.4 Vegetation and Wildlife

The vegetation of Temeke like the rest of Dar es Salaam is constituted of various species of disturbed bushland and woodland species (URT, 1984) comprising of coastal shrubs along the beach areas and Miombo woodland, vegetation in coastal swamps and mangrove trees. Part of the municipal land is cultivated with different kinds of crops, comprising of mixed cropping; cultivation with tree, shade, bushy and herbaceous crops (URT, 1996a).

Tree species found in the study area include Neem trees (*Azadirachta indica*) and Ashoka trees (*Polyalthia longifolia*) (which are among the most commonly planted trees in Tanzania) and a few African teaks (*Milicia excelsa*).

There are limited wildlife resources in Dar es Salaam City due to its high demand for land for settlements and industrial development. The population particularly of larger animals has been significantly reduced. The only place where large animals can be found is in the Dar es Salaam Zoo located in Kigamboni, in Temeke municipality. Also a diverse assemblage of seabirds is found in the Dar es Salaam Marine Reserves System (DMRS), including both seasonal migratory and local birds. The common



bird species sighted include the White reef heron (*Egretta dimorpha*), and Little egret (*Egretta garzetta*), Whimbrel (*Numenius phaeopus*) and Sanderling (*Calidris alba*) (URT, 2005d).

#### 4.1.5 Marine and coastal resources

No specific studies of marine and coastal resources were found, thus the information provided in this section is general for Dar es Salaam city. The coastal zone of the is comprised of a complex mixture of beautiful sandy beaches, beach rocks as well as rock cliffs and platforms, islands fringed by coral reefs, numerous coral patch reefs, estuaries streamlined with mangrove forests, and lagoons with sea grass beds covering large areas (Kairu and Nyandwi, 2000). About eight mangroves species can be found along the beach areas of the city, namely; *Rhizophora mucronata* ('Mkoko' in Kiswahili), *Sonneratia alba* ('Mlilana' or 'Mpira'), *Avicennia marina* ('Mchu'), *Ceriops tagal* ('Mkandaa'), *Bruguiera gymnorrhiza* ('Msinzi' or 'mshinzi'), *Heritiera littoralis* ('Msikundazi or Mkungu'), *Lumnitzera racemosa* ('Kikandaa' or 'Mkandaa dume') and *Xylocarpus granatum* ('Mkomafi') (URT,2011).

The city has about 88 species of hard coral species belonging to 34 genera. There are about 12 species of seagrasses in the coastal waters occupying much of the shallow lagoon between the islands and the mainland along the entire coast (URT, 2011). The city coast is home to a number of endangered species such as marine turtles, hawksbill (*Eretmochely imbricata*) and green turtle (*Chelonia mydas*) dolphins, Sea Turtle, humpback whales and whale sharks (URT, 2011). Fishing is one of the major economic activities along the coastal areas, and is mainly done for both subsistence and commercial purposes. Fishes of commercial importance to local communities include Siganidae, Lutjanidae, Lethrinidae, Scaridae, Labridae, Acanthuridae, Mullidae, Haemulidae, Serranidae, and Dasyatidae (Kamukuru, 2005)

#### 4.1.6 Administrative Setting and Population

Temeke District is the southernmost of three districts in Dar es Salaam city. The municipal has a total area of 786.5 km<sup>2</sup>. Administratively the municipal is divided into 3 divisions, 30 wards and 180 sub-wards. According to the nation population census results of 2012 Temeke district had a total population of about 1,368,881 and average household size of 3.9. The total population in the project wards makes about 67.37% of the total population in Temeke.

#### 4.1.7 Land Management

**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 the transactions.

**Land use-** Major land use categories in Temeke municipality include residential, commercial, mixed uses, agricultural, industrial and recreational areas (DCC, 2008).

□

The major land use is agriculture/vacant. Only 8% of the municipal land is residential. Table 4.1 shows the area coverage of land use in Temeke municipality.

**Table 4.1: Existing Land use pattern in Temeke Municipality**

Land use category	Area (km <sup>2</sup> )	%
Residential	62.3	8.0
Industry	7.2	0.9
Other urban use	5.9	0.8
Military	0.9	0.1
River/water	42.5	5.5
Vacant/Agriculture	655.7	84.6
<b>Total</b>	<b>375.1</b>	<b>100</b>

(Source: JICA, 2008)

#### 4.1.8 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, where by 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.

#### 4.1.9 Air Quality

There are many sources of air pollution in Temeke District, including gaseous dust and particulate emissions from motor vehicles, industrial stacks, waste dumps, construction activities and mining activities. Sources of noise are such as construction activities, traffic, entertainment centers and commercial sites like markets. The main pollutants emanating from these sources are sulphur dioxide, carbon monoxide, nitrogen oxides and particulate matter. Typical air quality status in unplanned settlement is presented in Table 4.2, showing results of air quality assessment in unplanned settlement in a neighboring district, Kinondoni. It has been assumed that situation in Temeke will be roughly the same due to similarities source types and climatic conditions. Average concentrations of three major pollutants were found to be above the WHO guideline.

**Table 4.2: Concentration of major air pollutants in unplanned settlement**

Pollutants	Value range	Unit	WHO Guidelines	Remarks
Average hourly sulphur dioxide	127 - 1385	µg/m <sup>3</sup>		Above guidelines

Average hourly nitrogen dioxide	32 - 65	$\mu\text{g}/\text{m}^3$	190-320 for 1 hr	Below guidelines
Average hourly suspended particulate matter (SPM)	712 -743	$\mu\text{g}/\text{m}^3$	150 - 230 for 24 hr	Above guidelines
Average hourly Particulate lead	11.41-11.88	$\mu\text{g}/\text{m}^3$	1.5 $\mu\text{g}/\text{m}^3$	Above guidelines

Source: Rwanga, (2005); Jackson (2005)

#### 4.1.10 Traffic and Construction Noise

At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of the day. Variation is caused both by changes in the noise source, and by changes in weather conditions. Referring to a study by JICA (JICA, 2010), noise level (Leq) in Dar es Salaam City ranges between 40 and 80 dBA. Passenger vehicles contribute more significantly to the problem compared to other vehicles. Noise pollution is more significant during day time, with peaks in morning and evening hours. During night times, noise levels decrease to values below 60 dBA. According to Kassenga and Mbuligwe (1999), roads construction noise and vibration pollution in Dar es Salaam City varies between 60 dBA and 70 dBA and surpass Tanzania environmental noise standards for residential areas. The WHO suggest that exposure to an environmental average noise level of 70 dB will not cause hearing impairment. An adult person's ear can tolerate an occasional noise level of up to 140 dB, but for the children the exposure should never exceed 120 dB.

#### 4.1.11 Surface Water Quality

Part of River Msimbazi is in Temeke Municipality. The river Kizinga valley is also within the municipality. These water sources are heavily contaminated by disposal of different types of waste from small industries, domestic and institutional sanitation systems and solid waste from residential areas. No water samples were analyzed during the EIA instead, available recent data in literature (Table 4.3) for Msimbazi and Kizinga rives/stream are used as reference point. The waters in these sources have high levels of BOD, COD, color, nitrates and turbidity.

**Table 4.3: Water quality parameters for rivers/stream in Temeke**

Parameter	Concentration		
	Msimbazi River	Kizinga valley	Guidelines
pH	7.56	7.26	6.5 – 8.5
Salinity (mg/L)	0.23	12.74	
Electric conductivity ( $\mu\text{S}/\text{cm}$ )	498.33	419.77	
TDS (mg/L)	249.00	346.97	
Colour (NTU)	410.33	310.11	300
Turbidity (mg/L)	124.66	237.01	30
Nitrites (mg/L)	-	8.91	100
NH <sub>4</sub> -N (mg/L)	8.05	16.80	20
PO <sub>4</sub> (mg/L)	9.25	-	6
DO (mg/L)	-	3.18	
COD (mg/L)	213.37	206.37	60
BOD (mg/L)	119.49	123.12	30
<b>Source</b>	<b>Massawe (2010)</b>	<b>Swalehe (2012)</b>	<b>TBS</b>

#### 4.1.12 Ground Water Quality

Groundwater pollution in Dar es Salaam City as a whole is due to both point and diffuse sources. Point sources in Temeke municipal include on-site sanitation facilities (septic tanks and pit latrines), infiltration from waste stabilization ponds, solid waste dumpsites, underground fuel tanks, garages and petrol stations, industrial establishments and other commercial points. Most of these sources were observed in the study area, with the exception of waste stabilization ponds and underground fuel tanks. Diffuse sources are such as urban agricultures such as the small vegetable farms we see in swampy areas or along the stream/river banks. Secondary data on estimates of ground water pollution load from households in unplanned areas are presented in Table 4.4. These estimates can be used in estimation of these parameters from new toilets, and from camp sites (if any).

**Table 4.4: Estimation of Ground water pollution loads in Dar es Salaam**

Parameter	Pollution load (kg/yr)	
	Unplanned ares	Planned ares
COD	52.1	101.6
BOD5	5.2	10.2
TOC	29.8	58.1
NH3-N	19.3	37.8

Source: Mato, 2002

Secondary data on ground water quality from 36 randomly selected boreholes in Dar es Salaam city from the year 1999 to 2001 (Table 4.5) reports high levels of nitrite and bacterial contamination in boreholes located in highly populated areas like Mansese and Mabibo wards in Temeke District (Mato, 2002). The concentrations of chlorides and fecal coliform were above TBS guidelines. Similar results were reported in 1999, where the concentrations of Nitrate and sulfates ranged from 4.2 - 96 mg/l and 0.7 to 4.4 m/l respectively (Rwegasira *et al.*, 1999).

**Table 4.5: Groundwater quality parameters in Temeke municipalities from 1999 - 2001**

Parameter	Sulfates	Nitrites (mg/L)	Chloride (mg/L)	Turbidity (mg/L)	Faecal Coliform bacteria (colonies/100ml)
Yombo Makngarawe	60.5	1.6	774	2	1
Yombo Dovyia	16.5	2.2	875	1	3
Temeke	50.1	1.6	795	2	2
Kigogo	26.8	18.3	1120	5	3
Tandika	83.9	1.5	2713	1	8
TSB standard	<b>600</b>	<b>100</b>	<b>800</b>	<b>30</b>	<b>0</b>

(Source: Mato, 2002)

## 4.2 Existing Situation of Subprojects

### 4.2.1 General

There are 8 stretches of subproject roads within the Temeke Municipal Council (TMC) that are included in the DMDP. All the subproject roads within Temeke Municipality are presently gravel road (except Temeke-Mbagala and Chang'ombe road) and are to be upgraded to bitumen standard. Generally, there is neither flora nor fauna of ecological importance in the project area. As for most towns, the project sites are characterized by the presence of commercial and residential buildings and physical infrastructures such as telephone lines, electricity lines, water supply system, sewerage system and storm water drainage system. Detail description of the current environmental status of the subprojects is given in Table 4.6 below.

**Table 4.6: Physical features of the project roads**

SN	Road Name	Land Use	Topography	Type of Road	Side Drains	Presence of Bus stops	Traffic	Utilities Present	Vegetation	Need for Resettlement	Zoning
1	Chang'ombe road	• Commercial/ Residential	Relative ly Flat	Tarmac	• Most part has side drains	Yes	Very High	• Electric Transmission Lines • Telephone lines • Water Supply pipes	• Mango trees • Shade trees • Ashoak trees	No	Urban
2	Temeke- Mbagala	• Commercial/ Residential	Relative ly Flat	Tarmac	• Most part has side drains	Yes	Very High	• Electric Transmission Lines • Telephone lines • Water Supply pipes	• Neem trees • Indegenous trees • Shade trees • Ashoak trees	No	Urban
3	Nzasa- Kilungule - Buza	• Commercial/ Residential/ Farming	Undulat ing	Gravel	• Small sections has Side drains	No	Moderate	• Electric Transmission Lines • Telephone lines	• Neem trees • Mango trees • Ashoak trees • Coconut trees	Yes	Peri-Urban
4	Mchicha Road (sandali)	• Commercial/ Residential	Flat	Gravel	• Only one small section has side drain	No	Moderate	• Electric Transmission Lines • Telephone lines • Water Supply Pipes	• Neem trees • Indegenous trees • Ashoak trees • Coconut trees	No	Peri-Urban
5	Kijichi- Tuangoma - Bridge	• Small Scale Farming	Valley	Earth	• No	•No	Non	• Non	• Indigenous trees • Riverine Grasses • Paddy	No	Peri-Urban
6	Mbagala Industrial road	• Commercial	Flat	Gravel	• No	•No	Moderate	• Electric Transmission Lines • Telephone lines	• Neem trees • Ashoak trees	No	Peri-Urban
7	Mwanamt	• Commercial/	Undulat	Gravel/	• Side drains at	No	Moderate	• Electric	• Neem trees	Yes	Peri-Urban

SN	Road Name	Land Use	Topography	Type of Road	Side Drains	Presence of Bus stops	Traffic	Utilities Present	Vegetation	Need for Resettlement	Zoning
	oti Road	Residential	ing	Earth	some small sections			Transmission Lines	<ul style="list-style-type: none"> <li>• Shade trees</li> <li>• Ashoak trees</li> <li>• Coconut trees</li> </ul>		
8	Access road to Mtoni Closed dump site	• Residential	Flat	Earth	• Non	• No	Little	• Electric Transmission Lines	<ul style="list-style-type: none"> <li>• Neem trees</li> <li>• Ashoak trees</li> <li>• Coconut trees</li> </ul>	No	Peri-Urban

### 4.2.2 Road Side Air Quality

Road side air quality measurements were not performed during this study, however the secondary data has been used to provide status of road air quality in Dar es Salaam City. Several studies have been performed since 1991 and the latest one was conducted by Othman in 2010. Table 4.7 below shows the road side air quality in terms of SO<sub>2</sub>, NO<sub>2</sub>, CO and Dust (SPM) in Dar es Salaam from several studies.

**Table 4.7: Road side air quality in selected roads of Dar es Salaam**

Site	NO <sub>2</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	CO (µg/m <sup>3</sup> )	Reference
Askari Monument	1000	9867	762	9.7	Othman (2010)
	298	272	141	----	Othman (1996)
	250	3290	187	----	NEMC (1992)
	-	3968	----		Mwakibete (1991)
	43.7				Henricson (1999)
	44.8			7.4	Musabila et al. (2003)
Gerezani	567	9833	1175	15.3	Othman (2010)
	497	1886	723	----	Othman (1996)
	428	3356	692	----	NEMC (1992)
	5110	1687	----	----	Othman (1991)
	59.8			9.6	Musabila et al. (2003)
Kariakoo	733	10533	1134	18.0	Othman (2010)
	288	1520	782	----	Othman (1996)
	249	3323	757		NEMC (1992)
MMC	42	4757	187	1.8	Othman (2010)
	290	1662	136	----	Othman (1996)
	200	3319	609		NEMC (1992)
Kunduchi Beach Hotel	20	235	77	0	Othman (2010)
	75	309	78	----	Othman (1996)
	187	1230	85		NEMC (1992)
Several Sites	<53	<1385	<1161	----	Jackson (2005)
WHO Guide Value	<b>200</b>	<b>350</b>	<b>230</b>	<b>10</b>	

Source: Othman, 2010

### 4.2.3 Noise and Vibrations

Despite the fact that no measurements of noise levels was done during the time of conducting the survey, the fact that the traffic volume is low, the noise and vibrations levels are rated to be insignificant.

### 4.3 Biological Environment

The flora along the project roads is characterized by mosaics sparsely spaced exotic strip street vegetation. As for Many urban areas, The Project areas are deprived of vegetation mainly due to human activities and settlements. The typical vegetation that was found in most of the roads are Neem Trees, Ashoka trees, Mango Trees, Almond Trees, Coconut Trees, Baobab Trees, Palm Trees and Planted Shade trees. Also shade



trees of various species can be found here and there along the project roads. The main fauna of the area for which the project roads passes consist of domestic animals such as livestock, dogs, pigs, cows, chicken and birds. Other aquatic creatures includes toads, and monitor lizards.

#### 4.4 Socio-Economic Environment of the project roads

##### 4.4.1 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 constitutes 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.

##### 4.4.2 Annual Expenditure Per Household

Like differences in earning in incomes, the same trend is observed for expenditures. Table 4.8 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 4.8: 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: Socio-economic Study: March 2013

#### 4.4.3 Descriptions and status of the Houses

The study was interested to know the structures of the houses and the purposes of the buildings in the project areas. This has implication in terms of compensation because it gives a picture of types of houses available in the project area. Basically buildings were found being used multi-purposely – meaning multifunctional residential, sleeping, combined residential and business activities. As portrayed in Figure 4.2, 175 (52.2%) people responded that the purpose of their building were multi-functional and residential while 103 (30.7%) of the respondents indicated that their buildings were exclusively for residential. Other purposes included combined residential and businesses i.e. 43 (12.8%) respondents.

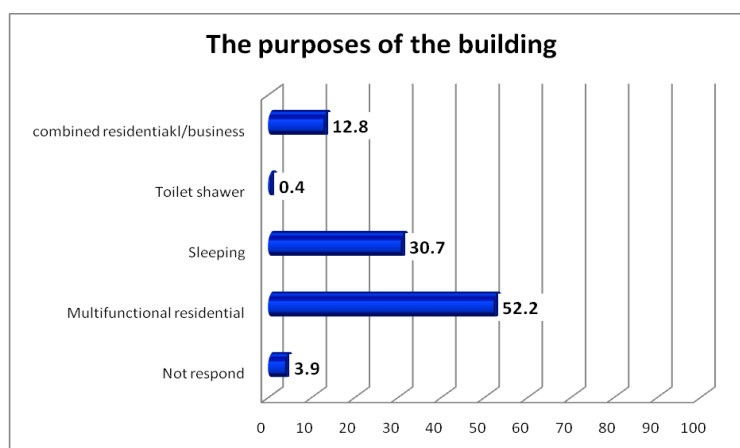
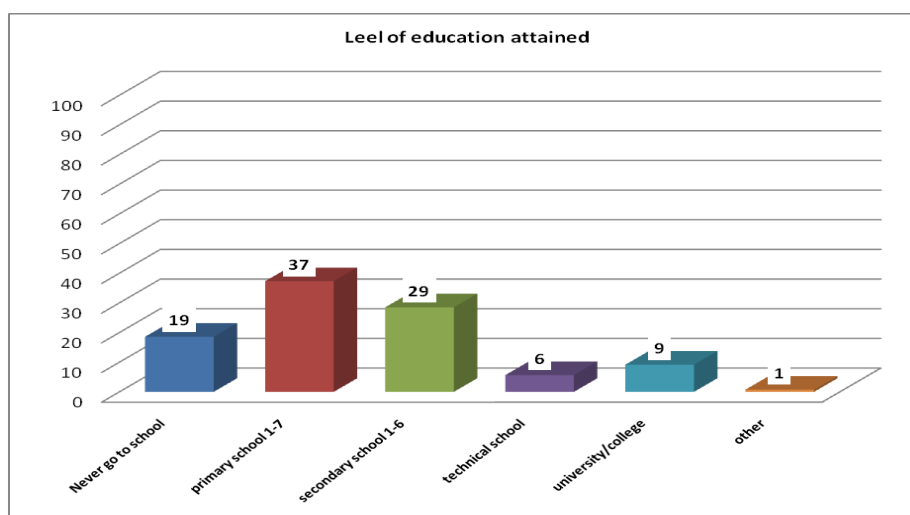


Figure 4.2: Purposes of the building (Socio-economic study (March 2013))

In addition to finding out the variation in the uses of the buildings, the study was also interested to know the size of the houses, type of floor and construction materials from household respondents. The majority of the interviewed households indicated to possess houses with concrete floor. The total amounted to 272 (81.2%) people and 46 (13.7%) replied to have their floors made of floor tiles. Only 15 (4.5%) respondents had earth floor in their houses. The remaining houses have cement screed floors finishes.

Almost all houses had walls constructed with cement blocks. This accounted for 320 (95.5%) of the total interviewed households with exception of 11 (3.3%) people and 4 (1.2%) who had their walls made of mud blocks with plaster and mud block respectively. According to household responses, all houses interviewed (99.7%) were roofed with corrugated iron sheets with exception of one house.



**Figure 4.3:** Level of education attained (Socio-economic Study March 2013)

#### 4.4.4 Education

The field study established level of education obtained within the interviewed households whereby 148 (19%) had never been to school this includes children under school age. The majority were primary school leavers accounting to 297 (37%), followed by 227 (29%) in secondary school level. The table above shows those attended (or still attending) technical and those with university education at the time of study. Some adults have also not been to school or dropped on the way for various reasons.

#### 4.4.5 Health services

During the study, respondents in the project areas named more than 35 health facilities (hospital, health centre, dispensary and clinics) where they obtained health services. Each respondent named the nearby facility and most of them spent less than an hour to reach the nearby facility whereby the longest facility was reached not more than 3 hours.

Households sought health services in order to check their health status or obtain medical treatments as a result of different diseases / illnesses contracted in the project areas or elsewhere. Out of all interviewed households, y (xx %) stated that they suffered from diseases while only vv (ff %) of the respondents had not suffered from any of the disease. The diagram below indicates responses regarding diseases. The interviewed household representatives mentioned different types of diseases which caused family members to suffer. The diseases included malaria, diarrhea, TB, skin rashes, pneumonia, coughing, and typhoid, to mention but few examples.

HIV and AIDS epidemic as a developmental and crosscutting issue was not mentioned in any of the interviewed households. This could be due to ignorance or because of stigma and discrimination. However, the pandemic prevails given the prevalence rate of HIV infection in Dar Es Salaam region which is 6.9% (THMIS: 2012) while sources from Temeke VTCs and PMTCTs indicated the prevalence rate of 4.5% for Temeke Municipality.

The prevailing of various diseases in the project area reflects some of the reported top ten diseases for the 2009 in the municipality which are Malaria, ARI, Diarrhea diseases, Intestinal worms, Eye Infections, UTI, Pneumonia, Skin Infections, Minor surgical conditions and Anaemia. Most of these diseases are communicable and indeed preventable. With the implementation of the project, it is possible for rate of some of these diseases to increase and spread to more people due to various factors as discussed under the negative impact and mitigation measures.

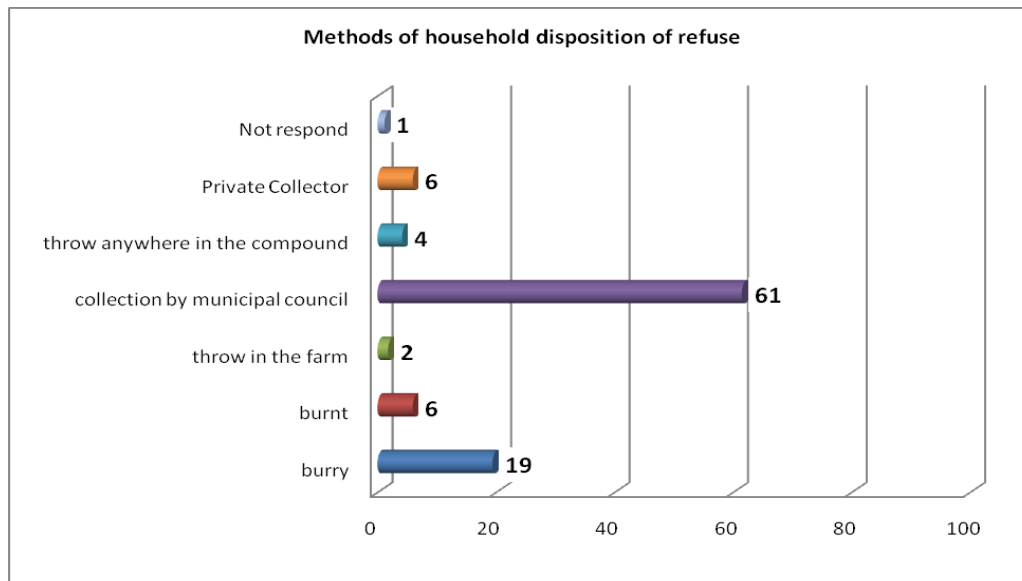
#### **4.4.6 Disposition of Household refuse**

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 / sites for example Temeke at Mwembe –Yanga, Temeke Sudan, and Kilungule – Kiburugwa, etc.

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 / bye-laws are crucial. See Figure 4.4 on methods of solid waste disposal in the project areas.

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.



**Figure 4.4:** Methods of household disposition of refuse (Socio-economic survey March 2013)

#### 4.4.7 Sources of energy

In the project areas, inhabitants mentioned different sources of energy for different uses especially cooking, lightning, ironing and running electrical equipment. The costs for each sources varied and therefore household opted type of sources based on affordability, accessibility and reliability. Among mentioned sources were electricity, charcoal, gas, solar power, kerosene, candles, batteries etc. Very few mentioned firewood.

Due to unreliability of electricity as one of the major sources and fluctuation of prices of different sources of energy, many households embarked on multiple uses of sources which implied more costs. Several problems associated with sources of energy in the project areas were mentioned dominated by cut-off of electricity (interruption or rationing). According to the Municipality report (2010/11), only about 1% of householders have electricity in peri-urban while in urban areas about 52 percent have access to electricity. Efforts to Supply electricity power to the coastal area of Temeke have proved futile.

During the study, 143 (42.7%) experienced this problem followed by high costs of different sources like kerosene, electricity, charcoal etc. Heavy reliance on charcoal has a detrimental impact on natural resources such as forests and other natural trees.

Upgrading / rehabilitation of roads could have an impact on some of the challenges / problems outlined by residents, for example, prices of some items could go down or remain constant without frequent fluctuation. This is so because less cost will be incurred in transportation from the sources to the consumer because of improved roads.

Unreliable electricity also throw lights on caution to be taken during construction of roads and installation of traffic lights that there must be alternatives to this source, for example, solar power to avoid inconvenience in controlling vehicles and causing

traffic jam and accidents as being experienced in other traffic lights in the city. Power cut-off causes destruction to properties and insecurity due to darkness and might influence other problems like theft even in the construction camps.

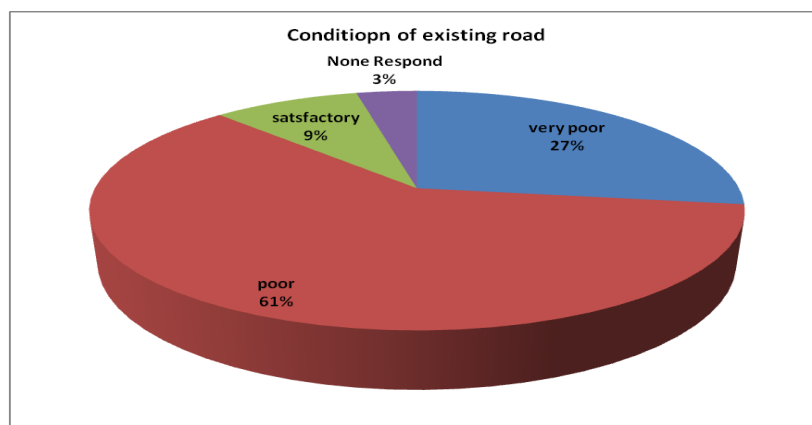
#### 4.4.8 Properties in the Right of Way

As mentioned in the description of roads, buildings of were observed congested, of different types, values and used multi-purposely. Both public and individual buildings as well as services will be affected. Some of the roads have public trees and flower beds. Gravel roads pass through unplanned squatter areas.

However, interviews from households indicated that there are some households with planted trees of different species for different uses along the Right of Way (RoW). Besides, along Nsasa – Kilungule – Buza, we observed a yard of graves along the Right of Way. Since these are in the squatter areas, it means that owners deserve compensation after establishment of the right alignments of the proposed roads. From the socio-economic study, 8 (2.4%) respondents mentioned that they own graves along the RoW and 33 (9.9 percent) had trees planted along the proposed roads whereas 89% (239) had no trees along the road. Generally, the project areas have no other cultural resources that need special attention. The process of removing graves requires special attention and this has to be taken into account during valuation.

#### 4.4.9 Condition of the existing roads

An interview showed different responses given to express the condition of the proposed roads for upgrading and rehabilitation. Some of the descriptions were related to difficulties to pass especially during rainfall, muddy and dusts, corners, holes along the road, lack of road signs, narrow, unfriendly for those walking on foot, etc. Generally, responses varied according to the status of each road. The roads were described as poor, very poor or satisfactory as indicated in the diagram hereunder.



**Figure 4.5:** Condition of the existing roads in the project area (Socio-economic Study 2013)

Several comments were provided from respondents on the possible impact that will be associated with the project during implementation of the project. Some of which are destruction of environments, destruction of peoples' properties, construction will cause people to reach to their working places, health related problems (e.g. bad

smells, dust, smokes), heavy vibrations, hardship related to transport, interruption and disconnection of other infrastructure, e.g. water pipes, electricity, theft, etc.

In response to the above impact, the interviewed persons proposed several issues to be considered in order to alleviate some other above. These included replanting of trees along the road after completion, provision of education to residents on the proper use of the roads, provision of compensation, dissemination of information to stakeholders, construction of standard roads (bus stops, crossing points, road lights, bumps, road signs, etc) watering of roads during construction to minimize dusts, provision of job opportunities to youth, construction and completion of the roads in time, etc.

#### 4.4.10 Awareness and Sources of information about the project

The majority of the interviewed households admitted to be aware about the proposed project and obtained information from different sources (Table 4.9). 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 Crown Tech Consult staff during the conduction of this ESIA study. Other sources are as indicated in Table 4.8.

**Table 4.9: Awareness level on the proposed project**

Source of information	Frequency	Percent
Not responded	56	16.7
government leaders	201	60.0
crown tech	24	7.2
media	5	1.5
Others	13	3.9
Total	299	89.3

Source: Socio-economic Impact Assessment (2013)

## **5.0 STAKEHOLDER CONSULTATIONS AND PUBLIC INVOLVEMENT**

### **5.1 Introduction**

Public consultation an essential requirement of the environmental impacts assessment process, Its aim is to ensure the public acceptance of the project as well as to limit adverse impacts; it also helps to uncover issues that the preparation team may not have been identified nor addressed in the EIA. If the community participates in the early stages of project preparation, then it should be possible to develop a close relationship between the community and the project team, thereby allowing the community to put forward valuable proposals before project implementation. The Objectives of public consultation are to:

- share information about project components and proposed project activities with the community in the project areas, and also with relevant stakeholders.
- gather different viewpoints and opinions, and to understand the concerns and sensitivities of local authorities and communities on environmental problems in the project areas, especially problems which were not identified by the EIA team. Using this information, public concerns can be addressed in time, during project design and when selection between alternative solutions are made
- perform a thorough and comprehensive evaluation of all environmental impacts and propose the most effective mitigation measures that exactly address the expected adverse environmental impacts of the project.

### **5.2 Public Consultation Process**

#### **5.2.1 Stakeholders Consulted**

The relevant issues and concerns were noted and summarized for both reporting and further reference. The consultations were done mainly to technical people in Temeke Municipal Council, TANESCO zone manager as well as TANROADS Regional offices. Also meetings in the wards were conducted to probe for the social implications of the project.

Before commencement of detailed SIA study, letters were sent to the TANROADS Regional offices of Dar es salaam, Managing Director of Temeke, municipal Executive Directors of Temeke and ward Leaders. These letters were written by Client to the respective authorities. Apart from giving the project information in brief, the client requested the above named government leaders to inform their respective mitaa Executive Officers about initiation of the project activities and support to the study team.

#### **5.2.2 Consultative Meetings with Municipal Council and Other Stakeholders**

Consultative meetings included discussions with municipal officers, agencies and other stakeholders (see list of consulted persons) and key informants were held in respective offices and other key selected locations along the proposed road corridor. These consultations were conducted differently depending on the number of participants, information sought, timing and type of tool applied.



In this case, either: an approach of direct, personal interviews with selected informants, or Focus Group meetings with authorities and technical personnel (e.g. Municipal Engineer, Municipal Valuer, HIV and AIDS Focal Person / Coordinator, TANROADS staff, Manager TANESCO, etc) were applied.

In short, some of the key aspects covered during consultations included:

- Brief presentation on the project information (including background information, objectives of the project, importance of socio-economic impact assessment for the design of the project, etc);
- Descriptions of the proposed sub-project roads (name of roads, length and width, current status and future status after improvement);
- Seek clarifications on policy issues and legal framework guiding project implementation with regard to road construction projects and compensation eligibility criteria and entitlement packages;
- Obtaining from the authorities their environmental and socio-economic concerns and perceptions regarding the proposed sub-project and
- Discussions on the role and responsibilities of the consulted parties with respect to the project set up
- Seeking clarifications on some of the issues raised by residents / communities during public consultation
- Collection of relevant documents e.g. district profiles

The table below gives a summary of issues discussed and some responses / explanations provided;

**Table 5.1: Issues Raised and Responses During Consultative Meetings**

S/N	ASPECT	ISSUE	DISCUSSION / RESPONSE
1	Project set up	Roles and responsibilities	<p>The municipal council is the client (owner) of the sub-project responsible for technical support from the start to the end – designing stage through implementation. In addition, the council is responsible for quality assurance.</p> <p>The ministry of Regional Administration and Local Government (TAMISEMI) is the overall incharge responsible for coordination, procurement and overall decision maker on project issues. It facilitates preparation and designing of the project</p> <p>The World Bank will provide funds for construction of proposed sub-project under DMDP.</p> <p>TANROADS is not responsible or not involved in this project but a stakeholder given its general roles and responsibilities.</p> <p>Note that the proposed and approved roads underwent a participatory process including councilors.</p>

2	Design	Road alignment and measurement	<p>The client proposed the requirements to the consultant and proposed the alignment to follow the existing routes of the roads with the width of =====</p> <p>The consultant is responsible for designing and coming up with technical proposals upon submission to the client.</p>
3	Impacts	Compensation	<p>It entails a lot of challenges. The Municipal is responsible for compensating Project Affected Persons where resettlement will take place. The issue of compensation has to be discussed and seriously worked out in this project, otherwise the project remain incomplete for so long.</p> <p>Residents understand that where the road or project development encroaches them and requires partial or full removal, they deserve compensation. Many of them have inadequate knowledge on laws and regulations, suggesting the need for sensitization and awareness creation.</p> <p>Timing, fairness and transparency during compensating PAPs will help to offset anticipated grievances. Past experiences should provide lessons to this project</p> <p>The law provided that delayed compensation up six months after the cut-off date (valuation), PAPs deserve to be paid with an interest rate and does not state the need to reevaluate.</p> <p>Mechanism to manage conflicts / grievances need to be established or reviewed at the level of municipal and mitaa in order to suit the current project</p> <p>There are some differences between the government Acts and those of the World Bank guiding compensation, for example, Land Law of 1999 No.4 does not consider compensation of tenants but World Bank (RAP) does so. Harmonization is essential.</p> <p>The government plan to establish Compensation Fund to reduce the problem of shortage of funds during compensation from own sources.</p>
4	Roads and reserve	Ownership	<p>Roads and reserve corridors are owned by the municipal council and other users are allowed to put in their infrastructure / utilities like TANESCO,</p>

	corridor		<p>DAWASA, Telecommunication, etc but have no rights because they do not own land.</p> <p>It is high time that providers of utilities participate in acquiring land for their services to people</p> <p>Removal of utilities (telecoms and electrical poles, water pipes, etc) will require the road reserve owner to incur expenses to allow utilities agencies remove or relocate them elsewhere. Coordination, timely communication and cooperation are vital among stakeholders.</p>
5	Land	Value	The value of land varies from one place to another due to a combination of factors like economical, location, types of activities etc determined by the market
6	General	Involvement of stakeholders	<p>Participation of all relevant stakeholders in all stages of the project is a cornerstone to success and offset unnecessary grievances.</p> <p>Political interests should not interfere with project implementation at all levels or phases.</p>
		Project acceptance	Given the positive impacts of the project, is accepted at all levels by all stakeholders

### 5.2.3 Public Consultations

Public consultations were conducted to inform the public about the proposed roads / bridges to be implemented under DMDDP, the purpose of carrying out public consultations and to explain what the consultancy expected to get from them. The public meetings were conducted successfully in different places according to respective proposed roads or bridges and meetings were attended by different groups of population such as owners of houses and other properties (assets) and tenants along the road, women, men, youth of both sexes, ward and mitaa leaders. All these groups were being engaged in different socio-economic activities for earning their livelihood. The public meetings were well moderated allowing full participation and democracy whereby residents expressed their concerns, raised questions which were responded by the team of ESIA and contributed their ideas / views regarding the expected socio-economic impact of the sub-project.

In brief, the sub-project (roads & bridges) was accorded mass praise and acceptance in all public meetings. Minutes of each meeting were noted and officially stamped, lists of attendees were prepared and attached to the minutes for reference. Generally, public consultations were dominated by questions from residents both men and women which aimed at knowing more about the sub project and about their fate and clarifications / responses from the consultancy team.

During the course of implementation, the following key matters were performed / accomplished during public consultations;

- Provision of information on DMDP to create awareness about the project, proposed roads/bridges, DMDP set up and financing (support from World Bank on construction), rationale of conducting ESIA/RAP prior to commencing of other procedures and construction;
- Obtaining opinions / views and perceptions from general population regarding the proposed project of upgrading the road;
- Obtaining concerns and suggestions from the project affected persons on their preferred positive, negative and mitigation measures; and
- Collect secondary information from respective wards and mitaa related to socio-economic issues

Informing the public about other ESIA activities to be conducted parallel or after public consultations, for example, household interviews to randomly selected households, etc.

In addition, public consultation was seeking the present opinions and concerns of women and youth regarding the proposed project so as to involve them in the overall planning of mitigation measures (refer to mitigation measures).

In the table below, we present a summary of key and relevant issues which transpired during the public consultations and some of the raised issues called further clarifications from the responsible authorities, for example, the width of the each proposed road.

**Table 5.2: Issues Raised and Responses During Consultative Meetings**

S/N	ASPECT	ISSUE / QUESTION	DISCUSSION / RESPONSE
1	Project (DMDP)	<p>Constitutes sub-projects to be implemented in all three municipalities of Temeke, Ilala and Temeke</p> <p>Project objectives</p> <p>Project components</p> <p>Project set up and financing -Who is going to construct the road (constructor)?</p>	<p>All issues were introduced to the public during consultations in Temeke MC</p> <p>The proposed sub-project's objectives were explained to the public – mainly to decongest the traffic in the city</p> <p>The project is under the Prime Minister's Office and Ministry of Regional Administration and Local Government Authorities (PMO &amp; RALG) / Municipal Council. The ministry (government) is responsible for project coordination and compensation to PAPs. Funds for construction will be provided</p>

		<p>Duration:</p> <ul style="list-style-type: none"> <li>-When will road construction start and end?</li> <li>- When will PAPs get out of the road corridor to allow construction?</li> </ul> <p>SIA:</p> <p>How can we give our views / opinions about impact without knowing the exact width and alignment of the road?</p>	<p>by the World Bank through IDA.</p> <p>Actual construction will start after completion of all preliminary procedures such as SIA / ESIA, design (engineering), RAP, approval by parties including World Bank, availability funds for compensation and construction, tendering / procurement procedures, etc</p>
2	Road design	<p>Several questions were raised as the inhabitants wanted to know the exact alignment of the road and its width</p> <ul style="list-style-type: none"> <li>-What is the width of the road?</li> <li>- Which houses are affected? - Where does the road pass?</li> <li>- Where are the road drawings showing sub-project routes?</li> </ul>	<p>The client (Temeke Municipal Council) had proposed the widths of roads which were yet approved. Residents were requested to wait for the exact measurements after completion of the roads design which involved surveying.</p>
3	Project Impact (socio-economic impact)	Positive	<p>Generally, there were neither questions nor rejection of the project positive impact apart from welcoming and cherishing it (upgrading and rehabilitation) as a tremendous socio-economic development move to the areas</p>
		<p>Negative:</p> <ul style="list-style-type: none"> <li>i) Demolition of buildings / houses</li> <li>ii) Compensation</li> </ul>	<p>Residents' / PAPs concerns were well captured and documented during public consultations as shown in the attached Minutes.</p> <p>Compensation will be executed according the government policies, laws and regulation in harmonization with World Banks guiding principles.</p> <p>According to the land law both 2 types of ownerships will be considered during compensation i.e. PAPs with title deeds and those</p>

			with residential licenses (Customary Land Tenure). Compensation will depend on market rate to value different affected properties e.g. building, land, crops, etc.
		iii) Mitigation measures	<p>Compensation issues and other negative impacts occupied a high priority among project inhabitants during consultative meetings.</p> <p>Residents (PAPs) proposed several mitigating measures which have been well articulated in this report (refer chapter five</p>

Evidently, public consultations has put forward a number of aspects, issues and challenges raised as well as some responses to clarify matters raised. These were collected from various stakeholders of the project namely, government, public and private agencies and public consultations at local level. This chapter has highlighted key issues, general and specific ones including issues related to the potential project impacts both positive and negative and finally proposed mitigation measures which have been deeply addressed in the next chapter.

**Table 5.3: Issues of Concern Raised from Consultative meetings**

S/N	Temeke Municipal Council Institution /	Positive impact	Negative impact	Issues and Concern
	Temeke		Demolition of buildings	<p>Any person who will lose building or property should be compensated</p> <p>PAPs should be compensated in time immediately after valuation. Failure to do so people become despair and develop hostility to the government</p> <p>The impact on tenants is going to be high because some will have already paid their rental charges to the landlords for 6 months, a year or years. A big conflict / misunderstanding is going to happen between tenants and lords – the house owner will be compensated and will disappear without considering the tenant</p>
			Conflict resolution	<p>Where will people's complaints be registered?</p> <p>Formation of a road construction</p>

				committee at mtaa level for PAPs
	Kiburugwa		Conflict	If there will be a conflict during implementation of the project, the mtaa government, contractors and PAPs should jointly dialogue and solve the conflict instead of going to the court
	Mwanamtoti			
	Chang'mbe	Negative	Objection of the proposed road	The meeting was postponed and ward leaders refused to organize a public meeting because they opposed a proposed road. They preferred the DMDP sub-project to include feeder roads within Chang'ombe ward instead of upgrading the proposed tarmac road.

## **6.0 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF ALTERNATIVES**

### **6.1 Spatial, Institutional and Temporal boundaries**

#### **6.1.1 Spatial Boundaries**

The spatial dimension encompasses the geographical spread of the impacts regardless of whether they are short term or long term. The spatial scale considers the receptor environmental component and can be local or broader. Following this, three zones of impacts are considered;

*The core impact zone:* This includes the area immediately bordering the project (local). In the case of this project local impacts will include the site of the construction, (borrow areas, quarries and the actual sub projects)

*Immediate impact area:* These are immediate surrounding areas (project wards)

*The zone of influence:* This includes the wider geographical areas that are influenced by this project (e.g. Temeke Municipality, Dar es Salaam city).

#### **6.1.2 Institutional Boundaries**

Institutionally, Temeke Municipal Council (under PMO\_RALG) and have the mandate to develop and maintain the urban infrastructures in the Temeke Municipality. Its primary function includes the maintenance and development of the infrastructures to support the economic and social development of in the Municipality. They will also be responsible for addressing the environmental issues posed by the subprojects. The proposed Infrastructures will be under the municipal engineer while solid waste collection and disposal will be under the Municipal health officer.

From the central government line of administration, by virtue of their location, the urban infrastructures to be developed by this project in Dar es Salaam region is under the jurisdiction of the Regional Commissioner for the Dar es Salaam region.

#### **6.1.3 Temporal Boundaries**

Temporal boundaries refer to the lifespan and reversibility of impacts. For example, the impact of construction work for the project may be short-lived, but the presence of these infrastructures may have implications that stretch far into the future. Therefore, some of the impacts that may occur during construction, e.g. noise caused by bulldozers will disappear as soon as the construction phase will be completed. The construction period will last for not more than 3 years while the operational phase is designed for 20 years unless unforeseen event occur.

Also for a number of reasons the Government may wish to do one or several decisions. For instance, abandoning a portion of the infrastructure and creating another one or an alternative portion; and diverting the original course and substituting it with a new one. Other measures are expanding the infrastructure because of several reasons; and if there is a decision for closing the infrastructure permanently then the required activities for decommissioning process will be obligatory.



## 6.2 Impact Identification

The impacts are categorized into Pre-Construction phase impacts, Construction phase impacts and Operational phase impacts. The main receptors of impacts associated with the anticipated Infrastructure Upgrading include physical resources (hydrology, surface water quality, soils, air quality and noise); ecological resources (vegetation); material assets, public health and safety, aesthetics and landscape.

The following impacts were identified to be likely to occur during pre-construction phase;

- Job creation and increased income
- Land expropriation , loss of property and resettlement
- Loss of employment and income

The following impacts were identified to be likely to occur during construction phase;

- Job creation and increased income
- Destruction of public utilities
- Soil erosion and instability of slopes
- Risk Water and Land Pollution
- Increased noise, vibration and air pollution
- Occupational Safety and health risks
- Increase road accidents
- Increased Waste
- Loss of Scenic Quality
- Loss of Vegetation
- Child Labour
- Increased HIV/AIDS
- Population Influx
- Visual Intrusion during Construction
- Dangers of Borrow Pits

The following impacts were identified to be likely to occur during operational phase;

- Job creation and increased income
- Improved Transport in Dar es Salaam suburbs
- Decongestion of Dar es Salaam main Roads
- Reduced Vehicle operation costs
- Increase road accidents
- Interference to local hydrology (Flooding)

The interaction between the intended project activities and the different environmental receptors are summarized in a simplified matrix presented in Table 6.1.

## 6.3 Impact Rating

Taking into account the criteria stated in methodology section (1.6.3), A simple matrix with the following ratings was used to determine significance of the identified impacts stated in section 6.2 above:

+3	Very high positive impacts
+2	High positive impacts
+1	Minor positive impact
0	No impacts
-1	Minor negative impact
-2	High negative impacts
-3	Very high negative impacts

**Table 6.1: Environmental and Social Impacts Matrix for the Proposed Temeke Local Roads**

S/N	Environmental parameters/Impacts	Impact Rating Criteria					Impact Significance Rating			
		Spatial Scale	Temporal Scale	Reversibility	Cumulative Effects	Residual Impact	Mobilization Phase	Construction Phase	Demobilization Phase	Operation and Maintenance
<b>Negative Impacts</b>										
1.	Land expropriation , loss of property and resettlement	L	ST	R			-3	-2	0	0
2.	Loss of employment and income	L	ST	R			-2	-1	-2	0
3.	Destruction of public utilities	L	ST	R			-1	-2	0	0
4.	Soil erosion and instability of slopes	L	ST	R	✓		0	-2	-1	0
5.	Risk Water and Land Pollution	L	ST	R			-1	-2	-1	-1
6.	Increased noise, vibration and air pollution	L	MT	R	✓		-1	-2	-1	-1
7.	Occupational Safety and health risks	L	ST	R			-1	-2	0	+1
8.	Increase road accidents	L	MT	R	✓		-1	-2	-1	-2
9.	Increased Waste	L	ST	R			-1	-2	-1	0
10.	Interference to local hydrology (Flooding)	L	LT	R		✓	0	-1	0	-2
11.	Loss of Scenic Quality	R	LT	IR		✓	-1	-3	-1	-1
12.	Loss of Vegetation	R	LT	R		✓	-1	-3	0	0
13.	Child Labour	L	ST	R			-1	-1	-1	-1
14.	Increased HIV/AIDS	R	LT	IR	✓	✓	-1	-1	-1	0
15.	Population Influx	L	ST	R	✓		-1	-1	-1	-1
16.	Visual Intrusion during Construction	L	ST	R			-1	-1	-1	0
17.	Increased Accidents	L	MT	R	✓		-1	-2	-1	-2
18.	Dangers of Borrow Pits	L	ST	R			-1	-1	-1	-1
<b>Positive Impacts</b>										
1.	Job creation and increased income	N	MT				+2	+3	+1	+2
2.	Improved Transport in Dar es Salaam suburbs	R	LT				0	0	0	+3
3.	Decongestion of Dar es Salaam main Roads	R	LT				0	0	0	+3
4.	Reduced Vehicle operation costs	R	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)

The team focused on significant positive and negative impacts that were rated +2, +3, -2, -3 and developed mitigation measures and ESMP for them.

The following significant impacts were predicted to be likely to occur during pre-construction phase;

- Job creation and increased income
- Land expropriation , loss of property and resettlement

The following significant impacts were predicted to be likely to occur during construction phase;

- Job creation and increased income
- Destruction of public utilities
- Soil erosion and instability of slopes
- Risk Water and Land Pollution
- Increased noise, vibration and air pollution
- Occupational Safety and health risks
- Increase road accidents
- Increased Waste
- Loss of Scenic Quality
- Loss of Vegetation

The following significant impacts were predicted to be likely to occur during operational phase;

- Improved Transport in Dar es Salaam suburbs
- Decongestion of Dar es Salaam main Roads
- Reduced Vehicle operation costs
- Increase road accidents
- Interference to local hydrology (Flooding)

In the next sections, significant impacts (positive and negative) associated with each phase of the project are discussed or evaluated.

## **6.4 Pre- Construction Phase**

### **Positive impacts**

#### **6.4.1 Job Creation and Increased Income to Local Communities**

During this phase people shall be employed by the contractor to do mobilization works such as construction of camp sites, quarrying and material extraction and transportation activities etc. About 50 people shall be employed during this phase. This shall increase the income to all those who have the opportunity to be employed by the contractor.

### **Negative Impacts**

### 6.4.2 Land expropriation, loss of property and resettlement

The use of land for road construction or improvement may entail the voluntary sale or compulsory acquisition (expropriation) of homes, property, businesses, farms and other productive resources. In Tanzania expropriation method is common, which by its nature causes social disruption and economic loss for the affected individuals and their families. The impacts of expropriation are not only social and economic, but also psychological and in most cases complex or devastating.



**Figure 6.1:** Houses very close to the Mwanamtoti Sub-project

The construction would most likely involve among other things, demolition of people's houses and business premises affecting all communities along the project road. The risk of compulsory resettlement is however not very high since most of the people who will be affected know that they will be compensated before they are relocated if the improvement of the roads is to take place.

Apart from buildings, some of the cultivated land and planted trees will be affected. Compensation for lost property (trees or building) is an important issue that should not be underestimated. During consultations with the communities and Municipal Council, it was very clear that compensation must be made prior to implementation of the project. Failure of implementing the compensation plan can result into social friction with local communities that can cause delay in construction schedule. Table 6.2 below shows the estimated affected persons and buildings for each road involving resettlement in Temeke Municipality. For additional details on resettlement see the RAP summary in Appendix V or consult that Resettlement Action Plan.

**Table 6.2: Estimated project affected persons and properties**

Road Segment	Affected properties	Partially affected households	Fully affected households
Chang'ombe Road	92	9	14
Mchicha road	108	8	19
Mwanamtoti Road	200	24	26
Temeke – Mbagala	160	24	16
<b>Total</b>	<b>560</b>	<b>65</b>	<b>75</b>

Source: Preliminary RAP report (2014)

### 6.4.3 Loss of Employment and Income

The loss of business premises will affect both the owner and the employees. The owners will lose income while the employees will lose employment and consequently income. A vivid example is at Simu 2000 road, where a number of business quarters are very close to the project road.



**Figure 6.2:** Shops very close to the Nzasa-Kilungule subproject

## 6.5 Construction Phase Impacts

### Positive impacts

#### 6.5.1 Job Creation and Increased Income to Local Communities

Most of the casual labourers and some skilled workforce will be absorbed from within Temeke Municipality. The Project is expected to employ more than 150 casual labourers from nearby streets. In addition, the local people will be selling food and other merchandise to the construction workforce. The utilization of local workmanship will take place for the activities that do not require a high specialization, and in any case there will be diffusion of knowhow from the more qualified personnel towards the local personnel.

### Negative Impacts

#### 6.5.2 Destruction of Public Utilities

Electric Power Supply lines, water supply pipes and telephone lines are expected to be affected by the project since the utilities run alongside the project roads. These shall cause disruption of services during construction caused by moving of the utilities outside the corridor of impact.



**Figure 6.3:** Power Transmission line Along Mchicha Subproject

### **6.5.3 Soil Erosion and Instability of Slopes**

Construction works would accelerate erosion problems in most cut sections. Nevertheless, all cuts in the sloping grounds should be refurbished firmly and provided with the vegetation cover to reduce the effect of soil erosion. Major soil erosion is expected at the quarry sites and borrow pits.

### **6.5.4 Increased water and soil pollution**

Whichever construction method used, small-scale and short-term water pollution may result especially at river crossings and during construction of off-road drainage structures. Impacts can also result from accidental spillage of fuels and construction materials, which may pollute both water and soil. Culvert construction may stir riverbed deposits into suspension. Though the large particles may settle quickly, the finer ones will increase the turbidity of surface water sources. The turbidity impacts may be short-term since the stream construction takes place within a few weeks.



**Figure 6.4:** Kizinga River where Tuangoma Bridge Subproject shall be implemented

### **6.5.5 Noise, Vibration and Dust during Construction Phase**

Dust will arise from roads construction work due to excavation work, movement of vehicles, stock piling of materials, operation of crusher and asphalt plants, and general earth works at the site. Exhaust fumes will mainly come from construction plant, machinery and vehicles in operation. Fumes will also come from the processing of asphalt. Dust and fumes will have major direct but short-term impacts during the project construction phase. Along the project roads, the adjacent areas are relatively open, without impediment to air movement hence enhance dilution of air pollutants. For areas away from the road, leafy vegetation should be able to filter out a considerable content of low level air borne pollutants. Thus, ventilation and vegetation are anticipated to lessen the air pollution problem. Moreover, sprinkling of the road with water during construction work will further lessen generation of dust, and consequently alleviate the air pollution problem.

Noise and vibration will be produced by construction vehicles, plant and machinery during delivery of materials, processing of materials, and actual construction work. Due to an increase in activities and number of operational vehicles, the impacts of noise and vibration will cause disturbance to humans and animals as well as birds. Vibration may even cause physical damage to properties near the construction site. The vegetation and loose soil along the roads in the project area have the potential for damping noise and vibration. As such, noise and vibration impacts will have short range – near the construction site. Dust will be a temporary nuisance to the people within the core impact area especially during construction in the dry season.

### **6.5.6 Safety and Health Risks**

Road construction exposes the labourers and the general public to bronchial and other respiratory tract diseases due to dusts. Also poor use (or not using at all) of the safety gears during construction phase will result into loss of lives or injuries during construction. The incidence rate of water borne diseases such as cholera and diarrhoea will increase if there will be no proper sanitation practices at the camps.

### **6.5.7 Increased Road Accidents**

Increased traffic during construction and poor road safety measures like absence of diversion (where necessary) during construction and road safety awareness campaigns will result into unnecessary road accidents to people especially school children and old people. Every street along the project road has got a primary school, all of them are very close to the road, and this will make school children more vulnerable to the risk of accidents.

### **6.5.8 Increased Wastes**

It is obvious that construction activities are associated with production of wastes. These wastes can either be solid waste or liquid waste. The waste streams are Construction activities and Domestic activities of the workers at the camp and site. The solid waste include, Spoil, rubbles, Tree logs, metals, glasses, papers etc while the liquid waste include Sewage, oils etc. The quantities are provided in chapter two of this report. These wastes if not well handled can change the aesthetic nature of the



project area and can even lead to water pollution in case of improper disposal of oils. The quantities and types of wastes were presented in chapter 2.

### **6.5.9 Loss of Scenery Quality**

Scenic quality deterioration will occur due to stock piling of construction materials and discoloration of plant leaves and houses in the vicinity of the roads due to windblown dust. Excavation work as well as presence of construction vehicles, plant and equipment will also add to scenic quality deterioration. Scenic quality deterioration will also occur off-site, at the sources of construction materials, the quarries and sand mines. If these are not made good they may become an eyesore. Scenic quality deterioration can destroy the economic and aesthetic value of public and/or private property including land. Scenic quality degradation effects will be significant, short term and direct. They will, in spite of everything, be manageable given proper site operation and prior warning as well as issuance of site operation guidelines.

### **6.5.10 Loss of Vegetation**

Land clearance to obtain the 7m carriage way will involve uprooting trees which falls within the corridor of impact as well as displacing huge masses of topsoil. Detours to provide access to traffic during construction phase will further cause loss of vegetation.



**Figure 6.5:** Large trees near the Temeke-Mbagala Subproject

## **6.6 Operational Phase Impacts**

### **Positive Impacts**

#### **6.6.1 Job Creation and Increased Income to Local Communities**

There would also likely be employment availability during the operation phase pertaining to roads maintenance such as grass cutting, cleaning drainage culverts, etc;

as well as some clerical / low level supervision jobs. Such employment would contribute to poverty reduction, especially for women.

### **6.6.2 Improved Transport in Dar es Salaam suburbs**

The project roads will open up many presently difficult to reach suburban areas in Dar es Salaam. The road will facilitate easy transportation within the Municipality as well as increasing communication among the communities along the project roads. The improved roads would be particularly beneficial to passengers and cargoes where journey time will be shortened. Improved roads are expected that will attract more investment on vehicles providing services along the road therefore prices of travel will be lowered and will save time spent on journey.

### **6.6.3 Decongestion of Dar es Salaam main Roads:**

The project roads will help to decongest the major roads currently experiencing frequent traffic jams during peak hours. The roads will provide breather routes of similar standard. severe congestion is no longer confined to peak hours (7:00-9:00 am and 16:30-19:30) and is now a day long experience on most arterial roads. City road density is barely 0.84km/sq.km (which should be around 5km/sq.km.). A lack of roads and connections between existing roads coupled with an ever increasing number of vehicles adds to the deteriorating traffic congestion problems. This Problem shall be eased by this project.

### **6.6.4 Reduced Vehicle operation costs**

The cost of operating the vehicles shall go down due to savings on fuel, tyres, oil, spare parts consumption; vehicle depreciation and utilization, etc. At present vehicle owners incur high operating costs such as high fuel consumption and frequent need to replace parts such as the suspension system due to the condition of the road. Moreover, during wet season, the road is not freely passable therefore sometimes fuel consumptions become high. There will be an increase in the number of vehicles from passing the project roads thus lowering transport costs.

### **6.6.5 Improved Community Life and Services**

There are several social related advantages that will accrue from the project. Improved transportation will enable easy delivery of drugs/medicines to health care facilities. The proposed roads will facilitate patients in the streets along the subprojects to receive faster medical attention (especially emergency cases). Health workers and teachers will enjoy easier access to work than before. The roads will facilitate easy access to health centers, and thus lives of some patients will be saved.

Bitumen roads will reduce current level of dusts experienced in the subprojects. In so doing quality of settlement will increase and health of people living in the project areas will be protected.

### **Negative Impacts**

### **6.6.6 Increased Road Accidents**

Road deaths, injuries and damage to property are most tangible negative impacts on the community environment and may be reduced or increased as a result of road projects. The project roads transverse villages and the effects the road causes on safety in these settlements are dependent on location.

Increased traffic and speed driving will result into unnecessary road accidents to livestock and people especially school children and old people. The main causes for accidents are poor road conditions due to lack of maintenance, reckless driving, defective vehicles, drunkenness, poor road facilities for the pedestrian and cyclists and unqualified drivers.

Vehicles travelling at increased speeds will make it difficult for road users to cross the road, particular children and elderly people will be at risk of accidents.

### **6.6.7 Interference with Local Hydrology**

The proposed road will not entail any new and undue interference with the hydrologic and drainage aspects of the project area. The change from gravel surfacing to bituminous surfacing will improve drainage of the area, especially with improvement of roadside drainage and cross drainage. This will result into a minor negative impact on the natural hydrological regime of the area and might cause floods at some areas. Other negative hydrologic and drainage impacts are not foreseen.

## **6.7 Analysis of Alternatives**

### **6.7.1 Overview**

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. Environmental assessment for each alternative is also carried out, since each alternative is likely to have a different set, or degree, of impacts. In this EIA consultations with stakeholders and site visits provided basis for identifying alternatives. The following types of alternatives are presented for consideration:

### **6.7.2 No Project Alternative**

The no project alternative entails retaining the current status quo without upgrading the proposed local roads. Adopting this option would mean avoiding most of the negative impacts associated with the project and missing all the positive benefits such increased productivity and economic growth in Temeke Municipality. Therefore adopting a no project alternative would mean failure to implement the transport and poverty alleviation policies.

### **6.7.3 Alternatives Sites**

During the inception of this project more local roads (than the selected ones) were considered for the project. Through a number of meetings and site verification,

Municipal Council came out with the last list of the local roads (Table 2.1) which are considered by this project. The following criteria was used to select the sub-wards for this project

- Sub ward have Roads leading to collector roads finally connecting the Main Road in hierarchic order.
- Sub-wards have no very long road sub project without adequate Right Of Way (ROW) and avoid requirement of high Compensation.
- Sub-wards with less compensations.
- Community is ready to offer free space used as roads before.

This assessment led to the selection of the proposed project areas.

#### 6.7.4 Alternative design

**Roads:** The use of other pavement materials for pavement construction instead of asphalt concrete was considered. Other materials that was considered includes bricks and concrete. However Asphalt concrete was selected because it offers the following advantages over othe pavement materials;

- **Durability:** Asphalt Concrete is a flexible pavement, with same bridging action, which allows it to withstand occasional overloads without serious damage. Its resistance to freeze-thaw and deicing salts allows it to wear better during winter. Its lack of repetitive joints removes the possibility of blowups that plague Portland Cement Concrete during summer. Inch for inch, asphalt cement concrete performs better than Portland Cement Concrete.
- **Economical:** Research have shown that a dollar spent on asphalt pavements goes 26.9 percent farther than a dollar spent on concrete pavements. That is because asphalt is cost-effective. It has a lower first cost than concrete and it lasts longer. Staged construction helps spread out the cost of placement. Because asphalt pavement has no joints to repair and is not affected by freezethaw actions, it is much less expensive to maintain.
- **Safety:** Asphalt pavements offer high skid resistance values. The dark color of asphalt reduces glare and provides a high contrast for lane markings.
- **Ease of Construction:** Asphalt Concrete is machine-placed, removing the need for time-consuming form work and steel reinforcement. Traffic can use the pavement almost immediately, no delay is required to allow the pavement to cure. The lack of pavement joints reduces maintenance requirements. Repair of an asphalt surface is quick and easy, because there is little downtime waiting for a patch to cure.
- **Staged Construction:** A major advantage for Asphalt Concrete is the potential for staged construction. The asphalt base course can be placed and used under traffic during initial construction. This pavement can then be overlaid with final surface courses. Staged construction improves on-site conditions, removes the aspect of muddy soils, and provides a place to store construction materials and equipment. This method also provides an opportunity to discover and correct unanticipated problem areas, such as a weak subgrade, poor drainage, or poorly compacted trenches, which can be repaired at minimal cost.

- **Recyclable:** Another major advantage of Asphalt Concrete is its ability to be completely recycled. Not only can the aggregates be reused, but the asphalt cement binder also retains its cementing properties and can be reused in a new mix. Pavements can be recycled both on site using cold mix or via a hot mix plant. Recycled pavements have been tested and proven in both the laboratory and the field to perform at least as well as virgin aggregate mixes. Asphalt pavements are 100 percent recyclable.

**Storm water drains:** In this project, covered storm water channels shall be constructed instead of open drains. Both options was considered but the covered drains options was selected because it offers the following advantages;

- Prevent solid waste from entering the channel and reduce the carrying capacity
- The risk of accidents that can be caused when people (especially children) fall into the channel taking into consideration the project is located in unplanned area
- Can be used as walkway and therefore serve the space that could have been taken for walkways for the case of open channel. This in turn reduces compensation costs.

## 7.0 IMPACTS MITIGATION MEASURES

### 7.1 General Considerations

This chapter is devoted to describing measures or actions that shall be implemented so as to minimize or enhance any of the potential 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.

### 7.2 Enhancement Measures for Pre-Construction Phase Impacts

#### 7.2.1 Job Creation and Increased Income to Local Communities

- First priority for employment shall be given to local people
- Gender balance shall be observed
- Remuneration for all employees shall be according to Tanzania Government Scale

### 7.3 Mitigation Measures for Pre-Construction Phase Impacts

#### 7.3.1 Land Expropriation, Loss of Property and Resettlement

- Compensation shall be done according to World Bank/ Tanzania laws governing resettlement before commencement of the construction activities.
- Resettlement Action Plan (RAP) have been prepared and shall be observed
- The roads have been designed to strictly follow the existing alignment.
- The roads width has been adjusted to fit the present width of the road without compromising safety
- The overall total compensation cost, therefore, for the four sub-projects roads involving resettlement is approximately **Tsh 5,520,000,000 equivalent to USD \$3.3 million.**

Note that these are indicative cost estimates as of December 2014, after an initial design review was conducted in part to minimize resettlement costs through revising design standards to more appropriate road widths for the areas. This initial review resulted in a substantial reduction in compensation costs from over US \$5.3 million to about US\$3.3 million, largely through reducing the number of households that would require permanent relocation. This may be reduced further pending a more detailed design review after project effectiveness, after which the RAP will be finalized. The RAP and valuation report will be updated after this detailed design review.

#### 7.3.2 Loss of Employment and Incomes

- 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

#### **7.4 Enhancement Measures for Construction Phase Impacts**

##### **7.4.1 Job Creation and Increased Income to Local Communities**

- First priority for employment shall be given to local people
- Gender balance shall be observed
- Remuneration for all employees shall be according to Tanzania Government Scale

#### **7.5 Mitigation Measures for Construction Phase Impacts**

##### **7.5.1 Destruction of Public Utilities**

- The TANESCO, DAWASA and TTCL shall be involved from the early stages of these project so as to have an integrated planning.
- 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.

##### **7.5.2 Soil Erosion and Instability of Slopes**

- Unnecessary ground clearance and sensitive re-alignments shall be avoided.
- Lined drainage channels at sensitive terrains shall be provided to control speed and volumes of storm-water. The discharge points shall be carefully chosen to avoid erosion of arable land and creation of gullies.
- The contractor should plant grass or any other vegetation cover to minimise exposed soil surface.
- Proper grading to promote sheet flow and minimize flow concentration on unconsolidated soil.
- Directing flow to properly designated channels.

##### **7.5.3 Increased water and soil pollution**

- Transfer of materials should not be carried out near water bodies, and any local spillage to soil should immediately be remedied.
- Good house keeping shall be practiced within material storage compounds or vehicle maintenance yards where the possibility of spillage is great. This can easily be done by provision of Spill tanks and Secondary containment at vehicle maintenance yards.
- The contractor should Plant vertiver grasses to minimize exposed soil surface area where necessary

- The use of silt fences and hay bales to remove suspended solids from surface water runoff
- Silt curtains should be used to minimize sediment suspension and transport while working near water crossings.

#### **7.5.4 Noise, Vibration and Air**

- The nuisance of noise, vibration and dust will be transient and good work practice can minimize them. In addition, these impacts are already being experienced due to the existing road segments.
- The impacts of noise and dust emissions will further be minimized by proper choice of plant and machinery (i.e. fitted with noise and dust silencers or reducers) and locating quarry areas away from human habitations (at least 500 m away).
- Dust at work places within or close to human habitation should be critically minimized by periodic water sprinkling on working sections. The contractor shall advise or notify local households on dust, noise, vibration and other dangers.
- Watering should be practiced regularly at all active work sections along the road and at all quarries and borrow sites for the protection of workers. In addition, sections of road heavily traversed by construction vehicles should also be regularly watered.

#### **7.5.5 Safety and Health Risks**

- Appropriate working gear (such as nose, ear mask and clothing) and good camp management shall be provided.
- During construction the contractor shall ensure that the campsite is fenced and hygienically kept with adequate provision of facilities including waste disposal receptacles, sewage, fire fighting and clean and safe water supply. The contractor may be required to drill a borehole for obtaining water for construction.
- A well-stocked First Aid kit (administered by medical personnel) shall be maintained at each camp, quarry sites and each active work section along the road.
- The medical personnel shall also be responsible for primary treatment of ailments and other minor medical cases as well as providing some health education to the workforce.

#### **7.5.6 Increased Road Accidents**

- The road design shall take account of safety concerns especially at human habitation crossings e.g. installation of bus stops at settlement centres.
- Traffic management plan shall be incorporated in the designs to include for example details of signs, markings, intersection layouts, access restrictions, bus stops, crossings, footpaths etc.
- The traffic management plans shall be presented both in English and Swahili.



### **7.5.7 Increased Waste generation**

- Adequate number of waste bins shall be provided at the construction sites
- Only inert materials or readily decomposable materials shall be disposed by burial.
- No burning of waste materials which produces black smoke shall be approved. Plastics shall not be burned.
- No open burning of oils shall be done
- The construction sites shall have adequate toilets with septic tank-soak away treatment system

### **7.5.8 Loss of Definite Materials and Land Degradation**

- The topsoil shall be stock piled for later use in reinstating the pit. Shallow slopes will encourage rapid re-vegetation thus preventing erosion as well as providing safety to animals.
- Obtaining sand from valleys and riversides must be well investigated to avoid accelerated land degradation and pollution of water sources and/or interfere with agricultural activities in farmland.

### **7.5.9 Loss of Vegetation**

- Close supervision of earthworks shall be observed in order to confine land clearance within the proposed new corridor of impact boundaries.
- Topsoil shall be stockpiled and used for reinstating flora along the road. It is assumed that displaced fauna will return once the work is over, or seek another habitat locally.
- The road design shall try as practicable to offset the route so as to avoid felling all big trees that take many years to grow or other flora of outstanding importance.
- Consultation with the Temeke Municipal Natural Resources Officer shall be made

## **7.6 Enhancement Measures for Operational Phase Impacts**

### **7.6.1 Improved Transport in Dar es Salaam suburbs**

- TMC shall see to it that maintenance of the roads is done promptly
- Vehicles exceeding the weight capacity of the roads shall not be allowed to these roads
- Heavy penalties shall be imposed to those who exceed weight limit

### **7.6.2 Decongestion of Dar es Salaam main Roads**

- More roads shall be constructed together with the project roads to reduce city traffic
- Bus stands shall be provided as they also cause congestion on the roads
- The Government has good plans on improving railway transportation in the city
- DART project phase one is almost complete and is one of enhancement measures to decongestion of main roads

### **7.6.3 Reduced Vehicle operation costs**

- TMC shall see to it that maintenance of the roads is done promptly

### **7.6.4 Improved Community Life and Services**

- The proposed roads shall have a safe pedestrian walkway to make people move safely along the road
- The proposed roads shall have street light so that people can use them even at night
- The roads shall have adequate bus stands
- Storm water channels shall be provided to collect all the storm water and reduce the risk of flooding
- 

## **7.7 Mitigation Measures for Operational Phase Impacts**

### **7.7.1 Increased Road Accidents**

- Capacity building of district police (traffic) offices
- Installation of proper road signs and regular inspections for their presence
- Installation of speed control devices like humps
- Installation of pedestrian lanes at human settlement crossings

### **7.7.2 Interference with Local Hydrology**

- Good design features shall be adopted to ensure that the changes of the hydrological regimes are minimized and that any impacts are insignificant.
- The design will provide controlled and effective storm water dispersion by installation of adequate and appropriate drainage structures.
- The discharge points shall be well designed to avoid accelerating erosion downstream.
- To reduce blockage of the covered drains due to solid waste dumping, the following shall be performed by the Municipal Council as part of operation and maintenance of the drains;

- Routine drain cleaning shall be performed (at least once a month)
- Reporting of defects and blockages
- Semiannual inspection shall be performed
- Prompt Repairs to all defected drains
- Passing of by-laws regarding the use of drains and enforcement of by-laws.

## **8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

### **8.1 Introduction**

The Environmental and Social Management Plan (ESMP) presents the implementation schedule for the proposed mitigation measures to both environmental and social impacts as well as planning for long-term monitoring activities. 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 proposed facilities become more environmental friendly. The implementation steps will involve the PMO-RALG, Contractor, the Resident Engineer, Temeke Municipal Council, some utilities provides such as DAWASCO and TANESCO, and the local communities at large. Table 8.1 provides the ESMP for the proposed Local roads project.

### **8.2 Environmental and Social Costs**

The principal environmental and social cost includes the cost for implementing the mitigation measures proposed and that for carrying out monitoring of specific environmental and social parameters. These costs are indicated in Table 8.1. It should be noted that most of the costs for mitigation measures are included in the bills of quantities of the overall works. The costs for the environmental and social supervisor shall be included in the overall supervision cost of the works. The supervisors shall be engaged for at least 15 man-days a month over the entire construction period.

**Table 8.1: Environmental and Social Management Plan (ESMP) for the Proposed Temeke Local Roads**

Impact	Mitigation measure	Responsible institution/Individuals	Mitigation Time frame	Annual Costs	Lump sum (Onetime costs) Costs
Pre- construction phase					
Land acquisition/ Loss of Property/farmland	<ul style="list-style-type: none"> <li>• Compensation shall be done according to World Bank/ Tanzania laws governing resettlement before commencement of the construction activities.</li> <li>• Resettlement Action Plan have been prepared and shall observed</li> <li>• The roads have been designed to strictly follow the existing alignment.</li> <li>• The road width has been adjusted to fit the present width of the road without compromising safety</li> <li>• The total compensation cost for the project is approximately Tsh 5,520,000,000 which shall be paid to the PAPs</li> </ul>	<ul style="list-style-type: none"> <li>• PMO-RALG/TMC/ Consultant/Affected people</li> </ul>	Before construction phase		
Loss of employment and Income	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Women food vendors shall be promoted in place so as to uplift their income flow. Hygiene of the service providers should be emphasized</li> </ul>	<ul style="list-style-type: none"> <li>• PMO-RALG/TMC/ Consultant/Affected people</li> </ul>	Before construction phase		5,520,000,000
Construction phase					
Destruction of Public	<ul style="list-style-type: none"> <li>• TANESCO, DAWASA and TTCL shall be</li> </ul>	<ul style="list-style-type: none"> <li>• PMO-RALG/TMC/</li> </ul>	Design and Construction		

Impact	Mitigation measure	Responsible institution/Individuals	Mitigation Time frame	Annual Costs	Lump sum (Onetime costs) Costs
Utilities	<p>involved from the early stages of these projects so as to have an integrated planning.</p> <ul style="list-style-type: none"> <li>• Early notice shall be given to the community before any service interruption</li> <li>• The funds for the relocation of this infrastructure shall be part and parcel of the project.</li> </ul>	Contractor/ Consultant / TANESCO/DAWASA/ TTCL			
Soil Erosion and instability of Slopes	<ul style="list-style-type: none"> <li>• Unnecessary ground clearance and sensitive re-alignments shall be avoided.</li> <li>• Lined drainage channels at sensitive terrains shall be provided to control speed and volumes of storm-water. The discharge points must be carefully chosen to avoid erosion of arable land and creation of gullies.</li> <li>• The contractor should Plant vertiver grasses to minimise exposed soil surface.</li> <li>• Proper grading to promote sheet flow and minimize flow concentration on unconsolidated soil.</li> <li>• Directing flow to properly designated channels.</li> </ul>	<ul style="list-style-type: none"> <li>• PMO-RALG/TMC/ Contractor/ Consultant/ Env Supervisor</li> </ul>	During Design and Construction	14,000,000	
Noise pollution	<ul style="list-style-type: none"> <li>• Provide working gear to workers</li> <li>• All noisy works shall be restricted during day time only</li> <li>• Proper choice of equipment which offer environmental advantages</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor/PMO-RALG/TMC/ Env. Supervisor</li> </ul>	Construction	2,500,000	

Impact	Mitigation measure	Responsible institution/Individuals	Mitigation Time frame	Annual Costs	Lump sum (Onetime costs) Costs
Air pollution	<ul style="list-style-type: none"> <li>Watering road section (near human habitation)</li> <li>Proper choice of equipment which offer environmental advantages</li> </ul>	<ul style="list-style-type: none"> <li>PMO-RALG/TMC/ Contractor/ Supervisor Env.</li> </ul>	Construction	4,000,000	
Vibration	<ul style="list-style-type: none"> <li>Advance notice to local communities</li> </ul>	<ul style="list-style-type: none"> <li>PMO-RALG/TMC/ Contractor</li> </ul>	Construction	1,000,000	
Occupational Safety and health risks	<ul style="list-style-type: none"> <li>Appropriate working gear (such as nose, ear mask and clothing) and good camp management shall be provided.</li> <li>A well-stocked First Aid kit (administered by medical personnel) shall be maintained at each camp, quarry sites and each active work section along the road.</li> </ul>	<ul style="list-style-type: none"> <li>PMO-RALG/TMC/ Contractor/ Supervisor community Env. Local</li> </ul>	Construction Phase	3,000,000	
Increased Accidents	<ul style="list-style-type: none"> <li>Contractor shall prepare Traffic Management plan which shall be approved by the Engineer and the PMO RALG</li> <li>A transport coordinator shall be appointed to control the movement of vehicles and equipments and he shall be responsible for safe and smooth deployment of fleet.</li> <li>All drivers and operators shall possess a valid Tanzania license for the types of vehicle being driven or machinery operated.</li> <li>An in-house training on defensive driving techniques and safe tipping operation shall be imparted to all drivers before allotting vehicles to them.</li> <li>Over speeding shall not be allowed at any case and if observed do so disciplinary actions shall be taken against the defaulter.</li> </ul>	<ul style="list-style-type: none"> <li>PMO-RALG/TMC/ Design team/ Traffic Police/ Contractor</li> </ul>	Design stage and Construction Phase	7,000,000	

Impact	Mitigation measure	Responsible institution/Individuals	Mitigation Time frame	Annual Costs	Lump sum (Onetime costs) Costs
	<p>Maximum speed shall be limited to 40km/hr.</p> <ul style="list-style-type: none"> <li>Nobody is allowed to drive if under the influence of alcohol or drugs.</li> <li>Beware signage shall be established on public institutions' entrances</li> </ul>				
Increased Waste	<ul style="list-style-type: none"> <li>Vegetations (Trees, Grasses) and remnants of timber shall be given to residents near the project roads to be used as Source of energy.</li> <li>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 camp site/office</li> <li>Top soil shall be used as backfilling material in the borrow pits, fill the diversions.</li> <li>Plastics and Scrap Metals shall be sold to certified recyclers</li> <li>Tins Glasses and other inert materials Taken to the Authorized dumpsite at Pugu Kinyamwezi</li> <li>Sewage shall be directed Septic tank –Soak away system at the camp site/office and mobile toilets along the route.</li> </ul>	<ul style="list-style-type: none"> <li>PMO-RALG/TMC/ Contractor/ Env. Supervisor</li> </ul>	Construction Phase	6,500,000	
Loss of Scenic Quality	<ul style="list-style-type: none"> <li>The topsoil shall be stock piled for later use in reinstating the pit.</li> <li>Sand and Gravel shall be sourced from the</li> </ul>	<ul style="list-style-type: none"> <li>Contractor/Consultant/ /Supervisor/ PMO-RALG/TMC</li> </ul>	During Mobilization, Construction and after construction	3,000,000	



Impact	Mitigation measure	Responsible institution/Individuals	Mitigation Time frame	Annual Costs	Lump sum (Onetime costs) Costs
	approved Sand mines and Quarries (Which have mining license)				
Loss of Vegetation	<ul style="list-style-type: none"> <li>• Close supervision of earthworks shall be observed in order to confine land clearance within the proposed new corridor of impact boundaries.</li> <li>• The contractor shall replant trees and grasses along the roads where possible.</li> <li>• Topsoil shall be stockpiled and used for reinstating flora along the road. It is assumed that displaced fauna will return once the work is over, or seek another habitat locally.</li> <li>• The road design shall try as practicable to offset the route so as to avoid felling all big trees that take many years to grow or other flora of outstanding importance.</li> <li>• Consultation with the Temeke Municipal Natural Resources Officer shall be made prior to clearing trees.</li> <li>• Trees and Crops to be removed shall be compensated</li> </ul>	<ul style="list-style-type: none"> <li>• PMO-RALG/TMC/ Contractor/ Supervisor/ Temeke / Contractor</li> </ul>	During Construction	16,000,000	
<b>Operation phase</b>					
Interference to local hydrology	<ul style="list-style-type: none"> <li>• The design shall utilize as much as possible the existing channels</li> <li>• Where possible, the designs shall leave enough unpaved space alongside the road for water to seep into the ground</li> <li>• The design will provide controlled and effective storm water dispersion by installation of adequate and appropriate</li> </ul>	<ul style="list-style-type: none"> <li>• Design engineer/ PMO-RALG/TMC</li> </ul>	Design Stage	N/A	

Impact	Mitigation measure	Responsible institution/Individuals	Mitigation Time frame	Annual Costs	Lump sum (Onetime costs) Costs
	<p>drainage structures.</p> <ul style="list-style-type: none"> <li>The discharge points shall be well designed to avoid accelerate erosion downstream.</li> </ul>				
Increased Road accidents	<ul style="list-style-type: none"> <li>In order to prevent accidents, during the operational phase, the project should include information education and communication component (IEC) in its budget. This will help to raise more awareness on road safety issues.</li> <li>Capacity building of district polices (traffic) offices</li> <li>Installation of proper road signs (in Swahili Language) and regular inspections for their presence</li> <li>Installation of speed control devices like humps</li> <li>Installation of pedestrian lanes at human settlement crossings</li> </ul>	<ul style="list-style-type: none"> <li>Design Engineer /Traffic police/ PMO-RALG/TMC</li> </ul>	Operation phase	3,000,000	
<b>Total Cost</b>				<b>60,000,000</b>	8,768,587,224

## **8.3 Roles and Responsibilities for ESMP Implementation**

### **8.3.1 Institutional arrangements**

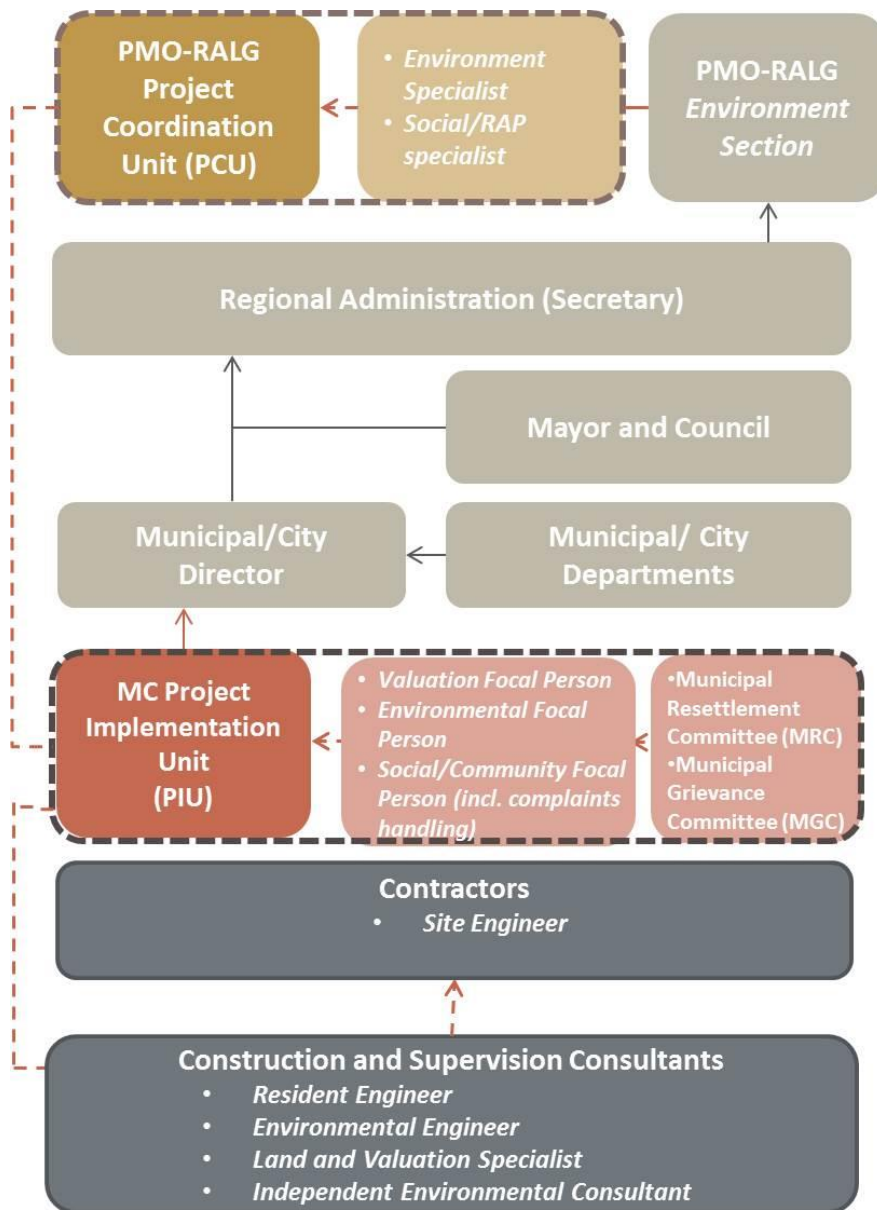
The Project Coordination Unit (PCU) in the Prime Minister's Office-Regional Administration and Local Government (PCU-PMO RALG) will be responsible for the overall monitoring and quality assurance of the Project. While TMC through Project Implementation Unit (PIU) shall be responsible for EMP implementation, the Project (PCU-PMO RALG) will have a quality assurance and monitoring role including all safeguards aspects. TMC-PIU will submit all safeguards progress and monitoring reports to the (PCU-PMO RALG).

The Figure and subsequent Table below summarize the roles and responsibilities of the key parties and their relationships with regard to the implementation of the EMP.

Contractors have the main responsibility for implementing mitigation measures. Those measures will be included in the bidding documents and the costs are to be included in their bids and the construction contracts.

CSC is responsible for supervising and monitoring the day-to-day implementation of mitigation measures. The associated costs are included in CSC service contracts. They may contract an independent environmental monitoring consultant (IEMC) who would be responsible for environmental monitoring which includes (i) support to the PIU for implementing supervision and monitoring, and (ii) reporting on the implementation through periodic monitoring reports. The relationship, roles and responsibilities are outlined in Figure 8.1 and Table 8.2.

**Figure 8.1: Environmental Management Organization Chart**



**Table 8.2: Role and Responsibilities of Key Parties for EMP Implementation**

<b>DMDP/ PMO-RALG Project Coordination Unit (PCU)</b>	<p>DMDP/PMO-RALG is responsible for the overall implementation, administration and enforcement of the recommendations of the ESIA and the ESMP Report.</p>	<p>The Project Coordination Unit with oversight of the Ministry's Environment Section will:</p> <ul style="list-style-type: none"> <li>• Ensure that the ESMP provisions are included in all tender documents issued for construction work and activities on site and shall monitor/enforce that the Tenderers/Contractors abides by the specifications thereof;</li> <li>• Coordinating the implementation of the ESMP among the Dar es Salaam Local Authorities (DLAs), Basin Water Office (BWO) and other agencies and contractors;</li> <li>• Holding monthly coordination meetings on safeguard implementation with the PIU specialists and preparing meeting minutes that summarise progress, issues, and good practices.</li> <li>• Receiving safeguard compliance quarterly reports from DLAs and BWO and preparing annual environmental progress reports;</li> <li>• Conducting training for institutional capacity building;</li> <li>• Provide NEMC with reports on environmental and social compliance as part of their annual progress reports and annual environmental monitoring reports;</li> <li>• Report to International Development Association (IDA) on the status of safeguard matters through submission of annual progress reports.</li> </ul>
<b>Dar es Salaam Local Authorities (DLAs) – Project Implementation Unit (PIU)</b>	<p>As implementers of the projects, the oversight by local authorities is crucial for successful implementation of ESMP once some of the mitigation measures are better undertaken by local communities with the support of the local government authorities. It is therefore important that Municipal Councils be involved in the implementation of ESMPs (through the PIU environmental and social specialists and Municipal Environmental Management Officers - MEMOs).</p>	<p>Specifically, DLAs responsibilities include the following:</p> <ul style="list-style-type: none"> <li>• Visit and inspect major Sub-project sites regularly, to ascertain the level of compliance of works and report back environmental issues;</li> <li>• Maintain inspection reports on files;</li> <li>• Working with the Resident Engineers who have day-to-day interaction through supervisory staff;</li> <li>• Ensures the Contractors have all plans, procedures, approvals, and documentation in place to ensure ESMP compliance prior to commencement of any work;</li> <li>• Verifying environmental compliance and issuing of penalties for contraventions of the ESMPs;</li> <li>• Ordering the removal of person(s) and/or equipment not complying with the ESMP specifications;</li> <li>• Taking decisions in case severe non-compliances to the ESMPs are detected;</li> <li>• Providing input for on-going internal review of the ESMPs;</li> <li>• Stopping works in case of emergency or if significant environmental impacts are apparent or imminent;</li> <li>• Monitoring and verifying that environmental impacts are kept to minimum;</li> </ul>

	The PIU environmental specialist has the responsibility to oversee and monitor adherence to, and implementation of ESMP by the Contractors (which includes compliance with the relevant obligations contained in the ESMPs).	<ul style="list-style-type: none"> <li>• Preparing reports on environmental and social mitigation and monitoring and submit them to PMO-RALG quarterly;</li> <li>• Recommending PMO-RALG the issuing of penalties for contraventions of the ESMPs;</li> <li>• Support the Resident Engineer through the site construction supervision staff.</li> </ul>
<b>Contractor</b>	The Contractor will be responsible for construction works and ensuring compliance with ESMP requirements. The Contractor shall appoint a <b>Site Engineer</b> .	<p>Contractor shall:</p> <ul style="list-style-type: none"> <li>• Ensure that the environmental and social specifications of the ESIA and ESMP (including any revisions, additions or amendments) are effectively implemented;</li> <li>• Notify the MEMO/DAWASA, Basin Waters Office (BWOs) and Engineers immediately, in the event of any accidental infringements of the environmental requirements to enable appropriate remedial action to be taken;</li> <li>• Notify the MEMO/DAWASA, BWOs and other relevant agencies and Engineer, at least ten working days in advance, of any activity he has reasons to believe that may have significant negative impacts, so that mitigation measures are implemented accordingly;</li> <li>• Ensure environmental awareness among his/her employees and subcontractors so that they are fully aware of, and understand the environmental and social requirements and the need for them;</li> <li>• Report and record all accidents and incidents resulting in major injuries or death;</li> <li>• Inform MEMO/DAWASA, BWOs and other relevant agencies of problems arising when implementing the ESMP and ways of improving the ESMP;</li> <li>• Undertake rehabilitation of all areas affected by construction activities in order to restore them to their original state, as determined by the Engineer;</li> <li>• Undertake the required works within the designated working areas.</li> </ul>
<b>Construction Supervision Consultant (CSC)</b>	The Supervision Consultant will be appointed by PMO-RALG and will be responsible for monitoring and supervision of the	<p>Supervision activities will comprise:</p> <ul style="list-style-type: none"> <li>• Environmental compliance and monitoring, including checking, verifying and validating the overall environmental performance of the project through regular audits, inspection and review of project submissions.</li> </ul> <p>Monitoring activities by the resident engineer will comprise:</p>

	<p>construction works including implementation of ESMP. The Supervision Consultant will appoint a Resident Engineer.</p> <p>For supervision and monitoring of the implementation of ESMP throughout the construction phase, the implementing agency can engage an Independent Environmental Consultant.</p>	<ul style="list-style-type: none"> <li>• Visual observation during site inspection carried out at the same time as the engineering supervision activities,</li> <li>• Site inspections that will take place with emphasis on early identification of any environmental problems and the initiation of suitable remedial action;</li> <li>• Where remedial actions have been required on the part of the Contractor, further checks will need to be made to ensure that these are actually being implemented to the agreed schedule and in the required form.</li> </ul>
<b>Municipal RAP Committee (MRC)/ Municipal Grievance Committee (MGC)</b>	Each MRC will support their respective DLA in organizing and implementing the compensation, assistance, and resettlement.	<ul style="list-style-type: none"> <li>• Overseeing update of RAPs</li> <li>• Overseeing/monitoring implementation of RAPs including compensation payments</li> <li>• Implement public disclosure, consultation and participation</li> <li>• Handling grievance issues and keeping records</li> <li>• Quarterly reporting to DLA and PMO-RALG</li> <li>• Liaise with ward-level grievance desks</li> </ul>

### 8.3.3 Capacity Building Program

#### Current capacity and capacity upgrading needed

The study on Institutional Strengthening of Dar es Salaam Local Authorities in Support of preparation of proposed DMDP conducted by Innovex in 2014, has stated that the three Municipal Councils (MCs) have no staff specifically dedicated to Environment and implementation of safeguard requirements. However the Municipal Council have Urban Development, Natural Resources and Environment departments which as a whole oversee the Environmental Issues in the Municipality. The departments have got at least one (1) environmental officer who solely deals with environmental issues on daily basis. Otherwise, other staff in these departments and whole Councils have limited knowledge of WB safeguard requirements and generally lack experience in environmental and social issues. Such low capacity represents a risk to the implementation of safeguards requirements as contained in the ESMPs and as required by the WB policy. It is therefore necessary to address this weakness through capacity building through technical assistance that will support the Municipal Councils during the implementation of the ESMPs. The

technical assistance will specifically provide the necessary support to MCs in their work with contractors as well as other entities involved in the implementation of the ESMPs.

The technical assistance will include support to experts and training that will cover:

- general knowledge of safeguards requirements and project procedures, and
- important specific knowledge in safeguard procedures and requirements for project staff, consultants, and national contractors.

Specifically, the above will include, for example, assistance with the preparation of documents and implementation of training programs on environmental management and environmental monitoring for contractors and relevant staff of MCs (DMDP coordinators of contract packages) to do their tasks. It will also include assisting MC environment and social staff with the review of contract documents to ensure compliance with the ESMPs. It will further provide general environmental guidance as requested by MCs to enhance overall project implementation and performance.

Given the nature, locations, and scale of construction, it is anticipated that the safeguard technical assistance support and training will be provided at least during the first 3 years of the project implementation. The WB safeguard specialists will support this in the capacity building program, in particular in the training activities as appropriate.

#### 8.3.4 Proposed training programmes

Table 8.3 below provides examples of the basic training programs for safeguards during project implementation. The training programs will be developed and delivered by the Technical Assistance Team (TAT) for the implementation of safeguards for the TMC training. The TMC trained staff with the support of the TAT for the implementation of safeguards will provide the training to contractors and other entities concerned.

Other more specific and tailored training will be developed and agreed upon between TMC and the TATs for the implementation of safeguards during project implementation based upon reassessment of needs and the status of safeguards implementation.

- **Target groups for the training:** TMC Staff, PMO-RALG staff, Contractors and community representatives in the project area.
- **Training schedule:** at least 1 month before the construction of the first contract. The training can be adjusted in line with the implementation schedule of the subproject/contracts.
- **Training frequency:** The basic training programs proposed in Table 8.3 below will take place every six months on a yearly basis and its content updated and adapted to implementation issues. Training frequency and content will be reassessed during implementation depending on needs. It is foreseen that the training program for TMC staff will continue until year ending the construction period. Three days of training for contractors are also planned to take place twice a year on an annual basis for at least two years.

**Table 8.3: Training Programs for Capacity Building in Environmental Supervision and Management**



<b>Target Group</b>	<b>PMO-RALG Staff and MC Staff</b>
Course Title	Environmental supervision, monitoring and reporting
Participants	Environmental staff and technical staff
Training Frequency	Soon after project effectiveness but at least 1 month before start of construction of the first contract. Follow-up training will be scheduled as needed.
Time	Four days of training, to be held twice a year, and then to be repeated on a yearly basis until year three of implementation.
Content	<ul style="list-style-type: none"> <li>• General environmental management relating to the project, and covering the requirements of WB;</li> <li>• General aspects of environmental supervision;</li> <li>• Implementation and supervision of mitigation measures;</li> <li>• Community participation in environmental supervision monitoring.</li> <li>• Guidance and supervision of contractors, Subcontractors and community representatives in the implementation of environmental supervision.</li> <li>• Use of forms for environmental supervision;</li> <li>• Risk response and control;</li> <li>• Receipt and submission of reporting forms</li> <li>• Other areas of training needs, as determined</li> </ul>
Responsibilities	PMO-RALG, TMC with support of the Technical Assistance Team for the implementation of safeguards.
<b>Target Groups</b>	<b>CONTRACTORS, SUBCONTRACTORS, WARDS AUTHORITIES, COMMUNITY REPRESENTATIVES</b>
Course Title	Implementation of mitigation measures
Participators	On-site construction management staff; environmental staff of contractors; ward/group authorities.
Training frequency	After bidding, and determine based on needs
Time	3 days of training for contractors and 2 days of training for others, to be repeated twice a year on an annual basis depending on needs
Content	<p>Overview of environmental monitoring;</p> <p>Requirements of environmental monitoring;</p> <p>Role and responsibilities of contractors</p> <p>Scope and methods of environmental monitoring;</p> <p>Response and risk control;</p> <p>Propagate monitoring forms and guide how to fill in the forms and risk report;</p> <p>Preparation and submission of reports</p> <p>Other areas to be determined.</p>

Responsibilities	PMO-RALG, TMC with support of the Technical Assistance team for the implementation of safeguards
<b>Target Groups</b>	<b>COMMUNITIES AND WORKERS</b>
Course Title	Environmental sanitation and safety
Participators	Representatives of community and/or worker leaders (as appropriate)
Training frequency	As appropriate
Time	One-day presentation and one-day on-the job training twice a year, to be repeated on as needed basis
Content	<ul style="list-style-type: none"> <li>• Preliminary presentation on environmental protection and environmental overview</li> <li>• Key issues that require communities' and workers' attention to minimize safety risks (roads, waterways, equipment, machines, open excavations, etc.) as well as reduce pollution (dust, fumes, gases, oil/grease spills, waste management, etc.)</li> <li>• Management of environmental safety and sanitation on work sites;</li> <li>• Mitigation measures at construction sites;</li> <li>• Safety measures on electricity, mechanical, transportation, air pollution;</li> <li>• Procedures to deal with emergency situations;</li> <li>• Other areas to be determined.</li> </ul>
Responsibilities	Contractor and TMC

## 8.4 Redress and Grievance Mechanism

### 8.4.1 Scope of the grievance mechanism

A grievance mechanism must be made available to parties who have grievances or are not satisfied with any part of the resettlement and compensation process. These grievances could relate to the valuation of assets, amount of compensation paid, level of consultation, non-fulfilment of contracts, and timing of compensation, amongst others. Complaints and grievances also concern issues related to construction safety and nuisances caused by construction. Grievances will be handled through negotiation aimed at achieving consensus.

### 8.4.2 Grievance Committee

In order to address grievances, a Grievance Committee will be formed for dealing with any grievances as they arise. This will include a representative of the RAP team, representative of the District Lands Department, representative of the Ward Council, as well as a representative of the PAPs. It should also include an independent valuer. If the grievance is in relation to compensation amounts. The grievance procedure will be simple and will be administered as far as possible by the Grievance Committee at the District and Ward level.

### 8.4.3 Grievance Mechanism Procedures

At the beginning of the individual RAP processes, PAPs will be informed about how to register grievances or complaints, including specific concerns about compensation and relocation. The PAPs should also be informed about the dispute resolution process, specifically about how the disputes will be resolved in an impartial and timely manner.

All attempts shall be made to settle grievances amicably. The grievance redress mechanism is designed with the objective of solving disputes at the earliest possible time, which will be in the interest of all parties concerned and therefore, it implicitly discourages referring such matters to the National level government authorities or National level courts for resolution.

Compensation and resettlement plans (contracts) will be binding under statute. The Grievance Committee shall maintain records where grievances and complaints, including minutes of discussions, recommendations and resolutions made, will be recorded.

The procedure for handling grievances should be as follows.

The affected person should file his grievance in writing, to the ward leader. The grievance note should be signed and dated by the aggrieved person. Where the affected person is unable to write, he should obtain assistance to write the note and emboss the letter with his/her thumbprint.

The ward leader should notify the Grievance Committee and respond within 14 days during which any meetings and discussions to be held with the aggrieved person should be conducted. If the grievance relates to valuation of assets, an independent valuer should be requested to revalue the assets, and this may necessitate a longer period. In this case, the aggrieved person must be notified by the Ward Leader that his/her complaint is being considered.

If the aggrieved person does not receive a response or is not satisfied with the outcome within the agreed time, s/he may lodge his/her grievance to the District Administration.

The Grievance Committee will then attempt to resolve the problem (through dialogue and negotiation) within 14 days of the complaint being lodged. If no agreement is reached at this stage, then the complaint can be taken through the formal court process, i.e. to the Ward Tribunal where relevant, District Tribunal and the High Court (Land Division) at the National level.

The complainants will be exempted from all administrative and legal fees that might be incurred in the resolution of their grievances and complaints. The Grievance Committee will prepare a report-containing summary of all grievances and will make this available to PMO-RALG on a quarterly basis.

## 9.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

### 9.1 Environmental and Social Monitoring

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 ESPM and its effectiveness. The monitoring results are also used extensively during the environmental auditing.

The Tanzanian EIA regulations 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 9.1). 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 project road especially during operation.

#### **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 change of use (functional changes) or demolition triggered by change of land use.

**Table 9.1: Environmental and Social Monitoring Plan for the Proposed Temeke Local Roads**

Parameters		Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (TSH)
<b>Pre construction stage</b>								
<b>Air quality</b>	Dust	Once before the construction starts	At the start, Middle and end of all project roads	$\mu\text{g}/\text{m}^3$	<i>Micro Dust Pro</i>	<0.01	Contractor/ Env. Supervisor	600,000
<b>Noise Baseline</b>	Noise level	Once before the construction starts	At the start, Middle and end of all project roads	dB(A)	Noise Level Meter	<110	Contractor/ Env. Supervisor	200,000
<b>Water Quality</b>	Turbidity, COD, BOD, Ph, DO	Once before the construction starts (During rainy season)	All points where the river cross project roads		APHA 2009	TZS 789:2003	Contractor/ Env. Supervisor	400,000
<b>Compensation</b>	Rate of compensation for land and properties	Once before the construction starts	All affected people	Once before construction begins	Resettlement Action Plan (RAP).	-	PMO-RALG/ TMC/ Consultant	N/A
<b>Construction stage</b>								
<b>Air pollution</b>	Dust	Once Per Month	At the start, Middle and end of all project roads	$\mu\text{g}/\text{m}^3$	<i>Micro Dust Pro</i>	<0.01	Contractor/ Env. Supervisor	7,200,000
<b>Noise pollution</b>	Noise level	Once Per Month	At the start, Middle and end of all project roads	dB(A)	Measurements	<110	Contractor/ Env. Supervisor	2,400,000
<b>Water Quality</b>	Turbidity, COD, BOD, Ph, DO	Once Per month during dry season Everyday during rain season	All points where the river cross project roads		APHA 2009	TZS 789:2003	Contractor/ Env. Supervisor	4,800,000

<b>Soil erosion</b>	Soil erosion along the road	Once in three Months	Project roads	Level of erosions	Site inspection	-	Env. Supervisor/ Contractor/ TMC Env. officer	4,000,000
<b>Vegetation</b>	Biomass	Once in three month for construction period	Trees along the road	-	Inspection	-	Env. Supervisor/ Contractor/ District Forests Officer	4,000,000
<b>Vibration</b>	Vibration levels	Once per Month	Project road	No per time	Records	-	Contractor/ Env. Supervisor	2,000,000
<b>Frequency of illness of construction workers</b>	Illness of construction workers	Once in a month for the construction period	Project site	Number of cases	Health records	-	Municipal Health officers/ Contractor	10,000,000
<b>Employment opportunity</b>	Percentage of local construction labourers	Three times a year	Project site	Number of local people employed in the project	Records, inquiries and observation	-	Municipal council/ Contractor/ PMO-RALG	2,000,000
<b>Safety and health risks</b>	Number and type of safety equipment such as mask, helmet gloves and ear plugs. Health and sanitation facilities in camps.	Once in three month	Project site	Number of safety measures provided	Actual injuries and illness statistics	-	Contractor/ PMO-RALG	4,000,000
<b>Dust Suppression</b>	Water sprinkling	Everyday	Project site	Frequency of water sprinkling	Inquiries and observation	Minimum dust emission	Contractor/ Environmental Supervisor	12,000,000
<b>Operation stage</b>								

<b>Safety of human beings</b>	Road accidents and roads signs	Three times a year for the project life span	Project site	Road signs and number of accidents	Records, inquiries and illness statistics	Zero accident and sufficient no of road signs	Traffic police/ Municipal council	6,000,000
<b>Total monitoring costs</b>								<b>59,600,000</b>

## 10.0 COST BENEFIT ANALYSIS

### 10.1 Introduction

The use of scarce resource for one activity denies the use of the same resource to another activity. The use of resource should therefore be gauged on the benefits to be accrued in undertaking such a project as opposed to the cost of foregoing the other activity competing for the same resource. It is necessary to undertake economic analysis before embarking into a new project in order to determine the economic profitability indices.

### 10.2 Transport Costs

Transport costs consist of both the cost of providing / keeping the road infrastructure and the cost of operating the vehicles. The cost of providing the infrastructure includes the initial cost of constructing the road and its maintenance cost throughout the life of the project. The cost of operating vehicles include vehicle operating costs due to roughness of the road, the travel time cost, cargo delay cost, pollution cost, accident costs etc. While the cost of providing the infrastructure is borne by the Agency responsible for infrastructure, the cost of operating the vehicles is borne by the operators and the society.

### 10.3 Methodology

The approach used in the economic analysis of the road consisted of evaluating the transport costs involved in the “Without” and “With” project cases. The “Without” project case defined a situation whereby the existing minimum unpaved and paved road maintenance practices prevailed throughout the analysis period (20 years in this case). On the other hand the “With” project case defined the roads rehabilitated/improved followed by setting up an appropriate unpaved and paved road maintenance regimes again throughout the 20 year analysis period.

The road capital and maintenance costs, passenger time costs and vehicle operating costs involved during each year of analysis, were compared between the two project cases and discounted back to the base year, using an appropriate discount rate and summed to obtain the Net Present Value. The discounted Costs and Benefits were further used to calculate the Benefit / Cost ratio, the Internal Rate of Return (IRR %) and the First Year Benefits (FYB %).

### 10.4 Evaluation Model

In this study, the Highway Design and Maintenance model (HDM-4 version 2.04) has been used to perform the economic analysis of improving/reconstructing the project road. HDM-4 was developed by the International Study of Highway Development and Management (ISOHDM). It is the successor of the widely used HDM-III model which was developed by the World Bank in the period 1980-1986.

The HDM-4 analytical framework is based on the concept of pavement life cycle analysis. The model analyses the project road with different investment and maintenance options, taking into account the associated costs and benefits projected annually over the analysis period, with a view to determining the economic and engineering viability of the project.



Once a road is constructed and opened to traffic, its pavement deteriorates as a consequence of several factors, most notably:

- Traffic loading
- Environmental weathering
- Effect of inadequate drainage systems

The rate of road deterioration is directly affected by the standards of maintenance applied to repair defects on the pavement surface such as cracking, raveling, potholes, etc., or to preserve the structural integrity of the pavement (for example, surface treatments, overlays etc.), thereby permitting the road to carry traffic in accordance with its design function. The overall long-term condition of roads directly depends on the maintenance or improvement standards applied to the road. When a maintenance standard is defined, it imposes a limit to the level of deterioration that a pavement is permitted to attain. Consequently, in addition to the capital costs of road construction, the total costs that are incurred by road agencies will depend on the standards of maintenance and improvement applied to road networks.

The impacts of the road condition, as well the road design standards, on road users are measured in terms of road user costs, and other social and environmental effects. Road user costs comprise:

- **Vehicle operation costs** (fuel, tires, oil, spare parts consumption; vehicle depreciation and utilization, etc.
- **Cost of travel time** – for both passengers and cargo, and
- **Cost to the economy of road accidents** (that is, loss of life, injury to road users, damage to vehicles and roadside objects).

The social and environmental effects comprise vehicle emissions, energy consumption, traffic noise and other welfare benefits to the population served by the roads. Although the social and environmental effects are often difficult to quantify in monetary terms, they can be incorporated within the HDM-4 economic analyses if quantified exogenously.

Road User Costs in HDM-4 are calculated by predicting physical quantities of resource consumption and then multiplying these quantities by the corresponding user specified unit costs. It is necessary to ensure that the vehicle resource quantities predicted are in keeping with the range of values observed in the area of application.

Economic benefits from road investments are then determined by comparing the total cost streams for various road works and construction alternatives against a base case (without project or do minimum) alternative, usually representing the minimum standard of routine maintenance. HDM-4 is designed to make comparative cost estimates and economic analyses of different investment options. It estimates the costs for a large number of alternatives year by-year for a user-defined analysis period. All future costs are discounted to the specified base year. In order to make these comparisons, detailed specifications of investment programmes, design standards, and maintenance alternatives are needed, together with unit costs, projected traffic volumes, and environmental conditions.

## 10.5 Definitions

The purpose of this section is to provide a description of various concepts used in economic evaluations in general.

### **10.5.1 Opportunity Cost of Capital (OCC)**

For investment by commercial enterprises, the time-cost of money is assumed to be an average of the short-term and long-term rates of interest. When the effect of public investment in highways is considered, the interest rate must reflect the return on investment in the national economy. An OCC of 12% was used in this study.

### **10.5.2 Net Present Value (NPV)**

The NPV of a given investment is obtained by subtracting the present value of the costs from the present value of the future benefits. The benefits as well as the costs were discounted at the OCC discount rate. The investment is viable if the NPV is positive.

### **10.5.3 Internal Rate of Return (IRR)**

The IRR of a given project is defined as the discount rate at which the present value of benefits and the present value of costs are equal or discount rate which would result to NPV of zero. It is a measure of the marginal efficiency of capital. For a project to be viable, the IRR has to be greater than the OCC rate. The 12% is the opportunity cost of capital used in appraising public investments in most developing countries.

### **10.5.4 First Year Benefits**

The First-Year Benefits (FYB %) is defined as the ratio, in percent, of the net benefit realized in the first year after construction (or improvement) completion to the increase in total capital cost. FYB gives a rough guide to project timing, if it is greater than the discount rate, then the project should go ahead, otherwise it should be delayed until it satisfies the criterion.

## **10.6 Need for Shadow Pricing**

### **10.6.1 Financial and Economic costs**

It is required to use Economic costs as opposed to financial costs in the economic analysis. Prices of goods in the market include taxes and duties which are just transfer payments and do not constitute the resource cost. To convert financial Costs to economic costs therefore taxes and duties need be eliminated and the Cost Insurance and Freight (CIF) and Free On Board (FOB) prices used in case of imported and exported goods respectively.

Further, shadow pricing need to be conducted to eliminate distortions in the market prices for foreign exchange and labor.

**Foreign Exchange-** Foreign exchange need to be evaluated using a Shadow Exchange Rate which eliminates in the Official Exchange Rate the market distortions due to imposition of trade barriers such as import quotas, tax barriers and tax on imports. In Tanzania, Foreign Exchange has been liberalized and the Tanzanian Shilling is, for practical purposes, a currency fully convertible at current market rates, the conversion factor applied to all expenditures in foreign currency amounts to unity.

**Labor-** Distortion in the labor market results if the Market Wage Payable for Labor by the government ministries and Large projects are higher than the Marginal Value Product of Labor elsewhere. A shadow wage rate needs to be calculated for unskilled as well as skilled labor to be used for the project. Taking into consideration the widespread unemployment and underemployment in Tanzania the market wages for skilled and unskilled labor can be considered as shadow wages.

### 10.6.2 Conversion of financial to economic costs

**Standard Conversion Factor:** An alternative method for shadow pricing is establishing a factor to convert financial to economic costs including construction and maintenance costs by calculating a Standard Conversion Factor (SCF) using the following formula:

$$\frac{[\text{Imports}+\text{Exports}]}{[\text{Imports}+\text{Exports}+\text{Import duties/taxes}+\text{Export subsidies}]}$$
 Conversion factors applied on similar recent studies ranged between 0.8-0.9. Consultant has applied 0.82, which excludes 18% VAT. Exchange rate used was US\$=1599 Tshs (Bank of Tanzania, selling rate for 19<sup>th</sup> April 2013).

### 10.7 Improvement/Rehabilitation of DMDP roads

The existing roads are spread in three municipalities of Dar es Salaam region. For economic analysis purpose 12 homogenous sections were devised as shown in table below. Normal traffic and condition data were available from field surveys undertaken in 2013

**Table 10.1: Temeke Local DMDP roads**

S/N	Name of Road	Length (Km)	Proposed intervention
1	Chang'ombe road	4.6	Widening the existing road to two lane
2	Temeke- Mbagala	3.5	Widening the existing road to two lane
3	Nzasa- Kilungule- Buza	6.0	Construction of Kilungule bridge and upgrading of 3km roads to Tarmac level
4	Mchicha Road (Sandali)	1.5	Upgrading to tarmac level
5	Kijichi- Tuangoma- Bridge	3.0	Upgrading to tarmac level
6	Mbagala Industrial road	2.5	Upgrading to tarmac level
7	Mwanamtoti Road	1.8	Upgrading to tarmac level
8	Access to Mtoni closed dump site	0.3	Upgrading to tarmac level

**Source: TOR DMDP and Consultant evaluations**

#### 10.7.1 Project Implementation

Tendering and award have been assumed to be completed in 2014, while improvement/reconstruction works were assumed to be completed in two years up to 2016. The first year at which the road sections will be fully open for traffic has been assumed to be 2017.

#### 10.7.2 Calculation Base Year

The calculation base year for the economic indicators, defined as the year at which all costs and benefits are discounted is 2013. This is also the statistical base year, which is the latest year important statistical data are available for evaluation of costs and benefits of each maintenance alternative.

### 10.7.3 Analysis Period

The analysis period has been specified at 24 years commencing on the Calculation base year. The project costs and benefits have been discounted at 12% discount rate which is considered to be as close as possible to opportunity cost of capital.

### 10.8 HDM4 Project Road Network

The road network to be used for the project has been pre-defined under the name DMDP roads network in the Road Network folder in HDM4.

### 10.9 Traffic volume input

Traffic input consisted of Normal and Generated traffic as shown in Table 10.2.

**Table 10.2: Normal traffic for project roads**

S/N	Road Name	NMT	Motorcycles	Cars	4WD & Pickups	Mini bus	Large bus	T < 3.5T	T > 3.5T (2axles)	T > 3.5 T (3 or 4axles)	Semi Trailer (ST)	Full Trailer (FT)	AADT
1	Chang'ombe road												
	Kawawa rd jct.-National stadium	420	3742	4004	3253	1004	2041	762	380	569	71	6	16251
	National Stadium-Mandela rd jct	141	628	1507	932	371	38	109	104	82	13	2	3928
	Kawawa rd jct-Mandela rd jct.	667	2620	2592	1811	3480	941	219	149	104	12	1	12597
	Kawawa road junction-Keko (National Stadium jct)	1086	6362	6596	5064	4484	2982	981	530	673	82	7	28848
	Keko (National Stadium jct)-Mandela rd junction	808	3249	4100	2743	3851	979	328	253	187	24	3	16523
2	Mandela rd jct -Usalama round about	1875	4317	14441	5043	2164	4058	277	130	69	104	17	32496
	Temeke-Mbagala												
	Kilwa rd jct.-Mandela rd jct (Serengeti)	1533	3453	2873	3572	2135	4048	234	102	50	60	11	18071
	Kilwa rd jct-Mandela rd jct. (Kwa Sokota)	329	1576	1790	2209	1962	1691	272	142	112	109	22	10212
	Mandela rd jct (Serengeti)-Mandela rd jct (Kwa Sokota)	343	865	11567	1471	29	10	43	28	20	44	6	14426
	Mandela rd jct.(Kwa Sokota-Usalama round about	671	2441	13357	3680	1991	1701	315	170	132	153	28	24638
3	Usalama roundabout- Kilwa rd jct	1861	5028	4663	5781	4098	5738	506	243	162	168	33	28283
	Nzasa-Kilungule-Buza	561	1917	515	488	590	315	59	41	32	0	1	4519
	Mchicha road	167	1914	2071	1727	258	186	197	112	52	10	3	6694
	Kijichi-Tuangoma bridge	61	460	780	438	406	96	150	89	99	50	16	2645
	Mbagala Industrial road	488	1886	814	1332	179	41	149	253	238	180	7	5567
	Mwanamtoti	164	4425	1219	940	222	82	81	59	50	53	43	7339
	Access to Mtoni closed Dump site	51	2878	1044	584	84	40	95	90	1	0	0	4867

Source: Consultant evaluations

### 10.10 Vehicle Fleet Adopted

The vehicle fleet has been pre-defined in the vehicle fleet folder in HDM-4 as DMDP roads vehicle fleet, consisting of NMT (Bicycles), Motorcycles, Cars, Pickups, 4WD's, Light goods Vehicles (Trucks < 3.5 Ton), Medium Goods Vehicles (Trucks > 3.5 Ton, 2 axles),

Heavy Goods Vehicles (Trucks >3.5Ton, 3 or 4 axles), Very Heavy Goods Vehicles (Semi trailers-ST and Full trailers-FT), Mini buses < 25passengers and Large buses > 25 passengers.

### 10.11 Project Alternative Cases

Two project alternative cases were considered, “Without” Project Case and “With” Project Case. The “Without” Project case represented a continuation of current minimum maintenance practice, consisting of pothole patching when potholing exceeds 1no/km, and heavy patching when Wide structural cracking exceeds 5% in case of paved roads. For unpaved roads it consisted of grading once or twice per year and , spot gravelling.

The “With” Project Case represented the implementation of the projects by rehabilitating/reconstructing the paved roads. For unpaved roads it included Engineered gravel road rehabilitation or paving to DBST or AC surface roads. After rehabilitation/construction works the roads will receive more intensive maintenance, apart from patching, crack sealing and edge repair consisting of resealing at every 8 years and overlay at every 15 years

The Project Cases and the associated works are summarized in table below. Maintenance works are specified before and after improvement. A summary of the maintenance operations and the intervention limits are given also in another table below.

**Table 10.3: Road Maintenance And Rehabilitation Status During Evaluation Period 2013-2036 For “Without” And “With” Project Cases.**

Year	Without Project Case	With Project Case
2013 -2014	Minimum maintenance of existing unpaved/paved roads	Design, Tender and Award
2015-2016	Minimum maintenance of existing unpaved/paved roads	Improvement/Reconstruction
2017-2036	Minimum maintenance of existing unpaved/paved roads	Proper maintenance of unpaved and paved road after rehabilitation/reconstruction

Source: Consultant Evaluations

**Table 10.4: Maintenance unit rates**

Work item	Intervention criteria	Unit maintenance cost	
		Economic	Financial
<b>Maintenance of unpaved roads</b>			
Grading	Once per year	USD1038/km	USD1260/km
Spot gravelling	If gravel thickness < 100mm	USD 15.57/ m <sup>3</sup>	USD 18.99/ m <sup>3</sup>
Gravelling	If gravel thickness < 100mm	USD 15.57/ m <sup>3</sup>	USD 18.99/ m <sup>3</sup>
<b>Maintenance of paved roads</b>			
Crack Sealing	Wide Structural cracking >5%	USD 11.48/ m <sup>2</sup>	USD 14.00/ m <sup>2</sup>
	Transverse Thermal Cracks >10 No./km		
Edge repair	Edge break > 1sq.m/km	USD16.40/ m <sup>2</sup>	USD 20.00/ m <sup>2</sup>
Patching	Pot holes >1 pothole/km	USD16.40/ m <sup>2</sup>	USD 20.00/ m <sup>2</sup>

Heavy patching	Severely damaged area >5%		
Resealing	Total damaged area >25%	USD 5.74/ m <sup>2</sup>	USD 7.00/ m <sup>2</sup>
Overlay	Roughness > 6IRI	USD16.40/ m <sup>2</sup>	USD 20.00/ m <sup>2</sup>
Reconstruction	Roughness >9IRI	USD 57.4/ m <sup>2</sup>	USD 70.00/ m <sup>2</sup>

**Source: Consultant Evaluations**

## 10.12 Improvement/Rehabilitation Options

Three improvement options have been considered consisting of (i) Engineered Gravel road rehabilitation/Rehabilitation by overlay, provision/rehabilitation of drainage structures & widening of paved roads (ii) Construction to DBST of unpaved roads/Reconstruction to DBST of paved roads and (iii) Construction to AC surface of unpaved roads/Reconstruction to AC surface of paved roads.

**Table 10.5: Improvement option description**

SN	Name of Road	Length (Km)	Option	Unit rate (US\$/Km)
1	Chang'ombe road	4.6	Option3	1,500,000
2	Temeke- Mbagala	3.5	Option3	1,500,000
3	Nzasa- Kilungule- Buza	6	Option3	950,000
4	Mchicha Road (Sandali)	1.5	Option3	950,000
5	Mwanamtoti Road	1.8	Option3	950,000
6	Mbagala Industrial road	2.5	Option3	950,000
7	Kijichi- Tuangoma- Bridge	3	Option3	1,000,000
8	Access to Mtoni Closed dump site	0.3	Option2	850,000

## 10.13 Evaluation Alternatives

The Alternatives employed in the analysis consisted of ALT0, ALT1, ALT2 and ALT3 as follows

- ALT0: Base Alternative
- ALT1: Engineered gravel road rehabilitation of unpaved roads and paved roads rehabilitation by overlay, widening and provision/rehabilitation of drainage structures
- ALT2: Construction to DBST surface of unpaved roads and Reconstruction to DBST surface of paved roads including widening and lanes addition and
- ALT3: Construction to AC surface of unpaved roads and Reconstruction to AC surface of paved roads including widening and lanes addition

The following potential benefits may accrue to the Tanzanian economy by implementing this project

## 10.14 Results of analysis

The results of the economic analysis are shown in the tables below. These results relate to project alternatives ALT1, ALT2 and ALT3 as compared to Base alternative ALT0. The

economic indices are Internal Rate of Return (IRR %), Net Present Value (NPV) and NPV/Cost ratio at 12% discount rate.

Engineered Gravel road rehabilitation (ALT1) was finally not evaluated. Paved road rehabilitation by overlay options (also under ALT1) was also not evaluated.

Upgrading to Asphaltic Concreted (AC) surface (ALT3) options yielded high and attractive economic benefits. IRR's were generally by far greater than the 12% cut off point. Resulting NPV's at 12% discount rate were also high and positive which ranged from US\$ 0.1 to 135million. NPV/Cost ratios also at 12% discount rate were also high and positive which ranged from 0.1 to 38 as shown in tables below.

To select an alternative for implementation, pavement performance charts were employed. These charts show HDM4 road roughness prediction during the 20 year analysis period. A pavement requiring an overlay in less than 10 years after construction was considered weak and a stronger option was recommended instead. Based on road roughness charts, much stronger pavements than those of crushed stone base will be required for Temeke-Mbagala road. Recommended options for implementation are shown also in table 10.6.

**Table 10.6: Economic Analysis**

SN	Name of Road	Length (Km)	Evaluation Alternative	IRR%	NPV (12% Discount Rate) (million US\$).	NPV :Cost Ratio(12 % Discount Rate
1	Chang'ombe road	4.6	ALT3	221.2	135.994	24.904
2	Temeke- Mbagala	3.5	ALT3	201.5	117.194	27.831
3	Nzasa- Kilungule- Buza	6.0	ALT3	108.3	61.603	16.936
4	Mchicha Road (Sandali)	1.5	ALT3	106.8	16.457	18.097
5	Kijichi- Tuangoma- Bridge	3.0	ALT3	65.6	15.686	8.242
6	Mbagala Industrial road	2.5	ALT3	97.2	23.127	15.151
7	Mwanamtoti Road	1.8	ALT3	102.7	16.934	15.565
8	Access road to closed Mtoni dump site	0.3	ALT2	62.5	3.968	7.207

### 10.15 First Year Benefits

The First-Year Benefits (FYB %) have been calculated as ratio, in percentage, of the net benefit realized in the first year after rehabilitation/construction completion to the increase in total capital cost. FYB for upgrading sections ranged from 10 to 100+%. Those for pavement reconstruction by addition of two lanes had similarly on average high FYB over 100+%. Taking all the roads as one project yielded FYB of 54%. The table below shows FYB for project road sections.

**Table 10.7: Calculation of FYB for Recommended Alternative**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>Road name</b>	<b>Recommended alternative</b>	<b>Discounted First year NPV (US\$ millions)</b>	<b>Un discounted rehabilitation cost (US\$ millions)</b>	<b>FYB% (c*100/d)</b>
Chang'ombe road	ALT3	5.9	2.263	104.3
Temeke- Mbagala	ALT3	7.807	4.3	181.6
Nzasa- Kilungule- Buza	ALT3	4.285	4.59	93.4
Mchicha Road (Sandali)	ALT3	1.0	1.15	86.8
Kijichi- Tuangoma- Bridge	ALT3	1.16	2.43	47.9
Mbagala Industrial road	ALT3	1.5	1.19	78.9
Mwanamtoti Road	ALT3	1.01	1.38	73.1
Access road to closed Mtoni dump site	ALT2	0.31	0.685	45.7

**Source: Consultant evaluations**

### **10.16 Conclusion and Recommendations**

As a result of the economic analysis, the sensitivity test and FYB analysis above it is economically feasible to implement Temeke DMDP road project.

It is recommended to implement the DMDP road projects. Works Cost estimates based on unit rates are shown in table below. Since average project FYB at 54% is greater than the 12% discount rate, the road rehabilitation/construction works can be implemented without delay.



## **11.0 DECOMMISSIONING**

### **11.1 Introduction**

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 issues into consideration shall be prepared by the developer prior to the decommissioning works. Should it be done, decommissioning may entail 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 give light to what shall be done if the need for decommissioning arise.

### **11.2 Preliminary Decommissioning Plan**

This Section provides a brief outline of the works required to demolish the Proposed infrastructures on the site incase it happen. 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.

#### **11.2.1 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 utilising manual labour and small plant including – bobcats, 3-5t excavators and dingo type loaders.
- The materials will be removed from site using small to medium sized trucks.
- The structures will be demolished using larger plant and equipment including 15-40t hydraulic excavators. These machines will be equipped with rock breakers, pulverisers and the like which would be used in a sequential manner.
- During the demolition process erosion control measures will be established. These will include treatment of dust and potential discharge into stormwater systems.

#### **11.2.2 Materials Handling**

Materials handling will be by mechanical plant (including excavators and bobcats) loaded into trucks (bogie tippers and semi trailers). The debris will be carted offsite to an approved waste facility or recycling centre.

The contractor shall submit a Demolition Waste Management Plan to Temeke Municipal council which outlines the objectives of:

- maximisation, reuse and recycling of demolition material
- minimisation of waste disposal
- evidence of implementation for specified arrangements of waste management

On-site storage of reusable materials will occur at Site. Recycling and disposal containers will also be accommodated at this location for collection vehicles. Hazardous materials will be treated separately. A hazardous materials inspection will be undertaken by an accredited consultant and a report issued. Hazardous materials will be removed in accordance with EMA 2004. A final clearance report will be provided by the hygienist which will include the provision of tip dockets from waste centres.

### **11.2.3 Proposed Sequence**

The Contractor will be required to prepare the following documentation prior to the commencement of demolition and/or excavation works:

- Dilapidation Survey
- Construction Waste Management Plan
- Demolition Management Plan

### **11.2.4 Protective Measures**

An A Class hoarding will be erected around the perimeter of the construction site prior to the commencement of demolition works. Additionally, wherever the risk arises of material falling into public areas, overhead protection will be provided in the form of a B Class hoarding. Scaffolding will be erected to facades where materials could fall in excess of 4m. The scaffolding will be clad with chainwire and shade cloth to enclose debris and dust onto the site. During the demolition, dust control measures will be used to minimise the spread of dust from site. The Contractor will have a senior representative on site at all times to ensure compliance with the safety guidelines and agreed work methods.

### **11.2.5 Traffic Management**

The management of construction traffic during the decommissioning phase will be subject to the provision of a detailed traffic management plan. This plan will be prepared by the Contractor for the various stages of demolition. During demolition, all traffic will be held within the site boundaries. The site will remain closed to pedestrian traffic and will be generally manned by security.

### **11.2.6 Occupational Health and Safety**

A detailed OH&S Policy will be provided by the Contractor prior to work commencement. A detailed Site Safety Plan will be prepared for the specific project.

### **11.2.7 Environmental Management Plan**

A detailed Environmental Management Plan will be provided by the Contractor prior to the commencement of the work.

## **11.2.8 Potential Impacts and Mitigation Measures**

### **Dust and Noise Pollution**

The demolition activities for the remained part (foundation structure) shall be accompanied with emission of a lot of dusts since the demolition works are expected to be carried out by conventional method using mechanical breakers and jackhammers. However, alternative methods of demolition including explosive techniques can be used.

### **Mitigation Measures**

- Water sprinkling shall be applied to open earth to reduce dust emission.
- Trucks transporting construction materials shall be covered if the load is dry and prone to dust emissions.
- The demolition area shall be fenced by iron sheets; this will prevent the dust at the ground to be picked up by the wind.
- Community notification shall be undertaken where appropriate where work is likely to cause dust impact on the public and nearby residents.
- Sound construction equipment, with noise sinks, shall be used
- Machine operators in various sections with significant noise levels shall be provided with noise protective gear.
- Construction equipments shall be selected, operated and maintained to minimize noise.

### **Increased Waste**

A lot of demolition waste is expected as a result of the demolition of these blocks. These shall include blocks, concrete, reinforcements, pipes etc. Most of the block materials shall be salvaged and recycled.

### **Mitigation Measures**

- All materials which can be reused shall be reused
- Materials that cannot be reused shall be sent to a the authorized dumpsite

## **11.2.9 Costs for Undertaking the Mitigation Measures**

The cost for undertaking Mitigation measures during decommissioning is estimated to be USD 30,000,000.

## 12.0 SUMMARY AND CONCLUSION

The EIA study results show that although there are some limited negative environmental implications of the project, the local roads will have high socio-economic benefits to the people of Temeke Municipality and Dar es Salaam in totality. The associated negative impacts, to a large extent have been minimized through good engineering design and envisaged construction practices. Specific mitigation measures have been suggested in this report to offset some of the inherent adverse impacts. Implementing these mitigation measures would increase environmental soundness of the project road.

It is, therefore, concluded that, implementation of the proposed project will entail no detrimental impacts provided that the recommended mitigation measures are adequately and timely put in place. The identified adverse impacts shall be managed through the proposed mitigation measures and implementation regime laid down in this EIS. PMO-RALG and TMC is committed in implementing all the recommendations given in the EIS and further carrying out the environmental auditing and monitoring schedules.

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## **APPENDICES**

## Appendix I: Terms of References

### DRAFT TERMS OF REFERENCE FOR THE PROPOSED LOCAL ROADS SUBPROJECT IN TEMEKE MUNICIPALITY (23.2 KM) UNDER THE DAR ES SALAAM METROPOLITAN DEVELOPMENT PROJECT (DMDP)

#### 1. INTRODUCTION

The Government of the United Republic of Tanzania through the Prime Minister's Office, Regional Administration and Local Government (PMO-RALG), intends to improve road networks in the Dar es Salaam Metropolitan area covering all the three municipalities- Kinondoni, Ilala and Temeke. In Temeke Municipality, 8 roads covering a total of 23.2km, will be upgraded from gravel/earth to bitumen standard or by improving the existing tarmac roads. The local roads improvement aims to provide safe and efficient access to social and economic activities by removing transport flow constraints, supporting the present and projected economic and social development in Dar es Salaam. The Dar es Salaam Metropolitan Development Project (DMDP), as nicknamed, will be implemented with financial assistance from the World Bank.

The detailed scope for undertaking Environmental and Social Impact Assessment is intended to guide the Consultant to address relevant environmental and social issues during the assessment process. Among others, the ESIA shall be conducted in accordance with the requirements of the Environmental Management Act (2004). The Consultant shall do everything necessary to meet the objectives of the services and not less than the following task that should be undertaken during the Environmental and Social Impact Assessment.

#### 2. SCOPE OF WORK

##### Task 1: Description of the Proposed Project

The Consultant shall provide a brief description of the relevant parts of the project using maps of appropriate scale where necessary and include the following information:-

- Project justification;
- Location;
- General layout, size, and capacity;
- Area of influence of the road works
- Pre-construction activities
- Construction activities
- Schedule of project activities
- Staffing and support;
- Facilities and services
- Operation and maintenance activities
- Required offsite investments
- Life span

[Note: specify any other type of information relevant to the description of the project]

## **Task 2: Description of the Environment**

Assemble, evaluate, and present baseline data on the relevant environmental characteristics of the study area. Include information on any changes anticipated before the project commences. Modify the lists below to show the critical information for this project category or which is relevant to it. Environmental characteristics of the study area shall be presented on a map to facilitate the understanding of the study area

Physical environment This shall cover geology; topography; soils; climate and meteorology; ambient air quality; surface and groundwater hydrology; existing sources of air emissions; existing water pollution discharges; and receiving water quality.

Biological environment: All flora and fauna present at the project site (if any).

Socio-cultural environmental; population, land use; planned development activities community structure; , goods and services; recreation; public health; Gender issues and HIV/AIDS, Cultural/ historic properties and attitudes to the project.

## **Task 3: Legislative, Policies, Administration Framework**

Describe the pertinent regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protections of endangered species, siting, and land use control at international, national regional and local levels, The Consultant shall undertake a review of policies, legislation and administrative framework within which the environmental management of the proposed road works will be carried out. The following and any other relevant legislation and policies shall be reviewed:-

- Environmental Policy (NEP) of 1997
- National Construction Industry Policy (2003)
- National Land Policy (1995)
- National Energy Policy (2003)
- National Human Settlements Development Policy (2000)
- National Gender Policy (2002)
- National Community Development Policy (1996)
- National Policy on HIV/AIDS (2001)
- Environmental Management Act No. 20 of (2004), Cap. 191
- The Land Act No. 4 of 1999
- The Water Resources Management Act No. 11 of 2009
- The Road Act, 2007
- Public Health Act 2009
- Land Use Planning Act (2007)
- Occupation Safety and Health Act (2003)
- The Standards Act No. 2 of 2009

- Regional and District Act No 9, 1997
- The Land Acquisition Act 1967
- Employment and Labour Relations Act No. 6 Of 2004
- Engineers Registration Act and its Amendments 1997 and 2007
- The Contractors Registration Act (1997)
- The HIV and AIDS (Prevention and Control) Act of 2008
- The Industrial and Consumer Chemical (Management and Control) Act, 2002
- The Tanzania 2025 Development Vision
- Land (Assessment of the Value of Land for Compensation) Regulations, 2001
- Environmental Impact Assessment and Auditing Regulations (2005)
- National Strategy for Growth and Reduction of Poverty (2005)
- Environmental Assessment and Management Guidelines for the Road Sector (2011)
- Standard Specifications for Road Works (2000)

#### **Task 4: Interagency Coordination and Public/NGO Participation**

Assist in coordinating the ESIA with other government agencies, in obtaining the views affected groups, and in keeping records of meetings and other activities, communications, and comments and their disposition. Establish the views of the public with regards to the potential impacts of the proposed Project. Identify the different groups of stakeholders, and then use the most appropriate method to establish their views. Particular attention shall be paid to the disadvantage groups (e.g. children, the elderly and women) that may be affected by the proposed Project.

The Consultant shall undertake an open and transparent consultation process to ensure that the views of interested and affected parties are and approximately incorporated in the project design.

#### **Task 5: Analysis of Alternatives to the Proposed Project**

Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives, which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Compare alternatives in terms of potential environmental and social impacts; capital and operating costs; suitability under local conditions; and institutional, training, and monitoring requirements. When describing the impacts, indicate which are irreversible or unavoidable and which can be mitigated. To the extent possible, qualify the costs and benefits of each alternatives, incorporating the estimated costs of any associated mitigating measures. Include the alternative of not constructing the project to demonstrate environmental and social conditions without the project.

Various environmental and social criteria should be developed to select the best road alternatives.

**Task 6: Identification, Analysis and Assessment of Potential Impacts**

The Consultant shall identify, analyse and assess environmental and social impacts of the proposed road works. The Consultant shall distinguish between positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. Identify impacts that are unavoidable or irreversible. Wherever possible, describe impacts quantitatively, in terms of environmental components affected (area, number), environmental and social costs and quality of available data, explaining significant information deficiencies and any uncertainties associated with the predicted impacts.

The assessment should focus on the potential for negative environmental and social impacts caused by planned and unplanned (spontaneous) in-migration of people; clearing of forest lands for agriculture; increased pressure on fuel wood, fodder and water resources; social disruptions and conflicts; and threats to woodlands and important wildlife species.

The assessment should also examine the potential for linear resettlement that usually involves projects producing linear patterns of land acquisition. An overview shall be provided of different groups of people and their cultural, ethnics and socio-economic characteristics, and how they are likely to benefit and / or be negatively affected by the project. Negative impacts may include but not be limited to physical relocation, loss of land or other physical assets, or loss of access to livelihood.

The significance of impacts of the proposed road works shall be assessed, and the basis of this assessment shall be specified. The Consultant should take into consideration existing by-laws, national and international environmental standards, legislation, treaties, and conventions that may affect the significance of identified impacts. The Consultant shall use the most up to date data and methods of analyzing and assessing environmental and social impacts. Uncertainties concerning any impact shall be indicated.

The Consultant shall conduct a review of gender issues in the project study shall include the road section influence to the lives of men, women, children, the elderly and disabled so as to come up with a quantifiable analysis of the benefits which will accrue to them during and after the road construction.

**Task 7. Mitigation Measure**

The Consultant shall suggest cost-effective measures for minimizing or eliminating adverse impacts of the proposed road works. Measures for enhancing beneficial impacts should also be recommended. The costs of implementing these measures shall wherever possible be estimated and presented. If compensation is recommended as one form of mitigation, the Consultant shall identify all the names and physical addresses of people to be compensated.

**Task 8. Environmental and Social Management Plan (EMP)**

The Environmental Management Plan focuses on three genetic areas: implementation of mitigation measures, institutional strengthening and training, and monitoring. The Consultant shall prepare an Environmental and social Management Plan, Which will include proposed work programme, budget estimates, schedules, staffing and training requirements and other necessary support services to implement the mitigation measures. Institutional arrangements required for implementing this management plan shall be indicated. The cost of implementing the monitoring and evaluation including staffing, training and institutional arrangements must be specified. Where monitoring and evaluation will require inter-agency collaboration this should be indicated.

Identify institutional needs to implement environmental assessment recommendations. Review the authority and capability of institutions at local, regional, and national levels and recommend how to strengthen the capacity to implement the environmental and social management and monitoring plans. The recommendations may cover such diverse topics as new laws and regulations, new agencies or agency functions, inter-sectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support.

Prepare detailed arrangements to monitor the implementations of mitigating measures and the impacts of the project during construction and operation. Include in the plan an estimate of capital and operating costs and a description of other required inputs.

In the case of land acquisition, a Resettlement Action Plan should be prepare and implemented in according to the National Land and Village Land Act 1999. All properties to be affected by the road project should undergo valuation for compensation.

### **3. REPORTING**

The ESIA reports should be concise and limited to significant environmental Issues. The Main text should focus on findings, conclusions, and recommended actions supported by summaries of the data collected and citations for any references used in interpreting data. Detailed or un-interpreted data are not appropriate in the main text and should be presented in appendices or separate volume. Unpublished documents used in the ESIA may not be readily available and should also be assembled in appendices. Organized the ESIA may not be readily available and should also be assembled in appendices. Organized the ESIA reports according to the outline in the Environmental Impact Assessment and Audit Regulations (2005). The main report contains separate an Executive Summary both in English and Swahili.

### **4. STAFFING**

The Consultant should employ an Environmental Impact Assessment Expert, an Environmental Engineer, Socio-economist and Road Engineer, to carry out the EIA study. In addition, the Consultant may wish to absorb other supporting staff to facilitate efficient expedition of the work.

**Appendix II: Letter from NEMC that approved the ToRs**

**NEMC APPROVAL LETTER WAS ISSUED TO PMO-RALG**

## Appendix III: List of Stakeholders Consulted

DATE	NAME	INSTITUTION	POSITION	ADRESSS/PHONE NO.	SIGNATURE
01/02/13	Photiclas Kigimbo	Temeke mc	Ag. Director	+255 713568120	
-11-	Edward Simon	Temeke mc	DMDP coordinator	0719-553112	
-11-	Anton Mwanambo	Temeke MC	MT	07641000726	
1/2/13	GODFREY MWANLOANGO	Tmc	/msc	0713-670730	
1/2/13	Baraka N. Albert	Tmc	msc	0754 526320	
1/2/13	TATU AMBAKISYE	TMC	/MALDO	0768-932919	

DATE	NAME	INSTITUTION	POSITION	ADRESSS/PHONE NO.	SIGNATURE
01/02/2013	KHALIDI A. ONDICO	TMC	Ag Mwanambo	0714498002	
01/02/2013	Ernest H. Mwanayo	Tmc	SNM focal person DMPD	0754-550361	
"	Laurian J. Munna	Tmc	Economist	0755 896331 l.j.munna@pma.co	
"	Jessy Mwangale	Tmc	Secondary Ed. officer	0714118454	



DATE	NAME	INSTITUTION	POSITION	ADRESSS/PHONE NO.	SIGNATURE
1/02/13	Eng Mohammed S Mkhumba	TMC	MEMO	0717-156430 mm56@yahoo.com Co-UK	
1/02/13	Juliana Zacharia	TMC	CC	0717 035353 julianazacharia@yahoo.com	
1/2/13	FATUMA MWA FUIZ	TMC	CC	0655 201198 fmwzfujo@yahoo.com	
1/2/13	JOHN Bwana	TMC	MEMO	0713-236905	
1/2/13	Eng R.P. Lemo	TMC	M.E	0715233145 rickp.lemo@yahoo.com	

DATE	NAME	INSTITUTION	POSITION	ADRESSS/PHONE NO.	SIGNATURE
20/3/2013	H. J. ULONI	CHANGOMBE WARD TEMEK MC	WARD EXECUTIVE OFFICER	0655 70748	
22/03/2013	M. E. TWANGABO	TEPELE WARD TMC	WARD (WED) EXECUTIVE OFFICER	0754-535928 0712-790087	
25/03/2013	ALI KINYAKA	MTONI TEMEKE.	WARD COUNCILOR	0754827926 0718 282597	
25/03/2013	A. S. KIZIBA	MTONI	WED	0653941494	
25/3/13	A. S. MANDORI	TMC AZIMU WARD	WED	0754-565815	

DATE	NAME	INSTITUTION	POSITION	ADRESSS/PHONE NO.	SIGNATURE
01/03/2013	BAKARI SIMBILIKILA	MGENINANI	MALUMBE S/MTAA	0719 146774	
01/03/2013	BAZIL L. DAVID	WED KUTCHI WARD	WED	0715 671903	
01/03/2013	GOSBERT ISHENGOMA	CHARAMBE WARD	WED	0715 773062	

## Appendix IV: Minutes of Meetings

<p>MUHTASARI WA MKUTANO WA MRADI WA UJENZI WA BARABARA TA CHANG'OMBE KATI TA WANANCHI NA WATAALAM WA BARABARA WA CROWN TECH TAREHE 19/08/2024</p>	
AGENDA	
1.	KUFUNGA MKUTANO
2.	UTAMBULISHO
3.	KUJADIWI MRADI
4.	KUFUNGA MKUTANO
1.	<p>Mwenyekiti alifungua mkutano mnamo saa 8:00 mchana na kuwaomba wananchi kuwa watulivu na wasikivu ili waelewe malengo ya mradi. Aieleza kuwa kutakuwa na nafasi ya kuuliza maswali pale ambapo mtu hatalewa.</p> <p>Mwenyekiti aliwaomba wataalam wa barabara wajiambulisho na kisha kiongozi wa msafara aendelee na maada ya mkutano. Wataalam waligijambulisha ni Anna Msolle, Anselm Aman, Yoswe Msongwe (Kiongozi).</p>
3.	<p><u>KUJADIWI MRADI</u></p> <p>Kiongozi wa msafara alianza kwa kuwakaribisha na kuwashukuru wanandi waliofika kwenye mkutano.</p> <p>Alisema kuwa mkutano unawahusu wale ambao wameguswa na mradi wa upanuzi wa barabara ambayo itaboreshwa kwa kuwa na njia mbili chini ya mradi wa DMOP ambao uko chini ya ofisi ya waziri mkuu na utatekelezwa katika marispa zote tatu za Dar es Salaam.</p> <p>Barabara hizi zitaboreshwa iki</p>



barabara kuu. klanandi ambao nyumba zimeguswa itabidi wapishe barabara kwa kuhama baada ya kushirikishwa katika hatua zote muhimu pamoja na dodoso, mitutano na kushauriana kwa lengo la ushirikishwaji. kwa hiyo mkutano huu ni kuelezea juu ya mpango wa makazi mbadala.

### MASHUMUNI

- I. Kutoa taarifa rasmi kwa walishtirika na mradi juu ya mradi na utaratibu wa utekelezaji
- II. Kupafanua au kujibu maswali kutoka kwa wadau (wanandi)
- III. Kupata maoni, ushauri, mapendekezo na athari pamoja na matarajio kutoka kwa walengwa wa mtadi.
- IV. Kufanya dodoso kwa kila kaya iliyoguswa na barabara.

Pia kiongozi alisema athari zitakuwa kubomolewa makazi, kupoteza sehemu za biashara na kipato. klapangaji kukosa sehemu za kupanga maeneo ya wazi (ardhi mazao mbalimbali (miti, maua) m.k)

Mtaalam alieleza kwamba serikali ya Tanzania itatoa fidia kwa wale walishtirika na mradi na Banki ya Dunia watasaidia kujenga barabara fidia itajumuisha mambo yafuatayo

- a) Masurufu ya usumbufu
- b) Gharama za usafiri
- c) Fidia ya nyumba iliyobomolewa na ardhi



wa miezi 36 au miaka mitatu. Fidha itakuwa kwa fedha taslimu baada ya wataalamu kufanya tathmini na kufanya hesabu kwa kila mlenywa. Bwana Msongwe aliwaomba wanandi watoe ushirikiano wa kutasha kwa wanaoendesha zoezi la dodazo na kwa wataalamu wa tathmini ili kila mmoja apate haki yake.

Pia alisema mambo mengine ya kuzingatia ni kwamba.

- Fidha itajanywa kwa kuzingatia bei ya soko ili mtu apate kitu alicho kuwa nacho au kama ni jengo liwe bora zaidi.

- Kkakati wa tathmini kila mmiliki awepe na ashiriki pamoja na viongozi wa mitaa wawepo kushuhudia na kuwatambua watu hao.

- Fidha itatolewa kwa kila anayestahiki mwenye hati na asiye kuwa na hati miliki.

- Muda wa kutasha utatolewa kabla ya kuanza ujenzi wa barabara baada ya kulipwa fidha ili walioathirika wapate makazi mbadala na kuhama.

- Vitendo vya ulanganyifu, kula njana na rushwa havitakuwa na kinyume cha sheria.

Baada ya hapo alikaribisha ali maoni ushauri, mapendekezo na maswali.

#### MASWALI

1. Je wenye miti ambao nyumba zao



kwa bei zinatotambuliwa na sentkali kutengemea aina na umri wa miti

2. Klapangaji kwenye nyumba itakuwaje, mbona hawatajwi?

Jibu: Kwa mujibu wa sheria za Tanzania wapangaji hawatambuliwi na hivyo hawatalipwi. Tutalichukua kama ombi ili nao wajikiriwe na mradi.

3. Ni nani atakayelipa fidha?

Jibu: Katika maelezo ya awali alisema kwamba sentkali itatoa fidha kwa wale walioathirika na mradi Benki ya Dunia itakuja kusaidia ujenzi wa barabara

4. Klatu walioquswa na barabara na nyumba zao zimebomolewa, watapelekwa wapi?

Jibu: Kama nilivyosema awali, watu wote watagidiwa pesa taslimu halafu kita mmoja atatafuta sehemu ya kwenda sentkali haina eneo la kumpatia mtu maana watu ni wengi.

5. Ni baada ya muda gani kuchekweshwa malipo, tathmini inaganywa upya? Au riba inatokwa?

Jibu: Kwa mujibu wa sheria ni baada ya miezi 6 tokea kuihinishwa kwa malipo. Mara nyingi huwa inatokwa riba kwa sababu kupanya tathmini upya ni gharama kubwa.



MAPENDEKEZO / USHAURI

1. Klananchi watitoa ushauri barabara ijengwe viguri kwa viwango vinavyo kubalika. Suala la mtaro wa maji machagu liganyiwe kazi ipasavyo maand wakazi tunapata hasara kubwa maji yanapojitika na kupaa maeneo ya makazi.
2. Mawasiliano yaboreshwe kati ya kata ya chang'ombe na ile ya Temeke maara maeneo yanaingiliana.  
Hata hivyo wananchi tusiporidhika na tathmini turehusiwe kuwa na wathamini binafsi kwa sababu uzoefu unaonyesha gharama zinakuwa ndogo na wananchi tunapunjwa.  
Pia baada ya tathmini kukokota hesabu kita mlenywa apewe/aonyeshwe hesabu yake kabla ya kuandaa hundi klananchi waliomba na kusema kuamba fidha isikatwe kodi maara matokeo yake watu watu wanaoathiriwa na mradi watapunjwa na fidha si uzalishaji.
3. Krongozi pia aliwaomba wale wote wanao guswa na mradi wawe na kikao chao ili wajipange na kujadili kwa udani chini ya Afisa Mtendaji.

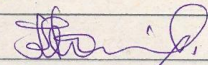
KUFUNGA MKUTANO

Baada ya maswali kujibwa, na mape-  
ndekezo kutokwa wananchi waliridhika.



ano uendelee na kuwashukuru  
wananchi wa wataalam kwa mkutano  
mzuri. Mkutano ulimalizika  
mnamo saa 11:30 jioni.

~~HAUADI TAJIRI~~  
HAUADI TAJIRI  
MWENYEKITI

  
H. J. UDONI  
KATIBU

AFISA MENDAJI WA KATA  
CHANG'OMBE

## **Appendix V: Summary of RAP**

### **CONSOLIDATED RAP FOR TEMEKE MUNICIPALITY SUB-PROJECT ROADS (PHASE1)**

#### **Main resettlement impacts**

The sub-project is associated with several categories of impacts that have to be mitigated prior to commencement of construction. The major impacts include building structures for different uses which will be demolished, loss of livelihoods / businesses among PAPs, loss of different infrastructure located within the road corridor, loss of community assets, loss of different properties (land, crops, trees) and loss of buildings. The details of these impacts have been presented in this report for the Ilala Municipality sub-projects under DMDP phase 1.

#### **RPF with focus on compensation policy / legal framework**

Relevant legal and policy frameworks were reviewed. Some of the policies and acts related to land acquisition, eligibility, entitlement, compensation and resettlement are applied in preparation of RAP. These include the Village land act No.5 (1999), Land acquisition act (1967) and land assessment (value of compensation) regulation, 2006. All policies and acts have been assessed and incorporated into the report. This is to ensure that all processes and procedures are done according to both Tanzanian laws and policies and World Bank (OP/ BP 4.12) to ensure fairness in the RAP process.

#### **Baseline information**

Baseline information has been presented in this report in length and in details and covers several aspects and issues concerning the existing socio-economic situation in the sub-project area. These include; Socio-economic activities, infrastructure and available social services (e.g. health, education, sanitation, water, energy, etc), major prevailing diseases, main sources of income in the sub-project and expenditure, housing conditions (building materials) and various uses, various assets / properties located within the road corridor, condition of the existing road, the situation and perception of HIV infections and AIDS epidemic, population in the ward, household composition particulars, to mention but few examples.

Results of the survey census show that approximately 560 properties will be affected by the said project.

#### **Institutional arrangements and responsibilities**

The overall responsibility of compensation and resettlement will be carried out by Ilala district council in collaboration with the Prime Minister's Office, Regional Administration and Local Government (PMO-RALG).

#### **Complaints and grievances**

At the time that the individual resettlement plans are approved and individual compensation contracts are signed, PAPs and households will have been informed of the process of airing their dissatisfaction and to seek redress. The grievance procedure will be simple and will be administered at local levels to facilitate easy access by PAPs.

The resettlement committees will be formed at each ward level with representatives from all key stakeholders. The issues related to resettlement and compensation will be discussed. Sensitization workshops will be conducted. All efforts will be made to settle the grievances



amicably before taken to legal procedures including courts. In cases where the litigation reaches the courts, the Honorable Court will be requested to expedite and resolve any litigation related to acquisition and/or compensation in the best interests of the project and the people.

### Implementation process and schedule

PAPs will be informed on the implementation schedule for RAP including, the formation of the Project Implementation Unit, grievances procedures and selection representative from PAPs in the grievances committee. The time allocated to evacuate the site and removal and salvage of remain materials. The date for starting road construction will also be communicated to the PAPs. No PAPs will be required to vacate the area before the compensation is being affected.

### Overall Budget

The overall total compensation cost, therefore, for all the four sub-projects roads involving resettlement is approximately **Tshs 5,520,000,000 equivalent to USD \$3.3 million**. The table below outlines the affected properties and cost estimates.

Road Segment	Affected properties	Partially affected households	Cost of partially affected households (USD)	Fully affected households	Cost of Fully affected households (USD)	Other compensation costs (USD)	Total Compensation Costs (USD)
Chang'ombe Road	92	9	\$ 257,089	14	\$ 399,916	\$ 824	\$ 657,830
Mchicha road	108	8	\$ 123,782	19	\$ 293,983	\$ 665	\$ 418,430
Mwanamtoti Road	200	24	\$ 510,315	26	\$ 552,842	\$ 2,866	\$ 1,066,023
Temeke – Mbagala	160	24	\$ 696,686	16	\$ 464,457	\$ 1,942	\$ 1,163,086
<b>Total</b>	<b>560</b>	<b>65</b>	<b>\$ 1,587,873</b>	<b>75</b>	<b>\$ 1,711,198</b>	<b>\$ 6,297</b>	<b>\$ 3,305,368</b>

Note that these are indicative cost estimates as of December 2014, after an initial design review was conducted in part to minimize resettlement costs through revising design standards to more appropriate road widths for the areas. This initial review resulted in a substantial reduction in compensation costs from over US \$5.3 million to about US\$3.3 million, largely through reducing the number of households that would require permanent relocation. This may be reduced further pending a more detailed design review after project effectiveness, after which the RAP will be finalized. The RAP and valuation report will be updated after this detailed design review.

**Appendix VI: Plates**



Chang'ombe road



Chang'ombe road



Temeke- Mbagala Road



Temeke- Mbagala Road



Nzasa- Kilungule- Buza Road



Nzasa- Kilungule- Buza Road



Mchicha Road (Sandali)



Mchicha Road (Sandali)





Kijichi- Tuangoma- Bridge



Kijichi- Tuangoma- Bridge



Mbagala Industrial road



Mbagala Industrial road



Mwanamtoti Road



Mwanamtoti Road



Access road to Mtoni Closed dump site



Access road to Mtoni Closed dump site

## Appendix VII: Social Survey Questionnaire

### SOCIO - ECONOMIC IMPACT ASSESSMENT QUESTIONNAIRE FOR DAR ES SALAAM METROPOLITAN DEVELOPMENT PROJECT

Interviewer's name ( <i>Mdodosaji</i> )										
Interviewee's name ( <i>Mhojiwa</i> )										
Name of the household head										
Sex of the respondent & Age	Sex(Me / Ke):					Age:				
Household number										
Code Number										
GPS Location (UTM) Homestead E 04	E						N 95			
Mtaa name										
Ward name										
District / Municipal name										
Date of Interview	..... / 03 / 2013									
Duration of household interview	Starting time: ..... End: .....									

#### 1. Demography data

##### (a) What is the composition of this household?

1. Male residents in the household .....
2. Female residents in the household .....
3. Disabled members .....
4. Widow .....
5. Orphan .....
6. Divorced .....
7. Widower(s) .....

##### (b) What are ages of people living in this household?

- 0 - 5 .....
- 6 - 17 .....
- 18 - 35 .....
- 36 - 50 .....
- 50 - 70 .....
- 71 and above .....

##### (c) Who heads this family?

1. Father .....
2. Mother .....
3. Elder child in the family .....
4. Both father and mother .....
5. Any other .....

**2. Literacy : Level of education reached :**

1. Number of household members never attended formal school.....
2. Primary school: 1-7 .....
3. Secondary school: form 1- 6 .....
4. Technical school .....
5. College / University : .....
6. Other .....

**3. What is the main source of income for the family?**

1. Agriculture .....
2. Business .....
3. Small scale business .....
4. Livestock rearing .....
5. Hand craft activities .....
6. Formal employment .....
7. Informal employment .....
8. Renting .....
9. Others (specify) .....

**4. Description of Main Homestead structure (Circle the correct answers)**

N O	Purposes of building	No. of Rooms	Floor	Walls	Roof
	1= Multifunctional residential  2= Sleeping 3= Kitchen only 4= Toilet, Shower 5= Combined residential/(business 6= Business only 7= Spiritual house 8= Other (specify		1= Earth 2=Concrete 3= floor tile 4=Other (specify)	1= Mud Block 2= Mud Block with plaster 3= Concrete blocks 4= Clay (Burnt) 5= Reeds or Sticks 6= Plastic 7= Corrugated iron sheets 8=Other (specify)	1= No roof/ 2= Thatch 3= corrugated iron sheets 4= Tiles 5= Corrugated iron sheet and Thatch/ Plastic 7= Other (specify)/

**5 . How many years has the homestead been living here .....****6 . Does the household head have another home (circle the answer)**

1 = Yes                      2 = No

**7. (i) Is the household head living here?**

1 = No                      2 = Yes

**7 (ii) If the answer is no above, where else is s/he living?**

.....

**8 . Where is water for domestic purposes obtained? (Tick in the box of the right answer)**

Rain water tank		Protected Communal pump on the site	
Traditional Well		Buy water	
Shallow wells		Buy water from vendors	
Domestic connection		Surface water sources	
Protected Communal pump off the site ( outside of this village		Other (specify	

**9. How long does it take to walk to the sources of drinking water from your homestead (minutes), that is, going and coming back** .....

**10. What is the amount of water consumed or generally used in your household per day? (Circle the answer)**

- 1 Less than 1 bucket of 20 liters
- 2 1 - 2 buckets
- 3 3 - 4 buckets
- 4 More than 4 buckets

**11. Explain the quality of water used at home**

- 1. Taste of the water:  
.....  
.....
- 2. Cleanness:  
.....
- 3. Other (specify):  
.....  
.....  
.....

**12.(i) Please indicate the energy source used in the following activities in your household and provide the estimated monthly costs**

Lighting	Tshs	Cooking	Tshs	Multiple uses	Tshs

**(ii) How often do you buy fuel or sources of energy? (Circle the answer)**

1. Every day      2. Once a week      3. Twice a week      4. Three weeks and more

**14. What problems do you have with your current source of energy?**

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**15. What are your coping mechanisms for the problems mentioned above?**

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**16. Please tell us how your household disposes refuse (circle the answer):**

1. Burry      2. Burnt  
3. Throw in the farm      4. Collection by municipal Council  
5. Feed to livestock      6. Throw anywhere in the compound

**17.(i) Did any members of your household suffer from any of the disease / maladies as indicated in the table below in the past six-month?**

1. Yes      2. No

**17 (ii) If yes please tell us how many of the household members were affected by each of the following diseases**

Disease / Malady	No. affected	Disease/ Malady	No. affected	Disease /Malady	No. affected
TB		Skin flash		HIV/ AIDS	
Malaria		Diarrhea		Other (name it)	

**18. (i) Are there graves belonging to the homestead situated locally or along the proposed road project?**

1. Yes (Number of graves)      2 No

18 (ii) Do you own planted trees along the proposed road?

1. Yes

2. No

19. Does your homestead currently have access to land that you use for gardening or other uses and which is within the road reserve? (Circle the answer)

1 Yes

2 No

24. Do you own livestock in your household? (Circle the answer)

1. Yes

2. No

25. If yes, how many livestock do you have and what type?

Type of livestock:

Number:

i) \_\_\_\_\_

ii) \_\_\_\_\_

iii) \_\_\_\_\_

iv) \_\_\_\_\_

26. Please tell me how much money, if any, was received by your household from each of the following sources in the last month of 2013 (February) We are only interested in cash income available to the homestead

		Tshs
Immigrant remittances		
Formal Employment	Salaries, wages of resident household members	
Self Employment	Gross profits from self-employment	
Agriculture	Livestock sales	
	Crop, vegetable, fruit, nut sales	
	Animal product sales	
	Other	
Other		

27. (i) What is the household average expenditure per day? \_\_\_\_\_

(ii) Expenditure of household / family per annum Tshs. \_\_\_\_\_

28. Obtain the following information on household members involved in informal / small business

Name	Nature of Business	Frequency **	Location of Business	Location of Market

Refer to Q28\*\* Indicate whether 1=daily, 2=weekly, 3= monthly, in season or occasionally



**29. How do you describe the condition of the existing (current) road?**

- 1. Very poor
- 2. Poor
- 3. Satisfactory

**30. What are problems / difficulties related to the existing condition of the road?**

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**31. In the following table, please indicate the number of working items that are available in the household**

Item	Number	Item	Number	Item	Number
Telephone (table)		Cell phone		Chair/Bank stool	
Radio		Sewing machine		Beds	
Television set		Maize mill		Bedroom suite	
Private Car		Private toilet		Lounge/ dining suite	
Wheelbarrow		Hi-fi-set/ music system		Gas stove	
Refrigerator		Table		Other (specify)	

**32. Do you know (are you aware) about the proposed Road rehabilitation project? (Circle the answer)**

- 1 Yes
- 2 No

**33. If the answer yes to the Qn. 32 above, what was the main source of the information?**

- 1. Government leaders (Mtaa / Ward / Municipal, etc)
- 2. Councilor
- 3. Crown Tech Consult Ltd
- 4. Media

**34. Indicate in the following table the location and distance from the homestead to the following public services**

	Location (Name of Mtaa / Ward)	Distance from homestead (km/hrs)
Church		
Mosque		
Primary school		
Secondary school		
Bus stop		

Clinic		
Farm		
Market		
Shop		
Water source/pump		
Preferable grazing area		

**35. What improvement would you like to see after road rehabilitation (respondent expectation on the road improvement)? *Positive impact of upgrading of the road project***

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**36. What are anticipated negative impacts resulting from the implementation of the road upgrading project?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**37. What do you think are important issues to be considered by implementers of this road during the process of implementation and after completion?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**38. Are there any other comments that you would like to make about the proposed road rehabilitation / upgrading project?**
