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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 METROPOLITANT DEVELOPMENT PROJECT(DMDP)

THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT (ESIA) OF THE PROPOSED LOCAL ROADS SUBPROJECTS IN KINONDONI MUNICIPALITY (24.65 KM)

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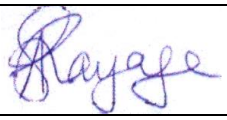
Anna S. K. Mwema	Sociologist	

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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 Governments (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 Kinondoni Municipality, 13 roads covering a total of 24.65km, 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 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 Kinondoni Municipal Council (KMC) is among the three municipalities of the Dar es Salaam City, consisting of 4 divisions, 34 wards, and 171 sub-wards. The Municipality has a total population of 1,775,049 and an average household size of 4.0 according to 2012 national Census. Out of the total population 860,802 are male and 914,247 female. The Dar es Salaam City experiences relatively high rainfall (800-1200mm per year), and high ambient temperature (25-35^{o}C) and humidity (67-96%). The geology of Dar es Salaam consists of two major geological units, that is, the underlying substratum of semi consolidated formations and outcropping rocks and superficial material mainly loose sediments. The soil is largely clayey and sandy.

The Municipal vegetation is constituted of various species of disturbed bushland and woodland species comprising of coastal shrubs along the beach areas in Mbezi Beach, Kunduchi, and Mbweni, Miombo woodland, and vegetation in coastal swamps and mangrove

trees. Part of the municipal land is cultivated (especially in the periurban areas) with different kinds of crops, comprising of mixed cropping; cultivation with tree, shade, bushy and herbaceous crops. The Mabwe Pande natural forest is within the municipality boundaries and is home to some endemic plants. Tree species found in the study area include Neem trees and Ashoka trees and teak trees. Wildlife in the municipality are mainly invasive bird species, particularly the Indian house crow which has out-competed many small native African birds. The municipality has a number of beautiful beaches including the Oysterbay, Mbweni, Ndege Beach, Ununio, Kunduchi and Buyuni beaches. In the northern coast between Msasani bay and Mbweni is an area of sensitive sand beach ridges mainly used as tourist attraction.

The municipality has several seasonal rivers/streams including Tegeta, Mbezi, Mlalakuwa, Kijitonyama and Sinza. Only the Sinza stream crosses the subproject roads, Makanya Road. Many of the rivers are considered grossly contaminated due to incessant discharge of both liquid and solid wastes. Air and noise pollution are among the modern issues in the city of Dar es Salaam. the air pollution sources include gaseous dust and particulate emissions from motor vehicles, industrial stacks construction activities and mining activities. The main pollutants emanating from these sources are sulphur dioxide, carbon monoxide, nitrogen oxides and particulate matters. The sources of noise are construction actives, traffic, entertainment centers and commercial sites like markets. 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.

The main landuse in the subprojects areas is human settlement, of which many of the areas are unplanned. During the ESIA study, it was revealed that (33.5%) of households were engaged in business and (28.1%) depend on formal employment, 18. % are dealing with small scale business, and informal employment is occupied by (12.6%).

The Kinondoni Municipal Council has 33 public health facilities and 168 private health facilities. There is one municipal public hospital (Mwananyamala) and 2 municipal public health centres namely Magomeni and Sinza. According to soicila survey study conducted under this consultancy in the subprojects the main diseases include; Malaria (20.2%), Skin flash (14.1%), Diarrhoea (11.3%), TB (7.9%), and HIV/AIDS (0.3%). The HIV infection prevalence rate in Dar Es Salaam region is 6.9% in 2012, which almost the same rate for Kinondoni 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;

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

- TANROADS Regional offices.

- Meetings at Msasani, Magomeni, Ndugumbi, Tandale, Manzese, Sinza, Kijitonyama, Makuburi and Kimara wards.

Results of Public Consultations

The following issues were raised by stakeholders;

- **Land take:** Unfair compensation of affected properties. This was echoed at every mtaa meeting. Inability of the proponent to mark out the Right of way (RoW) in advance and people are worried about government officials' who may embezzle compensation funds. The eligibility and compensation packages should be made transparent to the PAPs. The PAPs should be educated and counseled in implementing resettlement. Majority of people are insisting that the government should help them to find new land to relocate despite of being compensated.

- **Destruction of property within RoW:** The project will impact properties that are within the RoW. These include residential, business premises and community structures. The loss of these properties will affect livelihoods. It is felt that compensation may not be forthcoming or fair.

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

- **Parking area considered in the design and bus stand:** Since there are a lot of vehicles in Dar es salaam, it is important for a road design to consider establishment of special areas for car parking to avoid unnecessary accidents caused by poor packing of the vehicles. Almost all wards expressed their dire need to have bus stops in their respective areas as this will have several benefits to their wards.

- **Temporary road diversions during road construction:** During roads construction temporary routes should be prepared so that vehicles/buses continue to operate along the roads. This will help to reduce traffic congestion and Kinondoni roads have a socio- economic importance to people in Dar es Salaam area and neighbouring municipals.

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

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

- **Compensation process:** Compensation exercise should be implemented in a participatory manner where all family members will be aware of the entitlements of the affected people and the amount of money expected to be received. This will help to avoid misuse of the money and family conflicts. The couple should be both signatories of the bank account.

Potential Significant Environmental and Social Impacts

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

Impacts during pre-construction phase;

- 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) shall be prepared and 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 wetted.
- 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 coridor 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 Kinondoni 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, Kinondoni 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/mtaa 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 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 Kinondoni 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	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
KMC	Kinondoni Municipal Council
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
TTCL	Tanzania Telecommunication Company Ltd
ToR	Terms of Reference
WB	World Bank
VCT	Voluntary Counseling 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 Kinondoni Municipality, 13 roads covering a total of 24.65km, 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 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 Kinondoni 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 and April 2013.

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 EIA 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

Field study

The Social Impact Assessment team visited the project area from 4th to14th 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 Kinondoni Municipal council. Other sources of information included; divisions, wards, hamlets ("mtaa" as known in Kiswahili language) and communities along the project roads.

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 Kinondoni 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 Kinondoni, Ilala and Temeke.

Consultation with Government Leaders

Consultations were held with Municipal Authorities as well as TANROAD Staffs. 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.

Community Consultative Meetings

The 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. Since it was not possible to carry out public meetings in all mitaa along the roads, 10 wards were selected / visited and the meetings were conducted. This included the following wards Msasani, Magomeni, Ndugumbi, Tandale, Manzese, Sinza, Makuburi, Makumbusho and Kijitonyama.

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.

Figure 1.1: Consultative meetings conducted at Kwatundo Subward

Household questionnaires

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. From the household questionnaires one gets mainly quantitative information while other sources give qualitative information. It should also be noted that through the household questionnaires the respondents were also able to get more information about the project and raise their concerns.

The Consultant therefore carried out household surveys in 10 wards along Kinondoni roads project. 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. Every ward had a representative mitaa included in the study. Therefore, in total, 27 mitaa were surveyed and a total of 383 household heads or representatives were interviewed.

Sampling technique

The road project passes through 10 wards located in Kinondoni municipal . There are 27 *mitaa*s along the roads subprojects; it was possible to administer questionnaires in each mitaa. Therefore the consultant adopted sampling techniques. It should be noted that all mitaa along the proposed roads project had different number of population. The criterion used for number of questionnaires to be included in each mtaa was: Population, that means mitaa which had big number of people were given more questionnaires.

The study ensured that the whole community was fairly represented and issues related to gender diversity was addressed accordingly. For that matter, at least three men and three women pair category were interviewed. In total 383 questionnaires were administered.

Table 1.1: Number of questionnaires administered in each Ward

Name of the municipal	Name of the Ward	Number of Questionnaires
Kinondoni	Makuburi	50

	Kimara Sinza	50 45
	Manzese	45
	Tandale	45
	Kijitonyama Magomeni	40 35
	Ndugumbi	33
	Msasani Makumbusho	25 20
Total		383

Recruitment of Enumerators (study approach)
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;

i. **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

ii. **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

iii. **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

iv. **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 cummulative impacts;

Table 1.4: Types and Characteristics of Cummulative 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

v. **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.

vi. **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 were 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:

i. **Chapter one** contains the introduction on the background information of the proposed project, its development objectives, rationale and the proposed project implementation arrangements.
ii. **Chapter two** contains the project description, in which there is a description of the location and relevant components of the project and their activities.
iii. **Chapter three** illustrates policy, legal and administrative framework, which are the relevant Tanzanian environmental policies and legislation applicable to construction projects.
iv. **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.
v. **Chapter five** express the consultation exercise at the project area detailing the list of stakeholders consulted and the issues raised.
vi. **Chapter six** describes the positive and negative environmental impact 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 $6^{o}51'S$ latitude and $39^{o}18'E$ longitude. With an area of 1,350 square kilometres (km^2), it occupies 0.19 percent of the Tanzanian mainland, stretching about 100 km between the Mpiji River to the north and beyond the Mzinga River in the south. The Indian Ocean borders it to the East (Figure 2.1).

Kinondoni Municipality is located in the northern part of Dar es Salaam City. It has an area of 531 sq. km. It is boudered by Indian Ocean to the East and North, Coast Region to the west and Ilala Municipality to the South. Figure 2.2 below shows the respective subprojects within the Kinondoni municipality.

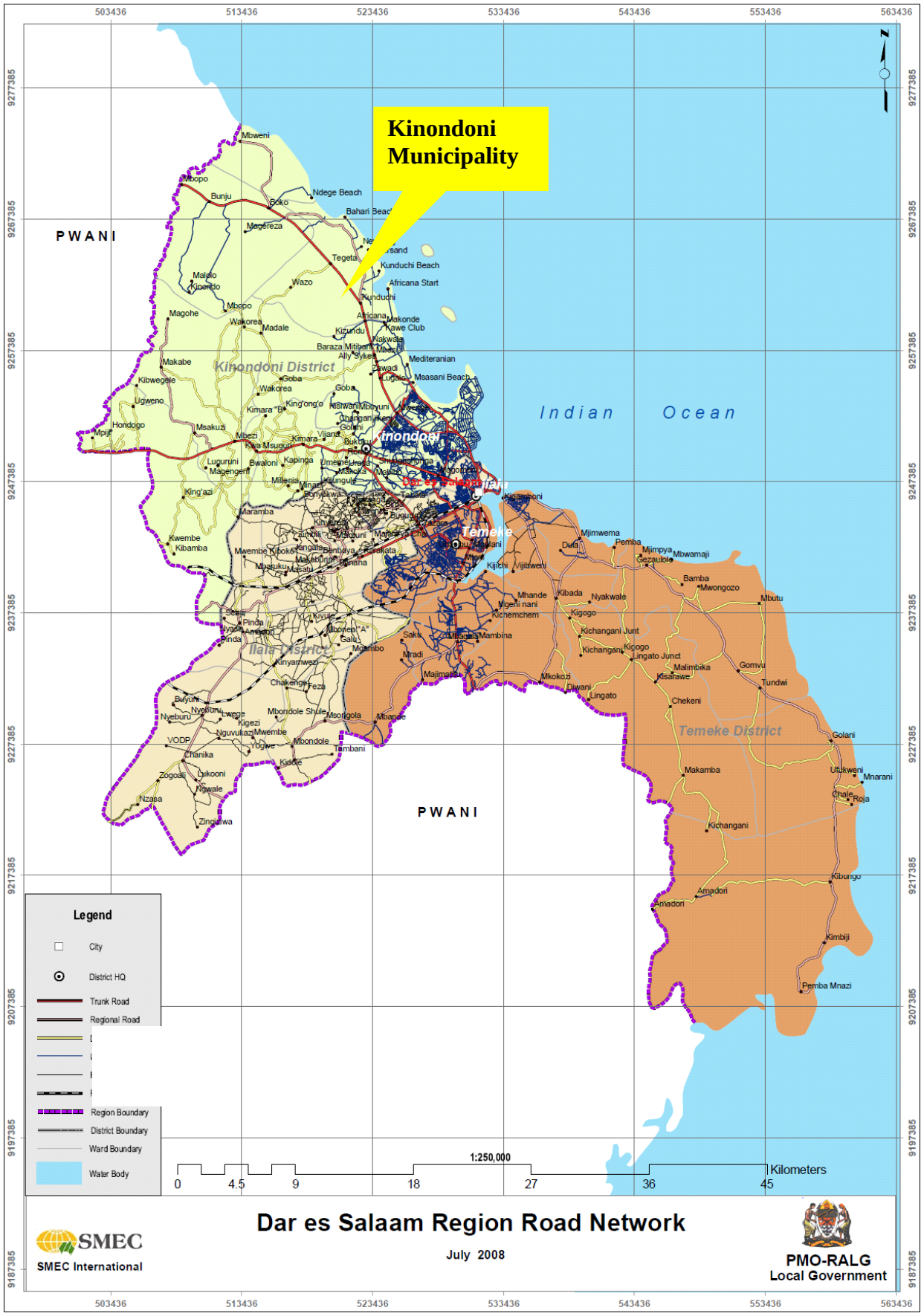

Figure 2.1: Map of Dar es Salaam showing Project Area-Kinondoni Municipality

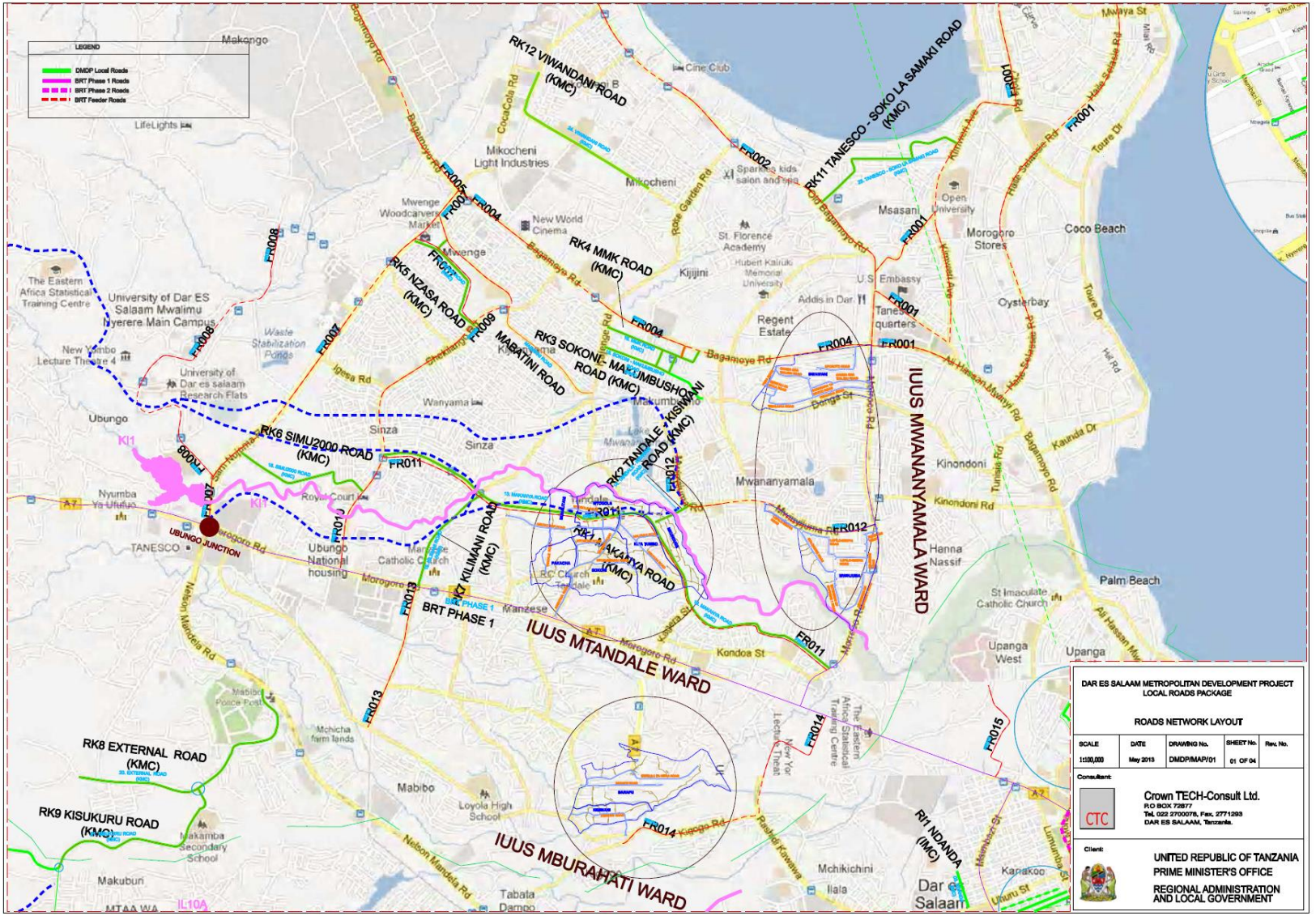

Figure 2.2: Map showing the Kinondoni local subprojects roads in colour green

2.2 Project Components and Design

2.2.1 Project Components

There are 13 stretches of subproject roads within the Kinondoni Municipal Council (KMC) that are included in the DMDP. All the subproject roads within Kinondoni Municipality are presently gravel road (except Makanya) and are to be upgraded to bitumen standard. Table 1 below gives the names of the Project roads and their description.

Table 2.1: Kinondoni Local Roads to be Upgraded

SN	Road Name	Length (km)	Proposed Treatment	Road Network
1	Kilimani	1.3	Upgrading to Tamarac level	Connecting Morogoro and Makanya roads
2	Makanya	5.1	Widening and Resurfacing	Connecting Kawawa Road (BRT Feeder Station) and Shekilango road
3	Tandale Kisiwani	0.8	Upgrading to Tamarac level	Makanya (Kwa Mtogole)- Mwinjuma road to Mwananyamala Hospital
4	Tanesco-Soko la Samaki	1.58	Upgrading to Tamarac level	Old Bagamoyo road- Kimweri road to city centre
5	Sokoni Makumbusho	.96	Upgrading to Tamarac level	Connecting Bukene road (From Mwananyamala Hospital)- Kajenge - Sokoni Makumbusho to Ali Hassan Mwinyi Road (LAPF Millenium Tower)
6	External	2.65	Upgrading to Tamarac level	Connecting Mandela road (EPZ)- Kisukuru- Maji ya chumvi (Tabata Ilala) -Kilungule-Morogoro road (Korogwe)
7	Kisukuru	1.9	Upgrading to Tamarac level	Connecting Mandela road (EPZ)- External- Maji ya Chumvi (Tabata ilala) -Kilungule-Morogoro road (Korogwe)
8	Korogwe-Kilungule	2.88	Upgrading to Tamarac level	Connecting Morogoro road (Korogwe)- Makoka-Kibangu-Riverside-External- Mandela road (EPZ) to Maji ya chumvi (Tabata-Ilala)
9	MMK	1.45	Upgrading to Tamarac level	Connecting Sokoni Makumbusho to Ally Hassan Mwinyi road (Lapf Milenium tower) or Kajenge road
10	Nzasa	1.25	Upgrading to Tamarac level	Connecting Shekilango road and Sam Nujoma road
11	Simu 2000	1.3	Upgrading to Tamarac level	Connecting Shekilango road (Mugabe- Sam Nujoma road (Tanesco Quarters Ubungo)
12	Kilongawima	1.8	Upgrading to Tamarac level	Connects Africana and Kunduchi Roads
13	Viwandani	1.68	Upgrading to Tamarac level	Connects Cocacola and Rosegarden Roads

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
- 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 Makanya, Kusukuru, Kilungule and MMK roads.
- 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
- A road reserve 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	20,396,250m^3
	Hard Stone	Section 2.4.2	60m^3
	Sand	Section 2.4.3	100m^3
	Water	Section 2.4.4	100,000ltrs
	Cement	Wazo Hill, Dar es Salaam	5tonnes
	Reinforcement bars	Dar es Salaam	20tonnes
	Timber	Local vendors (Dar es Salaam)	150m
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 Authorized dumpsite at Pugu Kinyamwezi
Liquid waste	Sewage	1.6 m^3 (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.
- 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

Requirements	Type	Source	Quantity required
Raw Materials	Gravel	Section 2.4.1	109,589,000m^3
	Hard Stone	Section 2.4.2	200m^3
	Sand	Section 2.4.3	250m^3
	Water	Section 2.4.4	300,000ltrs
	Bitumen	South Africa/Saudi Arabia	6,133.6tonnes
	Cement	Dar es Salaam	15,358tonnes
	Reinforcement bars	Dar es Salaam	415tonnes
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's 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 fuel 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

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Vegetations (Trees, Grasses) and remnants of timber.	About $300m^3$ 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^3 (Based on removal of 10cm topsoil from the $(5x25.25)m^2$ 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	$4m^3$/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 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

Source: Consultant's 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)

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 authorized 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 Kinondoni Municipal Council (KMC). The design period is 20 years, after which re-surfacing will be needed. During this time, KMC 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)

Requirements	Type	Source	Quantity required
Raw Materials	Gravel	Section 2.4.1	14,897.5m^3
	Hard Stone	Section 2.4.2	20,000m^3
	Sand	Section 2.4.3	30,000m^3
	Water	Section 2.4.4	150,000ltrs
	Asphalt	Saudi Arabia	5,362m^3
	Cement	Dar es Salaam	4tonnes
Manpower	Skilled	Contractor	2
	Unskilled	Local People along the road	18
Equipments	Excavator	KMC/Contractor	1
	Wheel loader	KMC /Contractor	1
	Water Boozer	KMC /Contractor	1
	Bull dozer	KMC /Contractor	1
	Motor grader	KMC /Contractor	1
	Roller Compactor	KMC /Contractor	1
	Plate compactor	KMC /Contractor	1
	Crasher	KMC /Contractor	1
	Tippers	KMC /Contractor	1

Source: Consultant's 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 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. The asphalt will be stored in their respective containers which will be kept in the storage rooms.

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 $5m^3$/ 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 shall 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 taken 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

Gravel material for pavement layers construction will be sourced from Kwa Msambaa borrow Pit located at Boko area about 22.5km from Ubungo and 4km offset distance in the left hand side along the Dar es Salaam to Bagamoyo Road. The pit is privately owned and estimated to have about 20 hectares, with average depth of 4m. The current average price rate of materials for one trip of $15m^3$ is Tshs. 5,000/- (excavation, loading and hauling at contractors expenses). Estimated amount of gravel available in the pit is $980,000m^3$.

2.4.2 Hard Stones

The aggregates will be sourced from the Lugoba Quarry, about 20km from Chalinze Town (or 120km from Dar es Salaam. The quarry produces various sizes of aggregreatates. The

quarry is privately owned by several companies including Ms. Estim Contractor, Ms. Kerai, Ms. Tembo Quarry etc. For instance, available quantities of materials under Ms. Estim Constrocrors is estimated to be 300,000m^3.

2.4.3 Concrete Sand

Sand for concrete and other construction works will be collected from Kerege River (river sand) at Bagamoyo and which is being used for other ongoing projects in Dar es Salaam. Estimated quantities available amounts to 220,500m^3.

2.4.4 Water Sources

Water for construction will be drawn from the city water reticulation system operated by DAWASCO.

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 Labolatories 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 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 MMI steel industry located in Mikocheni light induatrial area. Their strength and other properties of reinforcing steel will to 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 availaval in Tanzania. However, before the material is purchased for use in this projects, its properties will be checked by testing representative samples in approved laboratories.

2.5 Ressettlement and Compensation Issues

The project shall entail expropriation of properties such as buildings/houses, business premises, land, crops, trees etc. Seven of the 13 road segments in Kinondoni would require resettlement and compensation. A 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 project affected persons, affected buildings and compensation value for in Kinondoni Municipality. A brief 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)
External	116	10	$ 281,682	19	$ 535,197	$ 1,380	$ 818,259
Kilimani	88	4	$ 988	18	$ 4,448	$ 434	$ 413,079
Kilongawima	80	4	$ 40,284	16	$ 161,137	$ 444	$ 201,865
Korogwe-Kilungule	60	8	$ 193,947	7	$ 169,703	-	$ 363,650
Makanya	392	23	$ 754,089	75	$ 2,458,986	$ 1,157	$ 3,214,232
SIMU 2000	60	10	$ 136,990	5	$ 68,495	$ 819	$ 206,303
Tandale Kisiwani	112	5	$ 105,873	23	$ 487,015	$ 301	$ 593,190
Total	**908**	**64**	**$ 1,513,854**	**163**	**$ 3,884,981**	**$ 4,534**	**$ 5,810,578**

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 a cornerstone of its support to sustainable poverty reduction. The 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 bank and borrower staffs in the identification, preparation, and implementation of programs and projects. These Policies includes;

- OP 4.01 - Environment Assessment
- OP 4.12 - Involuntary Resettlement
- OP 4.11 - Physical Cultural Resources
- OP 4.10 - Indigenous Peoples
- OP 7.50 - Projects on International Waterways
- OP 7.60 - Projects in Disputed Areas
- OP 4.37 -Safety on Dams
- OP 4.36- Forests
- OP 4.04-Vegetations

This EIA 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 essentialy 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 community 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 has been triggered as, the Makanya Road 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 have 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 ordre to maximaxi their participation in ther own development and so forth. The policy also recognise and emphasize that family householsd 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 Sectoral 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 Kinondoni 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) provide 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 Kinondoni 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 0f 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 practise. 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 of 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 Petrolium 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 restrict 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 with 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 (lEE) 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 contain 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
- 1712Clean 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. Roads upgrading project is likely to interfere with the normal lives of nature such population and some habitats. The contractor shall be instructed to employ local people wherever possible so as to minimise the cultural interference. If necessary awareness campaigns shall be conducted.

3.6 Institutional Framework

Institutionally, Kinondoni 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 KMC 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 Kinondoni Municipality Synopsis

4.1.1 Climate

The Municipality experiences a modified type of equatorial climate. It is generally hot and humid throughout the year with an average temperature of 29^0C .The hottest season is from October to March while it is relatively cool between May and August with temperature around 25^0C. There are two rain seasons, the short one is from October to December while the long one is between March and May. The average annual rainfall is 1300mm. Humidity is around 96% in the mornings and 67% in the afternoons. The climate is also influenced by the Southwest monsoon winds from April to October and Northeast monsoon winds between November and March.

4.1.2 Topography and Land forms

Land units characterize Kinondoni Municipal, each with homogeneous characteristics potential for the future municipal development.

(i) The shorelines immediately abutting the sea comprise sand dunes and tidal swamps.
(ii) Hills are characterized by weathered slopes and well drained with unconsolidated clay bond sands. An occasional outcrop of raised coral limestone also occurs especially around the Wazo-Kunduchi area.
(iii) A limestone coastal plain at Kawe rises in the North before falling to eight kilometres at Mpiji River. Lakes and Ponds are scattered throughout this landform with clay soils and Zero gradient impede natural drainage.
(iv) River Valleys is another land unit dissect the coastal plain in the series of the steep sided U- Shaped Valley culminating in cracks and Mangrove swamps before entering Indian Ocean. Valley soils are generally poorly drained silt clay soils enriched with clay matters.
(v) The forests are natural and man-made. The natural forests are merely the natural vegetation of low land forest with scattered dominant trees bushes; tall grasses and mangrove forests especially along the coast and river estuaries while the man –made forests are trees planted by the forest Department and managed by village governments. Pande forest, which was declared a forest reserve in 1960s having about 3,030 Acres of land, located about 15 km off Bagamoyo road, was then declared Pande game reserve in 1990s accommodating various species of Wild animals like monkeys and birds.

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 Y. *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 Y. *et al* 2012).

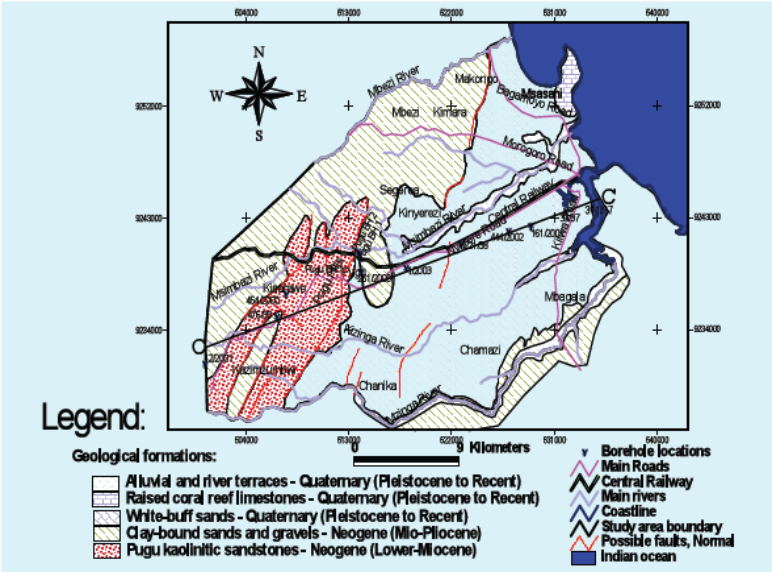

Figure 4.1: Map showing geological formation of Dar es Salaam (Mjemah, 2013)

4.1.4 Vegetation and Wildlife

The Kinondoni Municipal vegetation is constituted of various species of disturbed bushland and woodland species (URT, 1984) comprising of coastal shrubs along the beach areas in Mbezi Beach, Kunduchi, and Mbweni), 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). The Mabwe Pande natural forest is within the municipality boundaries

and is home to some endemic plants (URT, 2011). The most common vegetation type in the study area include Neem trees, Coconut trees, Mango trees, ashoks and a few other indigenous plants.

Mabwe Pande is also the only remaining biological species reserve in the city, and it contains a significant diversity of monkeys, bats, birds and reptiles (Baker and Baker, 2002). A few birds (mostly the Indian Crow), and reptiles such as lizards and a significant number of rats and flies were observed in the study area. Rats and flies were seen in waste dumpsites where as replies were seen along the stream banks and in residential areas. The Indian crow on the other hand were all over the place, in residential area, scavenging waste dumps, in hotel and restaurants etc.

In addition to the limited availability of large animals in the city, presence of invasive bird species, particularly the Indian house crow (*Corvus splendens*) has out-competed many small, native African birds. The Indian house crow destroys the habitat of many other birds and as a result in Dar es Salaam City, there are now only a few other common bird species (UNEP, 2006). The Indian house crow (Plate 5.1) has spread from the coast inland over the last 20 years. The house crow came aboard ships from India – probably as early as the late 1800s. This bird kills other species, destroys nests, and eats eggs and chicks of the domestic chicken. It also spreads disease and is generally a serious pest in towns along the coast of Eastern Africa (UNEP, 2006). The Government of Tanzania in collaboration with other stakeholders such as the Wildlife Conservation Society of Tanzania (WCST) have implemented some initiatives, including trapping with the aim of eradicating this invasive bird.

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 seagrasess 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). Kindondoni Municipality has one standard fish market at Kunduchi area and many other non-

official markets near the sea. There is no direct link between the Local roads project and pollution of marine resources, but pollution of feeders streams might be of concern.

4.1.6 Wetland resources

The municipality has a number of beautiful beaches including the Oysterbay, Mbweni, Ndege beach, Ununio, Kunduchi and Buyuni beaches. In the northern coast between Msasani bay and Mbweni is an area of sensitive sand beach ridges mainly used as tourist attraction (URT, 2011). There are two main bays within the municipality, the Msasani Bay and Oyster Bay. Also there are several smaller estuaries, some of which occur along seasonal streams. Several of these estuaries support mangroves and/or sea grass beds. Although there are no significant wetland resources in the study area, pollution of feeder streams could result into pollution of these resources outside the study area. The main threat to these resources is pollution mainly from residences, industries as well as from other activities like construction activities.

4.1.7 Freshwater resources

The municipality has several seasonal rivers/streams including Tegeta, Mbezi, Mlalakuwa, Kijitonyama, Sinza and Tabata. None of these are within the project areas. These are used as a source of water for different types of human activities, mainly as last resort water sources for poor families in unplanned settlements who cannot afford to purchase water commercially (URT, 2011). Ecologically, these rivers/streams collect and drain storm water to the wetlands and the ocean, thus, protecting the built-up areas from flooding hazards.

4.1.8 Administrative Setting

Kinondoni Municipal has four (4) divisions namely: Magomeni, Kinondoni, Kibamba and Kawe. These divisions are divided into thirty four (34) wards, which are sub divided into sub wards commonly known as Mtaa (singular) or Mitaa (plural). There are 171 Mitaa. The Municipality also has 3 electoral constituencies namely: Ubungo, Kawe, and Kinondoni. The Municipal governing body is the Full Council which comprises 56 Councillors out of whom 34 are elected Ward representatives, 12 councillors (women special seats from wards), 3 are members of parliament elected constituencies representatives (MPs) and 7 are Members of Parliament(MPs) (women special seats).

4.1.9 Population Size

Kinondoni Municipality have a total population of 1,775,049 and an average household size of 4.0 (Census, 2012). Out of the total population 860,802 are male and 914,247 female.

4.1.10 Air Quality

There are many sources of air pollution in Kinondoni District, including gaseous dust and particulate emissions from motor vehicles, industrial stacks construction activities and mining activities. Sources of noise are such as construction actives, traffic, entertainment centers and commercial sites like markets. The main pollutants emanating from these sources are sulphur dioxide, carbon monoxide, nitrogen oxides and particulate matters (Mbuligwe and Kassenga

(1997) and Jackson (2005). Table 4.5 presents results of air quality assessment in unplanned settlement in Kinondoni district. Manzese was used as a pilot study. Average concentrations of three major pollutants were found to be above the WHO guideline.

Table 4.1. Concentration of major air pollutants in unplanned settlement in Kinondoni

Pollutants	Value range	Unit	WHO Guidelines	Remarks
Average hourly sulphur dioxide	127 - 1385	µg/m^3		Above guidelines
Average hourly nitrogen dioxide	32 - 65	µg/m^3	190-320 for 1 hr	Below guidelines
Average hourly suspended particulate matter (SPM)	712 -743	µg/m^3	150 - 230 for 24 hr	Above guidelines
Average hourly Particulate lead	11.41-11.88	µg/m^3	1.5 µg/m^3	Above guidelines

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

4.1.11 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 decreases 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.

4.1.12 Surface Water Quality

A number of rivers and stream are found in Kinondoni Municipality. In the study area specifically, there are a number of seasonal streams, which are heavily contaminated by human activities. Main sources of pollution are 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 data from an unpublished source (only for one major stream passing through Sokoni, Tandale and Mburahati wards) have been used. Samples were collected in Tandale ward during the dry season and were analyzed for parameters shown in Table 4.2.

Table 4.2: Water quality parameters for Tandale stream

Parameter	Concentration	Tanzania Standards for drinking water (TZS 789:2003)
pH	6.2 – 7.9	6.5-9.2
Electric conductivity (µS/cm)	8.5 – 15.7	
Colour (TCU)	103 – 267	1.5-50
Turbidity (NTU)	52 – 75	5-25
Sulphates (mg/L)	156 – 302	200-800
Nitrites (mg/L)	71 – 127	2

Source: Paul *et al.*, 2005

The result above show that the water is highly polluted as the values for Colour, Turbidity and Nitrates are way above the prescribed standards. High values of nitrates also signify that water is polluted by faecal matter (On site sanitation practised at upstream and Tandale). The water cannot be used for drinking purposes.

4.1.13 Ground Water Quality

Groundwater pollution in Dar es Salaam City as a whole is due to both point and diffuse sources. Point sources in Kinondoni 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 in Kindononi. Secondary data on estimates of ground water pollution load from households in unplanned areas are presented in Table 4.3. These estimates can be used in estimation of these parameters from new toilets, and from camp sites (if any).

Table 4.3: 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 reports high levels of nitrite and bacterial contamination in boreholes located in highly populated areas like Mansese and Mabibo wards in Kinondoni District (Mato, 2002). The connetrations of chlorides and fecal coliform were above TBS guidelines. Similar results were reported in 1999, where the concetrations 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 4.4: Ground water quality parameters from 1999 - 2001

Parameter	**Sulfates**	**Nitrites (mg/L)**	**Chloride (mg/L)**	**Turbidity (mg/L)**	**Feacal Coliform bacteria (colonies/100ml)**
	54.9-60.1	14.6–15.6	653-913	1	0-9
TSB standard	600	100	800	30	0

Source: Mato, 2002

4.1.14 Ethnicity and Religion

The main tribes along the roads project of Kinondoni Municipal are Zaramo and Ndengereko, but due to urbanization, many people of different ethnic groups have migrated to live in the areas. There is in-migrants were searching for employments opportunities and business opportunities. (source: Kinondoni Municipal Profile 2012). The dominating religions are Islamic and Christianity

4.1.15 Language

In Tanzania, Swahili is the national language that is spoken by majority including population in the project areas. However, in some instances, the elder population are more conversant in their mother tongues. Swahili is spoken almost in every mitaa. (source: Kinondoni Municipal Profile 2012).

4.2 Existing Situation of Subprojects

4.2.1 General Overview

There are 13 stretches of subproject roads within the Kinondoni Municipal Council (KMC) that are included in the DMDP. All the subproject roads within Kinondoni Municipality are presently gravel road (except Makanya 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 4.5.

Table 4.5: 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	**Tandale Kisiwani**	• Commercial/Residential	Flat	Earth-bad condition	• No side drains	No	Minimum	• Electric Transmission Lines • Telephone lines	• Few trees	Yes	Urban
2	**Kilimani**	• Commercial/Residential	Flat	Gravel/ Earth	• Some Sections have side drains some have no Side Drains	No	Moderate	• Electric Transmission Lines • Telephone lines • Street lights	• Few trees	Yes	Urban
3	**Makanya**	• Commercial/Residential	Flat	Tarmac	• Some Sections have side drains some have no Side Drains	Yes, at some sections	Very high	• Electric Transmission Lines • Telephone lines • Water Supply Pipes	• Neem trees • Shade trees • trees • Coconut trees	No	Urban
4	**Tanesco-Soko la Samaki**	• Residential/ Institutional	Flat	Gravel-fair condition	• Some Sections have side drains some have no Side Drains	No	Moderate during noon time but high during morning and evening	• Electric Transmission Lines • Telephone lines • Water Supply Pipes	• Small grasses • trees • Neem trees • MadrasThorn fence • Coconut trees • Baobab tree within the road space at 1.3km	No	Urban
5	**Sokoni Makumbusho**	• Commercial/Residential	Flat	Earth-bad condition	• Two sides unlined drains	No	Moderate	• Electric Transmission Lines • Telephone lines • Water Supply Pipes	• Neem trees • Umbrella trees • Ashoka trees • Coconut trees • Almond trees	No	Urban
6	**External**	• Institutional/ Commercial / Residential	Flat	Gravel	• No side drains	No	Moderate	• Electric Transmission Lines for the first 1.3km	• Neem trees • Shade trees • Ashoka trees • Coconut trees	No	Urban

SN	Road Name	Land Use	Topography	Type of Road	Side Drains	Presence of Bus stops	Traffic	Utilities Present	Vegetation	Need for Resettlement	Zoning
									• Bushes • Indigenous trees from 1.3km		
7	**Kisukuru**	• Institution (Military area)	Undulating	Gravel	• No side drains	No	Minimum	• No	• Bushes and Indigenous trees	No	Peri-Urban
8	**Kilungule**	• Commercial/ Residential	Undulating	Earth	• Some Sections have side drains some have no Side Drains	No	Minimum	• Electric Transmission Lines • Telephone lines • Water Supply Pipes	• Neem trees • Umbrella trees • Shade trees • Ashoka trees • Coconut trees • Mango trees	Yes	Peri-Urban
9	**MMK**	• Commercial/ Residential	Flat	Gravel/ Earth-bad condition	• Two sides unlined drains	No	Moderate	• Electric Transmission Lines • Telephone lines • Water Supply Pipes	• Neem trees • Ashoka trees • Small grasses • Mango trees	No	Urban
10	**Nzasa**	• Residential	Flat	Gravel/ Earth	• Some parts have unlined drains	No	Moderate	• Electric Transmission Lines • Telephone lines • Water Supply Pipes	• Neem trees • Ashoka trees	No	Urban
11	**Simu 2000**	• Commercial/Residential/ Institutional	Flat	Gravel/ Earth	• No side drains	No	Moderate	• Electric Transmission Lines • Telephone lines • Water Supply	• Neem trees • Ashoka trees • Shade trees • Coconut trees	No	Urban
12	**Kilongawima**	• Residential	Flat for most part	Gravel/ Earth	• No side drains	No	Moderate during noon time but high during morning and evening	• Electric Transmission Lines • Telephone lines • Water Supply	• Neem trees • Shade trees	Yes	Urban

SN	Road Name	Land Use	Topography	Type of Road	Side Drains	Presence of Bus stops	Traffic	Utilities Present	Vegetation	Need for Resettlement	Zoning
13	**Viwandani**	• Industrial/ Institutional	Flat	Gravel	• Unlined side drains	No	Moderate	• Electric Transmission Lines • Telephone lines • Water Supply	• Neem trees • Shade trees • Ashoka trees •		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 4.6 below shows the road side air quality in terms of SO2, NO2, CO and Dust (SPM) in Dar es Salaam from several studies.

Table 4.6: Road side air quality in selected roads of Dar es Salaam

Site	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	SPM ($\mu g/m^3$)	CO ($\mu g/m^3$)	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	**200**	**350**	**230**	**10**	

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.

4.2.4 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. Kilungule and Kisukuru roads are the most vegetated 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.

4.3 Socio-Economic Environment of the project roads

4.3.1 Composition and age of household

The average family size in the project area is 4 family members per household though there are some families with more than five or less members. Also, it was revealed that the family structure is of the extended family. According to the data gathered, over two percent (2) of the household members were aged below 20 years while 2.1% were aged over 70 years. Twenty five point nine percent of the interviewed household are between 40 and 49 years. The table below portrays the composition.

Table 4.7: Age of household members

age group		
Age (years)	Frequency	Percent
10-20	10	2.6
20-30	59	15.4
30-40	68	17.8
40-50	99	25.9
50-60	69	18.1
60-70	30	7.9
70-80	6	1.6
80-90	2	.5
Total	343	89.8
System	39	10.2
Total	382	100.0

Source: Socio economic Field Study 2013

4.3.2 Gender status in the Household

Within the interviewed households, it was revealed that most of the women have attained primary school education and secondary education. Most of the people interviewed indicated that very few women have reached technical school and University level compared to men. These results indicate that women have high illiteracy rate than men.

4.3.3 The head of the family

Sixty seven point eight percent of households are headed by male while 19.4% consulted households are headed by women. Out of 19.4% household headed by women, some are widowed women. Orphans and disabled were also found among the households interviewed.

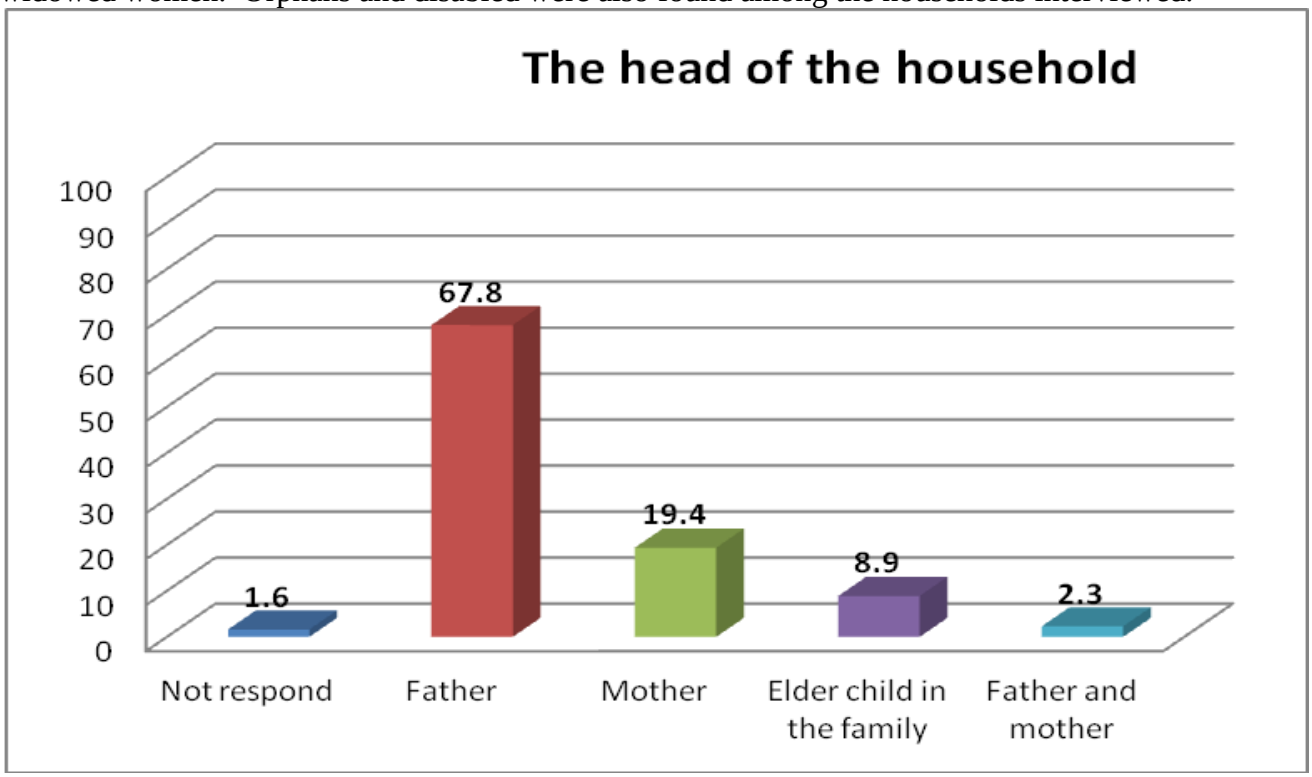

Figure 4.2: Head of the Household **(**Socio economic Field Study 2013)

Sustainable development among the mitaa comes when both women and men are given equal chances and opportunities to participate fully in all development stages. In the project area most of the women are not significantly involved in planning cycle and implementing activities especially in economic activities. According to the data gathered, it was revealed that most of the women are not engaging in development activities. The most common economic activities involving women are small business such as food vending; hair salon, and shop keeping. Furthermore, their dealing with vegetable gardening and animals keeping.

Regarding the access to economic opportunities such as land (house) and other family wealth, there is an existence of unequal access between men and women. This leaves women with very few options of earning their lives decorously. It is reported that sometimes some of the women resort to promiscuity in order to meet their needs. With the prevalence HIV/AIDS situation, they place themselves in a high-risk area, and the HIV/AIDS vicious cycle becomes difficult to break. In the project area, the challenge that faces gender issue in almost all consulted is house ownership. This is still a problem since most of the women are not given chances to own house.

4.3.4 Source of Income and Affected mitaa Occupation

During the study, it was revealed that (33.5%) of households were engaged in business, (28.1%) is depend on formal employment .About 18. % are dealing with small scale business, Informal employment is occupied by (12.6%), whereas 6.2% depend on renting while (1.6%) of households engage in agriculture, handcraft and livestock rearing.

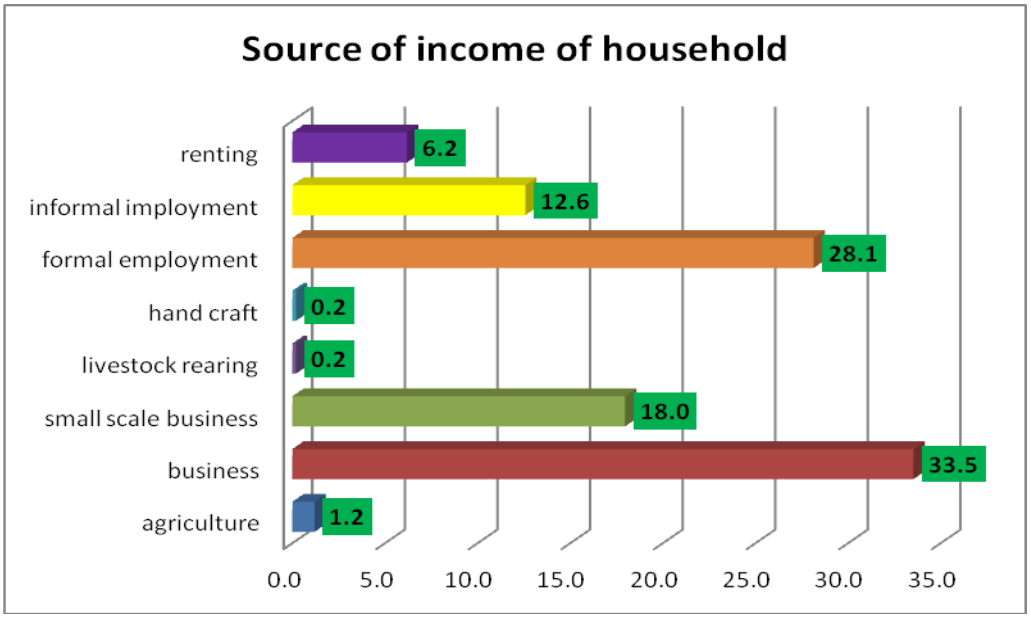

Figure 4.3: Source of household income (Socio economic Field Study 2013)

Regarding income of the households, majority of the respondents reported to earn below 100,000 Tshs per annum. (94.8%) received income from immigrant remittances. (64.7%) formal employment, (45.7%) Self employment and (92.4%) got money from agriculture. Followed by those who said they earn between 100,000 to 500,000 Tshs. (1.8%) received income from immigrant remittances, (17.5%) formal employment, (35.5%) self employment and (3.9%) got money from agriculture. On the other hand there are those who earn between 500,001/ - 1,000,000/- per month (1%) from immigrant.,(9.9%) formal employment (35.5%) self employment and (0.8%) earned from agriculture. The rest earn above 1,000,000/- Tshs per month. Some of the households did not respond on their income. Please refer to the figure below.

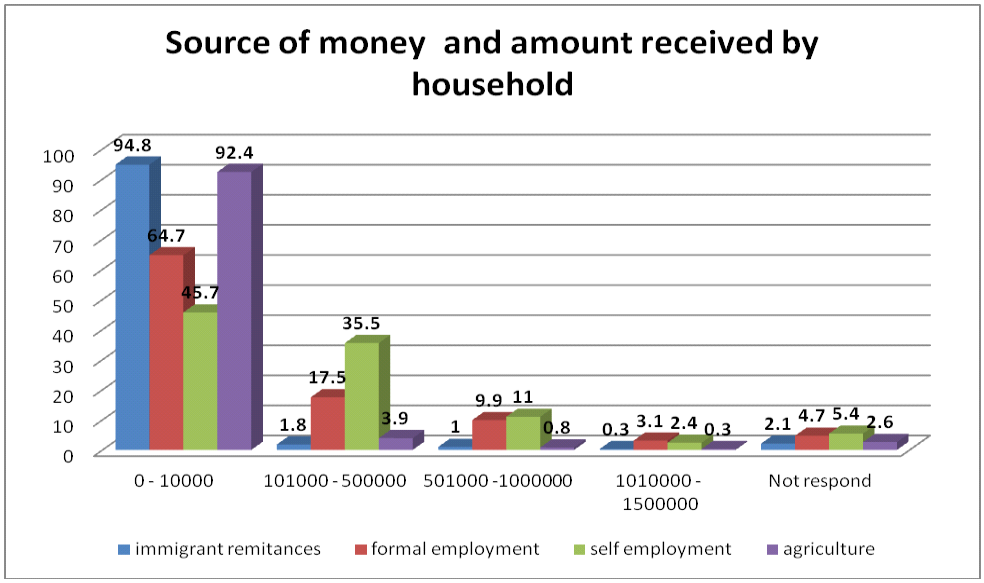

Figure 4.4: Total cash income for the last month (Socio economic Field Study 2013)

Although formal employment is termed as major source of income followed by self employment, still there are other sources including agriculture and livestock keeping. Livestock production is done by women while men are involved in agriculture.

4.3.5 Employment / Household

The main employment opportunity of households is mainly in the formal sector which comprises of Government sector and Private sector. Informal employment of households is mainly in the sector which comprises of farming, livestock keeping and petty businesses.

4.3.6 Agriculture

The principal food crops are Sweet potatoes, paddy, Cassava, maize, banana and pulses, other crops include; vegetable

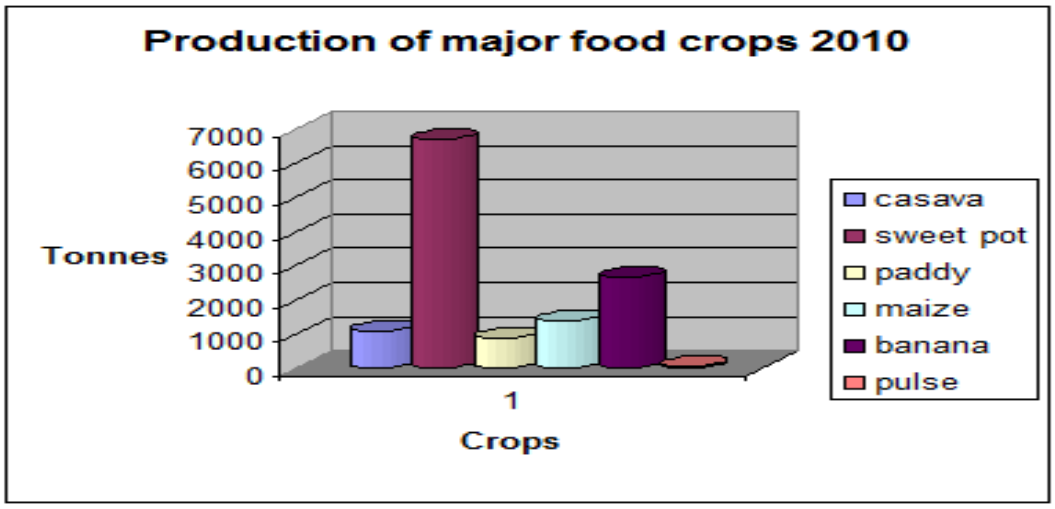

Figure 4.5: Major Food crops (Kinondoni municipal profile 2012)

4.3.7 Livestock keeping

Livestock in the Municipality contributes 34% of requirements. Actors engaging in livestock keeping include individuals, groups and institutions. Market for the livestock products are within the Municipality and Dar City at large. (20.2%) of the interviewed population keep animals. Type of livestock kept includes cattle, goats, pigs, and chicken. Due to inadequate grazing land in most of areas, zero grazing is practiced. Chicken feed haphazardly in the sheds for poultry in the household compound. For details refer figure 4.6 below;

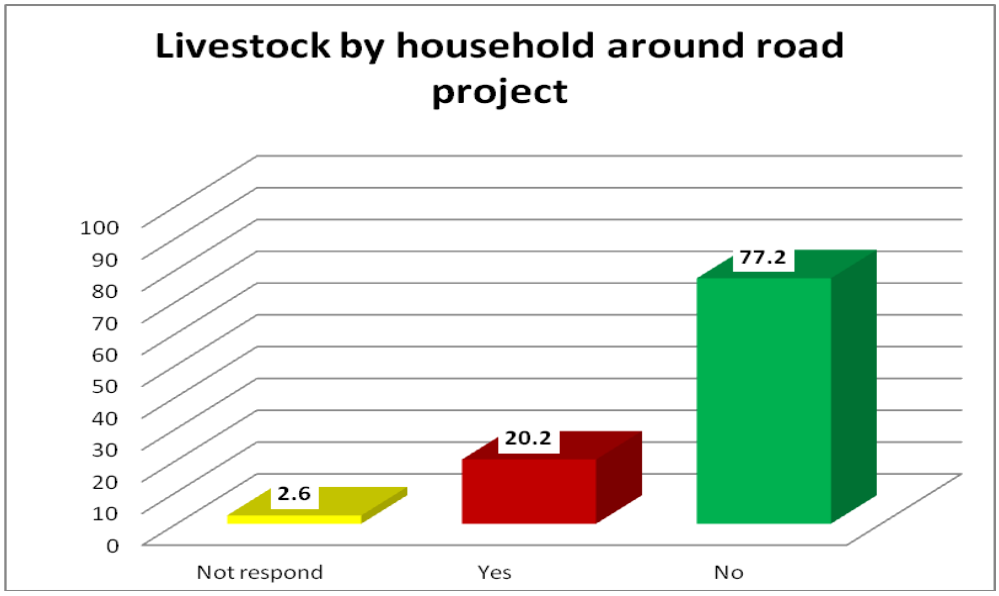

Figure 4.6: Livestock by households in the road project (Socio economic Field Study 2013)

4.3.8 Water Supply

Water supply in the project area is not uniform, the level of services differs from one area to another .Some of the areas have better services while others not. The surveyed areas are better serviced compared to squatter areas. The main source of water for Kinondoni residents is Dar Es Salaam Water and Sewerage Authority (DAWASA), which contributes 95% of water being consumed daily and the rest 5% is contributed by shallow and deep wells own both privately and by public. Out of total population of Kinondoni, which is 1,385,732 only 60%, have direct access to clean and safe water while the rest 40% have no direct access.(source: Kinondoni Municipal Profile 2012). Most of the shallow wells produced saline water. During the survey, people reported that shallow wells produce unsafe water for drinking that contribute to the occurrence of water related diseases such as diarrhoea, intestinal worms and typhoid.

4.3.9 Drainage System/Storm Water Drainage

The public sewer systems in Dar es Salaam were constructed between 1948 and 1950. The Mikocheni sewer system is the only one that was constructed after the independence (1961); this was constructed in 1976. The Mikocheni public sewer is also dilapidated the same due to poor construction. Generally the public sewer in Dar es Salaam is more than 48 years old. These sewers provide services to only 7% of the Dar es Salaam residents. The rest of the residents (93%) use onsite disposal services such as septic tank system and pit latrines. This situation imposes necessities for increasing the capacity of cesspit emptying services, which is being provided by both Municipal council and private sector.(Source Kinondoni municipal profile 2012)

4.3.10 Household Refuse Disposal

Sixty seven point eight percent (67.8 %) of the respondents reported to dispose off their waste by bins collected by municipal council, (25.4%) burry their solid waste, The rest are thrown in the farm, thrown anywhere in the compound an burnt . It should be noted that poor solid waste disposal result into air pollution

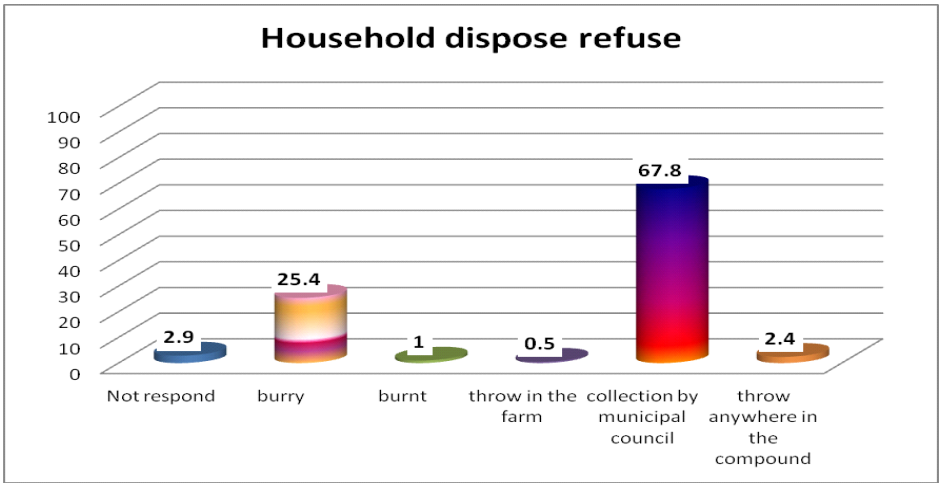

Figure 4.7: Household dispose Refuse (Socio economic Field Study 2013)

4.3.11 Energy

Most of the settlements along the road are connected to electricity, only few people around the road project are not connected to electricity. Most of the household are connected to the electricity from various sources including national grid, generators and solar energy. Eighty five point one (85.1) of the people interviewed use below 50,000Tshs for light services, 9.4% of the household interviewed use between 50,000-100,000 Tshs for the light services. The rest 2.1% use between 100,000-150,000, 1.3% of the respondents spend between 150,000-2000 and 0.3% use between 200,000- 250,000Tshs for light services. Electricity is the main source used for lighting houses at night.

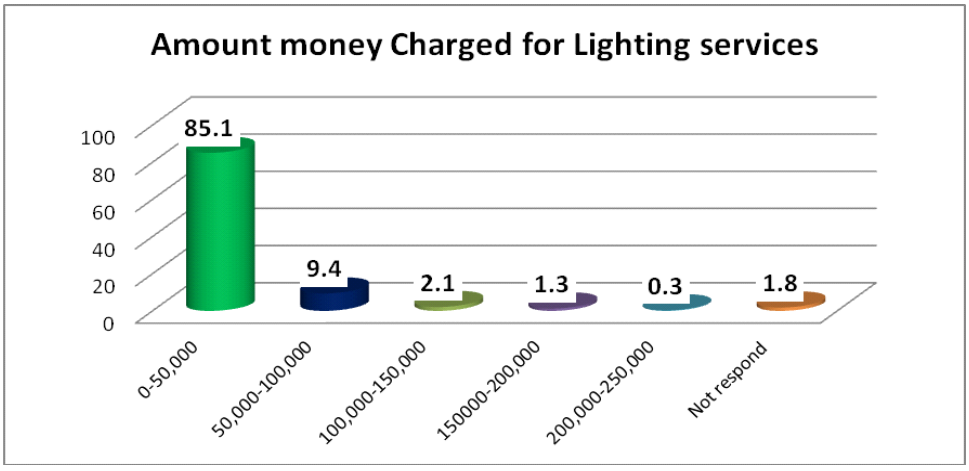

Figure 4.8: Amount of money used for lighting by respondents (Socio economic Field Study 2013)

4.3.12 Source of energy for cooking

According to the gathered data, the main source of energy for cooking in the project area is charcoal (91.1%), followed by charcoal and kerosene (1.6%), gas (1.3%) and charcoal and gas (1.1%). See the table below

Table 4.8: Source f Energy for Cooking

	source	Frequency	Percent
1	charcoal	348	91.1
2	Charcoal & Electricity	2	0.3
3	Gas	5	1.3
4	Charcoal & Gas	4	1.1
5	Charcoal & Kerosene	6	1.6
6	kerosene	4	1.1
7	Did not respond	14	3.6

Source : Socio economic profile of affected people 2013

Eighty seven point four (87.4%) of the household interviewed use below 50,000Ths for energy in cooking per one month, 9.4% of the household interviewed use between 50,000-100,000 Tshs for the energy in cooking. The rest of the household interview use above 100,000Tshs for energy in cooking. Charcoal is the main source used for cooking.

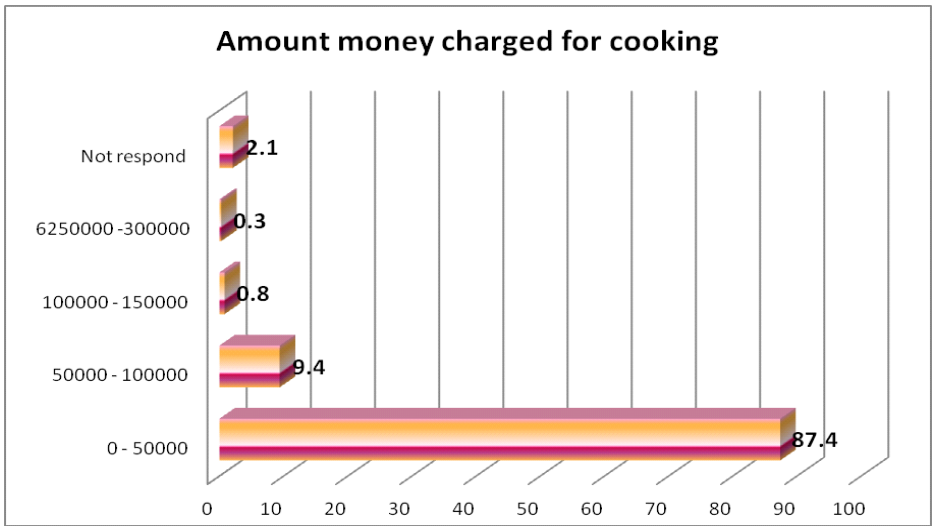

Figure 4.9: Amount of money charged for cooking (Socio economic Field Study 2013)

4.3.13 Telecommunications

All five mobile networks are available along the road project area. These Cellular phones operators include Vodacom, Tigo, Zantel, Airtel, Alphatel and TTCL. Post office, Internet and fax services are available along the road project area.

4.3.14 Health services

Accessibility to health facilities in the project area is relatively good. According to the municipality, the model of health services delivery in Kinondoni Municipal Council is based on preventive, promotive and curative care. The line of operation starts from the Dispensary, Health center to the Municipal Hospital. The mission of the Council is to ensure that health beneficiaries are provided with affordable and good quality of care at its health facilities and also to enhance preventive health services at facility and community level.

Disposition of refuse among other things has indirect relationship with the occurrence of communicable diseases. The study was thus interested to find out whether households were susceptible to different diseases over the past six months and the response was true for the majority (229 = 60%) of households in the project area. Only 130 (34%) respondents replied that they had not experienced diseases during the mentioned period. Other (6%) did not respond.

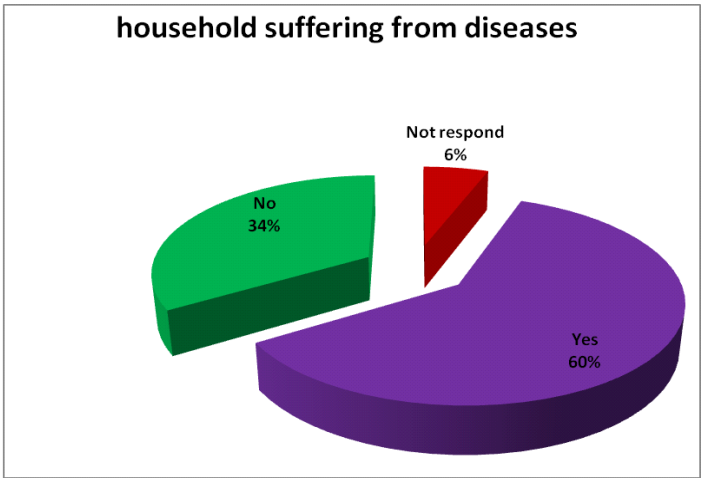

Figure 4.10: Household suffering from diseases (Socio economic profile of affected people 2013)

The Municipal Medical Officer of Health (MMOH) through the Council Health Management team (CHMT) plays the main role of managing, coordinating and supervising all health services provided at public health facilities. In addition the MMOH coordinators have the role of supervising more than 168 both public and private health facilities existing in the Municipality.

At present, the Kinondoni Municipal Council coverage plan comprises of 33 public health facilities and 168 private health facilities. There is one municipal public hospital (Mwananyamala) and 2 municipal public health centres namely Magomeni and Sinza.(source Kinondoni municipal profile 2012)

In the course of the survey, the Consultant learned that modern treatment was accessible to many households. The services are located within their reach, as on average they travel about 500m - 2 km to reach the dispensary, health centre or hospital.

4.3.15 Diseases / HIV/AIDS Prevalence Rates

Collected information from public consultation and confirmed by primary data revealed that the main diseases affecting the communities in the project area include; Malaria (20.2%), Skin flash (14.1%), Diarrhoea (11.3%), TB (7.9%), skin flash (3.2%) and HIV/AIDS (0.3%). (46.2%) reported to be affected by other diseases like chest, legs, cough, flue, headache and typhoid in the last six months. However, is doubtful whether the figure for HIV/AIDS is correct or not because few people responded on the disease occurrences.

Table 4.9: Diseases prevailing in the project area

	Disease	Frequency	Percent

1	TB	30	7.9
2	Malaria	77	20.2
3	Skin flash	54	14.1
4	Diarrhoea	43	11.3
5	HIV	1	0.3
6	Other Diseases	176	46.2

Source: Socio economic Field Study 2013

The Health department of Kinondoni Municipal is providing services in collaboration with other prominent organizations / institutions as follows:

According to the people interviewed, the interaction of people during road construction is expected to be very high that will result to the rise of HIV/AIDS infection specifically at Magomeni, Tandale, Ndugumbi and Manzese Ward.

4.3.16 Education

Education is a basic human right for all people regardless of sex, colour and ethnicity. In Tanzania every village/mtaa has a primary school. All mitaa in the road project have more than one primary school. However education sector in this area is faced with a number of challenges which need to be addressed, for instance, the secondary schools have few teachers, especially public secondary school. Schools are found in all wards along the road project. There is an average of one secondary school in every ward.

Literacy rate is relatively high as 14% of the interviewed households reported that they have never been to formal education including children. Thirty five percent have completed primary education. In the sampled households 32% completed secondary education. There are only few (7%) household members who have reached colleges including vocational training and (12%) household members reached university. For details refer the figure below;

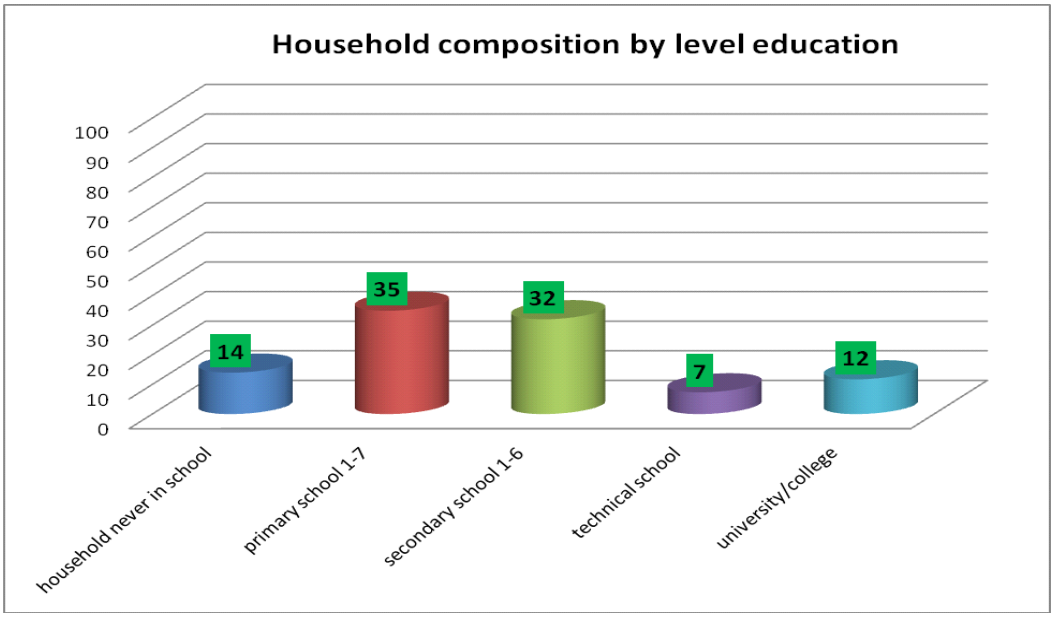

Figure 4.11: Education of household members

4.3.17 Housing structures

The observation revealed that 52.4% of housing structures are multifunctional including business premises and renting for accommodation, while 39.3% are used for sleeping only. The other 5.8% of the respondents use their houses for residential and business and 0.3% use for business only. The other 2.4% did not respond.

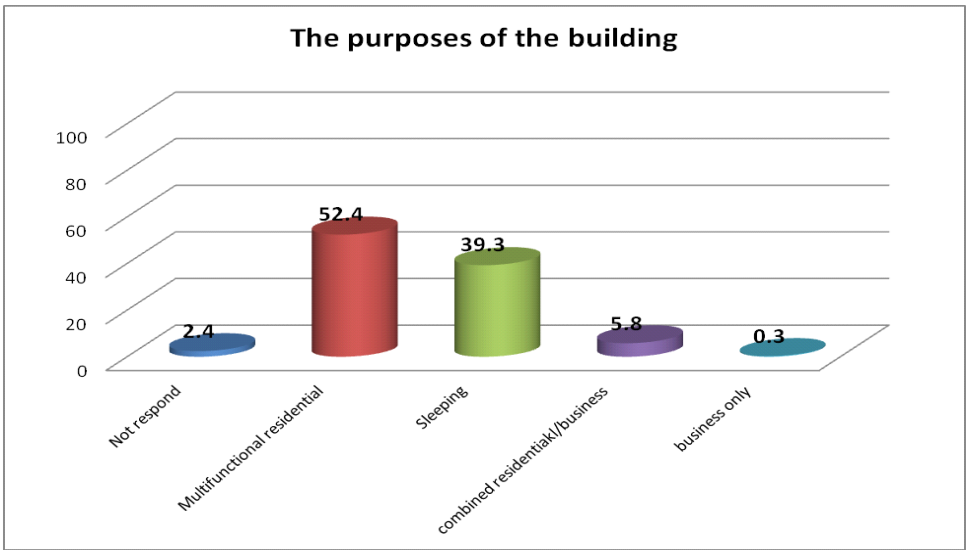

Figure 4.12: Main purpose of buildings (Socio economic profile of affected people 2013)

Most of the houses have rooms between 3 and 10 although some of them have up to sixteen rooms.

The material used for house construction is influenced by the income of the household. It was found that 79.5% of the respondent's floor of the structures is made of concrete followed by floor tile (18.9%).On the other hand 1% of the interviewed households reported to have houses floor made of earth.

Most of the roofing structures 98.7% are made of corrugated iron sheets while (0.5%) are thatched. The wells off household heads have good houses compared with poor families.

4.3.18 Awareness on road improvement program

During interviews, individual respondents were asked to answer whether they were aware about the road improvement program or not prior to this study. Fortunately, most of them (77%) were aware about it and the program was unknown to few of them, that is (22%). Sources of their information about the program were disclosed, people heard from media, consultants, government leaders at various levels and the like. High awareness implies that good communication, flow of information to the target population and therefore mutual participation of all stakeholders for achieving intended objectives

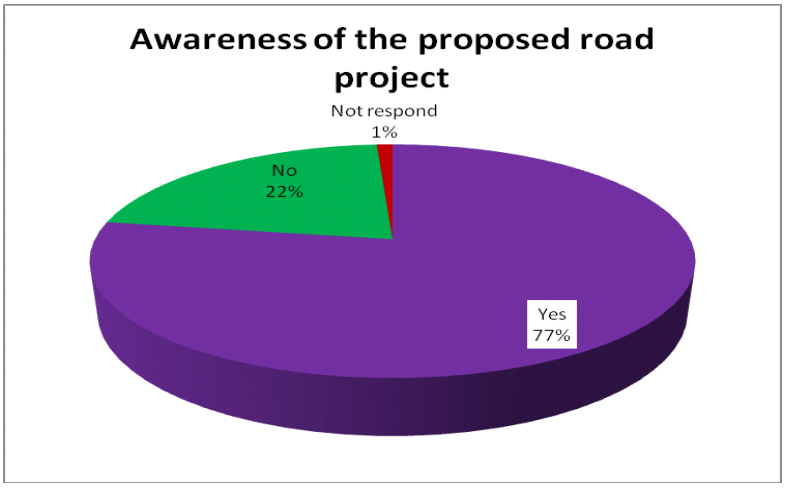

Figure 4.13: Awareness of proposed road project

4.3.19 Location and distance of schools

The majority of respondents indicated that their primary and secondary schools were mostly located in the mitaa of their residence. This is an advantage for pupils and students because it means they do not travel long distances to their schools for obtaining their education. For example, (97.4%) respondents stated that their primary schools were inside their mitaa while only (2.6%) households said their children went to the neighbouring mtaa for schools.

As noted for primary schools, the same is the case for secondary schools which are mostly located within their mitaa. Interviews revealed that (95.6%) had their secondary school in the mitaa and the rest (4.4%) households had their schools in their adjacent mtaa.

The locations and distances of other services did not vary much from the previous ones. Most of them are within the respective mitaa or adjacent to a concerned mtaa within 0.5-1 km away from the mtaa. For instance most of the respondents narrated that clinic services were located in their ward, with only few saying it was in the neighbouring ward. The longest distance to reach a clinic is 3 km. The majority walked between 0.5-1 km to the clinic, while few covered more than 1 km to the nearest clinic. Generally, the situation is not bad for the majority in terms of distance.

Bus stops are also located in the mitaa whereas (99.2%) respondents confirmed this fact. Just (0.8%) admitted to have their bus stop located in the neighbouring mitaa. People are not walking a long distance to the bus stop, implying that the households are very close from the main road. Figures indicated that most of the people have a distance of less than a 500metres, while few of them are 1km away from the bus stand stop.

As discussed elsewhere most services are located within their vicinity i.e. mitaa, with exception of markets. Slightly more than a third of respondents said the market is within a ward while the majority travelled to the nearby ward for their market services and the few were marketing outside the municipal especially Kariakoo. The distances for market places varied accordingly depending on locations. The majority covered 1-2 km to the market while the lowest distance of less than 1 km had few respondents. Shops are mainly found in the respective mitaa, that is, all respondents said that their shop services are in the areas.

Due to close locations, the majority walked a distance of less a km to the market and the rest covered 1-2 km to the market.

4.3.20 Expected improvements after rehabilitation of the road

Improved infrastructure plays an important role in developing socio-economic status in the community. The vivid expected positive impact of the proposed road improvement as mentioned by respondents include; comfortable travel and reliability of transport throughout a year, followed by improvement of business activities. Another expectation mentioned comprised of the improvement of social services. It is expected that the road improvement will also bring increase in economic activities.

4.3.21 Anticipated Negative Impacts

Contrary to expected improvements after road rehabilitation as discussed above, there are also negative expectations as spoken out by respondents during the interviews. Some negative impact associated with the road improvements scored more number of respondents, that is, for loss of properties/land take, for the increase of road accident and some of the social services like water will be distracted as a result of implementing the proposed road improvements in their areas.

Principally both positive and negative impacts of the proposed roads improvements have to be taken into account by all stakeholders prior to commencement of the project in order to make decisions and work out mitigation measures particularly for the negative ones, for example, compensation payments to project affected people (PAP), designing education programmes, safety measures on road uses, etc.

4.3.22 Land Tenure System

The project area is located in urban area where there is a mix of land tenure systems. There are residents who have title deed (certificate of occupancy) provided by the ministry of lands and there are residents who own the land customary (inheritance or bought from previous owners).

4.3.23 Attitude towards the project

Almost all people accepted the project; as they could foresee the benefits from the road project. It will improve the socio economic of the people along the road including the neighbouring municipals and districts. All people were positive about the road and have high expectation from its improvement. People prefer the roads to follow the existing alignments so that it could boost/enhance economic growth of the people and reduce traffic congestion. Since the project involves roads rehabilitation and upgrading, it is expected that the existing alignments will be followed.

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 Kinondoni Municipal Council, TANESCO zone manager, DAWASCO 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, Municipal Director of Kinondoni, Municipal Executive Directors of Kinondoni, Ward Directors of Msasani, Magomeni, Ndugumbi, Tandale, Manzese, Sinza, Kijitonyama, Makuburi and Kimara. 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 Authorities

Consultative meetings at Municipal and local levels included discussions with municipal authorities, specialists and other knowledgeable people and key informants, e.g. MD (municipal Director), Municipal Planners, Education Officers, Community Development Officers, Medical Officers, Water Engineers and Municipal Engineers.

Typically, the Agenda for these consultations included;

- Presentation about the project

- Presentation on the proposed road (using maps);
- Discussing the previous experience along the road corridor with respect to compensation eligibility criteria and entitlement packages;
- Obtaining from the authorities their socio-economic concerns and perceptions regarding the proposed road ; and
- Discussions on the role of the authorities in public information dissemination, monitoring and management plan

5.2.3 Community consultations

Dissemination of Project information among communities along the route corridor is an important aspect of the public participation process and they should be appropriately informed about what is planned. To achieve this objective the consultant carried out public meeting in 10 wards in the affected settlements. The following table below 7.1 shows the list of settlements consulted.

Table 5.1: Wards/mitaa that were consulted during field work

No.	Name of mtaa where public consultative meetings were conducted	The Municipal where the mtaa is located
1.	Msasani	Kinondoni Municipal
2.	Magomeni	Kinondoni Municipal
3.	Ndugumbi	Kinondoni Municipal
4.	Tandale	Kinondoni Municipal
5.	Manzese	Kinondoni Municipal
6.	Sinza	Kinondoni Municipal
7.	Kijitonyama	Kinondoni Municipal
8.	Sinza C	Kinondoni Municipal
9.	Makuburi	Kinondoni Municipal
10.	Makumbusho	Kinondoni Municipal

Source: Socio-Economic Survey, 2013

A number of public meetings were held at every direct impacted Mtaa along the project roads. The entire consultation process of the Project was seeking the present, opinions and concerns of women and youth regarding the proposed road project and involves them in the overall planning of mitigation measures.

5.2.4 Identification of issues and concerns

The following were the main issues and concerns raised by stakeholders in the project area;

- **Land take:** Unfair compensation of affected properties. This was echoed at every mtaa meeting. Inability of the proponent to mark out the Right of way (RoW) in advance and people are worried about government officials' who may embezzle compensation funds. The eligibility and compensation packages should be made transparent to the PAPs. The PAPs should be educated and counseled in implementing resettlement. Majority of people are insisting that the government should help them to find new land to relocate despite of being compensated.

- **Destruction of property within RoW:** The project will impact properties that are within the RoW. These include residential, business premises and community structures. The loss of these properties will affect livelihoods. It is felt that compensation may not be forthcoming or fair.

- **Increased infection of HIV/AIDS:** Road project will have a negative impact on the increase of new HIV infections which is currently 6.7% prevalent rate of HIV infections in Kinondoni Municipal (Municipal VCT&PMPCT report: 2012). Dar es Salaam has higher prevalence rate (6.9%) of HIV infection that the national prevalence rate of 5.1% (THMIS 2012) The presence of the road project might make the infection to shoot up if mitigation measures for the disease will not be enhanced or developed to accompany the implementation of the road project.

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

- **Parking area considered in the design and bus stand:** Since there are a lot of vehicles in Dar es salaam, it is important for a road design to consider establishment of special areas for car parking to avoid unnecessary accidents caused by poor packing of the vehicles. Almost all wards expressed their dire need to have bus stops in their respective areas as this will have several benefits to their wards.

- **Temporary road diversions during road construction:** During roads construction temporary routes should be prepared so that vehicles/buses continue to operate along the roads. This will help to reduce traffic congestion and Kinondoni roads have a socio- economic importance to people in Dar es Salaam area and neighbouring municipals.

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

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

- **Compensation process:** Compensation exercise should be implemented in a participatory manner where all family members will be aware of the entitlements of

the affected people and the amount of money expected to be received. This will help to avoid misuse of the money and family conflicts. The couple should be both signatories of the bank account.

Table 5.2 Summary of Public consultation results

S/N	Concern From Which wards/ Institution	Negative And Positive Impact	Issues And Concern	Response
1.	Raised by all the wards	Employment opportunities	It is expected that individuals within project areas are given priority in the whole process of recruiting labour force particularly unskilled labours	The contractor should give the priority of employment to the people hailing from the wards.
2.	Raised by all wards.	Compensation of affected properties	The affected properties might not be compensated or the compensations may not consider market value of the properties.	The eligible affected persons will be compensated based on national compensation framework
3.	Makumbusho, Tandale, Sinza , Magomeni and Msasani	Construction of the road below specified standard.	The community is concerned about the quality of construction work requesting for integrity and commitment by contractors to ensure that a sustainable road is constructed	Road specifications provided by municipal will be adhered to
4.	Tandale, Sinza, Manzese, Magomeni and Makuburi	Road accidents	Stakeholders in the villages raised their concerns on possible increase in traffic accidents.	There will be an assignment of putting road signs and speed bumps for the whole road by a contractor.
5.	Tandale, Manzese, Ndugumbi	Increased infection of HIV/AIDS	The project will contribute to increased immigration in the area with consequential HIV/AIDS implications.	There will be special HIV/AIDS program to be run by the contractor
6.	Makumbusho, and Sinza	Relationship between Contractors and communities	People argued that some contractors do not respect local communities and wards leadership when working in those areas.	The community to be involved in the whole process of road construction
7.	Sinza, Magomeni and Kimara	Storm water drainage systems closer to the houses- dangerous to children.	People assumes that during road construction all houses closer to the road may be affected by storm water that passes through the drainage system especially during rainy season.	The contractor will be responsible to make sure that drainage system does not affect people's properties
8.	Raised by all	Dust	Dust production is inherent to	The contractor will have

S/N	Concern From Which wards/ Institution	Negative And Positive Impact	Issues And Concern	Response
	wards.	management	all road construction works.	means of reducing the dust.
9.	Raised by all wards.	Land acquisition for resettlement	Majority of people are insisting that the government should help them to find new land to relocate despite of being compensated.	The government will follow the resettlement policy as well as good resettlement international practice will be adhered to.
10.	Kimara, Tanale, Magomeni and Makumbusho	Increase of crime	There is a possibility of increase of crime reported cases e.g., theft, robbery, drugs, and smuggling.	Mitaa committees responsible for security in collaboration with the police force will have to be watchful during the construction process to reduce possible crime incidences.
11.	Magomeni, Ndugumbi, Tandale, Manzese and Sinza	Bus stands in the roads	People expressed their dire need to have bus stops in their respective areas as this will have several benefits to their areas.	Road specifications provided by TANROADS and municipal will be adhered to
12.	Ndugumbi	Impact on Ritual Sites:	There are some sacred burial sites and protected that may be affected by project activities.	RAP shall be conducted

Source: Socio-Economic Survey, 2013

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. Kinondoni Municipality, Dar es Salaam city).

6.1.2 Institutional Boundaries

Institutionally, Kinondoni Municipal Council (under PMO_RALG) and have the mandate to develop and maintain the urban infrastructures in the Kinondoni 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 infrastructure 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 (1.5.3), 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 Kinondoni Local Roads

		Impact Rating Criteria					Impact Significance Rating			
S/N	Environmental parameters/Impacts	Spatial Scale	Temporal Scale	Reversibility	Cumulative Effects	Residual Impact	Mobilization Phase	Construction Phase	Demobilization Phase	Operation and Maintenance
	Negative Impacts									
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	ST	R	✓		-1	-2	-1	-2
18.	Dangers of Borrow Pits	L	ST	R			-1	-1	-1	-1
	Positive Impacts									
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 5.1: Houses very close to the Mwananyamala-Tandale Road

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 show the affected persons and buildings for each sub ward in Kinondoni Municipality. For a more detailed summary of the RAP see Appendix V.

Table 6.2: Estimated Project affected persons and properties

Road segment	Affected properties	Partially affected households	Fully affected households
External	116	10	19
Kilimani	88	4	18
Kilongawima	80	4	16
Korogwe-Kilungule	60	8	7

Makanya	392	23	75
SIMU 2000	60	10	5
Tandale Kisiwani	112	5	23
Total	**908**	**64**	**163**

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 5.2: Shops very close to the Simu 2000 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 Kinondoni 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 5.3: Power Transmission line just near the Makanya 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 5.4: River crossing the Kilungule Subproject

6.5.5 Noise, Vibration and Air Pollution 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 Occupational Safety and Health Risks

Road construction exposes the labourers 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.

Figure 5.5: Primary school pupils crossing the Kilimani Subproject

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 Scenic 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 5.6: Large trees near the Soko la Samaki-Tanesco 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 by eased by this project.

6.6.4 Reduced Vehicle operation costs

The cost of operating the vehicles shall go down due to servings 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 Kinondoni 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.
- Ccommunity 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 were 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 intering 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 spce that could have been taken for wakways for the case of open channel. This inturn reduce 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 all the seven sub-projects roads involving resettlement is approximately **Tsh 9,703,000,000** equivalent to **USD $5.8 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 was able to reduce the number of affected properties from 1959 to 908, including a reduction in the number of PAPs to be permanently relocated, which resulted in a substantial reduction in compensation costs from over US $18 million to about US$5.8 million. 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 constructio sites site
- 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 coridor 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 Kinondoni 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

- KMC 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 the 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 measure to decongestion of main roads

7.6.3 Reduced Vehicle operation costs

- KMC 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 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 polices (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 accelerate 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;
    i. Routine drain cleaning shall be performed (at least once a month)
    ii. Reporting of defects and blockages
    iii. Semiannual inspection shall be performed
    iv. Prompt Repairs to all defected drains
    v. 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, Kinondoni Municipal Council, some utilities provides such as DAWASCO and TANESCO, and the local communities at large. Table 8.1 provide 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 Kinondoni Local Roads

Impact	**Mitigation measure**	**Responsible institution/Individuals**	**Mitigation Time frame**	**Annual Costs(TSHS)**	**Lump sum (Onetime costs) Costs(TSHS)**
Pre- construction phase					
Land acquisition/ Loss of Property/farmland	• Compensation shall be done according to World bank/ Tanzania laws governing resettlement before commencement of the construction activities. • Resettlement Action Plan have been prepared and shall observed • The roads have been designed to strictly follow the existing alignment. • The road width has been adjusted to fit the present width of the road without compromising safety • The total compensation cost for the project is approximately Tsh 9,703,000,00027 which shall be paid to the PAPs	• PMO-RALG/KMC/ Consultant/Affected people	Before construction phase		**9,703,000,000**
Loss of employment and Income	• 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	• PMO-RALG/KMC/ Consultant/Affected people	Before construction phase		
Construction phase					
Destruction of Public Utilities	• TANESCO, DAWASA and TTCL shall be involved from the early stages of these projects so as to have an integrated planning. • Early notice shall be given to the community	• PMO-RALG/KMC/ Contractor/ Consultant / TANESCO/DAWASA/ TTCL	Design and Construction		

Impact	**Mitigation measure**	**Responsible institution/Individuals**	**Mitigation Time frame**	**Annual Costs(TSHS)**	**Lump sum (Onetime costs) Costs(TSHS)**
	before any service interruption • The funds for the relocation of this infrastructure shall be part and parcel of the project.				
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 must be carefully chosen to avoid erosion of arable land and creation of gullies. • The contractor should Plant vertiver grasses to minimise exposed soil surface. • Proper grading to promote sheet flow and minimize flow concentration on unconsolidated soil. • Directing flow to properly designated channels.	• PMO-RALG/KMC/ Contractor/ Consultant/ Env Supervisor	During Design and Construction	16,000,000	
Noise pollution	• Provide working gear to workers • All noisy works shall be restricted during day time only • Proper choice of equipment which offer environmental advantages	• Contractor/PMO-RALG/KMC/ Env. Supervisor	Construction	3,000,000	
Air pollution	• Watering road section (near human habitation) • Proper choice of equipment which offer environmental advantages	• PMO-RALG/KMC/ Contractor/ Env. Supervisor	Construction	5,000,000	
Vibration	• Advance notice to local communities	• PMO-RALG/KMC/ Contractor	Construction	1,000,000	

Impact	Mitigation measure	Responsible institution/Individuals	Mitigation Time frame	Annual Costs(TSHS)	Lump sum (Onetime costs) Costs(TSHS)
Occupational Safety and health risks	• Appropriate working gear (such as nose, ear mask and clothing) and good camp management shall be provided. • 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.	• PMO-RALG/KMC/ Contractor/ Env. Supervisor Local community	Construction Phase	3,000,000	
Increased Accidents	• Contractor shall prepare Traffic Management plan which shall be aproved by the Engineer and the PMO RALG • 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. • All drivers and operators shall possess a valid Tanzania license for the types of vehicle being driven or machinery operated. • An in-house training on defensive driving techniques and safe tipping operation shall be imparted to all drivers before allotting vehicles to them. • Over speeding shall not be allowed at any case and if observed do so disciplinary actions shall be taken against the defaulter. Maximum speed shalll be limited to 40km/hr. • Nobody is allowed to drive if under the influence of alcohol or drugs. • Beware signage shall be established on public institutions' entrances	• PMO-RALG/KMC/ Design team/ Traffic Police/ Contractor	Design stage and Construction Phase	8,000,000	
Increased Waste	• Vegetations (Trees, Grasses) and remnants of timber shall be given to residents near the project roads to be used as Source of energy. • Food remains, cardboards and papers (Degradable waste) shall be ccollected in a large skip bucket at	• PMO-RALG/KMC/ Contractor/ Env. Supervisor	Construction Phase	6,000,000	

Impact	Mitigation measure	Responsible institution/Individuals	Mitigation Time frame	Annual Costs(TSHS)	Lump sum (Onetime costs) Costs(TSHS)
	the campsite then to be composted and used as manure for the gardens at the camp site/office • Top soil shall be used as backfilling material in the borrow pits, fill the diversions. • Plastics and Scrap Metals shall be sold to certified recyclers • Tins Glasses and other inert materials Taken to the Authorized dumpsite at Pugu Kinyamwezi • Sewage shall be directed Septic tank –Soak away system at the camp site/office and mobile toilets along the route.				
Loss of Scenic Quality	• The topsoil shall be stock piled for later use in reinstating the pit. • Sand and Gravel shall be sourced from the approved Sand mines and Quarries (Which have mining license)	• Contractor/Consultant/ /Supervisor/ PMO-RALG/KMC	During Mobilization, Construction and after construction	3,000,000	
Loss of Vegetation	• Close supervision of earthworks shall be observed in order to confine land clearance within the proposed new corridor of impact boundaries. • The contractor shall replant trees and grasses along the roads where possible. • 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 Kinondoni Municipal Natural Resources Officer shall be made prior to clearing trees.	• PMO-RALG/KMC/ Contractor/ Supervisor/ KMC / Contractor	During Construction	15,000,000	

Impact	**Mitigation measure**	**Responsible institution/Individuals**	**Mitigation Time frame**	**Annual Costs(TSHS)**	**Lump sum (Onetime costs) Costs(TSHS)**
	• Trees and Crops to be removed shall be compensated				
Operation phase					
Interference to local hydrology	• The design shall utilize as much as possible the existing channels • Where possible, the designs shall leave enough unpaved space alongside the road for water to seep into the ground • 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 accelerate erosion downstream.	• Design engineer/ PMO-RALG/KMC	Design Stage	N/A	
Increased Road accidents	• 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. • Capacity building of district polices (traffic) offices • Installation of proper road signs (in Swahili Language) and regular inspections for their presence • Installation of speed control devices like humps • Installation of pedestrian lanes at human settlement crossings	• Design Engineer /Traffic police/ PMO-RALG/KMC	Operation phase	4,000,000	
Total Cost				**64,000,000**	**27,833,224,784**

8.3 Roles and Responsibilities for ESMP Implementation

8.3.1 Institutional arrangements

8.3.1 Roles and Responsibilities During EMP Implementation

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 KMC 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. KMC-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

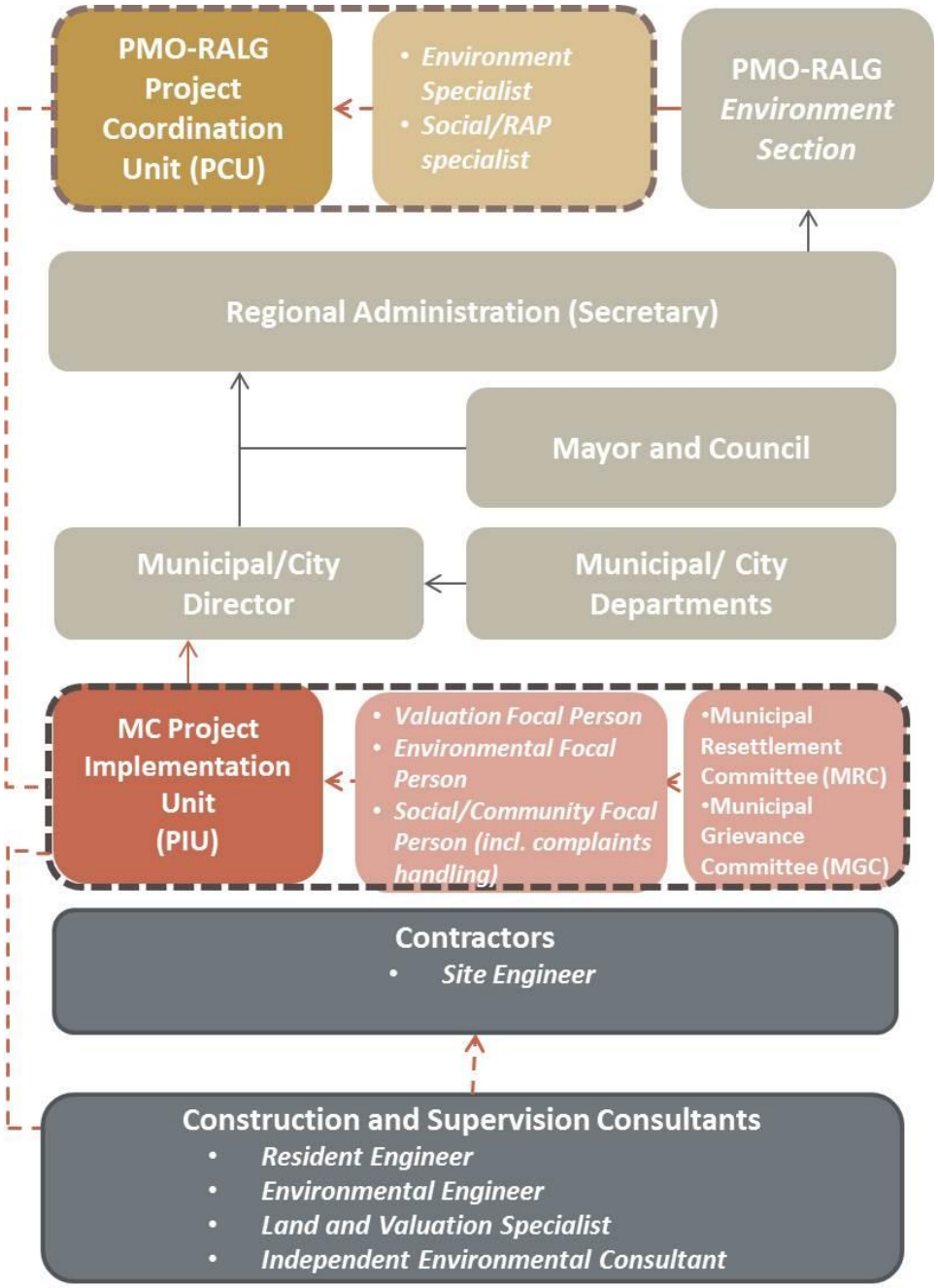

Table 8.2: Role and Responsibilities of Key Parties for EMP Implementation

DMDP/ PMO-RALG Project Coordination Unit (PCU)	DMDP/PMO-RALG is responsible for the overall implementation, administration and enforcement of the recommendations of the ESIA and the ESMP Report.	The Project Coordination Unit with oversight of the Ministry's Environment Section will: • 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; • Coordinating the implementation of the ESMP among the Dar es Salaam Local Authorities (DLAs), Basin Water Office (BWO) and other agencies and contractors; • Holding monthly coordination meetings on safeguard implementation with the PIU specialists and preparing meeting minutes that summarise progress, issues, and good practices. • Receiving safeguard compliance quarterly reports from DLAs and BWO and preparing annual environmental progress reports; • Conducting training for institutional capacity building; • Provide NEMC with reports on environmental and social compliance as part of their annual progress reports and annual environmental monitoring reports; • Report to International Development Association (IDA) on the status of safeguard matters through submission of annual progress reports.
Dar es Salaam Local Authorities (DLAs) – Project Implementation Unit (PIU)	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 -	Specifically, DLAs responsibilities include the following: • Visit and inspect major Sub-project sites regularly, to ascertain the level of compliance of works and report back environmental issues; • Maintain inspection reports on files; • Working with the Resident Engineers who have day-to-day interaction through supervisory staff; • Ensures the Contractors have all plans, procedures, approvals, and documentation in place to ensure ESMP compliance prior to commencement of any work; • Verifying environmental compliance and issuing of penalties for contraventions of the ESMPs; • Ordering the removal of person(s) and/or equipment not complying with the ESMP specifications; • Taking decisions in case severe non-compliances to the ESMPs are detected; • Providing input for on-going internal review of the ESMPs; • Stopping works in case of emergency or if significant environmental impacts are apparent or imminent; • Monitoring and verifying that environmental impacts are

	MEMOs). 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).	kept to minimum; • Preparing reports on environmental and social mitigation and monitoring and submit them to PMO-RALG quarterly; • Recommending PMO-RALG the issuing of penalties for contraventions of the ESMPs; • Support the Resident Engineer through the site construction supervision staff.
Contractor	The Contractor will be responsible for construction works and ensuring compliance with ESMP requirements. The Contractor shall appoint a **Site Engineer**.	Contractor shall: • Ensure that the environmental and social specifications of the ESIA and ESMP (including any revisions, additions or amendments) are effectively implemented; • 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; • 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; • 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; • Report and record all accidents and incidents resulting in major injuries or death; • Inform MEMO/DAWASA, BWOs and other relevant agencies of problems arising when implementing the ESMP and ways of improving the ESMP; • Undertake rehabilitation of all areas affected by construction activities in order to restore them to their original state, as determined by the Engineer; • Undertake the required works within the designated working areas.
Construction Supervision Consultant	The Supervision Consultant will be appointed by PMO-RALG and will be	Supervision activities will comprise: • Environmental compliance and monitoring, including checking, verifying and validating the overall

(CSC)	responsible for monitoring and supervision of the construction works including implementation of ESMP. The Supervision Consultant will appoint a Resident Engineer. For supervision and monitoring of the implementation of ESMP throughout the construction phase, the implementing agency can engage an Independent Environmental Consultant.	environmental performance of the project through regular audits, inspection and review of project submissions. Monitoring activities by the resident engineer will comprise: • Visual observation during site inspection carried out at the same time as the engineering supervision activities, • Site inspections that will take place with emphasis on early identification of any environmental problems and the initiation of suitable remedial action; • Where remedial actions have been required on the part of the Contractor, further checks will need to be made to ensure that these are actually being implemented to the agreed schedule and in the required form.
Municipal RAP Committee (MRC)/ Municipal Grievance Committee (MGC)	Each MRC will support their respective DLA in organizing and implementing the compensation, assistance, and resettlement.	• Overseeing update of RAPs • Overseeing/monitoring implementation of RAPs including compensation payments • Implement public disclosure, consultation and participation • Handling grievance issues and keeping records • Quarterly reporting to DLA and PMO-RALG • Liaise with ward-level grievance desks

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 KMC training. The KMC 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 KMC 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****:* KMC 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 KMC 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

Target Group	**PMO-RALG Staff and MC Staff**
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	• General environmental management relating to the project, and covering the requirements of WB; • General aspects of environmental supervision; • Implementation and supervision of mitigation measures; • Community participation in environmental supervision monitoring. • Guidance and supervision of contractors, Subcontractors and community representatives in the implementation of environmental supervision. • Use of forms for environmental supervision; • Risk response and control; • Receipt and submission of reporting forms • Other areas of training needs, as determined
Responsibilities	PMO-RALG, KMC with support of the Technical Assistance Team for the implementation of safeguards.
Target Groups	**CONTRACTORS, SUBCONTROCTORS, WARDS AUTHORITIES, COMMUNITY REPRESENTATIVES**
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	Overview of environmental monitoring; Requirements of environmental monitoring; Role and responsibilities of contractors Scope and methods of environmental monitoring; Response and risk control; Propagate monitoring forms and guide how to fill in the forms and risk report;

	Preparation and submission of reports Other areas to be determined.
Responsibilities	PMO-RALG, KMC with support of the Technical Assistance team for the implementation of safeguards
Target Groups	**COMMUNITIES AND WORKERS**
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	• Preliminary presentation on environmental protection and environmental overview • 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.) • Management of environmental safety and sanitation on work sites; • Mitigation measures at construction sites; • Safety measures on electricity, mechanical, transportation, air pollution; • Procedures to deal with emergency situations; • Other areas to be determined.
Responsibilities	Contractor and KMC

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-fulfillment 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 MONITORIG 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 Kinondoni Local Roads

Parameters		Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (TSH)
Pre construction stage								
Air quality	Dust	Once before the construction starts	At the start., Middle and end of all project roads	µg/m^3	*Micro Dust Pro*	<0.01	Contractor/ Env. Supervisor	600,000
Noise Baseline	Noise level	Once before the construction starts	At the start., Middle and end of all project roads	dBA	Noise Level Meter	<110	Contractor/ Env. Supervisor	200,000
Water Quality	Turbidity, COD, BOD, Ph, DO	Once before the construction starts (During rain season)	All points where the river cross project roads		APHA 2009	TZS 789:2003	Contractor/ Env. Supervisor	400,000
Compensation	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/ KMC/ Consultant	N/A
Construction stage								
Air pollution	Dust	Once Per Month	At the start., Middle and end of all project roads	µg/m^3	*Micro Dust Pro*	<0.01	Contractor/ Env. Supervisor	7,200,000
Noise pollution	Noise level	Once Per Month	At the start., Middle and end of all project roads	dBA	Measurements	<110	Contractor/ Env. Supervisor	2,400,000

Water Quality	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	4,800,000
Soil erosion	Soil erosion along the road	Once in three Months	Project roads	Level of erosions	Site inspection	_	Env. Supervisor/ Contractor/ KMC Env. officer	4,000,000
Vegetation	Biomass	Once in three month for construction period	Trees along the road	-	Inspection	-	Env. Supervisor/ Contractor/ District Forests Officer	4,000,000
Vibration	Vibration levels	Once per Month	Project road	No per time	Records	-	Contractor/ Env. Supervisor	2,000,000
Frequency of illness of construction workers	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
Employment opportunity	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
Safety and health risks	Number and type of safety equipment such as mask, helmet gloves and ear plugs. Health and	Once in three month	Project site	Number of safety measures provided	Actual injuries and illness statistics	-	Contractor/ PMO-RALG	4,000,000

	sanitation facilities in camps.							
Dust Suppression	Water sprinkling	Everyday	Project site	Frequency of water sprinkling	Inquiries and observation	Minimum dust emission	Contractor/ Environmental Supervisor	12,000,000
Operation stage								
Safety of human beings	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
Total monitoring costs								**59,600,000**

10.0 COST BENIFIT 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, ravelling, 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, tyres, 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 quantity 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 result 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:

[Imports+Exports] / [Imports+Exports+Import duties/taxes+ 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 19th 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 13 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: Kinondoni Local DMDP roads

S/N	Name of Road	Length (Km)	Proposed intervention
1	Kilimani	1.3	Upgrading to Tarmac level
2	Makanya	5.1	Widening and Resurfacing
3	TandaleKisiwani	0.8	Upgrading to Tarmac level

4	TANESCO-Soko la Samaki	1.5	Upgrading to Tarmac level
5	Sokoni-Makumbusho	1.3	Upgrading to Tarmac level
6	External road	2.6	Upgrading to Tarmac level
7	Kisukuru road	1.9	Upgrading to Tarmac level
8	MMK	1.2	Upgrading to Tarmac level
9	Nzasa	1.2	Upgrading to Tarmac level
10	Simu 2000	1.8	Upgrading to Tarmac level
11	Kilongawima	1.8	Upgrading to Tarmac level
12	Viwandani	1.75	Upgrading to Tarmac level
13	Korogwe-Kilungule	3.0	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

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
Kilimani road	611	952	278	240	49	61	65	13	10	3	0	2280
Makanya	1695	4538	4163	4352	666	2503	649	474	151	30	5	19245
Tandale-Kisiwani	828	1683	185	52	19	18	38	9	2	0	0	2835
TANESCO-Soko la Samaki	436	642	1396	1392	420	73	211	130	45	1	0	4745
Sokoni-Makumbusho	292	542	698	601	91	21	32	18	5	1	0	2300
MMK	292	542	698	601	91	21	32	18	5	1	0	2300
Simu 2000	506	1156	1694	1534	691	231	617	323	132	48	7	6938
Nzasa	506	1156	1694	1534	691	231	617	323	132	48	7	6938
External road	496	4183	1662	1717	270	72	211	104	19	19	13	8766
Kisukuru road	496	4183	1662	1717	270	72	211	104	19	19	13	8766
Kilongawima	51	2878	1044	584	84	40	95	90	1	0	0	4867
Viwandani	436	642	1396	1392	420	73	211	130	45	1	0	4745
Korogwe-Kilungule	168	3276	1022	770	115	45	82	76	8	2	1	5562

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 including lane additions to Makanya road. 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
Maintenance of unpaved roads			
Grading	Once per year	USD1038/km	USD1260/km
Spot gravelling	If gravel thickness < 100mm	USD 15.57/ m³	USD 18.99/ m³
Gravelling	If gravel thickness < 100mm	USD 15.57/ m³	USD 18.99/ m³
Maintenance of paved roads			
Crack Sealing	Wide Structural cracking >5%	USD 11.48/ m²	USD 14.00/ m²
	Transverse Thermal Cracks >10 No./km		
Edge repair	Edge break > 1sq.m/km	USD16.40/ m²	USD 20.00/ m²
Patching	Pot holes >1 pothole/km	USD16.40/ m²	USD 20.00/ m²
Heavy patching	Severely damaged area >5%		
Resealing	Total damaged area >25%	USD 5.74/ m²	USD 7.00/ m²
Overlay	Roughness> 6IRI	USD16.40/ m²	USD 20.00/ m²
Reconstruction	Roughness >9IRI	USD 57.4/ m²	USD 70.00/ m²

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. Reconstruction options included 2 lane additions to Makanya road.

Table 10.5: Improvement option description

SN	Name of Road	Length (Km)	Option	Unit rate (US$/Km)
1	Makanya	5.1	Option3	950,000
2	Nzasa	1.2	Option3	950,000
3	Simu 2000	1.8	Option3	950,000
4	Tanesco-Soko la Samaki	1.5	Option3	950,000
5	External road	2.6	Option3	950,000
6	Kisukuru road	1.9	Option3	950,000
7	Viwandani	1.75	Option3	950,000
8	Korogwe-Kilungule	3	Option3	950,000
9	Kilongawima	1.8	Option3	950,000
10	Sokoni -Makumbusho	1.3	Option3	950,000
11	MMK	1.2	Option3	950,000
12	Kilimani	1.3	Option3	950,000
13	TandaleKisiwani	0.8	Option3	950,000

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 Makanya 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	Kilimani	1.3	ALT3	144.0	2.708	24.67
2	Makanya	5.1	ALT3	292.0	147.97	38.079
3	TandaleKisiwani	0.8	ALT3	25.3	0.655	1.371
4	Tanesco-Soko la Samaki	1.5	ALT3	86	10.308	11.28
5	Sokoni -Makumbusho	1.3	ALT3	41.5	3.065	3.949
6	External road	2.6	ALT3	82.2	18.229	11.508
7	Kisukuru road	1.9	ALT3	82.2	11.919	11.508
8	MMK	1.2	ALT3	41.5	2.829	3.948
9	Nzasa	1.2	ALT3	123.5	18.579	23.407
10	Simu 2000	1.8	ALT3	122.7	25.575	23.271
11	Kilongawima	1.8	ALT3	55.2	6.463	6.013
12	Viwandani	1.75	ALT3	80.7	11.996	11.252
13	Korogwe-Kilungule	3.0	ALT3	62.7	13.514	7.424

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

A	B	C	D	E
Road name	**Recommended alternative**	**Discounted First year NPV (US$ millions)**	**Un discounted rehabilitation cost (US$ millions)**	**FYB% (c*100/d)**
Kilimani	ALT3	0.168	1.001	16.8
Makanya	ALT3	8.662	3.97	218.2
TandaleKisiwani	ALT3	0.061	0.616	9.9
Tanesco-Soko la Samaki	ALT3	0.728	1.168	62.3
Sokoni -Makumbusho	ALT3	0.225	1.001	22.4
External road	ALT3	1.049	1.995	52.6
Kisukuru road	ALT3	1.049	1.995	52.6
MMK	ALT3	0.207	0.924	22.4
Nzasa	ALT3	1.16	0.992	116.9
Simu 2000	ALT3	1.602	1.385	115.7
Kilongawima	ALT3	0.417	1.372	30.4
Viwandani	ALT3	0.798	1.347	59.2
Korogwe-Kilungule	ALT3	0.835	2.309	36.2

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 Kinondoni 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 Deccommissioning 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 Kinondoni 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 shadecloth 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 deccommissioning 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 Ocupational 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 deccommissioning 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 Kinondoni 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 KMC 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 KINONDONI MUNICIPALITY (25.25 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 Kinondoni Municipality, 13 roads covering a total of 25.25km, 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 environmental 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 0f 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

ESIA OF THE PROPOSED UPGRADING OF DAR ES SALAAM ROADS

LIST OF STAKEHOLDERS CONSULTED

S/N	DATE	NAME	INSTITUTION	POSITION	ADRESSS/PHONE NO.	SIGNATURE
1	30/1/13	Eng. MKIYO. G. A	KMC	Municipal Engineer	BOX 31902 0784-857357 gen.hard@yahoo.com	
2	30/1/13	Elieza R-Mayugo	KMC	Civil/Roads Engineer	Box 31902 0712208337 mwabrayia7@yahoo.co.uk	
3	30/1/13	DAUD A. SILALIA	KMC	QUANTITY SURVEYOR	Box 31902 0715947360 daud2011tz@yahoo.com	
4	30/1/13	Einhard Chuzaga	KMC	DMDP Coordinator	0788245145 einhardnorbert@yahoo	
5	30/1/13	Eng. Ismail Mafita	KMC	Local Roads Focal Person	ismailmafita@rocketmail.com	
6	30/1/13	FRANCIS MUSOMA	KMC	Drainage Engineer	musomoro@yahoo.com	

ESIA OF THE PROPOSED UPGRADING OF DAR ES SALAAM ROADS

LIST OF STAKEHOLDERS CONSULTED

S/N	DATE	NAME	INSTITUTION	POSITION	ADRESSS/PHONE NO.	SIGNATURE
	30/01/2013	SIMON C. MMBAGA	KINONONI MUNICIPAL COUNCIL	ROAD ENGINEER	Simon_mbabaga@yahoo.com 0754388504	
	30/1/2013	H. Bigere	KMC	ECONOMIST	0713675211	
	30/01/2013	J Masara	KMC	Engineer	0772-315772	
	30/01/2013	M. Magwiza	KMC	Community Development	0652-004004	
1	30/01/2013	SIXMUND NGOWI	KMC	C/TECH	0719348900	
2	30/01/2013	ELLY J. MMBAGA	KMC	C/ Tech	0655-591231	
		Q Felicissimi Tesha	Kmc	Quantity Surv.	0757083388	
		Mtumwa Juma	KMC	Tech Ldo	0754 271307	
4	8.03.013	GILBERT MUSHI	MSASANI WARD	WEO	0717494958	

ESIA OF THE PROPOSED UPGRADING OF DAR ES SALAAM ROADS

LIST OF STAKEHOLDERS CONSULTED

S/N	DATE	NAME	INSTITUTION	POSITION	ADRESSS/PHONE NO.	SIGNATURE
1	18/03/2013	BAHATI M. MSHANGA	MEO-BWAWANI	MEO	0713-264067	
2.	19/03/2013	DAVID J. MWAKIPOSA	KMC WEO SINZA	WEO SINZA	Box 31902 DSM 0767522990	
03.	19/03/2013	N-O- SWAI	KMC WEO-MAGOMENI	WEO MAGOMENI	0754 805110 0717 163744	
04	19/03/2013	ROSE S. KATAMBA	KMC WEO-TANDALE	WEO-TANDALE	0717517717	
05.	19/03/2013	SHIDA SALEH	KMC WEO-NDUGUMBI	WEO-NDUGUMBI	0756298003	
06	19/03/2013	SULEIMAN SHAIJ	KMC MEO-KIGAENI	MEO	0786-294134	

Appendix IV: Minutes of Meetings

MAKANYA ROAD

MKUTANO WA UPANUZI WA BARABARA YA MLANDIZI ROAD. KATIKA ENEO LA TANDALE

AGENDA ZA MKUTANO
(1) KUFUNGUA KIKAO/MKUTANO
(2) KUTOA TAARIFA ZA UPANUZI WA BARABARA
3) KUFUNGA MKUTANO

AGENDA YA KWANZA: KUFUNGUA MKUTANO
- Mwenyekiti amefungua mkutano saa 10:30

AGENDA YA PILI - KUTOA TAARIFA YA UPANUZI WA BARABARA
(2) Katika Agenda hii M/kiti amewakaribisha wageni kutoa taarifa za upanuzi wa barabara.
Upanuzi wa barabara.
barabara zilizopo ni Mbili
(1) barabara ya Mlandizi road
(2) Tandale Kisiwani.
barabara hizo zitakuwa na.
1) taa za barabarani
2) Vituo vya Mabasi
3) Mifereji mikubwa pembeni mwa barabara.
Hivyo tunaomba Maoni kutoka kwenu wananchi
Barabara ya Mlandizi itakuwa ni kubwa kwani itatumika

Maswali
Joshua Kahando - Mara nyingi na kuwa sipo. Mnaposema barabara pana itakuwa na upana gani

Jibu barabara itakuwa ni Moja ispokuwa ni kubwa ambayo itawezakuwa Mita 21

Hivyo mtu wa kuthamini nyumba atoke World banki na Walipaji wawe World banki kwani Serikali haitaweza kutulipa Vizuri.

ANNA/KAMPUNI - Tathimini zitokane wao na kujulikane kabla ya kwenda Serikalini

AGENDA YA MWISHO 3: KUFUNGA KIKAO

M/Kiti Barnabasi Mkoba amefunga mkutano mnamo saa 11:30 jioni amewashukuru Wananchi wote waliohudhuria.

BARNABAS MKOBA
MWENYEKITI WA KIKAO

PETER C MKONGWE
KATIBU

EXTERNAL

-Kia kuna mradi wa DMDP magari yaendayokasi na ghara miwa na benki ya dunia na Serikali inatoa fidia kwa waathirika - Upande wa shughuli za awali kutambua athari za hasara (faida na kubomolewa majengo na watu watapoteza vipato na wengine ambao wamepangisha na wapangaji watakosa mahala pa kuishi na kukatwa kwa miti na vitu vya jumuiya kama Shule, Kanisa, Makiti na miundo mbinu ya simu, maji na hata makaburi

-Mambo ya kimsingi 4 - 1 Kutoa taarifa ya muendelezo 2 mpango mbadala 3 baada ya watu kuekewa alama na kutakua na dodoso ili iwezekane kupati kama kwa taarifa za awali zitakazo toa picha halisi ya barabara itakapo pita. Lengine kuomba kupata mapendekezo maoni ili yawekwe kwenye taarifa

• Baada ya alama kuwekwa nini kinafuata - wanapaswa kupata fidia na itakua kwa majengo, mazao, miti na maeneo ya wazi pia atapata fidia na miundo mbinu kunafingu la kufidia wanaomiliki miundo mbinu kama maji na tanesco na fidia itafanywa baada ya wathamini kupita na muda utowekwa wakutosha na utaanza tenako, Ilala halafu Kinondoni

• Na wakati wakuthamini ni bora wamiliki wenyewe halali wawepo na dodoso linaweza kuanzia kesho na hapa unaweza kumuweka mtu kuliko katika tathmini

• Majengo na kingine ambacho kitahurishwa ni masuala ya usumbufu na suala la usafiri - kwa hiyo mtu anatafuta makazi mbadala na Serikali haitamtafutia mtu kiwanja kwani kila mtu atalipwa kulingana na thamani ya jengo na malazi kipindi cha mpito kabla ya kupata makazi na atapewa malazi kwa kipindi cha miezi 36 = 3yrs

• Wakati mwingine jengo linakatwa nusu, robo au kote au fensi na kwa majengo wanayoishi watu au kufanya biashara linakatwa nusu na utaratibu utakua wa jengo zima na mahitaji ya barabara kwa sasa ni vipimo vilivyowekwa na kuhama inaweza kuchukua muda na

- Wengine kwa namna moja au nyingine kimefidiwa na kuuzwa tena hakuna kitu kitaondo kingomelo
La mwisho walishukuru kwa uvumilivu na kushirikiana na wananchi kuitikia na dodoso linaweza kuanza kesho kutwa.

Kufunga Saa 8'58

SIMU 2000

MUHTASARI WA MKUTANO WA WANANCHI
WANAOATHIRIKA NA UJENZI WA BARABARA
YA SIMU 2000 Y SINZA C 30/8/2013

MAHUDHURIO; Kopi ya mahudhurio imeambatanishwa pamoja na muhtasari huu.

KUFUNGUA MKUTANO

Mkutano umefunguliwa na mwenyekiti wa serikali ya mtaa wa Sinza C.
Mwenyekiti alitoa utangulizi kwa kuwashukuru wananchi wote waliohudhuria mkutano. Lengo la mkutano ni kupata ufafanuzi kuhusu mradi wa ujenzi wa barabara kwa walengwa ambao wameathirika na mradi. Mwenyekiti aliwatambulisha wageni na kuwatambulisha wataalamu wa kampuni inayoshughulika na mradi (CROWN TECH - CONSULTANCY LTD)
Mwakilishi wa kampuni ya C.T.C Ltd alitoa ufafanuzi wa mradi:

- Mpaka ya msingi ni kutafsiri yale ya maendeleo ya mpango mbadala baada ya watu kuwekewa alama na pia kutoa na mradi. Itatolewa kuwafafanulia watu waliotaka ?
- Baada ya alama kitakachofuata ni fidia kwa majengo, mazao miti na maeneo ya wazi.
- Pindi tathmini itakapotangazwa ni kwa wamiliki halali wa majengo husika.
- Ujenzi utafanyika tu baada ya fidia kulipwa kwa walengwa/wahusika.
- Wawakilishi waliendelea kutoa ufafanuzi kuhusu mradi wa namna fidia zitakavyolipwa.

Masuali

- Vyanzo vya tathmini vitakuwa vipi?
- Tathmini za nyumba zitakuwa tofauti na tathmini za viwanja.
- Nyumba itakayokatwa katikati itafidiwa vipi.
- Chati zipo blue na kijani zina utofauti gani.
- Nyumba imekatwa nusu na mtu ataendelea kuishi, ataendelea kulipa kodi ya ardhi na manispaa?

Majibu

- Hakuna vigezo ila mmiliki wa halali wa eneo/maeneo watalipwa fidia kulingana na sheria za Serikali ya Tanzania.
- Fedha za viwanja na fedha za nyumba zitajumuishwa pamoja na kulipa hesabu kamili ya malipo
- Nyumba itakayokatwa katikati na ikaonekana mabaki yake ya awali hayataweza kuwepo, malipo yatakuwa ya nyumba nzima.
- Chati zote za blue na nyekundu hazina utofauti bali ni alama tu ya chati zinazotumika na wataalamu wanapofanya tathmini.
- Mita kumi ya ardhi itaendelea kulipwa, lakini kiwango kitakachotumika kulipwa, mwenye nyumba atapunguza sehemu eneo litakalochukuliwa na barabara halitalipwa. Tali

Kufunga Mkutano

Mkutano ulifungwa na mwenyekiti wa serikali ya mtaa na aliwashukuru kuhudhuria mikutano mbalimbali itakayoitishwa kwa ajili ya maendeleo ya wananchi.

— x — x —

Appendix V: Summary of RAP

This Resettlement Action Plan for Kinondoni Municipal Council 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, totalling 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.

Main 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 Kinondoni Municipality sub-projects under DMDP phase 1.The thirteen roads considered for investment in Kinondoni would impact approximately 900 properties, including 64 households that would have partial impacts (e.g. fences, verandas) and 163 households that would require full demolition and permanent relocation.

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 1959 people will be affected by the said project.

Institutional arrangements and responsibilities

The overall responsibility of compensation and resettlement will be carried out by Kinondoni 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 Project Implementation Unit (PIU), grievances procedures and selection representative from PAPs in the grievances committee. The time allocated to evacuate the site and removal and savage 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
A preliminary budget for the RAP has been prepared and included in this report. It should be noted that as far as Kinondoni Municipality is concerned a total of thirteen (13) roads may be implemented under phase one (i.e. External, Kilimani, Kilongawima, Kisukuru, Korogwe-Kilungule, Makanya, MMK, Nzasa, SIMU 2000, Sokoni Makumbusho, Tandale Kisiwani, TANESCO Soko La Samaki, and Viwandani). Out of these 13 subprojects, 7 would impact properties and require compensation. The estimated budget for compensation is approximately US$5.8 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)
External	116	10	$ 281,682	19	$ 535,197	$ 1,380	$ 818,259
Kilimani	88	4	$ 988	18	$ 4,448	$ 434	$ 413,079
Kilongawima	80	4	$ 40,284	16	$ 161,137	$ 444	$ 201,865
Korogwe-Kilungule	60	8	$ 193,947	7	$ 169,703	-	$ 363,650
Makanya	392	23	$ 754,089	75	$ 2,458,986	$ 1,157	$ 3,214,232
SIMU 2000	60	10	$ 136,990	5	$ 68,495	$ 819	$ 206,303
Tandale Kisiwani	112	5	$ 105,873	23	$ 487,015	$ 301	$ 593,190
Total	**908**	**64**	**$ 1,513,854**	**163**	**$ 3,884,981**	**$ 4,534**	**$ 5,810,578**

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 was able to reduce the number of affected properties from 1959 to 908, including a reduction in the

number of PAPs to be permanently relocated, which resulted in a substantial reduction in compensation costs from over US $18 million to about US$5.8 million. 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

Kilimani Road

Kilimani Road

Makanya Road

Makanya Road

Tandale -Kisiwani Road

Tandale -Kisiwani Road

Tanesco-Soko La Samaki Road

Tanesco-Soko La Samaki Road

Sokoni-Makumbuho Road

Sokoni -Makumbusho Road

MMK -Road

MMK -Road

Nzasa Road

Nzasa Road

Kisukuru Road

Kisukuru Road

Kilungule-Kimara Korogwe Road	Kilungule-Kimara Korogwe Road