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PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

TANZANIA STRATEGIC CITIES PROJECT – ADDITIONAL FINANCING (TSCP - AF), 2015 – 2017
(IDA CREDIT No. 5460 - TZ)

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR PROPOSED ADDITIONAL INVESTMENT SUB-PROJECTS IN TANGA CITY

FINAL REPORT

Proponent: ***City Director,***
Tanga City Council
P. o. Box 178
TANGA
Tel: +255 (27) 2172646701 / +255 (27) 2642444.

Consultant:

Eng. Restituta Paul
P O Box 35176, Dar-Es-Salaam.
Mobile: +255 786 581333, **Email:**restimapinduzi@gmail.com

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STUDY TEAM

Expert	Responsibility	Signature
Eng. Restituta Paul	Environmentalist and EIA Team Leader	
Mr. Given Mhina	Environmental Scientist	
Mrs. Rosina Minanago	Sociologist	
Eng. Flex Mtui	Civil Engineer	

EXECUTIVE SUMMARY

The Government of Tanzania (GoT) through the Prime Minister's Office, Regional Administration and Local Government (PMO-RALG) now known as the President's Office-Regional Administration and Local Government (PO-RALG) is implementing the Core Tanzania Strategic Cities Project (TSCP) in selected urban Local Government Authorities for 5 years financed by a World Bank (IDA) credit and a grant from the Government of the Kingdom of Denmark.
The Core TSCP is an investment operation that provides finance for critical infrastructure in the participating authorities namely: 4 Cities of Mwanza, Tanga, Mbeya and Arusha; 4 Municipalities of Ilemela, Dodoma, Kigoma-Ujiji, Mtwara-Mikindani and the Capital Development Authority (CDA). The planned sub-projects have involved upgrading/rehabilitation of a number of arterial urban roads and drainage with associated structures such as drain-ditches, culverts and bridges, footpaths and street lighting and; local infrastructure such as bus and lorry stands aimed to improve movement of the people, goods and services in the urban areas.

Core TSCP also, finances development of infrastructure to improve solid waste management including solid waste collection centres, equipment for transportation and disposal, and the development or improvement of disposal sites. So far, most of the prioritized infrastructure are complete and in use or in final stages of completion.

Brief Description of the Proposed Additional Financing

Some areas of the completed infrastructure in the so called participating LGAs have been identified where improvements need to be made. Earlier, a number of infrastructure facilities were not financed under the Core TSCP due to limited funds which were available under the credit. In the long run, the participating LGAs have identified additional sub-projects which are important for functionality of the existing sub-projects. Based on these identified gaps, GoT is preparing a credit – Tanzania Strategic Cities Project - Additional Financing (TSCP – AF) with a view of financing these additional infrastructure investments in the 8 urban LGAs and the CDA currently receiving funds from Core TSCP. TSCP - Additional Financing will fund civil works construction costs mainly involving extension and rehabilitation of existing infrastructure with few completely new structures.

The development objective of the proposed TSCP - AF remains the same as for the Core Project of improving the quality of and access to the basic urban to basic urban services in eight selected Participating LGAs and the CDA. TSCP - AF will be implemented to reinforce the functioning of the already built core urban infrastructure and services. Eligible investment projects fall in the categories of roads and drainage infrastructure and solid waste management. In effect, the

investments sub-projects in Tanga City Council under the proposed TSCP AF entail rehabilitation/construction of the following:

i. Rehabilitation of Street No. 8 (0.83km): Complete rehabilitation measures of the road from its current potholed pavement to asphalt paved road.
ii. Nguvumali 2 Road Upgrading (1.6km): Complete upgrading measures of the road from its current earth/gravel road to asphalt paved road.
iii. Jamatkhan Road Rehabilitation (1.1km): Complete rehabilitation measures of the road from its current potholed pavement to asphalt paved road. Additional improvements to a Bus Stand and a Lorry Parking area at Kange neighbourhood and,
iv. Feeder Drains to Duga and Mabawa Drains: Removal of standing water from two low lying areas and discharging the storm water into the recently constructed Duga Drain.

Objectives of the Environmental and Social Impact Assessment (ESIA)

This ESIA has been prepared according to the Environmental and Social Management Framework (ESMF) prepared under TSCP for environmental and social screening process. Its objective is to ensure that the proposed additional infrastructure development interventions are implemented in an environmentally and socially sustainable manner. The screening process aims to ensure that the City has firm strategies to identify, avoid or minimize and mitigate potential negative environmental and social impacts during the planning stage for construction of the sub-projects. This ESIA is complementary to the earlier Core ESIA and it presents definitive, conclusive and clear procedures consistent with the relevant existing legislations applicable in Tanzania Mainland and the World Bank's safeguard policies.

The ESIA for the Core Urban Infrastructure and Services component of TSCP which constitutes of rehabilitation/upgrading of urban roads and drainage and solid waste collection and disposal infrastructure was conducted and approved by the National Environment Management Council (NEMC) in 2010. The Tanga City authority was then awarded EIA Certificate No. **EC/EIS/260.** The adopted environmental and social assessment and management process for City responds the World Bank Safeguard Policies and to the requirements specified in the Tanzania EIA and Audit Regulations, 2005 (Part IX, Regulation 42, Sub-regulation (1); (2)(b); and (4)) on approval of changes to a project with a valid EIA Certificate.

As mentioned above, the TSCP obtained EIS certificate for proposed works with conditions attached in the certificate after verification of the carried out ESIA study between August and November 2009. Although the EIA regulations of 2005 GN No. 349 of 2005 allow for variation on issued certificate for any additional works where the developer is required to fill in Form No. 5 of the regulation, that will not apply to this case because the additional sub-projects are part of the previously selected

and designed sub-projects approved by NEMC but could not be implemented due to limitation of TSCP credit funds.

The World Bank Safeguards Policies require that, before a subproject is appraised, relevant safeguards instruments, such as ESIA containing an Environmental and Social Management Plan (ESMP), or just an EMP, and if the sub-project requires it, a Resettlement Action Plan (RAP), will be prepared and thereafter locally disclosed and also forwarded to the Bank for disclosure at the InfoShop.

Environmental and Social Impacts

The proposed sub-project investments in the Tanga City under the TSCP - AF may have significant negative impacts on the environment from a project specific perspective. These impacts include:

i. Change of scenery view of the project areas,
ii. Dust related air pollution,
iii. Increased dust and air pollution,
iv. Increased noise and vibrations,
v. Pollution of water sources,
vi. Increased waste generation,
vii. Loss of definite materials and land degradation,
viii. Interuption or lack of utility servives due to damage/relocation of existing utility infrastructure,
ix. Lacking or slow restoration of areas impacted by construction,
x. Risks to worker's and public safety,
xi. Overburdened local authority,
xii. Increased road accidents and,
xiii. Environmental hazards resulting from waste deposition into storm water drains.

Impact assessment was done using simple methods (checklists) and procedures (existing structures at local authorities). It is envisaged that the anticipated impacts from development of the infrastructure sub-projects in Tanga City will be short-term, site specific, confined, reversible and can be managed through the application of a set of mitigation and monitoring measures presented in the ESMP.
The ESMP clearly indicates the institutional responsibilities with regard to implementing mitigation measures, monitoring of the implementation of these mitigation measures and related estimated costs and time horizons. Furthermore, the ESIA has assessed the capacity of the City to implement the proposed screening process and mitigation measures. The City has a previous experience from earlier projects and programmes such as USRP and UDEM on the management of environmental and social issues related to construction/ civil works. PO-RALG in

turn, has the capacity and sufficient experience to do follow-up and backstopping to the City as needed. However, the capacity of the City authority is still at a nascent stage both to support and supervise construction work of the proposed infrastructure and to implement the required environmental and social screening.
Though there is some improvement, yet still, there are prevalent weaknesses in the integration of ESIA aspects into the infrastructure designs before sub-projects are commenced on and, in the monitoring of the mitigation measures. This ESIA, thus, has made recommendations as appropriate, which among others include training and re-tooling needs with corresponding estimated costs. It recommends on building the capacity right from Mtaa to the national level through provision of training to staff and decision makers who will be designated various roles in planning, reviewing, implementing, monitoring and supervision of soft and physical implementation at every stage of different infrastructure facilities and their auxiliary structures.
The role of NEMC in the context of TSCP – AF is to continue providing technical support, approval of sub-projects as relevant and facilitate training on social and environmental aspects relevant to the project.

LIST OF ACRONYMS

BATNEEC	-	Best Available Technology Not Entailing Excess Cost
CBO	-	Community Based Organization
COBET	-	Complementary Basic Education in Tanzania
DoE	-	Department of Environment
EIA	-	Environmental Impact Assessment
EMA	-	Environnemental Management Act of 2004
ESIA	-	Environmental and Social Impact Assessment
ESMF	-	Environmental and Social Management Framework
ESMP	-	Environmental and Social Management Plan
EMP	-	Environmental Management Plan
EIS	-	Environmental Impact Statement
EMA	-	Environmental Management Act
EWURA	-	Energy and Water Utilization Regulatory Authority
HIV/AIDS	-	Human Immune deficiency Virus /Acquired Immune Deficiency Syndrome
IDA	-	International Development Association
ICBAE	-	Integrated Community Based Adult Education Program
KUWASA	-	Kigoma Urban Water Supply and Sewerage Authority
LGSP	-	Local Government Support Project
NEP	-	National Environmental Plan
NEMC	-	National Environnemental Management
NGO	-	Non Governmental Organization
NSGRP	-	National Strategy for Growth and Reduction of Poverty
PO-RALG-		President's Office, Regional Administration and Local Government
STD	-	Sexually Transmitted Diseases
TAUWASA	-	Tanga Urban Water Supply and Sewerage Authority
TAC	-	Technical Advisory Committee
TANESCO	-	Tanzania Electricity Supply Company
TTCL	-	Tanzania Telecommunication Company Ltd
ToR	-	Terms of References
TSCP	-	Tanzania Strategic Cities Project
TSCP – AF	-	Tanzania Strategic Cities Project – Additional Financing
WB	-	World Bank

ACKNOWLEDGEMENT

The preparation of this report was guided by the Environmental and Social Management Framework (ESMF) for the Proposed TSCP – AF of 2014. The report builds on a previous document titled "Environmental and Social Impact Assessment for the Investment Sub-Projects in Tanga City, under the Proposed Tanzania Strategic Cities Project" of January 2010. This current report is a review with additions of the previous ESIA report.

The report is a result of cooperative efforts of a number of experts some of whom are listed in the study team. The projects proponent (PO-RALG) is indebted to all those who spared their precious time to contribute to the preparations of this report. A number of stakeholders and/or specialists were involved, a few of whom are mentioned here.

The study Consultant wishes to thank Eng. J. B. Bujulu and Dr. mukuki Hante of PO-RALG for a thorough technical guidance during the preparation of this report and, also the Management of the UWP Consulting (Tz) Ltd for awarding her team the consultancy which has yielded to this ESIA report.

Furthermore, the consultant wishes to thank the Tanga City Authority for the cordial cooperation and provision of technical information and documents without which this report would have not been completed.

The consultant is, also gratefull to all stakeholders interviewed during the scopping exercise, including the Ward and Mtaa leaders at the specific project sites. In an earnest manner, we also thank all other individuals who assisted in one way or another during the preparation of this report.

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1.0 INTRODUCTION

1.1 Background of Tanzania Strategic Cities Project (TSCP)

In 2010, the Government of Tanzania (GoT) through the Prime Minister's Office, Regional Administration and Local Government (PO-RALG) now known as the Presidents Office-Regional Administration and Local Government received funds from the World Bank (IDA Credit) and a grant from the Government of the Kingdom of Denmark to implement the Core Tanzania Strategic Cities Project (TSCP).

PO-RALG has been implementing the project for 5 years with a total of 8 participating urban Local Government Authorities (LGAs) namely: 4 cities of Mwanza, Tanga, Mbeya and Arusha; and 3 Municipalities of Dodoma, Kigoma-Ujiji and Mtwara-Mikindani as well as the Ilemela Municipality which was then added to the list of the participating LGAs after the carving of the Mwanza City.

- **Rationale for TSCP**

The Core TSCP was prepared in a response to a request from the GoT to assist with the financing of an investment operation that would provide finance for critical infrastructure in key urban LGAs and support for improved fiscal and management capacity for urban development and management. Basically, TSCP recognizes the strategic importance of Tanzania urban centres of being the engines for the country's structural transformation, economic growth and nation-wide improvement in welfare. The participating LGAs have strategic importance to mainland Tanzania in terms of their physical locations, importance for regional trade, demographic weight and contribution to the national economy.

- **TSCP Objectives and Outcomes**

Development Objective:

Improve the quality of and access to basic urban services in seven elected Participating LGAs.

Purpose:

Rehabilitation and expansion of urban infrastructure and institutional strengthening activities aimed at improving the fiscal and management capacities of the Participating LGAs.

Project Outcomes:

TSCP will improve the welfare and capacities of the LGAs to identify their key problems, determine the appropriate solutions in the form of sub-projects, plan their implementation and assume full responsibility for their maintenance and management.

- **TSCP Components**

Component 1: Core Urban Infrastructure and Services: supports investments in urban roads and drainage, including associated structures such as drainage ditches, culverts/bridges, footpaths and street lighting; solid waste management including solid waste collection centres, equipment for transportation and disposal, and the development or improvement of disposal sites; and local infrastructure such as bus and lorry stands. The component also finance construction supervision of the works for the investment sub-projects and technical assistance specifically for the implementation and monitoring of ESMPs and RAPs linked to sub-projects, including the payment of compensation costs.

Component 2: Institutional strengthening: to ensure the sustainability of the investments and lay the foundation for continued improvement of services, this component supports institutional strengthening and capacity building activities with the objective of increasing the financial resources at the disposal of Participating LGAs and their technical capacity to plan and implement their own infrastructure projects. This includes provision of support for management of environmental and social safeguards. Grant from Government of the Kingdom of Denmark is financing activities under this component.

Component 3: Implementation Support and Preparation of Future Urban Projects: supports project implementation and preparation of future urban projects.

This ESIA report, therefore, is for Component 1 and will be applicable to Tanga under and within the boundaries of the City authority.

- **Current Status of completed works**

Activities under the Core Urban Infrastructure and Services component have involved improvement or development of selected infrastructure sub-projects at various locations in Tanga City. Works have involved upgrading /rehabilitation of a number of arterial roads and drainage and associated structures aimed at improving the movement of people, goods and services in the City. Priority is given to roads to enhance connectivity (linking principal residential areas, commercial centres and service centres) to the main road networks, enhancement of traffic flow. Most of the infrastructure on the list of the first batch of prioritized sub-projects are complete and in use or in final stages (90%) of completion.

- **Rationale for TSCP Additional Financing**

Some areas of the completed infrastructure have been identified where further improvements need to be made. A number of infrastructure facilities were prioritized during the Core TSCP design and preparation but not financed under the core implementation due to cost estimates being far above the available funds under the credit. Thus, the GoT through PO-RALG has decided to apply for a credit that will finance improvements of these facilities.

1.2 Rationale of the ESIA Study

The ESIA for the Core Urban Infrastructure and Services component of TSCP in Tanga City was conducted and approved by the National Environment Management Council (NEMC) in 2010 and the City was awarded an EIA Certificate No. **EC/EIS/260.** The environmental and social assessment and management process for Tanga City responds the World Bank Safeguard Policies and to requirements specified in the Tanzania EIA and Audit Regulations, 2005 (Part IX, Regulation 42, Sub-regulation (1); (2)(b); and (4)) dealing with approval of changes to a project with a valid EIA Certificate.

The World Bank Safeguard Policies require that, before a project is appraised, relevant safeguards instruments, such as an ESIA containing an ESMP, or just an EMP, and if the project requires it, a Resettlement Action Plan (RAP), will be locally disclosed and will also be forwarded to the Bank for disclosure at the Bank's InfoShop.

1.3 Scope of Works

The indicative scope of Additional Financing works for the **Tanga City Council** is as follows:

(i) Rehabilitation of Street No. 8 (0.83km): Complete rehabilitation measures of the road from its current potholed pavement to asphalt paved road.
(ii) Nguvumali 2 Road Upgrading (1.6km): Complete upgrading measures of the road from its current earth/gravel road to asphalt paved road.
(iii) Jamatkhan Road Rehabilitation (1.1km): Complete rehabilitation measures of the road from its current potholed pavement to asphalt paved road.
(iv) Improvements to Bus and Lorry Stands
(v) Feeder Drains to Duga and Mabawa Drains: Removal of standing water from two low lying areas and discharging the storm water into the recently constructed Duga Drain.

1.4 Application Arrangements (Institutional Set-Up)

PO-RALG will be responsible for ensuring that the requirements of this ESIA are duly implemented. Notably, the necessary approvals as required by the law must be sought by the City authority involving the responsible approving bodies namely: the Vice President's Office (Division of Environment and the National Environment Management Council (NEMC).

1.5 Approach and Methodology for development of ESIA

1.5.1 The Approach

The following approach was used in the development of the ESIA.

- Identification of key issues for the ESIA study,
- Conduction of Scoping exercise which involved collection of data and information from literature, consultations with key informants and observations at the Tanga City to determine:
    - Baseline conditions of important biophysical and socio-economic receptors emphasizing prevalent trends and indicators;
    - Components of the TSCP - AF sub-projects and activities in general likely to interact with this baseline;
    - Potential resulting environmental and social impacts;
    - Best alternative approaches for designing and implementing TSCP – AF sub-projects;
    - Individual and institutional capacity building needs for implementation ESMP
- Developing the ESIA based on content specifically specified in the ToR.

1.5.2 Methodology

The methodology applied involved field studies, public consultation and assessment of the impact as follows:

Broader consultation:

The fieldwork for this study was carried out in December 2014. It involved reconnaissance to all sub-projects by observing the sites and interviewing various stakeholders and, meeting relevant City officials. *The field visits were* crucial for coverage of subprojects in terms of biophysical environment on their locations and socio-economic conditions.

Public participation:

Participation of affected communities was important and in these EIA and SIA studies, various stakeholders participated. It involved local communities, mtaa, ward and key city and municipal officials where community members had opportunities to air their concerns. Their concerns have been addressed in Chapter 5 of this ESIA Report.

Impact Assessment

Identifying impacts of subprojects onto the existing social and environmental naturality involved using pre-prepared checklists in form of impact matrix method in order to map significant impacts.

1.6 The Scope of the EIA/ SIA

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

- To provide a description of the project, it's components and activities throughout all project phases;
- To provide baseline information of bio-physical and socio-economic conditions within the project area of influence;
- To identify and consult key stakeholders and relevant authorities and communities that may be affected by the proposed project;
- A description of the legislative and institutional framework relevant to the project, including relevant World Bank Safeguard Policies triggered if project is implemented;
- To review of policies, legislation and administrative and institutional framework relevant to the project, including relevant World Bank Safeguard Policies triggered if project is implemented.
- To identify, assess and quantify the potential environmental impacts resulting from the Investment Sub-projects activities, especially within the zone of influence of the project.
- To assess and quantify the potential social impacts resulting from the establishment of the Investment Subprojects, and assess the target groups to be affected.
- Identifying mitigation and management options to avoid or minimize offset any adverse significant biophysical and socio-economic impacts, to develop an ESMP detailing actions and responsibilities for impacts mitigation and monitoring.
- To assess resettlement issues (Resettlement Impact Analysis).

1.7 Methodology

1.7.1 Study Team and Scoping

A multi-disciplinary team of experts was involved in this ESIA study in order to properly address the environmental and socio-economical issues. The team consisted of the following experts: Environmentalists, Sociologists, Drainage Engineer and Road Engineer. The team worked hand in hand with resident civil engineers and environmental experts in Tanga City Council.

Scoping was done through consultation and interviews with various relevant stakeholders, reviewing various reports, studies and literature relevant to environment and core urban infrastructure development in Tanzania. Related ESIA studies in Tanzania were reviewed in order to draw on existing knowledge and experiences. The information was further complemented by extensive field visits in the project area. The scoping exercise facilitated the identification of key stakeholders for the project and the main issues of concern to be addressed in detail in EIA and SIA studies. The scoping exercise was conducted in December 2014.

1.7.2 Field Studies and Public Participation

Broader consultation: The fieldwork for this study was carried out in November 2014. It involved reconnaissance in all sub-projects making various observations, site visits and interviews with stakeholders as well as meeting relevant Tanga City officials. Field visits were essential to fully realize the scope of the project, the biophysical environment specific to the location and the socio-economic conditions in the project area. The information was collected from various sources including the City officials, Ward Executive officers and Mitaa chairpersons in the project sites, Urban Water Supply and Sewerage Authority, the electricity supplying company, TANESCO and a few other relevant stakeholders.

Information and data collected include land use, ecosystems and human habitat, demography, hydrology, and other indicators related to environmental and socio-economic trends of sub-project areas. Other information was appraised through key informants, interviews and observations of the study experts.

Public participation was considered as an important element of the process. In these EIA and SIA studies various stakeholders participated. Broad consultations that involved local communities and, ward and key city officials were carried out. During these consultations, the local communities had opportunities to air their concerns. The following methods were used during field studies to ensure effective public involvement;

- *Focus Group Discussions*: The discussions were held with specific and targeted groups in the society including women, youths and small business entrepreneurs, Mtaa leaders and environmental committees. Guiding questions or checklists were prepared to facilitate the discussions and to focus it on issues related to a particular group. The dynamics of focus group

discussions were observed to ensure fruitful discussions under the leadership of the sociologist. The names of participants in the discussions are attached in Appendix II.

- *Meetings with Government Authorities*: Brief meetings were held with heads of various departments of the Tanga City Council, ward leaders and beneficiaries of the sub-projects. Meetings with authorities were held in their offices and involved a few other technical people.
- *Meetings with the community:* Brief meetings were held with WEOs in several wards (as indicated in Chapter 5). These meetings were conducted in the project sites. First, a brief description of the project was explained to them by the consultant before opening the floor for comments.
- *Direct observations:* Some facts were observed directly by the consultant team. The information obtained from this technique assisted the study team to have the starting point during subsequent one-to-one interviews with stakeholders and,
- *Secondary information*: This information was obtained from existing reports including:
    - World Bank Operational Policy 4.01
    - Tanga City Social economic Profile (2004),
    - Tanga City Environmental Profile (2009).

1.7.3 Project Impact Assessment

Superimposing project elements onto the existing (natural) social and environmental conditions has identified the potential social and environmental *impacts of the pr*oposed investment sub-projects. The checklist method has been used to identify the impacts and to recommend mitigation measures. Further, the environmental impact matrix method has been adopted to identify impacts of major concern.

However, this ESIA reveals that there is **no resettlement at the sites designated for the execution of additional** sub-projects. Works will be confined within legal boundaries of road Right of Way (RoW) or reserve, and zone designated for public utilities. Thus, a Resettlement Action Plan (**RAP) will not be prepared for the proposed additional works.** The design team will avoid interference with properties within and around project sites. The Tanga CC will collaborate with the supervision consultant and the contractors to resolve any unforeseen grievances on the basis of existing regulations. Firmly, consideration is taken of the earlier RAP study for the Duga- Airport road sub-project which has been dropped from the list of sub-projects to be financed by the World Bank to leave-way for AfDB to fund the it

under the Tanzania Roads Agency (TANROADS) on agreement with GoT. Importantly, GoT has committed to fairly compensate the PAPs in accordance with the approved RAP report as disclosed by the World Bank.

A key guiding assumption in this study is that the sub-projects will be designed, constructed, operated and maintained with due care for social and environmental safety 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 ESMP.

The environmental assessment has been undertaken in close interaction with the engineering planning and design team of M/s UWP Consulting Ltd. 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 ESIA. These data allow the study team to determine whether more detailed information on social and environmental conditions at the development site and its surroundings are needed and where such information can be obtained.
The sample of the study consisted mainly of ward division executives, committee members and the members of the general public who were considered to be potential affected persons and/or interested parties. All respondents were selected through convenient sampling techniques.

Both primary and secondary data were collected. Primary data were collected by direct measurement, questionnaires, 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 city and municipal profiles, wards, 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 national policies, legislations and institutional arrangements for social and environmental management in Tanzania and relevant international procedures to ascertain on the optimal management of impacts.

Identifying Environmental Impacts
This was undertaken by compiling a contender list of key impacts such as loss of flora and fauna, settlement patterns, social and cultural systems, water resources, land tenure systems and many others.

Predicting Environmental Impacts
The environmental impacts were identified and their potential size and nature were predicted. The prediction of impacts specified the causes and effects of the impact and, its secondary and tertiary consequences for the environment and the local community was assessed.

Determining the Significance of Impacts
The key activity was to evaluate the significance of impacts, that is, judgments were made about which impacts found in the study area were considered important and therefore need to be mitigated.

Identifying Mitigation and Management Options
The options for dealing with identified and predicted impacts were considered. 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.

1.8 Layout of ESIA Report

This report is divided into Eleven (11) chapters as described hereunder:

Chapter 1: Introduction
Provides the general overview of the project including how the project background and justification, objectives and scope of the study and methodology used for conducting the study.

Chapter 2: Project Description

This chapter details the project components and further outlines activities and materials used in all phases of the project i.e. (mobilization, construction and operation and decommissioning).

Chapter 3: Legal Requirement and Institutional Framework
The chapter gives an overview of Environmental and Social Management Requirements describing the United Republic of Tanzania policy, legislative and institutional framework and applicable World Bank safeguard policies.

Chapter 4: Baseline Environmental and Social Conditions
The first part of this chapter elaborates the project influence area and boundaries. Subsequently the chapter outlines the baseline / existing conditions of the study area divided into physical environment, biological environment and socio-cultural environment.

Chapter 5: Stakeholders Identification and Analysis
Chapter five explains how the stakeholders were involved during the ESIA process and presents their views regarding the project.

Chapter 6: Identification and Analysis of Impacts
This chapter discusses environmental and social impacts associated with the project analysed according to impacts significance.

Chapter 7: Impact Mitigation Measures
Mitigation measures are summarized in response to the adverse impacts identified in chapter 6 of the report.

Chapter 8: Environmental & Social Management Plan
The Environmental and Social Management Plan (ESMP) presents on how the identified impacts during design, construction and operation phases of the project will be managed so as to avoid, minimise or offset any adverse significant biophysical and socio-economic effects of the proposed development.

Chapter 9: Environmental and Social Monitoring Plan
Environmental and Social Monitoring Plan elaborates on how the implementation of the ESMP will be monitored throughout the phases of the project. It is a plan to monitor the efficiency of the proposed project mitigation measures.

Chapter 10: Decommissioning and Demobilisation
This chapter presents the activities involved when the proposed project is no longer operational and potential impacts to be managed.

Chapter 11: Conclusions and Recommendations

Conclusion sand recommendations summarize the findings with regard to how feasible, viable and environmentally acceptable the project is and provides recommendations to the proponent on the feasibility of the project. Further, the report will also provide a list of document used in a reference list and also a list of Appendices.

2.0 PROJECT DESCRIPTION

2.1 Project Location

Tanga City is situated on the North East Coast of Tanzania along the Indian Ocean lying between longitudes 38.53′ and 39.10′ East and latitudes 5 and 5.10′ South. The city covers an area of approximately 600 sq. kms. of which 62 sq. kms. is covered with water bodies. It also extends 20 kms inland from the coast and ranges in altitude between 0 – 17 metres above mean sea level (Figure 2.1).

That indicates that the topography of the City is mainly flat with some small, gently sloping hills punctuated by river valleys and streams. Tanga City is one of eight districts in Tanga region, others being Pangani, Mkinga, Muheza, Handeni, Kilindi, Korogwe and Lushoto The City has additional functions as a district and regional headquarter.(Figure2.2).

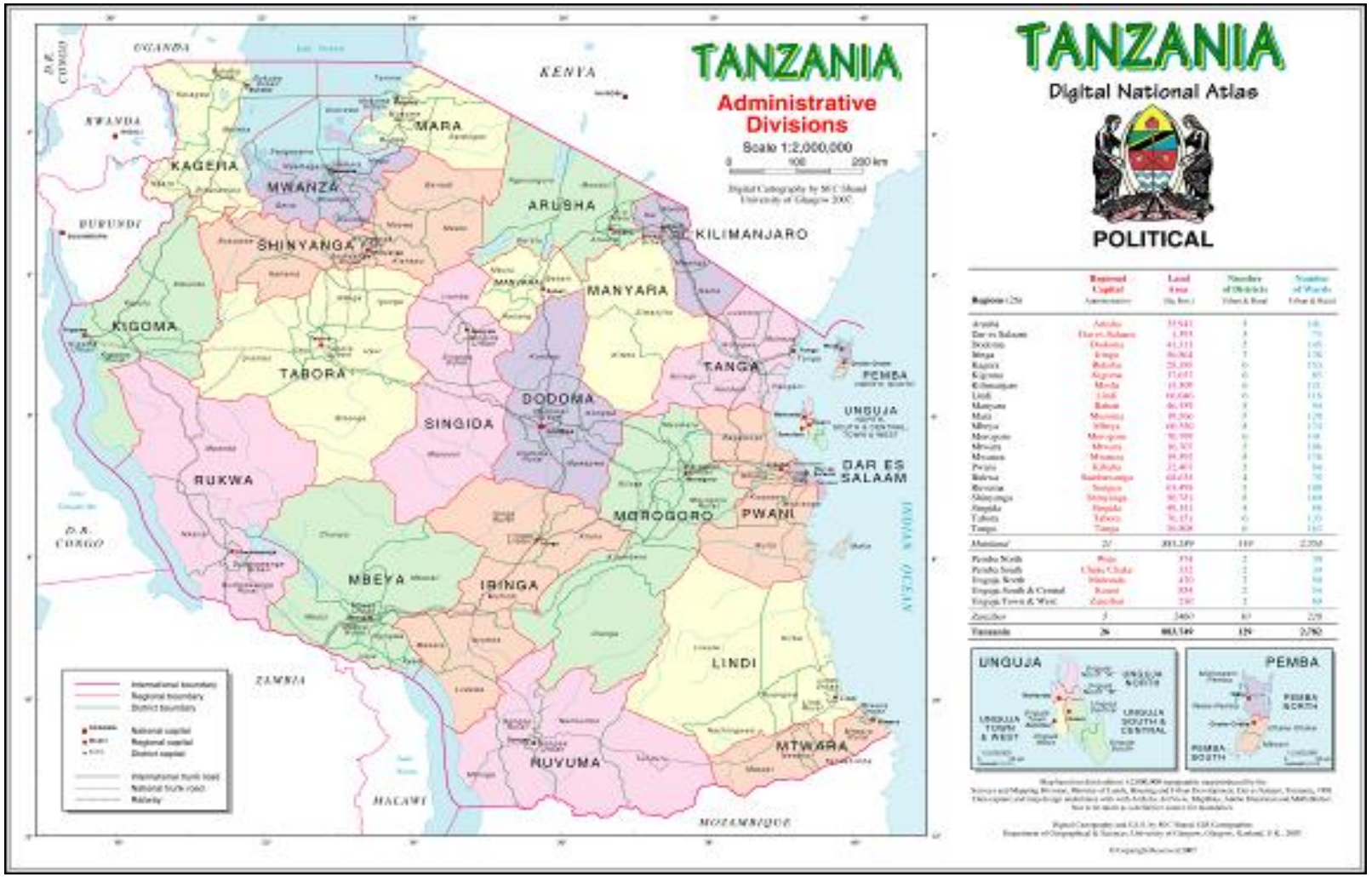
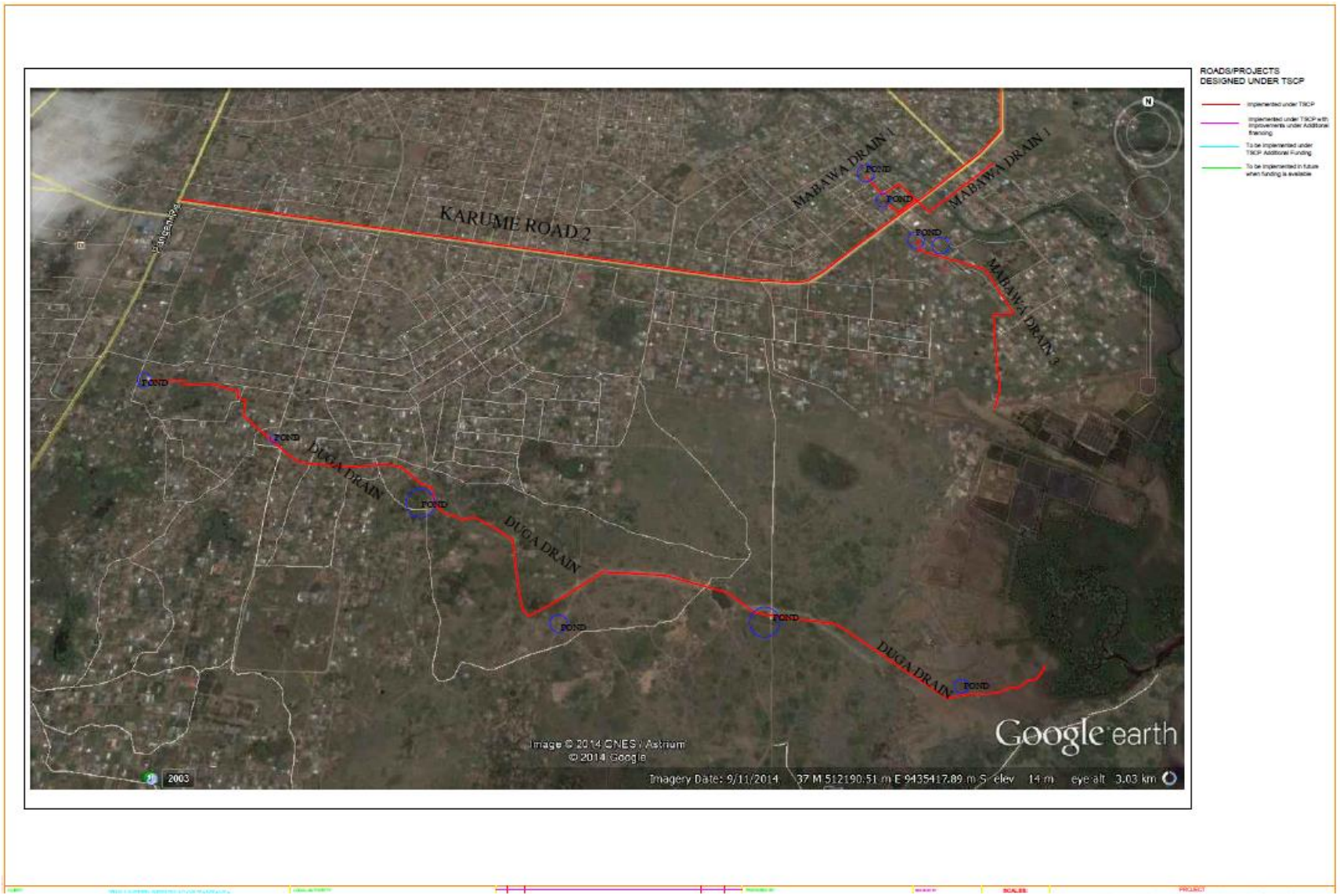


Figure 2.1: Map of Tanzania Showing the location of Tanga City.


ROADS/PROJECTS
DESIGNED UNDER TSCP
KARUME ROAD 2
MABAWA DRAIN 1
MABAWA DRAIN 1
MABAWA DRAIN 2
DUGA DRAIN
DUGA DRAIN
DUGA DRAIN
POND
Image © 2014 CNES / Astrium
© 2014 Google
Google earth
Imagery Date: 9/11/2014 37 M 512190.51 m E 9435417.89 m S elev 14 m eye alt 3.03 km
2003


ROADS/PROJECTS DESIGNED UNDER TSCP
Implemented under TSCP
Implemented under TSCP with improvements under Additional financing
To be implemented under TSCP Additional Funding
To be implemented in future when funding is available
Bombo
KARUME 1
Chumbageni
Ngamiani
MKWAKWANI ROAD 2
Tanga
Tanga Tanga
KARUME 2
Pangani Rd
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ROADS/PROJECTS
DESIGNED UNDER TSCP
A14

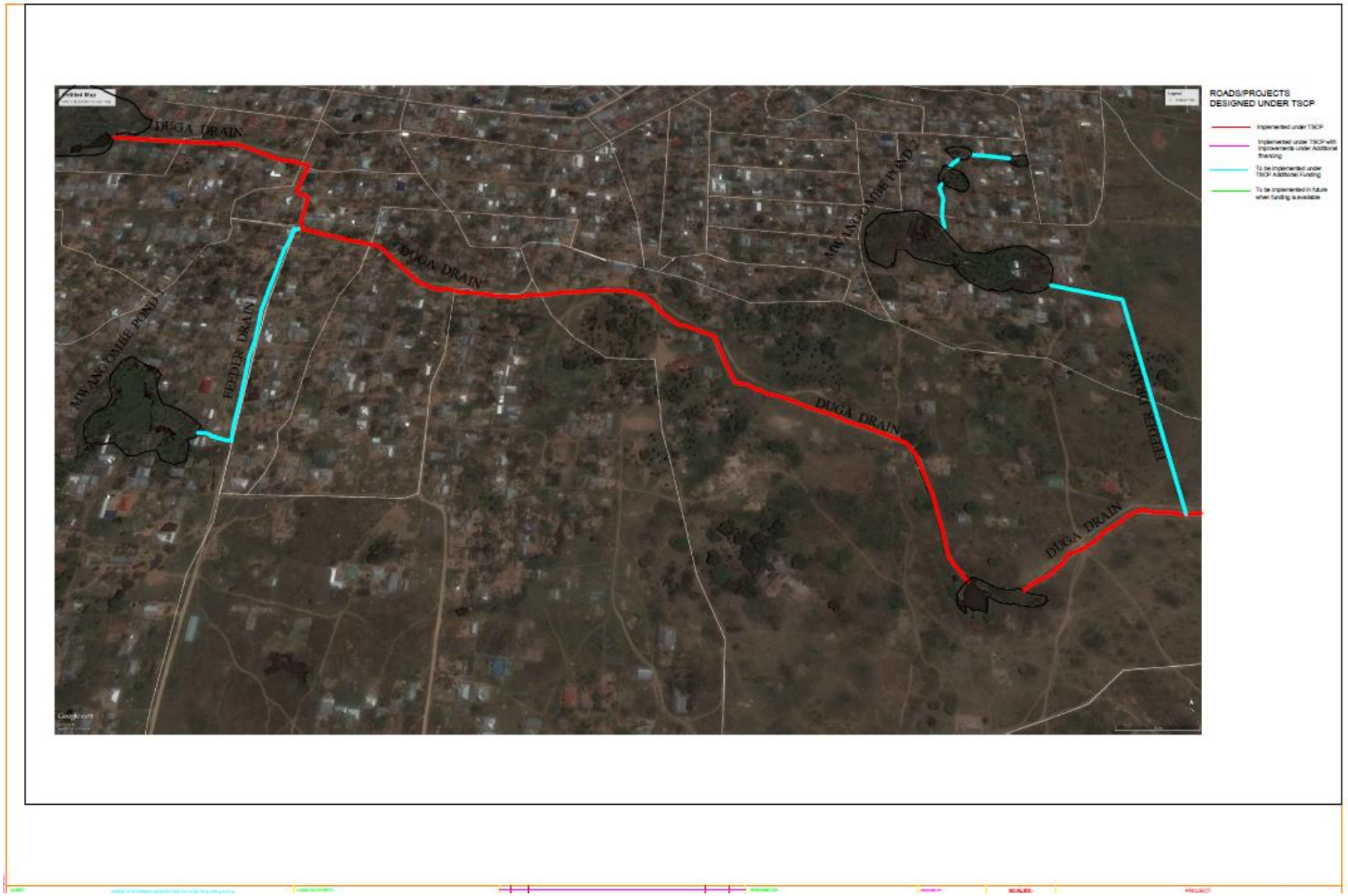

Figure 2.2: Shows satellite image of the Tanga City and the project sites.

Figure 2.3: Tanga City Council administrative boundaries

2.2 Project Components

The proposed TSCP - AF in Tanga City has five components as pointed-out below:

i. Street No. 8 Road Rehabilitation (0.83km)

Complete rehabilitation measures of the road from its current potholed pavement to asphalt paved road with

- Paved storm water drains
- Installation of culverts where required
- Lanes for pedestrians segregated from the vehicular lanes
- New pavement layers comprising
  - 30mm AC 14 on

  - 150mm CRS on
  - 150mm G45 Sub-base on
  - Improved sub-grade layers
- Installation of Street Lights

ii. Nguvumali 2 Road Upgrading (1.6km)

Complete upgrading measures of the road from its current earth/gravel road to asphalt paved road with

- Paved storm water drains
- Installation of culverts where required
- Lanes for pedestrians/cyclists segregated from the vehicular lanes
- New pavement layers comprising
  - 30mm AC 14 on
  - 150mm CRS on
  - 150mm G45 Sub-base on
  - Improved sub-grade layers
- Installation of Street Lights

iii. Jamatkhan Road Rehabilitation (1.1km)

Complete rehabilitation measures of the road from its current potholed pavement to asphalt paved road with

- Paved storm water drains
- Installation of culverts where required
- Lanes for pedestrians segregated from the vehicular lanes
- New pavement layers comprising
  - 30mm AC 14 on
  - 150mm CRS on
  - 150mm G45 Sub-base on
  - Improved sub-grade layers
- Installation of Street Lights

iv. **Improvements to Bus and Lorry Stands**

Activities at this sub-project comprise additional work to be carried out at these recently completed facilities in order to improve its *functionability* and to make the stands be more suitable for effective use. These additional works include

- Opening up and lining where necessary of the outfall drainage system to a disposal point including installation of culverts,
- Finishes to the perimeter block-work walls by installing metal grills, plastering and painting and,
- Providing elevated water storage tanks at the toilet blocks

v. Feeder Drains to Duga and Mabawa Drains

This sub-project involves removal of stagnant water and run-off from two low-lying areas and discharging it into the recently constructed Duga Drain. Activities include:

- Construction of stone pitched drains that feed into Duga drain and,
- Installation of culverts, guard rails and access/passage slabs where required.

2.2.1 Sub-projects alternatives

In the course of developing the proposed sub-projects for road, storm drain, street light and landfill structures, alternatives were compared in terms of potential environmental and social impacts; capital and operating costs, land availability and; suitability under local conditions. It was imperative to also examine and review different sub-projects settings, designs, and construction alternatives where two options were considered: *'No sub-project'* option and, the *Alternative sites.*

2.2.2 'No sub-project' option

The investment sub-projects for the City of Tanga under the proposed TSCP - AF are expected to improve sanitation and public health, promote safe and efficient mobility in the towns, improved economy and the general well-being in the city setting.

With contemporary fast increase of the population in the city, the challenge still prevails of inadequate stock and quality road, drainage, street lighting and waste disposal infrastructure. However, the sustainability of those infrastructure facilities depends on the good operation and maintenance of the facilities that will be adopted by the city authority.

If the 'no project' option was chosen, from the economic standpoint and social considerations, the following benefits will be foregone: i) improved transportation; ii) long life span for roads, iii) employment; iv) low incidence of accidents and v) controlled flooding inside urban centres against water stagnation. vi) good visibility and security at night and whenever natural light is dim, and vii) improved environmental sanitation in the city. Hence, for TSCP – AF sub-projects, the alternative of "no-project" would increase the risks on traffic and pedestrian accidents, flood damages to houses, vandalism of the infrastructure, untidy environment and general poor public health.
Thus, the 'no sub-project' option is not a viable alternative in this case.

2.3 Project Activities in General

2.3.1 Mobilization phase

- **Activities**

This phase entails mobilization of labour force, equipment and construction of office/camp as well as acquisition of various permits as required by the law. Other activities during this phase include carrying-out of topographic survey, geo-technical investigation, soils and materials investigation, land acquisition, material storage and preparation and, identification of sources of construction materials including and source of water.

During this period, auxiliary and preliminary works such as crushing of aggregates, locating of sign posts and identification of sites for disposal of wastes will be conducted.

- **Duration**

The duration of this phase will be Six (6) months.

- **Types and Sources of Project requirements**

Types and sources of project requirements during the pre-construction period involved materials investigation and characterization as done by the project design team. Among other things the focus was on investigation of existing and potential new borrow pits and quarry sites so as to get suitable materials for construction of gravel pavement layers, manufacture of surfacing materials for concrete and crushed stone structures.

Furthermore, the team identified sources of water and sand for construction works as shown in Table 2.1.

Table 2.1: Project requirements and Sources during the pre-construction phase

Requirements	Type	Source
Raw Materials	Gravel	**Borrow pits at Tongoni and Tundauwa.**
	Hard Core/Stones	**Amboni (Kiomoni) Commercial Quarry**
	Sand	**Commercial vendors**
	Water	**TUWSA**
	Cement	**Tanga Cement Co. Ltd**
	Reinforcement bars	**Local Vendors in Tanga city**
	Timber	**Local vendors (Tanga city)**
Energy	Electricity	**TANESCO (National Grid)/ Generators**

Requirements	Type	Source
	Fuel	**Local vending stations**
Manpower	Skilled	**Contractor**
	Unskilled	**Local people along the road**
Equipments	**Dump Trucks, Graders, Dozers, Water Boozers, Vibratorss, Excavators**	• **Contractor**

Source:
Design report for Proposed Additional Sub-Projects in Tanga, City under TSCP - AF, 2014)

Types, Amounts and treatment/disposal of Wastes

Types, amounts and treatment or disposal of wastes during the pre-construction phase are shown in Table 2.2:

Table 2.2: Types, amounts and treatment or disposal of wastes during the pre-construction phase

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Garbage: Food remains, cardboards and papers	20 kg/day (based on generation rate of 0.2 kg/day/ person and 100 workers)	Collected in skip buckets at working and camp sites/ office and then transferred to and processed at a compost unit to get manure worthy to local communities.
Solid Waste (Non-Degradable)	Scrap metals	4 - 8 kg per day	Sold to Recyclers
	Tins, glasses and plastics	2 - 4 kg per day	Taken to the authorised dumpsite at Mwang'ombe
Liquid waste	Sewage	3.2 m^3 (Based on 100 people, 40l/capita/day water consumption and 80% becomes wastewater)	Septic tank – Soakaway system at the campsites/ offices

Note: Estimation data used are typical waste generation rates in construction sites, based on the experience of the consultant on similar projects.

2.3.2 Construction phase

The project is essentially civil works in nature mainly consisting of the following:

1. Roads upgrading/rehabilitation

- Filling and reshaping the roads to sub-grade level
- Upgrading or construction of longitudinal and cross drainage structures
- Provision of sub-base, base course and asphalt concrete.
- Demolition and removal of culverts and temporary bridges;
- Provision of temporary crossings and traffic diversions;
- Excavation of the existing roads and the construction of fill embankments;
- Shaping of gravel from borrow pits for sub-base and base;
- Supply of bitumen and stone chippings;
- Construction of storm water drainage channels for the roads
- Laying a bitumen prime coat and bituminous surface treatment;
- Excavation for the construction of the concrete culverts and incidental works and;
- Construction of concrete culverts and incidental works.

2. Construction of feeder drains into Duga and Mabawa drains and lining of outlet drains to final disposal

- Site clearance;
- Levelling
- Upgrading or construction of longitudinal and cross drainage structures
- Provision of temporary crossings and traffic diversions (where required);
- Demolition/Excavation of the existing structures (if any) and excavation of trenches;
- Filling and reshaping and levelling trenches;
- Lining of the trenches and;
- Finishing the surface.

3. Construction of entrance/exist lane, drainage system, and perimeter /boundary fence for bus and lorry stands.

- Upgrading or construction of longitudinal and cross drainage structures
- Filling and compaction and levelling of the surfaces;
- Laying of the concrete base;
- Construction of surface drainage structures and;
- Installation of paving blocks

Duration

The duration of this phase will be one (1) years.

Types and Sources of Project requirements

Types and sources of project requirements during the construction phase are shown in Table 2.3:

Table 2.3: Project requirementsand Sources during the construction phase

Requirements	Type	Source
Raw Materials	Gravel	**Borrow pits at Tongoni and Tundauwa.**
	Hard Stone	**Amboni (Kiomoni) Commercial Quarry**
	Sand	**Commercial vendors**
	Water	**TUWSA**
	Bitumen	**South Africa/Saudi Arabia**
	Cement	**Tanga Cement Co. Ltd**
	Reinforcement bars	**Local Vendors in Tanga city**
Manpower	Skilled	• **Contractor**
	Unskilled	• **Local People**
Equipment	All construction machines and equipment	• **Contractor**
	All type Vehicles and Trucks	• **Contractor**

Source:
Design report for Proposed Additional Sub-Projects in Tanga, City under TSCP - AF, 2014)

Types, Amounts and treatment/disposal of Wastes

Types, amounts and treatment/disposal of wastes exepected to be generated during the construction phaseareshown in Table 2.4:

Table 2.4: 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 300 m^3 of biomass	Source of energy for cooking for residents in sub-projects
	Food remains, cardboards and papers	200 kg/day (based on generation rate of 0.2 kg/day/ person for 1000 people)	Collected in a large skip bucket at the campsite then to be composted and used as manure.
Solid Waste (Non-	Topsoils	40-60m^3	Backfilling material in cut sections

	Assorted default/damaged construction materials, Scrap metals, drums	20- 40 kg per day	Sold to Recyclers
	Tins, glasses and plastics	10-20 kg per day	Taken to the authorised dumpsite at Mwang'ombe
Liquid waste	Sewage	32 m^3/day (Based on 1000 people, 40 l/capita/day water consumption and 80% becomes wastewater)	Septic tank & Soakaway system at the camp site/office.

Note: Estimation data used are typical waste generation rates in construction sites, based on the experience of the consultant.

2.3.3 Operation phase

The actual usage of the facilities is expected to commence on after completion of construction works. This phase will mainly consist of the actual use of the facilities as well as the periodic maintenance of facilities and the environmental monitoring of some operations.

In the case of roads, for instance, routine maintenance of the facilities will include resurfacing of the roads, removal of debris from storm water channels, clearance of vegetation along the road. Similarly to the drainage systems and refuse facilities will require regular cleaning, removal of grass and proper handling of refuse. However, all sub-project facilities will be directly managed by the Tanga City Council.

Types, Amounts and treatment and disposal of Wastes

Types, amounts and treatment and disposal of wastes exepected to be generated during the operational phase are in nature, mainly the waste removed from storm drains during routine O&M of the drains, and paper wastes from the ticketing stations which will be constructed at the bus and lorry parking stands. These 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
Assorted wastes deposited into storm water drains	Plastics, Paper, Silt, Grass	N/A	Collection and disposal in authorized waste dump in Mwang'ombe
Solid waste	Used paper tickets from the ticketing station	N/A	

Note: Estimation data used are typical waste generation rates in construction sites, based on the experience of the consultant.

2.3.4 Decommissioning/Demobilization phase

Demobilization

Demobilization of temporary structures will be done for proper restoration of the site (e.g. removing/spreading top-soils piled along the road, restoration of borrow pits to required grades and removing all temporary structures). Depending on their design and status, camp sites may be left to the local governments depending on agreements that will be reached during the mobilization phase.
Decommissioning of roads is not anticipated in a foreseeable future as Tanzania still needs more road network and cannot afford to abandon these roads. Decommission of the commuter bus station or lorry parking area on the other hand is possible though not foreseen. Should decommission be needed, the existing structures and the ground pavements shall be demolished, the site be levelled and trees be planted to retain it to its original state.
That will also apply to the closure of landfill after its lifespan involving proper soil cover and vegetation of filled cells, extraction of gas and end management of leachate ponds and other associated facilities. Thereafter, a closure plan can be prepared to entice future socio-economic use of the decommissioned landfill site.

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

Types and Sources of Project requirements
Types and sources of project requirements during the demobilization phaseareshown in Table 2.6:

Table 2.6: Project requirements during the demobilization phase

Requirements	Type	Source
Manpower	Skilled	**Contractor**
	Unskilled	**Local People along the road**
Equipments	Bull dozer	**Contractor**
	Motor grader	**Contractor**
	Roller Compactor	**Contractor**
	Plate compactor	**Contractor**
	Tippers	**Contractor**

2.4 Design Considerations

This section presents design concepts and criteria for each of the proposed sub-project. Engineering drawings for the facilities are presented in Appendix VI.

2.4.1 Design of the city feeder roads

Road design standards as shown in Table 2.1, approved by the Ministry of Works – MoW shall be adopted and adhered to. Based on the analysis of the traffic data and applying the vehicle equivalency factors with an approximate traffic growth rate of 4.5% over the pavement *Design Life* of 20 years, it was concluded that the Duga - Airport road has to be designed for a Traffic Load Class, TLC 3, while the industrial road be designed for a Traffic Load Class, TLC 20. The traffic data analyses together with the design CBR of the sub-grade achieved through materials testing was subsequently used to conduct the pavement designs. The proposed pavement design for roads with bituminous surfacing is Asphalt surfacing TLC3.

Geometric Design: Following a site visit to the project sites, the previously proposed geometric designs have been checked, and adjusted where necessary to suit the practical existing field conditions. Further refinement has led to the development of construction working drawings to be used in the bidding phase of the project (Appendix IV).

Design Speed: The proposed roads are located in a predominantly existing built-up central business district and industrial area respectively and thus, they have clearly defined/restricted right of way (RoW) servitudes. The choice of design speed is based on a "safe practical" approach that best fits within the RoW rather than an "ideal" approach. Selected speeds vary between urban streets (commercial and industrial streets) of 30 km/h, to suburban roads (collector and arterial roads) of 50 km/h.

Design Vehicle: The design vehicle, i.e. Passenger Car Unit (PCU) and Single-unit Truck (SU), was adopted for design purposes.

Cross-sections: The proposed sub-project roads cross-section comprises of two surfaced lanes, one for each direction, with the traffic lanes measuring 3m and 3.5m for Street No. 8 and Duga – Airport road respectively. The lanes will be separated by a single line road marking system and are both cambered at a slope of 2.5%

towards the side drains. Duga – Airport road is in addition provided with 0.5m shoulders on either side. Side drains are provided on both sides of the roads and the road camber will direct the storm-water run-off from the road centre-line to both side-drains. The types of drains used are open trapezoidal drain for Duga – Airport road and covered drains for Street No. 8.

Horizontal and Vertical alignments: As far as possible, existing conditions permitting, vertical curves coinciding with horizontal curves have been contained within the horizontal curve and ideally have the same length or less.

Pedestrian and Cyclist Facilities: in the road design, asphalt surfaced side-walks and cyclists lanes have been provided for. Pedestrian and cyclists crossings will be provided at safe crossing zones comprising of painted road markings with adequate advance warning signage and traffic calming devices. Taxi / bus bays will also be provided on appropriate locations.

Table 2.1: Standards to be used for designing roads

Geometric design	**MoW Draft Design Manual of 1989, Code of practice for Geometric Design (Draft) published by SATTC –TU, 1998**
Pavement and Materials	MoW Pavement and Materials Design Manual, 1999
Specifications	MoW Standard Specifications for Road Works
Testing Procedure	MoW Central Materials Laboratory testing Manual
Structures	British Standards BS 5400
Hydrology and Hydraulics	TRRL East African Flood Model
Surveying	Land Survey and Mapping Standards of Tanzania (Land Surveying Regulations CAP 390)

2.4.2 Design of feeders to Duga and Mabawa Drains

Although Tanzania does not have its own National Standards for design of Drainage Systems, the design return periods that are normally used are within the ranges as stated in Table 2.2.

Table 2.2: Design Frequencies

Drain Type	Return Period
Road Side Drains	2
Secondary drains	2-10
Primary Drains	5-25

Peak Flow Estimation of Major Water Courses

Peak flow of major water courses was estimated using the East African Flood Model developed by the then Transport and Road Research Laboratory of the United Kingdom. This model was developed as a general flood model for small catchments (up to 200 km^2) in East Africa. The Data was collected from only 12 catchments, mainly in Kenya and Uganda, and therefore its broad application to Tanzania may be subject to some error.

The method was developed based on a linear reservoir model. It considers the factors of area, land slope; channel, land use, soil type, antecedent moisture condition and climatic zone to generate Runoff from monthly rainfall.

The TRRL Method allows the use of daily rainfall data lumped in the form of monthly rainfall input. This method has been used for catchment areas greater than 1 km^2, where the Rational Formula could not be used.

The storm-water drainage channels will mainly be comprised of open trapezoidal drains, concrete channels, and concrete box drains. Trapezoidal drains will be predominantly lined with the exception of those not subject to erosion in suburban areas. These will probably be unlined or grass-lined depending on the site conditions. Inlet and outlet structures will vary from open chutes to inlet chambers to headwalls. The accommodation of the additional storm-water capacity by the existing system will be checked from hydrological data provided.

2.5 Construction Materials and Labour Force

The essential construction materials include reinforcement iron bars, gravel, stones aggregates, sand, selected backfill soil, water and bitumen. All materials are available in the sub-project areas except bitumen, which will be imported by the contractor. Gravels will be obtained from the existing borrow pits though more may have to be opened up during the construction stage if the need will arise. Table 2.3 shows the potential material sources (Where samples were taken for Investigation).

Figure 2.4: Amboni commercial quarry containing Limestone rock in Tanga City

Table 2.3: Potential sources of material in Tanga City

Water	Sand Pits	Quarry Sites	Borrow Pit
TUWSA	Zigi pits	Amboni commercial quarry	Tondoni, Tanuwa, Urowa

Construction works are generally labour intensive undertakings. Apart from technical and skilled manpower, recruitment of unskilled labour will be done locally. It is estimated that more than 500 people will be employed by the sub-projects.

2.6 Camp Site location

The location of the campsite(s) has not been identified. In case a camp site(s) becomes a necessary requirement, the City authority shall discuss and agree with the contractor on a proper location for a camp site, in agreement with the local community.

However, due to the nature of sub-projects there is a possibility and it is encouraged that casual labourers return to their residents after working hours. The technical staff that might be from outside Tanga may stay in rented premises.

If it turns out that the sub-projects need a campsite, the contractor shall rent land from the community. The City authority will ensure that all legal issues are considered in order to have mutual benefits.

2.7 Waste Generation

Additional sources of waste streams will come from the camp sites, which will include domestic liquid wastes, general refuse and petroleum hydrocarbons. About 0.5-1 tonnes per month of domestic refuse will be generated at the camp sites. A local disposal site shall be designated by the Contractor in collaboration with the communities' leadership for disposal of solid wastes to be generated from project activities.

Sanitation facilities to be used in the camps will include ventilated improved pit latrines (VIP latrines) and septic tank/soak away pits. Other contingent plans to handle accidental oil spillages and general waste management shall be worked out during the preparation of the ESMP for the sub-projects.

3.0 LEGAL REQUIREMENTS AND INSTITUTIONAL FRAMEWORK

3.1 World Bank Safeguard Policies

The World Bank Safeguards Policies are Operational Policies (OP) and Bank Procedures (BP) approved by the Board for addressing environmental and social issues within the Bank's supported development projects. Core TSCP has been assigned Environmental Risk Assessment Category B and triggers the following World Bank Safeguards Polices: (i) Environmental Assessment (OP/BP 4.01); (ii) Involuntary Resettlement Policy (OP/BP 4.12); (iii) Physical Cultural Resources (OP/BP 4.11).
It is envisaged that the same policies will apply to the Sub-Project activities under the proposed Additional Financing. The safeguards policies considered applicable to both the Core TSCP and TSCP - AF specifically are:

3.1.2 OP 4.01 (Environmental Assessment)

The World Bank's safeguard policy OP 4.01 Environmental Assessment requires that all Bank-financed operations are screened for potential environmental and social impacts a view shared by the Tanzania National EIA procedures and processes. Both policies emphasize that the required environmental assessment be carried out on the basis of the screening results. Thus, the proposed screening process under section B4 of this framework will be consistent with the Tanzania legislation and the WB policy on environmental assessment.

In Tanga City, TSCP - AF intends to finance a variety of types of infrastructure (e.g. arterial city roads with the associated storm water drains, drainage channels from urban facilities and improvement of a bus stand), and these can have adverse social and environmental impacts. In this ESIA, these potential impacts are well described. The ESIA contains directions for City project teams, local leaders and management committees on practical ways of avoiding or mitigating adverse impacts. An ESMP is also included in this ESIA report.

3.1.3 OP/BP4.11 (Physical Cultural Resources)

Culturally, Tanzania is an extremely rich and diverse country and is home to ancient civilizations: 300-year-old Arab settlements; 100–year-old European buildings; graveyards; sacred areas; mosques; churches; etc. To mitigate potential adverse impacts on cultural property, training to LGA sub-project

teams and local leaders and management committees will be enhanced. Also, a sub-project planning checklist as well as other tools will be made available to ensure that cultural property resources are identified during sub-projects planning, and appropriate measures are taken to avoid damaging them.
Chance find procedures have been included into civil works designs and buffer zones will be created to avoid damage to cultural resources, such as "sacred" forests and graveyards. According to the designs, the proposed infrastructure facilities are such that they do not affect cultural resources.

3.1.4 OP 4.12 (Involuntary Resettlement)

WB Involuntary Resettlement Policy OP 4.12 requires that all sub-projects screened for potential environmental and social impacts be supported/guided by a Resettlement Policy Framework (RPF) that identifies involuntary resettlements under the planned sub-project, identifies impacts i.e. severe economic, social and environmental risks and; based on this defines the scope of the resettlement assistant programme (i.e. Resettlement Action Plan, RAP) for affected persons.
However, in Tanzania, there are no explicit requirements for a RPF or RAP. As regards to compensation, the Tanzanian laws require that only the rightful land or property owner (statutory or customary rights of occupancy) should be compensated, while the WB OP 4.12 require that any person (whether she/he is a rightful owner or not) who loses or is denied or restricted access to economic resources – including tenants, encroachers, squatters - should be compensated. Where there are significant discrepancies between WB requirements and Tanzania government's requirements regarding compensation and resettlement of Project Affected People (PAPs) in so far as TSCP - AF infrastructure sub-projects are concerned, the World Bank's safeguards policies will prevail.
Selected sub-projects in Tanga City involve rehabilitation/improvements of existing infrastructure at or along their original location. There will be no land take or resettlement of people at any of the sub-project sites and thus no involuntary resettlement has been considered.

3.2 Relevant National Policies and Environmental and Social Management Requirements

A clean and safe environment is the constitutional right of every Tanzanian citizen. Regulation on environmental management in the country is mainly vested on two public institutions, the National Environment Management Council (NEMC) and the Division of Environment (DoE) in the office of the Vice President.
NEMC undertakes enforcement, compliance, and review of environmental impact statements whereas the DoE provides policy formulations and

technical back-up and executes the overall mandate for environmental management in the country. The EIA certificate is issued by the Minister responsible for Environment. There are many policies and pieces of legislations on environmental management in Tanzania, the relevant ones to this project area briefly discussed below.

National Policies

Environmental awareness in the country has significantly increased in the past decade. 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 in the expense of the environment. The National Policies which address environmental management for the proposed sub-projects which form the cornerstone of the present study include *inter alia*:

3.2.1 General Environmental Management

- **National Environmental Policy (NEP) of 1997**

Tanzania is working to achieve sustainable development through the rational and sustainable use of natural resources by incorporating mitigation measures to safeguard the environment in any development activities. The environmental policy document seeks to provide the framework for making fundamental changes that are needed to bring consideration of the environment into the mainstream of the decision making-processes.
The National Environmental Policy, 1997 underpins that for a legal framework 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 emphasizes 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 settlements 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 and,
- 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.

Critically, the National Environmental Policy emphasizes 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 on the adoption of ESIA as a tool for screening development projects which are likely to cause adverse environmental impacts.

- **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 No. 19 of 1983, instead 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 III, Section 15(a) states that in matters pertaining to the environment, the Director of Environment shall coordinate various environment management activities being undertaken by other agencies to promote the integration of environment considerations into development policies, plans, programmes, strategies projects and undertake strategic environmental assessments with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of the quality of human life in Tanzania.

- **Environmental Impact and Auditing Regulations (2005)**

These regulations set procedures for conducting EIA and environmental audit in the country. The regulations are made from Section 82 and 230 of the EMA (2004) and prescribe that the Minister responsible for environment shall formulate regulations and guidelines on how EIA shall be conducted. The EIA regulations are applicable to all project contained in Third Schedule of the EMA (2004) and First Schedule of the EIA and Audit Regulations. These Regulations prescribes the stages and/or the EIA process, which are in principle managed by the NEMC.

- **Environmental (Registration of Environmental Experts) Regulations (2005)**

The law requires ESIAs be conducted by a person or firm of experts registered and certified by the Registrar at NEMC. PO-RALG has consulted fully registered EIA experts undertake this ESIA. The City through PO-RALG has strived to assign qualified independent experts to work with trained PO- RALG staff on this ESIA to a point where the sub-projects are eligible for granting of EIA certificate.

3.2.2 Management of Air Emissions and Ambient Air Quality

Environmental Management Act (EMA), Cap 191 (Sections 74, 75, 130-132)

EMA has provisions for three main areas: General Atmosphere; Climate Change and Management of Gaseous Wastes from Various Sources. The Act directs project proponents to adopt national standards on air emissions.

Environmental Management (Air Quality Standards) Regulations, (2007)

This regulation prohibits emissions/release of hazardous substance into the environment. The sub-project EMP for managing wastes will adhere to permissible emission limits and quantities of emissions of SOX, CO, black smoke and suspended particulate matters, NOX, O_3, hydrocarbon, dust, lead and substances in exhaust of motor vehicles prescribed by the regulations. If need be, Tanga City shall seek air pollutant emission permit issued by NEMC.

Public Health Act, Cap 336 (2009)

The Act sets requirements for management of gaseous wastes from various sources including vehicles. The sub-project ESMP will ensure that habitable buildings under TSCP – AF are designed to have adequate openings or ventilation, means of smoke, run-off and leachate escape as well as maintenance of equipment and devices.

Occupational Health and Safety Act, No.5 (2003)

The subproject ESMP for Tanga City has incorporated requirements and standards for personnel working in areas where dangerous fumes are likely to be present; and precautions in respect to explosive or inflammable dust, gas, vapour or substance.

3.2.3 Management of Solid Wastes

Environmental Management Act (EMA), Cap 191 (Sections 114 – 118)

By developing a landfill and solid waste management system as a whole, the City authority has fulfilled its responsibility required by EMA 2004 which empowers it to devise means for minimization of solid wastes and method of collection, transportation, treatment and disposal; as well as availing appropriate equipment and routes for collection; and designate transfer station / collection centres. The sub-projects ESMP will ensure proper functioning of the infrastructure and facilities.

Public Health Act, Cap 336 (2009)

By developing waste management infrastructure, the City also has fulfilled PHA requirement which vests the duty on the city authority to set aside and manage areas in respect of solid (and liquid) wastes; collect, transport and dispose wastes from all sources; cleanse all receptacles; clean, maintain, and keep streets and public places, dumping/landfill sites and control scavengers at all waste sites. The sub-projects ESMP and specific Waste Management Plans will ensure that the infrastructure and facilities in the City operate as per these requirements.

Environmental Management (Hazardous Waste Control and Management) Regulations (2009)

The sub-projects ESMP and specific Waste Management Plans will ensure that the proposed landfill and its facilities have specific procedures and practices for storage, transportation, treatment and disposal of all categories of hazardous and toxic wastes. That will include health care wastes, electrical and electronic wastes, pesticides, radioactive, industrial and consumer and chemical wastes.

Monitoring procedures set in this ESIA will ensure periodic records and annual reports of the performance of the licensed waste management landfills.

3.2.4 Management of Water quality

Environmental Management Act (EMA), Cap 191 (Sections 61, 62, 123 – 129)

By developing storm water management infrastructure, the City also has fulfilled EMA requirement that vests duty to the city authority to prepare for placement of storm water drains. The sub-projects ESMP will adhere to provisions on discharge of sewage and management of liquid wastes and storm water.

Environmental Management (Water Quality Standards) Regulations (2007)

The sub-project ESMP will ensure safe distances of water supply systems from pollution sources for any infrastructure activity near water sources. The inclusion of Environmental Management Officers in project teams and approval of sub-projects ESMP will ensure no discharge of water polluting substances will go uncontrolled.

Water Resources Management Act No. 11 of 2009

The Act provides for institutional and legal framework for sustainable management and development of water resources. 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.

Section 9 of this the law requires carrying out an Environmental Impact Assessment for any development in water resource areas or watershed. This ESIA is in line with this legal requirement, and the ESMP has provided measure to protect water resources in the sub-project areas.

Water Supply and Sanitation Act No. 12 of 2009
This is a new legislation that provides for sustainable management and adequate operation and transparent regulation of water supply and sanitation services; provides for establishment of water supply and sanitation authorities as well as community owned water supply organizations; and provides for appointment for service providers.
The main aim of this law is to ensure the right of every Tanzanian to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account among others; protection and conservation of water resources and development and promotion of public health and sanitation; and protection of the interests of customers.
This law is in line with these sub-projects because they will improve the sanitation of the City by provision of proper solid waste collection and disposal facilities.

3.2.5 Management of Soil Quality

Environmental Management (Soil Quality Standards) Regulations (2007)
The sub-projects ESMP will ensure main polluting activity and discharge effluent are prevented from contaminating soils or subsoil.

3.2.6 Management of Noise

Environmental Management Act (EMA), Cap 191 (Sections 147).
The screening procedure used during scoping delineated all sorts of activities with potential to emitting noise and vibrations in order to control noise and vibration pollution into the environment.

3.2.7 Management of Land and Land-use

Land affairs in the country are guided by the Constitution of the United Republic of Tanzania, Cap. 2 (1977); National Land Policy (1997); Land Act, Cap 113, (R.E 2002); Land Acquisition Act, Cap. 118 (R.E 2002); Urban Planning Act No.8 (2007); Land Use Planning Act No. 6 (2007); Land (Assessment of the Value of Land for Compensation) Regulations (2001); Land (Compensation Claims) regulations (2001); Courts (Land Disputes Settlements) Act, Cap. 216 (2002).

These laws and regulations govern the use of land and other assets in urban areas including property and land rights, acquisition of land and other assets, rights and compensation, and dispute resolution and grievance

management. Implementation of the sub-projects in Tanga City does not entail land-take and thus no compensation issues have arisen.

3.2.8 Management of Public / Occupation Health and Safety

Relevant tools in this area include the Occupational Health and Safety Act No. 5 (2003); Employment and Labour Relation Act Cap. 366 (2004); National Policy on HIV/AIDS (2001); The HIV and Aids (Prevention and Control) Act No. 28 (2008); Law of the Child Act No. 21 (2009); and Disabilities Act No. 9 (2010).

These guiding instruments make provisions for safety, health and welfare of persons at work places and general public. Sub-projects ESMP has incorporated measures that ensure employment opportunities to all while protecting right of children and people with disabilities and control of STDs and HIV infections. The occupation health and safety Act 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.
Thus, as stated in the ESMP, the Tanga City Council shall ensure that equipment used by employees are safe and shall also provide proper working gear as appropriate. The contractors shall abode to the provisions of this Act.

3.2.9 Others Relevant to Infrastructure Development

National Transport Policy (2003)

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 its ultimate eradication which is a major goal of the government. Most activities in the sub-project areas depend in one way or the other 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 and 6.13 on Road Transport and Environment respectively give policy directions towards enhancing environmental protection through environmentally friendly and sustainable transport infrastructure both in the rural and urban areas.

Road Act, 2007

For purpose of the investment in road sub-projects upgrading, the Act serves to guide on the use of the road RoW contrary to previous informal understanding that the reserve is exclusive of 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'.*

National Mineral Policy (1998)

The National Mineral Policy requires that mining activities are undertaken in a sustainable manner. Reclamation of land after mining activities is recommended. As far as TSCP – AF is concerned, mining refers to activities done in quarry and gravel extraction sites also called borrow pits.

Construction Industry Policy (2002)

Among the major objectives of the policy, include the promotion and application of cost-effective and innovative technologies and practices to support socio-economic development activities. The latter include road-works, water supply, sanitation, shelter delivery and income generating activities. The policy aims at ensuring the application of practices, technologies and products which are not harmful to either the environment or human health.

Energy Policy (2003)

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 has given priority to the rehabilitation of the 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. Smooth, well-surfaced and well maintained roads lead to energy savings.

National Human Settlements Development Policy (2000)

Among the objectives of this policy is 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/rural economic activities.
All weather roads and a reliable and efficient transport system, bus stands, drainage channels, and proper collection and disposal of solid waste are essential for sustainable human settlement development undertakings.

National Gender Policy (1999)

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.

This project will also ensure that women, who are the main users of the infrastructure, will be adequately involved at all levels of sub-projects planning and implementation.

Tanzania 2025 Development Vision

The Tanzania Vision 2025 aims at achieving high quality livelihood for its people and institute good governance through the rule of law and, developing a strong and competitive economy.
Developing core urban infrastructure is one of the most important aspect to enable Tanzania achieve its both social and economic Development Vision objectives, such as eradicating poverty, attaining water and food security, sustaining biodiversity and sensitive ecosystems. Providing good urban infrastructure through TSCP – AF will contribute to the attainment of the 2025 Vision.

Land Use Planning Act (2007)

The Act provides for the procedures for 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.

Development of Urban Infrastructure that affects land use and livelihood shall comply with the provisions of this Act. Any infringement on existing land use shall need consultation with land use planning authorities.

Explosives Act, 538

The Act requires all persons intending to use explosives in their activities to apply for an explosive license. In construction projects, explosives may be needed in material extraction from quarries and borrow pits. The developer shall apply for explosive license in case blasting becomes necessary at the working sites and/or materials extraction sites.

Environmental Assessment and Management Guidelines for the Road Sector

The Environmental Assessment and Management Guidelines for the Road Sector (EAMGRS) were developed in December 2004, just after EMA (2004) was enacted. The guidelines give procedures for the ESIA process as briefly explained in Table 3.1.

Table 3.1: Developed EIA Procedures in the Road Sector

EIA PROCEDURES IN THE ROAD SECTOR (as per EAMGRS 2004)
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.

Mining Act (1998)

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 makes sure that minerals are well controlled and; Section 6(1) states that no person shall, on or in any land to which this act refers to, 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.

3.3 Institutional Framework for Environmental and Social Management

Environmental and Social Management Authorities

Environmental Management Authorities as per Environmental Management Act, Cap 191 (2004) and EIA Regulations:

National Environmental Advisory Committee

The committee advises the Minister Responsible for Environment on environmental issues requiring making specific or necessary decision.

Minister Responsible for Environment

Issue guidelines and designate duties to various entities; approval by issuing of decision letter / EIA Certificate for development projects; delegate responsibility for ESIA authorization to Director of Environment, LGAs and Sector Ministries.

Director of Environment

Coordinates, advises, assesses, monitor and report environmental related aspects and activities; responsible for environmental policy and legal formulation and implementation; integration of environmental considerations into development policies, plans, programmes, strategies and projects; undertake strategic environmental assessment. The Director provides advice to the Minister on approval of Environmental Impact Assessment report (EIS) and issuance of EIA Certificate.

National Environment Management Council (A Corporate Body)

Undertake enforcement, compliance, review and monitoring of environmental impact assessment. NEMC role is to initiate /develop procedures and safeguards for the prevention of activities which may cause environmental degradation; provide advice and technical support to different stakeholders; enforce and ensure compliance of the national environmental quality standards.
NEMC has specific roles and responsibilities to NEMC in the undertaking ESIA/PESA for new development projects (Part III – XI); Environmental Audit for existing development projects (Part X); and Environmental Monitoring and Reporting (Part XI). Under the EMA, NEMC is empowered

to establish specific offices or to appoint or designate officers to effectively perform its functions.

- *Registrar of EIA Expert /Firm of Experts /Environmental Auditor/Environmental Inspectors:* Register and keep registry of qualified firms/individuals authorized to offer services in undertaking ESIA, Initial and Control Environmental Audit Environmental Inspection, EIA training and other technical support.
- *Environmental Inspector (Appointed or Designated):* Empowered to enter on any land, premise or facility of the project for the purpose of inspection, to examine records and to make enquiries on the project or for the purpose of monitoring the effects of activity carried out on that land, premise or facility upon the environment.
- *NEMC Zonal Offices:* Headed by Environmental Management Coordinators replicate all functions and departments of NEMC including overseeing Compliance and Enforcement; ESIA; Research and Planning etc. Tanga City is serviced by the Northern Zone office in Arusha.

Sector (Ministries) Environmental Sections

Responsible for all sector–specific environmental matters within the Ministry including participation in Cross-Sectoral Advisory Committee for review of ESIA Reports; review and verification of Environmental Audit Reports, monitoring on-going projects, and submit Monitoring reports to NEMC.

Regional Secretariat

Assists the Regional Commissioner; oversees/advises implementation of national policies, enforcement of laws and regulations at regional level. EMA 2004, Cap. 191 Section 34 confers additional roles to the Regional Secretariat to coordinate all environmental matters within respective region.

Local Government Authorities

Perform basic functions including promoting social and economic wellbeing and development of areas and people within jurisdictions including relevant to environmental and social management. EMA, Cap. 191 Section 37 confer additional functions for the environment committees; give general powers to the LGAs including to undertake inquiries and investigations, summon any person, resolve conflicts among various parties, inspect and examine any premise, order to remove substance or article harmful to the environment and prosecute or sue any violator.

- *LGA Environment Management Officers (designated/appointed):* Enforce, advise the Environment Management Committee, gather/ manage information, and report on the state of local environments.

EMOs are tasked to monitor the preparation, review and approval of environmental and social impact assessment for local investments.

- *LGA Standing Committee on Urban Planning and Environment:* The Committee is established under Section 42 (1) of the Local Government (Urban Authorities) Act, 1982 as a standing committee responsible for urban planning. EMA covers additional functions for the environment committees including overseeing proper management of the environment and social welfare within an urban area.
- *Standing Committees of Economic Affairs, Works and Environment of a Township:* Established under Section 96(1) of the Local Government (District Authorities) Act, 1982 while EMA, Cap. Additional functions for the environment committee include overseeing proper management of environment within a township.

3.4 Registered EIA Expert /Firm of Experts /Environmental Auditor/Environmental Inspectors

Qualified firms/individuals authorized to offer services in undertaking ESIA, Initial and Control Environmental Audit Environmental Inspection, ESIA training and other technical supports.

Other Actors as per EIA and Audit Regulations, 2005

- *Investor/ Developer / Project Proponent:* oversee and meet costs of Environmental assessment and implementation of ESMP/EMoP; undertake Initial Environmental Audits and Environmental Control Audit, Self-auditing during implementation of ESMP; undertake Baseline Survey before project implementation as basis for undertaking effective monitoring

General Public empowered by EMA and EIA Regulations to participate in all environmental management matters concerning them and at all stages of the ESIA process specifically to raise issues and concerns and to appeal when dissatisfied.

3.5 Other Authorities relevant to Infrastructure Development

Tanzania Electric Supply Company Limited (TANESCO)
Under the Ministry of Energy and Minerals, the core functions of TANESCO are generation, transmission, distribution, supply and use of electric energy. At so many locations, TANESCO uses road reserves for transmission infrastructure. The Tanga City Authority collaborated with TANESCO of Tanga Regional office during planning of sub-project activities.

Water and Sewerage Authority
Tanga Urban Water and Sewerage Authority (TAUWASA) was established to offer water supply and sanitation services in the City. The authority issues permits for discharging liquid wastes. The ESMP specifically states that the contractor shall apply to TAUWASA for water extraction and waste water discharge permits as necessary.

Tanzania National Roads Agency (TANROADS)
It issues approval or permit for undertaking physical works on roads or road reserves, extraction of construction minerals, using roads above set limits (tonnage, width and alike.

Occupational Health and Safety Authority (OSHA)
Oversees safety, health and welfare of persons at work, carries out all workplace inspections; hygiene surveys and measurements, occupational

health examinations of workers, offers advice on *ergonomics* and scrutinize workplace drawings. It is provided in the ESMP that the City shall engage OSHA expertise for inspection of work places during the operation phase.

Tanzania Commission for Aids (TACAIDS)

On the prevention and control of spreading of HIV/AIDS, it promotes advocacy and education on HIV/AIDS and protects human and communal rights of people infected with and affected by HIV/AIDS.

4.0 BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS

4.1 Spatial, Institutional and Temporal boundaries of Impacts

4.1.1 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, two zones of impacts are considered;

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

The zone of influence*:* This includes the wider geographical areas that are influenced by this project (e.g. Tanga City).
For roads and drainage systems, the spatial boundaries extend from the carriage way, way leave and the adjoining areas. The spatial boundary of the roads extends along the roads length while its influence may extend to about 500m on either side of the road. For the bus stand, the area of influence extends to about 500m around the lease area.

4.1.2 Institutional boundaries

Institutionally, the City Authority has the mandate to develop and maintain the urban infrastructures in the City area. Its primary function includes the maintenance and development of infrastructures to support the economic and social development of the City. The council is also responsible for addressing the environmental issues posed by the sub-projects. The proposed roads, street lights, bus stands, storm water drainage and the landfill will be under the City engineer.
From the central government line of administration, by virtue of their location, the urban infrastructure to be developed by TSCP - AF in Tanga region is under the jurisdiction of the Regional Commissioner.

4.1.3 Temporal boundaries

The temporal boundary of the proposed investment subprojects in Tanga City refers to specific project cycles from mobilization, construction, operation and maintenance and decommissioning. Each project phase is likely to have its

own impacts, although some may be similar. The duration of impact resulting from a specific phase are likely to last to the end of the phase. Pre-constructional and constructional phases tend to be short term impacts. Operational impacts are long term, according to the design period of the phase.

4.1.4 Administrative structure

The City of Tanga is the regional headquarters for Tanga region, made up of 4 divisions, which are subdivided into 24 administrative wards. Out of these 14 are urban and these are further subdivided into 146 "*mitaa*". The remaining 10 wards are in the peri-urban and rural areas, made of 23 villages, which are further sub-divided into 129 hamlets locally referred to as "vitongoji". The City has a total area of 600 km^2 of which 538 km^2 are land area and the remaining 62 km^2 are covered with water bodies.

4.2 Physical Environment

4.2.1 Climatic Conditions and Rainfall

Tanga is located a few degrees south of the equator and borders the Indian Ocean to the East. The climate is governed by the monsoon winds. There are two distinct rainy seasons due to wind changes from November to January (short rains); and from March to June (long rains). The mean annual rainfall in Tanga varies from 900 mm to 1,400 mm.

Temperatures are high throughout the year. The mean annual temperature is about 28°C. August, which is the coolest month of the year, has a mean range of approximately 24°C while November, which is the warmest month, reaches 30°C. Relative humidity is also high throughout the year. Mean daily humidity exceeds 80% in all months. Daily fluctuations are high ranging from 65% to 95%.

4.2.2 Topography and Drainage

The topography of Tanga City extends inland to about 20 kilometres from the coast. It is between 0 to 17 meters above sea level. The landscape is featured by small rolling hills punctuated by valleys with rivers and streams.

4.2.3 Population

The City of Tanga has a population of about 273,332 inhabitants with an average house hold size of 4.6 (Census, 2012), and an annual growth rate of 2.2%, which is the second lowest since the pre-independence period. In 1950s, Tanga grew at an annual rate of 11.4%; between 1957 and 1967 by 4.8%; between 1967 and 1978 by 8.1%; between 1978 and 1988 by 4.8%;

between 1988 and 2002 by 1.9% and between 2002 and 2012 by 1.3%. The dramatic fall in annual growth rate can be explained by the gradual decline and almost collapse of the sisal industry on which the growth of the town economy relied upon.

4.3 Economic Activities in the City

4.3.1 Manufacturing Industries

Tanga City has almost a whole spectrum of types of industries. They range from small scale to large-scale industries. Most of them are in the small and medium size range. In the past Tanga used to be rated second in terms of industrial development after Dar es Salaam.

In the recent past there has been a decline in the industrial sector in Tanga, which has been paralleled by a general decline in the importance of almost all sectors of the economy in the City.

Most industries in Tanga are located in specially designated industrial areas. Typical industrial areas include Gofu, Kange, Korogwe Road, Duga and SIDO Industrial Estate. An inventory of industries in Tanga City for the year 2006 showed that there are 22 operational industries including large-scale industries like Tanga Cement Factory, Athi River Lime Factory and AFRITEX.

4.3.2 Fisheries and Related Aquatic and Marine Resources

The most important source of fisheries resources in the City is the sea. Fresh water fishing is done in River Zigi, but this is on a small scale and is done mostly by residents who live along the river and is mainly for their home consumption. Major fisheries resources from the sea are fish, sardines and "mwani" (seaweed). The Tanga City coastal plain has a length of more than 210km.

Actors in the fisheries sector include private fishing and processing companies; small-scale fishermen and retailers. Small scale fishermen produce fish which are consumed locally as well as sold to private companies for eventual export. Sea Products, a company based in Tanga City processes an average of 180 tons per year of octopus, prawns, squid and other types of fish for export to Europe.

In general, major sea products in the City vary in the types of fish, prawns, "majongoo", lobsters, oyster, sardines and octopus. Fisheries statistics for

2002 – 2006 in the table present weight of fish and sardines recorded by the Natural Resources Department.

4.3.3 Tourism and Recreation

Tanga City is endowed with a number of tourist attractions, whose potential is yet to be fully exploited. These attractions include the Amboni Sulphur Springs in Amboni, Tongoni Ruins in Tongoni Village, Amboni Caves and Tanga Limestone Forests at Kiomoni village, the forests are very rich in birds, mammals, reptiles, amphibians and plants.
There are also small islands in the Indian Ocean, beautiful beaches at Mwarongo and coral gardens (reefs) along the shores of the Indian Ocean. Other features of interest as tourist attractions are historical buildings of Arab, German and British architecture, that are located in the city centre. These include the Greek Orthodox Church building and the old Regional Police Headquarters which used to be the official residence and office of the German governor. Others are the Tanga Library, the old Regional Commissioner's office and the Cliff Block at Bombo Regional Hospital.

In addition to the above, there are recreational areas provided for the local population. The city's central parks and gardens offer a potential tourism attraction. Another activity of importance in the tourism sector is the hotel industry. However, the number of tourist hotels in Tanga City has not increased significantly to match with the demand.

4.4 Social Services

4.4.1 Transportation

Road Transport
The City of Tanga is well served by reliable transportation network which comprises of a road network (of earth, gravel and bitumen standard); railway (cargo train), marine and air transport which link it to other parts of Tanzania and neighbouring countries.
The Central Business District (CBD) and the old planned neighbourhoods are well served by over 97.5 km of tarmac road. Under the World Bank financed Urban Sector Rehabilitation Project (USRP) 16.4 km of tarmac roads and lateral drains were rehabilitated. About 144 km of worn-out gravel roads and

708 km of earth or ungraded roads serve rural areas of the city. The city, also has major arterial roads namely the Korogwe, Mombasa and Pangani roads,
The main deficiency of the current road system is lack of storm water drains and the inadequate capacity to carry out routine maintenance. During rain seasons many parts of the City are affected by floods partly due to the deficiencies in the storm water drainage system. Such problems used to be very serious in low-lying areas such as Mabawa, Duga and Magaoni. The problem has partially been alleviated by the construction of a main drain in Duga.
The City Council plans to rehabilitate 30 km of existing tarmac roads and build another 5 km of storm water drains through Duga, Mwang'ombe and Magaoni to the Indian Ocean. Secondary drains are planned to be built in the areas of Nguvumali, Chumbageni, Duga, Mabawa, Msambweni, Makorora and Usagara.

The flat terrain of Tanga encourages walking and cycling. Latest estimates put the number of licensed bicycles in the city at over 14,000 while the total number of bicycles in the city is estimated at 22,000. Unfortunately, the existing and planned roads do not provide for traffic separation of road users in terms of cycle tracks and pedestrian ways, leading to safety risks for cyclists, pedestrians and other motorists.

Air Transport
For about a decade, Air transport was virtually non-existent in Tanga city, but with economic revival in the early 2000, private air charter services are provided by the Coastal Aviation Services daily plying between Tanga, Pemba, Zanzibar and Dar es Salaam.

Tanga Port
Tanga port is the second in terms of size after the Dar es Salaam port. It used to be the main gateway for Tanzania's exports before the 1990s. The current handling capacity of the port is 500,000 tonnes per year. The Port's utilization capacity was as low as 39% (198,000 tons) in 1990s. It gradually picked up to 65.6% (329,000 tons) during 2002/2003 period and dropped slightly to 60.6% (303,118 tons) in 2004/2005.

In 2005/2006 it rose again to 79.2% (395,106tons) and surpassed utilization capacity by 103.3% (516,914) in 2006/2007, but dropped again in 2007/2008. There are however good signs of improved performance all through from 2009

to 2014 due to revival of industries and privatization with preparations currently peaking up to establish a new port facility at Mwambani area in the City.

4.4.2 Telecommunications

Tanga has telephone services of cellular and radio link besides land lines. The main telephone service provider is the Tanzania Telecommunication Company (TTCL) which operates a Subscriber Trunk Dial (STD) telephone system. Mobile Cell phone network services are also available, provided and operated by TTCL mobile, Tigo, Vodacom, Zain and Zantel.

4.4.3 Health Services and Facilities

The City has 53 health facilities which include hospitals, health centres and dispensaries. The table below shows type and ownership.
Table 4.1: Health Facilities as per year 2008

Facility	Government	Voluntary/ Religious	Private	Total
Regional Hospital	1	0	0	**1**
District Hospital	0	0	0	**0**
Other Hospitals	0	0	2	**2**
Health Centres	4	2	2	**8**
Dispensaries	28	5	11	**44**
Specialized Clinical	0	0	0	**0**
Nursing Homes	0	0	0	**0**
Private Laboratories	0	0	2	**2**
Total	**33**	**7**	**17**	**57**

***Source**: Tanga City Health Department PHC Report Dec. 2008*

According to the Health Department, Tanga City Health Services are above the national standard of 10,000 people per unit. However, public health facilities lack necessary equipment, staff and buildings are dilapidated.

Health problems

The District Primary Health Care Report of 2008 for Tanga City indicates some improvement in disease incidence as compared to the 2006 report. However, Malaria still remains the most common public health problem in Tanga and Tanzania as a whole. It still tops the list of top ten most common

diseases at Outpatient Dispensaries in terms of morbidity and mortality, especially in children below five years of age and pregnant women. See the Table 4.2.

Table 4.2: Top ten common diseases in OPD (2008)

S/N	Diagnosis	< 5 years	>5years	Total
1	Malaria	79,354	99,491	**178,845**
2	Acute Respiratory Infection	43,787	35,176	**78,963**
3	Diarrhoea diseases	12,213	10,502	**22,715**
4	Intestinal worms	7,011	7,066	**14,077**
5	Pneumonia	17,207	10,152	**27,359**
6	Eye infections	4,145	5,028	**9,173**
7	Ear infections	3,176	4,461	**7,637**
8	Non-skin fungal infections	12,256	10,056	**22,312**
9	Asthma	1,382	3,380	**4,762**
10	**Cardiovascular disease**	**24**	**4,299**	**4,323**

Source: Health Department Tanga City - May 2007

The Health Department has introduced a health education campaign in order to sensitize people on issues such as oral health care, eye care services, diabetes, hypertension and malaria, as efforts towards prevention.

4.4.4 Education Services and Facilities

The Education sector has undergone tremendous changes, growth and expansion in the last ten years. With the introduction of Primary Education Development Programme (PEDP) in 2000 – 2010 and Secondary Education Development Programme (SEDP) in 2005 – 2010 new primary school classrooms and secondary schools in every ward have been or are under construction. These programmes have raised both primary and secondary education enrolment. Plans are underway to construct houses for teachers, lavatories and laboratories in secondary schools.

A national programme for teacher education has been introduced to meet the growing demand. Student Enrolment in primary schools rose from 45,976 in 2003 to 55,570 in 2008 and in Government secondary schools rose from 11,276 in 2006 to 14,660 in 2009.

4.4.5 Water Utilities

Water Supply

Supply water to the Tanga City is the responsibility of the TAUWASA though the City authority under the Local Government Act, 1982 to complement supply of water by means of wells, to City residents and institutions under its mandates such as schools and health facilities.

At present, Tanga is supplied with water from a constructed dam at Mabayani on River Zigi, 20km north-west of Tanga. The river has a catchments area of 1100km^2, of which 900km^2 are upstream of the dam. The area receives 1200 mm of rain per annum, in the southern end of the Usambara Mountains.

River Zigi has the capacity to supply up to 7.3 million cubic meters of water per year. A maximum withdrawal of 60,000 m^3 /day is possible at a draught probability of one percent. The present supply of water in the City is 25,000 cubic metres per day, but the capacity is 42,000m^3/ day.

Sanitation

Environmental sanitation practices in Tanga City, include among others the management of human excreta and sanitary sewerage. There are two types of sanitation: - on-site sanitation and off-site sanitation systems. On-site sanitation system encompasses pit latrines and septic tank – Soak-away systems. The off-site sanitation system is basically a central sewerage system which its age dates back to the 1930s.

Almost the whole of the Central Business District (CBD) of Tanga is served by the central sewerage system and, the extension of the service is hampered by the flat terrain of the city land which necessitates pumping. It is estimated that 75% of dwellings, use on-site sanitation of which 50% are pit latrines, mainly traditional facilities and the remaining 25% use septic tank systems.

Storm Water Drainage

Storm water drainage system is closely associated with roads. In Tanga, construction of storm water drainage went along with the rehabilitation of roads. Other main drains that discharge storm water into the sea include the Duga and the anti-malaria drains. Generally, in rural areas drainage is poor,

partly because roads, for which storm water drainage is normally provided, are poor and essentially very little budget has traditionally being set for drainage management.

4.4.6 Solid Waste Management

Poor solid waste management has been cited as one of the major environmental glitch confronting the city. The average daily production of solid waste is estimated to be 165 tons. Most of this refuse comes from dwelling houses, markets, street sweepings, industries, commercial areas, institutions, gardens and hedges. The present solid waste management systems are capable of collecting about 72 tons (43%) per day. Methods of collection include the kerbside collection method whereby waste is collected from door to door in the central area and, the skip bucket method in market areas, and other residential areas not covered by kerbside collection system. Skip bucket collection system is working very efficiently and has improved and raised the collection capacity from 40 tons to 72 tons per day.

Coverage has also expanded to cover 60% of the total city's urban area. The Tanga City dumping site of Mwang'ombe is situated about 8 km south of the city centre and has the capacity of about 21.5 ha. The area is not fenced; it has plenty of man-made sand mining pits which become filled with water during rainy seasons. Solid waste is crudely dumped in the open land then spread by wheel loader but often not properly covered.

4.5 Tanga City Environmental settings

4.5.1 Land

- **Characteristics of the land resource**

As a basis for development, land is an environmental resource vital for the development of people in Tanga City. The development activities on land resource have a resultant environmental consequence. The existing city land use set-up resulted from and tells of the past and present development activities. This could possibly monitor the future land use.

Land is under the control of the President and is held and administered for use and common benefit, direct or indirect of the Native of Tanzania "(Land Acts No. 4 & 5 of 199)" basing on this law land allocation have been pursued by the Local Government through the District Allocation Committee on behalf of the President.

At present following the Central and Local Government reform land allocation is performed by the Local Government that is the Local Authorities within their areas of jurisdiction.

- **Impacts of the Activity sectors on Land Resource**

Extensive agricultural activities, uncontrolled forest activities and urban development activities such as settlements expansion and infrastructure improvement cause environmental degradation. In turn, it causes dwindling of the land resource-base and disruption of the biodiversity.

4.5.2 Forests and Natural Vegetation

- **Characteristics of Forest and Natural Vegetation**

The outstanding feature of the vegetation in Tanga is seen by its complexity. The coastal area is dominated by bushland, palm gardens, mixed-crops cultivations and estates. Both natural and exotic trees are present in some parts inside the city. In the outskirts, there is small nature forest which includes mangroves, bush and grass lands which covers most parts of the coastal area.

Exotic trees are mainly found along the roads and in individual plots within the settlements. Man-made vegetation covers include trees planted along the collector roads in town; they provide shades to pedestrians. Vegetation of these plantations is mainly dominated by tree species of *Albizia* and *senna spp*.

- **Impact of the Activity sectors on the Forest and Natural Vegetation**

Deforestation has a major impact on the forest resource found in the City boundaries. In Tanga City deforestation occurs mainly due to urbanization whereby forests are cleared for plots acquisition, fuel woods, infrastructure development and housing activities. Clearing of forests and other natural vegetation causes macro and micro climatically changes and destroys biodiversity reducing soil fertility, and conservation of ground water; hence affect weather conditions, such as rainfall.

Activity sectors which result into deforestation are real threats in many aspects including change of air quality since it is well known that trees play a vital role in carbon dioxide sequestration. Also, an aesthetic destruction is an impact caused by clearing of forests and uncontrolled cutting of trees in many areas leaving bare land resulting into soil erosion and land degradation.

4.6 Environmental conditions at the sub-project sites

The sub-project sites in this regard include areas along the Jamatkhani and Nguvumali roads, and along street number 8. It also includes the Duga and Mabawa feeder drains, the area where the lorry packing lots and bus stand and, a landfill are constructed.

4.6.1 Condition of Jamatkhan road

This is an existing road which needs adequate rehabilitation. It is 1.04 km long with old asphalt. The road was built during the colonial era and it is currently characterised with a lot of pot holes. There are no side storm drains along the road (Figure 4.1). There is neither flora nor fauna of ecological importance along the road. About 10 trees may be affected by the construction works.
However, these trees are abundant in the adjacent area. The settlement along the road is a mixture of commercial-residential set-up, with most of the houses far outside the road reserve area. As it is a case in many cities, there are utility infrastructure such as telephone lines, electricity poles, water supply system, and sewerage systems along the road all of which will be affected during the construction.

Figure 4.1: Condition of Jamatkhan road

4.6.2 Condition of Nguvumali Road

This is a 2.29km rough road (earth/gravel surfaced), which is currently in use. In this project the road is planned to be upgraded to asphalt concrete. The buildings along this road are purely residential and most of them are permanent structures. The road is characterised with a lot of pot holes especially during the rainy season. At the current situation, there are no side

storm drains along the road. There will be no need for compensation because there reserved space for the road is wide enough

As it was the case for Jamatkhan Road, there is neither flora nor fauna of ecological importance along the road. About 10 trees may be affected by the construction works as they are in the RoW. The settlement along the road is a mixture of commercial-residential set-up, with most of the houses far outside the road reserve area. As it is a case in many cities, there are utility infrastructure such as telephone lines, electricity poles, water supply system, and sewerage systems along the road all of which will be affected during construction as seen in Figure 4.2.

Figure 4.2: Existing condition of Nguvumali road

4.6.3 Condition of the Road along Street Number 8

This is a 0.93 km rough road (earth/gravel surfaced), which is currently in use. The road is characterised with a lot of pot holes especially during the rainy season. So far, there are no road-side storm drains along the road. There is neither flora nor fauna of ecological importance along the road apart from few exotic trees planted by the community. The settlement along the road is a mixture of commercial-residential set-up, with most of the houses far outside the road RoW.

As it is the case in many cities, there are utility infrastructures such as telephone lines, electricity poles, water supply system, and sewerage systems along the road all of which will be affected during the construction as shown in Figure 4.1.

Figure 4.1: Existing utility infrastructure along street number 8 road

4.6.4 Feeder drains for Duga and Mabawa

These are lateral storm drains, 4.0 km at Duga and 3.3 km at Mabawa; intended to drain two low-laying settlements at Duga and Mabawa neighbourhoods. These areas are currently water-lodged due to increased impervious surfaces in the nearby settlements. The drains will act as feeder drains to the existing bigger storm channel directing the runoff to the ocean. These feeder drains are planned to go along the existing roads but still about three houses will have to be resettled.

Figure 4.2 presents the existing situation at the water-lodged settlement and the houses which will be affected by this sub-project as illustrated in Figure 2 and 3.

***Figure 4.2**: Areas to be drained at Duga (top left) and Mabawa (top right)*

Figure 4.3: The condition of the existing drains where the feeder drains are to be connected

4.6.5 Commuter bus stand and lorry packing area

The commuter bus station and trucks parking areas are located in Kange Ward in Tanga City and cover approximately 20,000 m^2 and 15,000 m^2, respectively. Both, the new bus stand and lorry packing lots are complete and some final arrangements are going-on to enable to operationalize the

facilities. According to the design specifications of the sub-project, storm-water is to be managed offsite. It is planned to be collected and drained away by the use of the open channels to a swampy area which is about 1.5km from the stand as shown in Figure 4.4. The marsh area designed for discharging the storm-water from bus stand and lorry packing area is currently defined as hazardous low land.

Currently, the swamp collects and stores storm runoff from the surrounding areas and when it is full the water slowly flows to the Indian Ocean some 5km away. The area is wet all over the year and the surrounding community is currently using the water for construction purposes and other non-domestic works. Being wet over the year, gradually the area is also attracting some minor agricultural activities.

Figure 4.4: The condition of the existing drains where the feeder drains are to be connected

A brief description of the existing physical and environmental status of the proposed sub projects is presented in Table 4.3 based on the order of priority. The table also indicates subprojects, which may require resettlement of people residing in their vicinity.

Table 4.3: Brief description of the existing physical and environmental status for sub-projects

Description of Sub Project	Length/ unit of Measure	Current Physical Status	Existing Infrastructure	Current Environmental Status
Drainage channels from the bus and Lorry stand	1.5Km	Earth surface	Non	-Scattered shrubs and trees - No visible Environmental pollution
Mabawa storm Drainage system	3.3 km	Non existing	Non	-Short grasses and few mango and coconut trees near the proposed route of the drains - swamps at Mabawa and Donge area -Swamps (at least 5) along the drain at Magaoni, and Mwang'ombe. A nearby Kwakombo swamp will also drain into the new drainage system. -variety of vegetables and maize planted in the swamps -**Observations**: signs of floods during the last rain rains, water marks on the structures around
Duga storm water drainage	4.0 km	Non existing	Non	
Street number 8 road	0.93	Non existing	-Telephone and Power lines alongside the road -Sewer lines and water infrastructure along the road	-Dust emission by vehicle movement -trees alongside the road -No vegetation on the road surface
Jamat Khan road	1.04	Existing	-Telephone and Power lines alongside the road -Sewer lines and water infrastructure along the road	-Dust emission by vehicle movement -trees alongside the road -No vegetation on the road surface

Description of Sub Project	Length/ unit of Measure	Current Physical Status	Existing Infrastructure	Current Environmental Status
Nguvumali road	2.29km	Existing	-Telephone and Power lines alongside the road -Several culverts	-Dust emission by vehicle movement -trees alongside the road -There are some vegetation on the planned route for the road

5.0 STAKEHOLDERS IDENTIFICATION AND ANALYSIS

5.1 Stakeholders Identification

Simple methods such as networking, literature review and interviews were used in the process of stakeholders' identification. From one stakeholder, the team was connected to another and another stakeholder, in a chain like manner. The main stakeholders included the Tanga City Council officials, Ward Executive Officers in the project areas, Urban Water Supply and Sewerage Authorities and TANESCO in Tanga City. Other stakeholders were the communities, specifically in Duga, Maweni and Usagara wards.

5.2 Stakeholders Involvement

Public Participation is a process through which different stakeholders influence and share their views regarding development initiatives and the decisions and resources that affect them. The effectiveness of resettlement programs is directly related to the degree of continuing involvement of those affected by a project. Comprehensive planning is required to ensure that local government, NGOs, sub-project staff and affected men and women interact regularly and purposefully during all stages of sub-projects.

The overall goal of the consultation process was to disseminate sub-project information and to incorporate the views of stakeholders in the preparation of the Environmental and Social mitigation measures, management plans and Monitoring Plans. The specific aims of the consultation process are to:

- Improve sub-projects designs and, thereby, minimize conflicts and delays in implementation;
- Facilitate the development of appropriate and acceptable entitlement options;
- Increase long term sub-projects sustainability and ownership;
- Reduce problems of institutional coordination and
- Increase the effectiveness and sustainability of income restoration strategies, and improve coping mechanisms.

An important element in the process of impact assessment is consulting with stakeholders to gather the information needed to complete the assessment. In the public consultation process three categories of consultation were considered. These were:

- Consultations with City Council officials,

- Consultations with service providers like the water authorities and TANESCO, and,
- Consultation with the communities living near proposed subprojects

Fundamentally these consultations were intended to disseminate sub-projects information and to collect feedback regarding the sub-projects. It was intended to collect information regarding core urban infrastructure in the city/municipality, environmental issues and views and perceptions regarding the project.

5.3 Consultative Meetings with City Council

Consultative meetings at regional, City and local levels included discussions with City Planners, Land Officers, Surveyors, Water Engineer, Health Officers, Development officer, etc. These consultations were conducted as either:

- direct, personal interviews with selected informants, or
- focus group discussions with authorities and technical personnel

Typically, the Agenda for these consultations included:

- Presenting the Project:
- Discussing the Status of the core urban Infrastructures in the City;
- Obtaining from the authorities their environmental and socio-economic concerns and perceptions regarding the proposed Investment Subprojects.

5.4 Consultative Meetings with Water Authorities and TANESCO

The meeting was held with TAUWASA, and TANESCO Headquarters. The method used was direct person to person interviews with the relevant specialists.

The agenda for these consultations included:

- Presenting the Project by the consultants:
- Information sharing concerning the location of TANESCO or TAUWASA infrastructures (i.e. electric poles/lines, water supply pipes and sewerage system) along the project area.

- Obtaining from the authorities their environmental and socio-economic concerns and perceptions regarding the proposed Investment Subprojects.

5.5 Community Consultations

Dissemination of sub-project information among communities living near the proposed investment subprojects is an important aspect of the public participation process and they should be appropriately informed about what is planned. In addition, they, including women and youth, should be involved in a two-way dialogue regarding the sub-project.

The main objectives of community consultations are to:

- provide clear and accurate information about the Project to the communities along the road;
- inform communities about the sub-project schedule;
- obtain the main concerns and perceptions of the population and their representatives regarding the project;
- obtain opinions and suggestions directly from the affected communities on their preferred mitigation measures; and
- Identify local leaders with whom further dialogue can be continued in subsequent stages of the sub-project.

The entire consultation process of the Project was seeking the present, opinions and concerns of women and youth regarding the proposed investment subprojects and involves them in the overall planning of mitigation measures.

The Agenda for the Community consultations included:

- presenting the Project,
- defining the local institutional framework and stakeholders, and
- obtaining from the local population their environmental and socio-economic concerns and perceptions regarding the proposed project.

The main concern of the stakeholders along the route included the positive anticipated impacts as well as negative impacts.

5.6 People's Attitude towards the project:

The overall stakeholder's attitude towards the TSCP-AF sub-projects in Tanga City was very positive, mainly because they have witnessed to

implementation of Phase I sub-projects, and thus they are optimistic that the current sub-projects too shall be successfully implemented. The community is eager to realize the benefits of the sub-projects in terms of economic and social growth. They appreciate the World Bank (IDA), the Tanzanian government and the City Council's effort to give its priority in improvement of the City Infrastructure. Some stakeholders urged the City council to engage competent contractor(s) for each sub-project, and make close supervision of the works. A summary of issues and concerns raised by various stakeholders is presented in Table 4.1. A column showing where relevant issues are addressed in the report is also provided. A list of people consulted is appended as Appendix II.

Table 5.1 presents issues of concern raised by different stakeholders during the consultative meetings.

Table 5.1: Issues of concern raised by stakeholders during the consultative meetings

Stakeholder	Key issues discussed	Section in the report where issues have been addressed
TAUWASA & TANESCO (Eng. Semkuyu Dickson and Omary M Makame Respectively)	1. Destabilization and/or destruction of the existing infrastructures such as electric poles, water supply pipes and sewer lines along the project roads. 2. The council to work closely with TAUWASA &TANESCO during the planning; design and implementation phases. Funds for relocated these infrastructures should be part and parcel of the budget for subprojects. 3. Temporal loss of access to water and electricity services for residents in the project area. 4. Possible environmental pollution by sewage if the sewerage system is destroyed/broken during construction. 5. Should there be any construction activities near water source/rivers, the contractor should take care not to cause pollution of water sources. 6. Employment opportunity priority should be given to the local people during the construction period.	7.3.4 7.3.1
TangaCity Council (The municipal planners, environmental engineer, roads engineer, surveyor and the Wards executive officers)	1. Reduced floods in the city as a result of improvements to road drainage systems, especially in the city centre. 2. Employment opportunity to the local people during construction period. *3. "Property value to rise in the project area, leading to inflation of rents".* *4. Construction of the roads will reduce traffic congestion in the city. However the contractor should install road signals and speed humps to avoid road accidents.* *5.* Possible environmental pollution by sewage if the sewerage system is destroyed/broken during construction *"the contractor should clearly state how the flowing sewage will be handled, in order to avoid environmental pollution by sewage'"*	7.3.2 7.4.5

Stakeholder	Key issues discussed	Section in the report where issues have been addressed
	6. Temporal loss of access to services such as road, water supply and electricity during construction. *"Residents will not appreciate prolonged service interruption periods".* 7. Reduced flooding in the city as a result of improvements to road drainage systems, especially in the city centre. 8. Construction of storm water drains at Duga and Mabawa area will eliminate flooding problem, especially in the low lying areas and hence reduce the associated nuisance and health risks. 9. The consultant should make sure that the works are well designed and construction works are well supervised to ensure sustainability and to avoid soil erosion. *"it has happened in the past projects that some parts of the road or the road surface finish were eroded just after the completion of the construction works"* 10. The contactor should leave the working site clean before handing over the work. 11. The contractor should use the existing borrow pits, stone quarries and sand pits in order to minimise land degradation at new sites. 12. Tourism and trade sectors will expand due to improvement of the city roads. *13.* Possible population influx into the project areas as a result of improved services. *"Population influx is highly associated with spread of communicable diseases (most deadly being HIV/AIDS) and scramble for resources.* *14.* Possible increased road accidents *"improved roads - increased vehicle speed- possible increased accidents."*	8.4 7.4.2

Stakeholder	Key issues discussed	Section in the report where issues have been addressed
	15. The city council must compensate the affected people. *"The City council is compensating the affected people residing along Karume road, and Duga airport road. The affected people are happy with the compensation rates".* The council is still negotiating with people along Mnyanjani road. 16. Employment opportunities to locals during construction. 17. The income of the city will increase as investors will come after the improvement of the core urban Infrastructures.	7.3.2 7.4.1
The general community in Duga, Usagara, and Maweni wards.	1. On beautification of the city it was stated that *"we are happy now that the road will be surfaced with tarmac, there will be no dust deposited on our houses and business places".* 2. *How will the design of the new stand look like, what facilities are included?* *3. "The status of the city will improve, but we are afraid the improvements will also raise property and land values in the project site. The house rents will accordingly skyrocket!"* *4.* Installation of road signals and speed humps to reduce road accidents in the city. *5.* Reduced traffic congestion in the city due to improved road network. *"Improvement to the roads will reduce travel costs, reduced costs for vehicle maintenance (wear and tear) and reduced travel time)".* *6.* Loss of income for people depending on small-scale farming in the swamps in Duga and Mabawa. 7. Temporal loss of access to services such as road, water supply and electricity during construction. *"we should be informed in advance if there*	 7.4.1

Stakeholder	Key issues discussed	Section in the report where issues have been addressed
	is any water or electricity cuts during the construction so that we can take necessary precaution measures" 8. The contractor should follow the activity time schedule in order to minimize the duration of service interruption. 9. Possible environmental pollution by sewage in case of accidental destruction of sewerage pipe during construction. 10. Emphasis on use of standard construction materials and good workmanship *"The selected contractor should make sure that the works are well constructed to ensure sustainability"* 11. Construction of storm water drains at Duga and Mabawa area will eliminate flood, especially in the low land areas and hence reduce the associated nuisance and health risks (such as cholera). 12. Tourism and trade sectors will expand due to improvement of the town roads. *13.* Possible population influx into the project areas as a result of improved services. *"Population influx is highly associated with spread of communicable diseases (i.e. HIV/AIDS) and struggle for resources.* *"unexpected pregnancy to young girls* 14. Possible increased road accidents *'the contractor should install road safety signs and speed humps especially near schools to minimise accident risks"* *15.* Compensation of the affected people is very important *"some of us will lose very valuable properties. We would like the city to timely compensate for every property loss".* *16.* "The public must be made aware of the developments planned at their area in advance". "*Affected people must be informed in advance, at least 36 days*	7.3.1 7.3.4 7.2.1 1O.2.2

Stakeholder	Key issues discussed	Section in the report where issues have been addressed
	before the date of demolition". Who will pay for the compensation? What are the rates to be used?" *17.* Local leaders at Wards, street/mtaa level should be involved during the process of compensation because they are more familiar with the environment, they know their people, and they can help in identifying exactly what belongs to whom. *18.* The City council should use the most current rates during compensation. *19. "Economic boost and opportunity for starting small business around the bust stand/Trucks parking area"* *20. The stand operators should pay tax to the area authority.* 21. Dust and noise generation during the construction activities. *"the contract should control dust by sprinkling water on the surfaces"*	10.2.2 7.2.3 7.3.7

Stakeholders Consultation July 2016

SN	Position/stakeholders	Views/Concerns	Response
1	Eng Ramson TSCP-AF Coordinator	• The project is a continuation of the TSCP that improved various infrastructures within the City Council • For Tanga City among others the project will improve storm water drainage to reduce floods and construction of roads	
2	Ms Asia- Community	• The purpose of these meetings is to inform people about the project	

	Development Officer	and that the implementation will take place soon. • The project will create temporary employment during the construction period • The project will increase the quality of settlement particularly in areas with flood problems • There is a GRM within the City Council to handle any complains arising from this project implementation therefore we argue you to choose your GRC members to facilitate the process	
3	Magaoni, Nguvumali kati and Nguvumali kaskazini wards	• We are aware of the proposed project and acknowledge that we have been consulted regarding the proposed project • Any complains raised during project implementation should be handled on a timely manner • There are still some areas which are prone to floods but have not been considered in this project. • The contractor should ensure prior to blocking a road under construction, there is an alternative road	-The Council in collaboration with the Engineer and the RE will ensure no impact on properties, however incase of any impact this will be compensated as per the TSCP-AF RPF
	Bus and Lorry stand users	• We acknowledge that we have been consulted about the project • The project should minimize construction activities during busy hours at the bus stand	-The construction schedule will ensure minimal impact to the stand.

6.0 IDENTIFICATION AND ASSESSMENT OF IMPACTS

6.1 Impact Zones

The geographical spread of short term or long term impacts is likely to encompass the following areas. The actual spatial dimension will vary with the nature of the impacts and the receptor environmental and social component.

6.1.1 Primary corridor of impact

This is the core impact zone where the rehabilitation works will concentrate. The site of the construction is the Right of Way of the total length of Street No. 8 (0.83km), Nguvumali Road (1.6km) and Jamatkhan Road (1.1km).
It also includes the RoW of Duga and Mabawa drain (300m) and the bus stand perimeter. This will also include areas immediately bordering these sub-projects.

6.1.2 Secondary impact area

These are off-site locations linked to sub-project activities including borrow pits and other sources of materials like sand, gravel, aggregates, fill materials, water, etc involving civil works / extraction activities done by / or on behalf of sub-projects.

Other sites will be waste disposal sites, camp site if so requires or other locations chosen for accommodation of crew and equipment and material storage. These secondary impact areas will be interspersed across the city and beyond where sources are located as explained in Chapter 2.

6.1.3 General sub-projects areas of influence

This includes a wider geographical area that is influenced by these sub-projects in the City and beyond including areas in the near vicinity within a 5km radius and transportation routes from sources of material to the sub-projects locations.
For the bus stands and landfill area, the area of influence extends to around 500m around the lease area.

6.2 Environmental Impact Identification and Evaluation

The proposed additional investment sub-projects in the city can cause a wide range of environmental and social impacts on a number of receptors. This ESIA identifies these impacts for the purpose of mitigating the adverse impacts and enhancing the benefits. Impact *identification* is a process designed to ensure that all potentially significant impacts are identified and taken into account in the ESIA 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 ESIA s*imple checklists and expert's knowledge were used.* These checklists are the simplest types that provide lists of potential impacts. These are designed to help practitioners to avoid overlooking some of the potential impacts.

The impacts are categorized into short-term or long-term direct or indirect impacts. The direct short-term impacts will be apparent only during the construction period and will include mainly construction related impacts. Long-term direct impacts will be realized after completion of construction, but includes also impacts which may become apparent during the construction phase. The long-term direct impacts, therefore, are the impacts which are both construction-related and resulted from the use of the facilities.

Indirect impacts are a kind of impacts which can be encouraged or enabled due to the presence of facilities under construction. As such, they will include social and economic impacts and tend to be long-term.
The main receptors of impacts associated with the proposed additional investment sub-projects are mainly physical resources such as hydrology, surface water quality, soils, air quality and noise, public health and safety, aesthetic features and the general landscape.

The following impacts were identified to be likely to occur during pre-construction phase of the proposed additional investment subprojects;

a) Job creation and increased income,
b) Change of scenery view of the project areas and,
c) Air pollution

The following impacts were identified to be likely to occur during construction phase of the proposed additional investment subprojects;

a) Job creation and increased income,
b) Increased dust and air pollution,
c) Increased Noise and Vibrations,
d) Pollution of surface and ground water,
e) Increased waste generation,
f) Loss of definite materials and land degradation,
g) Interuption or lack of utility servives due to damage/relocation of existing utility infrastructure,
h) Lacking or slow restoration of areas impacted by construction,
i) Risks to worker's and public safety,
j) Overburdened Local Authority,
k) Child Labour,
l) Increased social illnesses including HIV/AIDS,
m) Population Influx and,
n) Visual Intrusion during Construction

The following impacts were identified to be likely to occur during operational phase of the proposed additional investment subprojects;

a) Improved storm water collection,
b) Job creation and increased income,
c) Improved Community Life,
d) Improved Accessibility,
e) Increased security status of the new bus and lorry stands and,
f) Increased property and land values around the project areas.

The interaction between the intended project activities and the different environmental receptors are summarized in a simplified matrix presented in Table 6.1. A simple matrix with the following ratings was used to determine significant impacts:

Table 6.1: A Matrix of Rating

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

Table 6.1: Impacts Matrix for Duga- Airport road and Street No.08

		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.	Change of scenery view	L	ST	R	✓		-1	-2	-2	+2
2.	Increased dust and air pollution	L	ST	R	✓		-1	-2	-2	-1
3.	Increased Noise and Vibrations	L	ST	R	✓		-1	-2	-2	-1
4.	Pollution of surface and ground water	L	MT	R	✓		-1	-2	0	0
5.	Soil Erosion	L	ST	R			-1	-1	-1	-1
6.	Increased waste generation during construction	L	ST	R	✓		-2	-3	-2	-1
7.	Traffic disruption and congestion	R	ST	R	✓		-1	-3	-1	0
8.	Damage to existing infrastructure and public services	L	ST	R			0	-2	0	0
9.	Lacking or slow restoration of areas impacted by construction	R	MT	R		✓	0	0	-2	-1
10	Loss of definite materials and land degradation	R	ST	R	✓	√	-1	-3	-1	-1
11	Risks to worker's and public safety	L	ST	R	✓		-1	-3	-1	0
12	Overburdened Local Authority	R	MT	R	✓		-1	-2	-1	-1
13	Child Labour	L	ST	R			-1	-1	-1	-1
14	Increased HIV/AIDS	R	LT	IR	✓	✓	-1	-1	-1	0
15	Population Influx	L	ST	R	✓		-1	-1	-1	-1
16	Visual Intrusion during Construction	L	ST	R			-1	-1	-1	0
17	Increased Accidents	L	MT	R	✓		-1	-1	-1	-1
Positive Impacts										
1.	Job creation and increased income	R	ST	R			+2	+3	+2	+3

		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
2.	Improved Community Life	R	LT	R		√	0	0	0	+3
3.	Improved Accessibility	L	LT	R		√	0	0	0	+3
4.	Improved storm water collection and reduced soil erosion	R	LT	R			0	0	0	+3
5.	Reduction of road dust dispersion	L	LT	R		√				+3
6.	Increased property and land values	R	LT	R		√	0	0	0	+3

Table 6.2: Impacts Matrix forConstruction of lateral feeder drains into Duga and Mabawa main storm water drains

		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.	Increased dust and air pollution	L	ST	R	✓		-1	-2	-2	-1
2.	Increased Noise and Vibrations	L	ST	R	✓		-1	-2	-2	-1
3.	Increased pollution of soil and surface water	L	MT	R	✓		-1	-2	0	0
4.	Increased waste generation during construction	L	ST	R	✓		-2	-3	-2	-1
5.	Loss of property/land take/resettlement	L	MT	IR			-3	-2	0	0
6.	Lacking or slow restoration of areas impacted by construction	R	MT	R		✓	0	0	-2	-1
7.	Risks to worker's and public safety	L	ST	R	✓		-1	-3	-1	0

		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
8.	Loss of definite materials and land degradation	R	ST	R	✓	√	-1	-3	-1	-1
9.	Overburdened Local Authority	R	MT	R	✓		-1	-2	-1	-1
10.	Child Labour	L	ST	R			-1	-1	-1	-1
11.	Increased HIV/AIDS	R	LT	IR	✓	✓	-1	-1	-1	0
12.	Population Influx	L	ST	R	✓		-1	-1	-1	-1
13.	Visual Intrusion during Construction	L	ST	R			-1	-1	-1	0
Positive Impacts										
1.	Job creation and increased income	R	ST	R		√	+2	+3	+1	0
2.	Improved Community Life	R	LT	R		√	0	0	0	+3
3.	Reduction of flood in Dugan and Mabawa areas	L	LT	R		√	0	0	0	+3
4.	Reduced health risks related to water stagnation and floods	R	LT	R		√	0	0	0	+3
5.	Reduction of flood related soil erosion	L	LT	R		√	0	0	0	+3

Table 6.3: Impacts Matrix for construction of exist lane, drainage system, boundary fence for bus and lorry stands

		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.	Change of scenery view	L	LT	R	✓		-1	-2	-2	+2
2.	Increased dust and air pollution	L	ST	R	✓		-1	-2	-2	-1
3.	Increased waste generation during construction	L	ST	R	✓		-2	-3	-2	-1
4.	Lacking or slow restoration of areas impacted by construction	R	MT	R		✓	0	0	-2	-1
5.	Risks to worker's and public safety	L	ST	R	✓		-1	-3	-1	0
6.	Child Labour	L	ST	R			-1	-1	-1	-1
7.	Increased HIV/AIDS	R	LT	IR	✓	✓	-1	-1	-1	0
8.	Visual Intrusion during Construction	L	ST	R			-1	-1	-1	0
Positive Impacts										
1.	Job creation and increased income	R	ST	R	√	√	+2	+3	+1	+3
2.	Increased security level at the bus and parking stands	R	LT	R	√	√	0	0	0	+3
3.	Increased status of the municipality	R	LT	R	√	√	0	0	0	+3
4.	Increased revenue collection at the stands	R	LT	R	√	√	0	0	0	+3

Key: Spatial Scale: Local (L), Regional (R), National (N)
Temporal Scale: Short Term (ST), Medium Term (MT), Long Term (LT)
Reversibility: Reversible (R), Irreversible (IR)
Significance: Highly Adverse (-3); Adverse (-2); Mild Adverse (-1); No impact (0); Mild Beneficial (+1); Beneficial (+2); highly Beneficial (+3)

6.3 Pre-Construction and Construction Phase Impacts

Short-Term Direct Positive Impacts:

6.3.1 Job creation and increased income to local communities

During mobilisation and construction phases, a number of people will be employed in the sub-projects. It is expected that the inexpert labour and also the skilled labour will be sourced from local people or from within the Tanga City. Those who will secure employment even in short-term will get a modest payment which will help support their families for that time. Employment opportunities in the country are very scarce, especially for the unskilled people.

Presence of a construction force at the site will bring a good business opportunity to local food and refreshment vendors at or near the sub-project sites. The vendors are expected to benefit from the sell of food and other merchandise to the construction work-force and hence, raise their personal and household income. Apart from the payment, it is also expected that utilization of local labour will enable transfer of knowledge from the skilled workers and hence open the door to the possibility of acquiring employment in similar construction works elsewhere.

Short- term Direct Negative impacts

6.3.2 Increased water and soil pollution

No matter which construction method is used, still small-scale and short-term water pollution may result especially at river crossings and swamps 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 the soil. Culvert construction may stir river-bed 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.

Roads surface drainage and the storm drains in Duga and Mabawa respectively, will drain pollutants-concentrated run-offs from the roads. Moreover, soil and ground water pollution from accidental spillage of fuel or any other materials and chemicals associated with construction works is an undesirable possibility. Obviously, it is not possible to predict the location or type of spillage but, it is considered that any spillage to soil will be local in

nature and remediation should not be difficult. Spillage to water course is potentially very damaging causing impacts on humans, fishes and *riverine* vegetation.

6.3.3 Soil erosion and instability of slopes

During the construction phase of the sub-projects the soil is often weakened and exposed to erosion agents. Construction works would accelerate erosion problems in most cut sections. Nevertheless, all cuts in the sloping grounds should be firmly refurbished and provided with vegetation cover to reduce the effect of soil erosion.

6.3.4 Noise, vibration and air pollution

Air quality standards may temporarily change during the sub-project construction phase. Construction activities such as excavation works, movement of vehicles, stock piling of materials, operation of crusher and asphalt plants, and general earth works at the sites will produce a lot of dust. Exhaust fumes will mainly come from construction plants, machinery and vehicles in operation. Fumes will also come from the processing of asphalt and other similar materials. Dust and fumes will have major direct but short-term impacts during the project construction phase.
Roads and drainage systems in Tanga city are located in commercial/residential areas. Uncontrolled dust, noise and vibration will be a great nuisance to the people close-by. However, selection of proper construction machines and air dispersion and dilution are expected to lessen air pollution problems. Moreover, sprinkling of the working sites with water during construction work will further lessen generation of dust, and consequently alleviate the problem of air pollution.

Noise and vibration will be produced by construction vehicles, plants and machinery during delivery of materials, processing of materials, and actual construction work. Due to an increase in activities and number of operating vehicles, the impacts of noise and vibration will cause disturbance to humans especially because the sites are within commercial – residential areas. Vibration may even cause physical damage to properties near the construction sites. The vegetation and loose soil along the project sites have the potential for damping noise and vibration. As such, noise and vibration

impacts will have short range – near the construction site.
In addition to that, the dust will be a temporary nuisance to the people within the core impact area especially during construction in the dry season. However, the construction site of the lorry parking area and bus stand is located away from residential areas and hence the impacts will not be significant.

6.3.5 Population Influx

Similar to all other formal construction projects, the construction of the proposed sub-projects has the potential of attracting more people in the area due to the availability of employment opportunities as well as opportunities for other income generating activities. Construction of roads and drains will in particular increase accessibility to and through the areas. These may, as a result lead into an increase in social illnesses, especially sexually transmitted ones, like HIV and AIDS.
The population influx into the areas could also increase pressure on both resources and social services due to increased demand on the services and resources. This may lead to scramble for meagre resources which may cause conflicts in the community. The norms and traditions of the local people may potentially be affected by the social interaction between the local people and the new comers.

6.3.6 Safety and health risks

Unless the occupation health and safety is keenly taken care of, excavation and construction works expose the labourers and the general public to air borne diseases such as bronchial and other respiratory tract diseases. Issues related but not limited to lack of protective gears or poor use of the same during constructions may result into loss of lives or injuries. The incidence rate of water borne diseases such as cholera and diarrhoea will increase if there will be no proper sanitation facilities at the construction sites.

6.3.7 Loss of definite materials and land degradation

Construction of the roads, the drainage system, improvement of commuter bus stand and the lorry parking area will have direct impacts related to

excavation; quarrying and deposition of spoil material. Significant volumes of earthworks fill; road gravel and rocks will be extracted during project execution. For example; since the road will be constructed to bitumen standard, then, significant use of definite materials is expected.
Quarrying involves clearing the vegetation at the sites, excavation and transportation of materials. Thus, borrowing and quarrying activities will cause habitat change, land degradation due to removal of fertile top soil, landscape impairment in terms of visual intrusion and soil erosion which can lead to siltation of waterways. Quarrying, excavation and the disposal of spoil material can destroy the economic and aesthetic value of public and/or private property including land.
Some species may be affected during construction, but not to the level of extinction. However, establishment of detour routes specifically during construction of roads may damage some species.

Scenic quality deterioration will occur due to stock-piling of construction materials and discoloration of plant leaves and houses in the vicinity of the facilities due to wind-blown 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 well managed 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.

Abandoned borrow pits have damaging effects as experienced in other parts of Tanzania. Borrow pits and quarry sites provide good environment for disease vectors and thus posing serious public health hazards. Abandoned pits filled with water harbour disease vectors responsible for transmission of malaria and *schistosomiasis.*

6.3.8 Loss of natural habitats and trees

Tree and other minor vegetation along the sub-project areas are home to a number of higher and macro-organisms. Therefore, minimal vegetation clearance is expected mainly to obtain the 6-8 m carriage way and 45 m-road

reserve. This might involve uprooting trees and vegetation which fall within the RoW (Figure 6.1) as well as displacing huge masses of top-soil. Diversions to provide access to traffic during construction phase is expected to cause a minimal loss of habitat since the sub-project areas are to a large extent already disturbed.

***Figure 6.1**: Trees located close to the project roads which may have to be uprooted*

The road along street number 8 in the city centre has fairly a sufficient width though in some sections the width will need to be widened, and this will entail vegetation loss, including planted trees and natural trees along the existing road. A similar scene exists for the drains in Duga and Mabawa, where short grasses and vegetables in the swamps will be affected.

***Figure 6.2**: Vegetation, which may be affected along the route of Duga storm water drain*

6.3.9 Damage or relocation of existing infrastructure and public services

The existing infrastructure facilities for electricity, telephone, water supply and sewerage system which are located close to the sub-project roads (Figure

6.3) may be partly or totally destroyed during construction. This may lead to social, economic and even health problems to served communities. Interruption of water and power might affect businesses whereas overflows of sewage from broken sewer pipes and manholes may pollute water and cause the spread of water-borne diseases such as cholera and diarrhoea. This kind of temporal interruptions are likely to occur to users in the core impact zone, as well as in the zone of influence.

***Figure 6.3**: Sewerage pipe inspection chamber along street number 8 road*

Long-Term Impacts:

6.3.10 Overburdened local authorities

The implementation of the proposed investment sub-projects right from planning stage, construction stage to supervision will involve Wards and Mitaa leaderships. If these authorities are not involved in all phases of the sub-projects then it will be difficult to cope with TSCP - AF implementation pace, and as a result they will be overburdened by the sub-projects which may result in poor performance of the proposed investment subprojects. This impact can be short-term or long-term, depending on the nature of the overburden felt by the authority. For example, managing the landfill activities can be a burden during planning, construction and operation.

6.3.11 Increased spread of social illnesses

The major health risk the possibility of acceleration of spread of social illnesses, is always there when there is influx and or intermixing of people. Unhealthy social interaction might exist, as fuelled by many factors including economical benefits (i.e. from the construction force to the local community).

Unhealthy social inter-action might result in an increase in the incidence of diseases such as STI, and HIV/AIDS.

6.3.10 Loss of property/land-take and possible resettlement

To avoid any resettlement and land take, the sub-project have been designed to fit into the existing available land. Roads sub-projects have been fitted in the existing RoW of roads and storm-water drains.

Where open drains are too wide due to significant depth to appropriate Invert Levels to the extent that available space would not be adequate to accommodate the drain, subsurface storm-water drainage deploying the use of buried concrete pipes has been adopted to avoid land-take or demolition of existing properties to give way.

During the stakeholders' consultation, notably in the waterlogged areas of both Duga and Mabawa, it was established that the residents had agreed to give voluntary cooperation that would enable stagnant water to be drained-off from the water logged areas. Similarly, residents along sub-project roads are ready to give all necessary support needed from them for the sub-project to be implemented.

6.4 LONG TERM OPERATIONAL IMPACTS

- *Positive Impacts*

6.4.1 Improved Transportation Services

Well accessed roads save both the environment and the economy. Improvement of the existing roads and construction of new ones will improve transportation in the city. The road sub-projects were selected in such a way that traffic congestion in the city is reduced after the completion of their improvement. One of main causes of traffic congestion is the presence of potholes on the existing roads. It is expected that the improvement will reduce travel time around the city and, consequently reduce travel costs and pollution to the environment. The benefits of the improved roads will be experienced both at the core impact zone and at the zone of influence.

6.4.2 Improved community life, services and status

Among others, well accessible roads are pillars to sensitive public services. In general, community life and service provision will very much improved by better quality transportation system.

The current socio-economic status of sub-project areas will be improved and the general outlook will be beautified. These collective benefits will attract businesses including city tourism to the areas. Such improvements will benefit the nation as a whole.

6.4.3 Increased property and land values along the project area

Improved infrastructure will have back to back impact along and around the project zone. Road improvement shall increase the value and status of the area. Experience shows that house rents often increase with improved infrastructure in the area. These effects will be felt for over a long period of time to come and will be beneficial to property owners.

On the other hand, the tenants will see such improvements as a negative impact, mainly because of the increased rents. Looking at the large society, the increased property value is seen to be of more beneficial to the general community.

6.4.4 Landscape modification

In a better way, the sub-projects will make changes on the landscape. The landscape modification will be associated with land-take where necessary for road widening and cut and fill sections to improve both horizontal and vertical alignments. These are permanent features as it is highly improbable that any land taken or earthworks constructed for the sub-projects will ever be returned or reinstated.

6.4.5 Interference to local hydrology

Construction of roads, drainage channels together with the improvement of bus stand and lorry park will result into change in drainage patterns of the site. These facilities will increase the impervious surfaces limiting water infiltration into the ground altering the primary hydrology. Interference to local hydrology may have some benefits such as flood reduction along the road surface, but may also affect water resources and the ecosystem. The effects to water resources might lead to water shortage in the area especially during dry seasons. Other negative hydrological and drainage impacts are not foreseen.

Another main impact associated with the provision of road drainage channels is blocking of shortcut access paths to residences for houses located along the road.

6.4.6 Increased road accidents

It's a common knowledge that drivers would go at a higher speed on a good road than on a worn-out road surface. High speed, especially in a commercial-residential area can result in increased frequency of road accidents, especially near schools, markets, mosques or churches and many other public areas.

The roads in Tanga will be provided with safety signals and speed humps where appropriate. They are designed to provide for pedestrians way where possible. Unfortunately, there is no extra space for creation of pedestrian ways in the city centre of Tanga.

6.4.7 Increased noise, vibration and pollution

Upon completion of the project it is expected that soil, vibration and soil pollution levels will increase. This will be evident during the operation phase of facilities due to factors such as fuels and other chemical spillage, exhaust emissions from vehicles, noise and vibration from vehicles.
Noise is one of the most obvious negative impacts of daily road use. The discomfort caused by noise includes auditory fatigue and temporary lessening of hearing ability. However, perceived noise is related to background noise level, so that a new facility in quiet areas or noisy trucks at night are often perceived as worse than higher levels of noise in a busy area during the work day.

Nevertheless, the magnitude of the pollution is generally considered to be very low, except for the effect of exhaust fumes on air quality which is considered to be significant if no maintenance program will be installed. Under good maintenance schedule, traffic exhaust emissions, will be intermittent and atmospheric dispersal of exhaust emissions will maintain the air quality. However, concerted effort to check engine performance is needed so as to deter vehicles not road-worthy from using the road.

6.5 Long-Term Impacts- Operation Phase

- *Long-term positive impacts*

6.5.1 Improved storm water drains in Duga and Mabawa area

The area around Duga, Kwa-kombo, Mwang'ombe, Mabawa and Donge receive storm water from highland areas and they often get flooded. This sub project will improve storm run-off drainage at Duga and Mabawa. Construction of the earmarked drains will facilitate collection of storm water from the area and discharge it to the Indian Ocean. Floods have destabilised and destroyed properties especially houses and other infrastructure such as roads, water supply pipes and sewerage pipes thus causing ill-health to communities living around and losses to their economy.

Mismanagement of storm run-off led into retaliation of many other public services infrastructure. In turn, destruction of water supply pipes for example, caused water supply interruptions while destruction of sewerage pipes led into soil and ground water pollution and water thus jeopardising the public health. On the hand, water stagnation in the area created breeding sites for mosquitoes and other disease vectors.

Therefore, construction of the storm water drains will protect community health, and well being, as well as protect properties and available infrastructure. Another positive impact will be the reduction of soil erosion by controlling the flow of storm water.

- *Negative Long-Term Impacts*

6.5.2 Loss of income for vegetation growers

Some residents in Duga and Mabawa areas are engaged in small scale vegetable farming around the swamps along the sub-project area. The vegetations are sold to vendors in the nearby market. A bundle of vegetable is sold at Tshs 100/= and one farmer can earn at least Tsh 1,000/= per day. Provision of storm water drainage system will cause the swamps to dry up and, thus small-scale farmers will lose their income.

6.6 Short-Term Impacts: Operation Phase

- *Positive Impacts*

6.6.1 Reduction of traffic congestion in the city

The road sub-project is expected to reduce traffic congestion in the city centre. The location of the bus stand and lorry parking area outside the city will reduce the number of commuter buses entering the city centre. Commuter buses are largely responsible for causing traffic congestion in the city centre. At least 20 buses use the existing bus stand daily and the number is keeping on increasing as the city grows. Trucks especially those serving industrial areas and business centres are parked haphazardly and block the roads ending-up reducing the carriage way.

Construction of the bus stand and lorry parking will divert traffic from the city centre thus reducing congestion, which will eventually reduce travel time and number of accidents occurring in the city.

6.6.2 Establishment of new business at Kange area

The new bus stand and lorry parking will attract various businesses in the area. These include food and drinks vending, retail shops and increase of general hawkers. Local people will be employed to run the facilities such as pay toilets, water kiosks, solid waste collection, etc. The facilities will also attract investors in hotel/guest business thus creating employment opportunities to local residents. People residing near these public service facilities will benefit by reduction in travel time to work and business premises.

6.6.3 Job creating and increased income

The local residents will benefit from employment opportunities such as clerical jobs, bus conductors, hotel/guest house workers and shop attendants created by the presence of the new bus stand and lorry parking which will also create a new market for local produces. According to the ward executive officer, services such as water kiosks, public toilets, waste management will be run by the ward committees, where by the ward will benefit from levies

and the neighbouring communities from employment. The city will also benefit from tax collected from the parking charges and businesses. In general, the existence of these facilities in the area will stimulate the economic growth in Kange area and Tanga city as a whole.

- *Negative Long-Term Impacts*

6.6.4 Population Influx

The operation of facilities such as bus stand and lorry parking are usually accompanied by in-migration of job seekers, alms seekers and opportunistic business people besides normal travellers. Such immigrants may intensify the prevalent diseases in the area such as malaria, diarrhoea, dysentery, meningitis and measles. Considering the presence of HIV/AIDS in the city, increased population density in the area due to immigration may result in increased prevalence rate of the disease.

Influx of people may also lead to scramble for meagre resources; especially land, water and energy. If land development in the area will not be planned and guided, the area will develop into an informal or rather a big chunk of squatter settlements with associated social and infrastructural provision problems.

6.6.5 Increased noise and air pollution during operation phase

Noise levels and air pollutants may rise during the operation of the sub-project. Pollution will be evident during the operation phase of the facilities due to exhaust emissions from vehicles, spillage of fuel and oil. Fuel and engine oil may be washed by rain to water sources and adjacent soils. However, the magnitude of the pollution is anticipated to be low.

Noise is one of the obvious negative impacts of operating the facilities. The discomfort caused by noise includes auditory fatigue and temporary lessening of hearing ability. The severity of the noise pollution impact is expected to be limited only to residents living closer to the affected sub-project zone.

The effect on air quality of the increased traffic flow and is considered to be significant if no maintenance program will be run. Under good maintenance schedule, traffic exhaust emissions, will be intermittent and atmospheric dispersal of exhaust emissions will not impair the quality of the air. However,

concerted effort to check engine performance is needed intentionally to bar vehicles not road-worthy from using the facilities.

6.6.6 Increased Crime rates

There is likelihood that, the operation of the bus stand and lorry parking will attract different people from myriad of backgrounds in the area. Some might come for business ventures and others for miscellaneous illegal business. It is from common experiences that pick-pocketing, smuggling and related cases are common in crowded areas such as bus stands and markets. The residents near the facilities will probably not be left alone. Cases of gender-violence and lots of other social vices will probably increase. Advanced criminal activities in the area will be a major risk for neighbourhoods around and travellers and their properties in the sub-project areas.

6.6.7 Increased solid waste and waste-water generation in the area

Similar to any other populous public premises, solid and liquid waste management at the improved bus and lorry packing may be a challenge. This will un-doubtfully increase the amount of refuse and wastewater generated in the area. The mixed types of activities in the facility areas will generate a unique blend of solid waste which will involve collection, sorting and transportation to the proper city disposal facility.

Increased waste generation by the bus stand and lorry parking areas have repercussions on the existing facilities in terms of;

- Efficient ways of managing solid and liquid waste and maintaining quality environmental sanitation and,
- quality of water in the area.

7. 0 IMPACTS MITIGATION MEASURES

7.1 General considerations

This chapter describes what has to be done so as to minimize the foreseeable impacts that may result from the undertaking of the sub-projects. Most of the suggested mitigation measures are nothing more than good engineering practices which should be adhered to during designing and construction of the facilities.

7.2 Mitigation measures for direct short-term impacts

7.2.1 Increased water and soil pollution

- Spillage of fuels and chemicals is a risk, but spillages are likely to be local and remediation is relatively easy,
- Spillage to water-.course is harmful to all kinds of lives. In case of accidental spillage, the contractor shall exercise every possible effort to minimize the associated risks. For instance re-fuelling of plant or transfer of materials should not be carried out near watercourses, and any local spillage to soil should immediately be remedied and,
- Good housekeeping shall be practiced within material storage compounds or vehicle maintenance yards where the possibility of spillage is great.

7.2.2 Soil erosion and instability of slopes

- The city authority shall follow the detailed drainage designs included in the construction plans, intended to prevent storm-water from causing local flooding or scouring on slopes and areas of unprotected soil. The result can be heavy sediment loads that may affect local water-courses,
- Whenever possible unnecessary ground clearance and sensitive re-alignments shall be avoided and,
- Lined drainage channels at sensitive terrains shall be provided to control speed and volumes of run-off. The discharge points must be carefully chosen to avoid erosion of arable land and creation of gullies.

7.2.3 Noise, vibration and air pollution

- Nuisances of noise, vibration and dust will be transient and good work practice can minimize them. Nonetheless, nearly all these impacts are already being experienced due to the existing old road,
- The city authority is responsible for compliance with the relevant national legislations with respect to noise and vibration,
- The impacts of noise and dust emissions will further be minimized by proper choice of plants 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) and,
- Dust at work places within or close to human habitations should be critically minimized by periodic water sprinkling on working sections. The contractor shall advise or notify local households on shedding of dust, noise, vibration and other dangers.

7.2.4 Safety and health risks

- The contractor should prepare and implement action plan to cope with risks and emergencies in order to comply with relevant national regulations regarding workers' and public safety,
  Appropriate working gears (such as nose, ear mask devises and clothing) and good camp management shall be provided. During construction the contractors shall ensure that camp sites are 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 and,
- A well-stocked First Aid kit (administered by medical personnel) shall be maintained at each camp. 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.

7.2.5 Increased spread of social illnesses

- Since construction camps will attract many job seekers and trade mongers, the contractor shall enforce a code of conduct in the camp to encourage respect for the local community and maintaining of cleanliness of the camp at all times,

- The contractor shall deploy locally available labour force to reduce risks of spreading of communicable diseases and,
- A safety, health and environment induction course shall be conducted to all workers, putting more emphasis on initiatives against illicit drug use and contracting HIV/AIDS. Therefore, information education and communication should be budgeted for in this case to raise more awareness on the negativity of social illnesses.

7.2.6 Loss of definite materials and land degradation

- Construction materials should be obtained from the existing sites and if they are to be fetched from remote lands, they shall be purchased and this will be officially negotiated with Mtaa residents/villagers and/or Mtaa/village governments in order to avoid conflicts. The contractor may be compelled to pay a small fee to the Mtaa resident/villager and/or Mtaa/village government,
- Potential long-term environmental impacts of borrow pits and quarry sites relate to the way they are left once the resource has been extracted. In this case, all borrow pits and quarries shall be rehabilitated and proper landscaping done after completion of the individual facility construction. Pits shall not be left with steep or vertical sides.
- The top-soil (except for the solid waste disposal area) shall be stock-piled for later use in re-instating the pit. Shallow slopes will encourage rapid re-vegetation and thus, preventing erosion as well as providing safety to animals. Excavated soils from the landfill site shall be used for daily and final waste covers during the operation phase.
- The significance to the region of the depletion of the material assets is not considered to be high as deposits throughout the remainder of the region will not be significantly affected by these sub-projects and they remain available for other sub-projects as well,
- Obtaining sand from valleys and river-sides must be thoroughly investigated to avoid accelerated land degradation and pollution of water sources and/or interfere with agricultural activities in farmlands,

7.2.7 Loss of natural habitat

- Areas to be cleared should be minimized as much as possible. Re-vegetation shall be done according to the plan specified by the Standard Specifications for Road Works of 2000 Section 5700 (Landscaping and Grassing),
- Close supervision of earthworks operations is required in order to confine land clearance to within the road and drainage reserve boundary. Since the alignment largely follows the existing road and other sub-projects facilities, the impact will be small. Farmers (if any) will be notified early enough to enable them harvest affected crops on time and/or be fairly compensated,
- Top-soil shall be stock-piled and used for re-instating flora along the road. It is assumed that displaced fauna will either return once the work is over or seek other habitations elsewhere and,
- The Contractor will be instructed to re-plant new trees in place of the uprooted original trees by involving nearby residents through local government leaders or any other convenient arrangement. The design of facilities will try as far as is practicable to avoid felling of big trees or other flora of outstanding importance.

7.2.8 Landscape degradation

- Wherever possible mature trees along the roads shall be retained. However, trees planting campaign will be necessary to restore the original environment of the area. Also, any cleared plant material and top-soil shall be stock-piled so as to assist in replanting scheme,
- The harvested vegetation products shall be given to local communities (through local government) for use,
- Cut and fills sections shall be designed so as to minimize net materials import. Appropriate work method employed will minimize material import and,
- Borrow pits and quarries will be re-instated and blended to fit the surrounding landscape environment.

7.3 Mitigation measures for the direct short-term impacts - Construction Phase

7.3.1 Destabilization and/or destruction of infrastructures along the roads

- The city authority should negotiate with the service providers to relocation the afflicted services,
- The service providers should be notified in advance or even involved during the planning stage of the project,
- A work plan should be prepared to avoid water or sewage overflowing on the surface and also make sure that the service cuts are as short as possible, in order to minimize disturbances to the users. That will help saving the costs that would have been incurred if the lines were to be destroyed by the sub-project activities and, the involved costs should be included in the project costs.

7.3.2 Increased road accidents

By providing alternative diversions whenever necessary, the contractor will ensure that the traffic flow is not interfered during the entire construction period. No total closure of the road or drain for instance, will be allowed. The contractor shall provide diversions and deploy a person responsible for traffic safety.

7.3.3 Temporal Loss of access to services

- To avoid unnecessary interruption of services, the city authority to involve the affected service providers in the designing and construction phase.
- The general public and the service providers to be notified in advance, so that they can be well prepared during the period on service cut.
- Warning signals and diversions to be created where the road has been closed. The signals to be in both languages Kiswahili and English using simple signs that could be understood by all kinds of people and,
- The budget (or part of) for re-installing the service to be included in the sub-projects costs.

Mitigation measures for direct long-term impacts

7.3.4 Interference to local hydrology

- Construction of the facilities interferes with the natural surface and groundwater flow regimes. Good design features shall be adopted to ensure that the changes of the hydrological regimes are minimized and that any impacts are insignificant and,
- The design will provide controlled and effective storm-water dispersion by installation of adequate and appropriate drainage elements. The discharge points shall be well designed to avoid accelerated erosion downstream.

7.3.5 Increased noise, vibration and air pollution

- The design of the facilities shall take into account of appropriate mitigation measures to reduce noise and air pollution. Warning signage such as speed limit sign posts shall be erected, and so for exhaust emission control, shall be enforced especially in the CBD where air dilution is minimal and,
- Operation machines and equipment shall be those with the lowest possible noise and emissions levels. Whenever necessary construction works should be limited during day-times especially when it goes closer to residences.

7.3.6 Increased road accidents

- For roads, the design shall take account of safety concerns especially at human habitation crossings e.g. erection of bus stops at settlements,
- Erection of proper warning signs, regularly inspecting them,
- Installation of speed control devices like humps,
- Training of drivers and pedestrians and,
- Placing of pedestrian lanes at human settlement crossings

7.3.7 Interference to traditional norms and values

- Diffusion of cultural moral values and customs from one community to another is inevitable especially where more than one cultural background is in contact to one another, maintenance of local ties becomes very difficult. Though the issue is very difficult to control, communities shall be encouraged to stick to their traditions and copy only valuable traditional norms from the new comers.

7.4 Mitigation measures for direct long-term impacts

7.4.1 Loss of income for vegetation growers

- The community should be allowed to make use of the area adjacent to the storm drains for growing vegetation,
- The City should organize communities so that they can diversify income generating activities and,
- Establish small group businesses and SACCOS to assist people access loans to enable them run small businesses.

7.4.2 Population influx

Include in the sub-project, a budget for awareness sessions on social illnesses during the operation phase of the commuter bus stand and lorry parking area so as to reduce the transmission rate which may otherwise increase as a result of the influx of people into the sub-project area.
The City should plan to properly use existing resources such as land, water, energy and alike to minimize environmental degradation and scramble for resources in the area.

7.4.3 Increased noise and air pollution

- Drivers, conductors and other facility operators should be educated on noise and its effects to the surrounding environment,
- The Tanzania air quality standards should be enforced and polluters should be penalised by the city council,
- Vehicle inspecting institutions should insist on regular maintenance of vehicles to minimize emissions of pollutants and,
- Traffic police to conduct regular inspection of running vehicles,

7.4.4 Increased crime rate

- The city to provide full security for people and their properties in the facilities,
- The government to establish a police station in or near the commuter bus stand/lorry parking area,
- Jobless crowds should not be allowed to hang around the commuter stands or lorry parking area and,
- Gate entrance fees at the commuter bus stand/lorry parking area will minimize unnecessary movement into the area.

7.4.5 Increased generation of waste

- The waste generated in the commuter bus stand to be managed by the city or competent NGO,
- The city authority to provide waste bins within and around the commuter bus stand and lorry parking area for collection of waste,
- Retail mobile vendors (famously known as 'machinga') to be restricted inside the commuter bus station/trucks parking area,
- All permanent business owners/vendors inside the commuter bus station/trucks parking area to be regulated and made to pay fees for solid waste and waste water collection services,
- Polluters to be penalised, the city to enforce penalties for pollution offences and,
- Construction of a proper sewerage system for collection of waste water from the commuter bus stand and lorry parking areas.

8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The plan for Environmental and Social Management (ESM) 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 social and environmental costs needed to implement the recommended mitigation measures under the TSCP - AF. The engineering designs have already included some of the mitigation measures recommended in this report. Additional recommendations are provided in the ESMP of this ESIA to enable the proposed facilities become socially and environmental friendly.

8.1 Institutional structure for ESM

The LGA Project Team in Tanga City is responsible for project implementation including environmental and social management requirements. PO - RALG will provide overall coordination and technical support to the LGA Project Team including necessary link with national authorities (i.e. VPO, MoWorks, NEMC, MLHHSD, TANESCO, etc). The approved ESIA report is submitted back to the city authority to guide implementation and monitoring by the Council Teams, EMOs, Construction supervision Consultants and Contractors.

8.2 Environmental and Social Costs

The principal environmental and social costs include the costs for implementing proposed mitigation measures and the cots for carrying-out monitoring of specific environmental and social parameters. The estimated costs are to be included in the Contractor's BoQ. Additional costs for implementing environmental and social management measures have been estimated as described in Table 8.1- 8.3.

8.3 Implementation of the ESMP

The environmental measures incorporated in the detailed engineering design will be attached to the Contract Documents. The Contractor shall take stock of the contents of the Environmental and Social Impact Assessment Statement of the Project.

To facilitate effective implementation of the ESMPs, the City Technical Support Team will:

(a) establish an Environmental and Social Team (EST) responsible for ensuring timely implementation of ESMP, including monitoring, reporting, and capacity building related to safeguards;
(b) assign the Construction Supervision Consultant (CSC) to be responsible for supervision of the contractor's safeguards performance as part of the construction contract and this requirement will be included in the CSC terms of reference (ToR); and
(c) Hire qualified national consultants as the Independent Environmental and Social Management Consultant (IESMC) to assist the EST in performing these tasks.

The City authority will be responsible for implementing the mitigation measures during the operation stage of the project and ensure that the mitigation measures are implemented and adequate budgets are provided for. It will also provide the overall policy guidance and oversight for sub-projects implementation, including the ESMP. More details on organization, roles and responsibilities for the ESMP implementation and the monitoring program are described further below:

Table 8.1: Environmental and Social Management Plan (ESMP) for the storm drains at the Lorry /buses parking lots

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
Pre- construction phase				
Loss of property/farms/land take and possible resettlement	○ Development and implementation of the resettlement action plan (RAP), consistent with OP 4.12. see the RAP that has been prepared as a separate document from this ESIA ○ Confine clearance to road reserve /construction site boundary.	City Council	Before and during construction phase	1,000
Inadequate Knowledge of Environmental Management Issues	○ Training of 12 City council staff from various sections	○ City council	At least one Month Short Course.	25,000
Impact	**Mitigation measure**	**Responsible institution**	**Time frame**	**Estimated cost (US $)**
Construction phase				
Soil and water pollution	○ In case of accidental spillage, the contractor shall exercise every effort in order to minimize the associated risks. ○ Practice Good housekeeping. ○ The use of silt fences and hay bales to remove suspended solids from surface water runoff ○ The use of silt curtains to minimize sediment suspension and transport while working near water crossings.	○ City Council	During Construction and operation	N/A
Soil Erosion and	○ Unnecessary ground clearance and	○ City council/	During Design and	N/A

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
instability of Slopes	sensitive re-alignments shall be avoided. o Lined drainage channels at sensitive terrains shall be provided to control speed and volumes of storm-water. o The discharge points must be carefully chosen to avoid erosion of arable land and creation of gullies.	Contractor	Construction	
Loss of definite materials and Land degradation	o Where construction materials such as gravel and stones are to be obtained from village lands, the material shall be purchased and this will be officially negotiated with villagers and/or village government in order to avoid conflict. o All borrow pits and quarries shall be rehabilitated and proper landscaping done after completion of the road construction. o The topsoil shall be stock piled for later use in reinstating the pit. o 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.	o Contractor/ Village Leaders	During Mobilization, Construction and after construction	1,000
Noise pollution	o Provide working/protective gears to workers o Proper choice of equipment which offer environmental advantages	o City council/ Contractor o City council/ Contractor	Construction and operation phase	1,000

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
Air pollution	○ Watering working sections (especially near human habitation) ○ Proper choice of equipment which offer environmental advantages	○ City council/ Contractor	Construction and operation phase	1,000
Vibration	○ Advance notice to local communities ○ Proper location of quarry sites	○ City council/ Contractor	Construction and operation phase	1,000
Increased Road Accidents	○ Traffic management plan (in both English and Swahili) ○ Speed limits in villages ○ Conduct seminars to road users	○ City council/ Contractor Traffic police	Constructional Phase	3,000
Increased Spread of HIV/AIDS	○ Safety, Health and Environment (SHE) induction course ○ Support HIV/AIDS campaigns ○ Provision of condoms	City Council/ NGOs/CBOs/local communities		3,000
Safety and health risks	○ Regular maintenance of construction machinery to minimise accidents during construction period. ○ Safety, Health and Environment (SHE) induction course ○ Comply with the Occupation Health and *Safety* Act (2003) by provision of safety gears. ○ Adequate signage and availability of First Aid Kit	City council/ Contractor	Short-term (Construction phase)	500
Temporal Loss of access to services	○ The City to involve the affected service providers in the designing and construction phase.	○ Contractor/ city Council/ Relevant		

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
	○ The general public and the service providers to be notified in advance, so that they can be well prepared during the period on service cut. ○ Roads signals and diversions to be created where the road has been closed. The signals to be in both language and use simple signs that could be understood even by school children. ○ The budget for (or part of) re-installing the service to be included in the project costs.		Short-term (Construction phase)	1,000
Destabilization and/or Destruction of the existing infrastructures along the roads	○ Integrated planning is needed with owners of infrastructures at the proposed subproject ○ Early notice to users before interruption	○ Contractor/ City Council		1,000
Operation phase				
Interference to local hydrology	○ Good design and engineering practice ○ Efficient drainage system ○ Selection of proper outfall point so as to avoid flooding at the discharge point	○ City council/ Contractor ○ City council/ Contractor	Long-term	3,000
Safety of human beings (Increased Road accidents)	○ Traffic management plan (in both English and Swahili) ○ Speed limits in villages ○ Conduct seminars to road users	○ City council/ Contractor	Long-term	3,000
Noise, vibration	○ Good design practice	○ City council/	Operation phase	

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
and air pollution	o Provide side-hedges o Enforce speed and exhaust limits	Contractor		1,000
Soil and water pollution	o Proper handling of waste especially near water course o Watering the surface to minimize dust deposition into water courses o Encase of spillage, proper soil remediation to be followed, depending on the type/amount of spillage	City council/ Contractor	Operation phase	2,000
Total Cost				**47,500**

Table 8.2: Environmental and Social Management Plan (ESMP) for proposedRoads

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
Construction phase				
Soil and water pollution	○ In case of accidental spillage, the contractor shall exercise every effort in order to minimize the associated risks. ○ Practice Good housekeeping.	○ City council/ Contractor	During Construction and operation	N/A
Loss of definite materials and Land degradation	○ Where construction materials such as gravel and stones are to be obtained from village lands, the material shall be purchased and this will be officially negotiated with villagers and/or village government in order to avoid conflict. ○ All borrow pits and quarries shall be rehabilitated and proper landscaping done after completion of the road construction. ○ The topsoil shall be stock piled for later use in reinstating the pit. ○ 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.	○ City council/ Contractor/Village Leaders	During Mobilization, Construction and after construction	1,000
Noise pollution	○ Provide working gear to workers ○ Proper choice of equipment which offer environmental advantages	○ Contractor ○ Contractor	Construction and operation phase	1,000
Air pollution	○ Watering working sections (especially near human habitation)	○ Contractor ○ Contractor/ Env.	Construction	1,000

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
	○ Proper choice of equipment which offer environmental advantages	Supervisor	and operation phase	
Vibration	○ Advance notice to local communities ○ Proper location of quarry sites	○ Contractor ○ Contractor/ Env. Supervisor	Construction and operation phase	1,000
Increased Road Accidents	○ Traffic management plan (in both English and Swahili) ○ Speed limits in villages ○ Conduct seminars to road users	○ City council/ Contractor	Constructional Phase	1,000
Increased Spread of HIV/AIDS	○ Safety, Health and Environment (SHE) induction course ○ Support HIV/AIDS campaigns ○ Provision of condoms	○ City Council/ NGOs/CBOs/local communities		3,000
Land degradation, Soil Erosion and loss of natural habitat	○ Retain mature trees ○ Hand cut trees to local community through LGAs ○ Effect compensation to the affected land ○ Design cut and fill to minimize material import ○ Reinstate borrow pits & quarries ○ Avoid unnecessary ground clearing ○ Provide adequate drainage channels	City council/ Contractor	Design and construction phases	1,000
Safety and health risks	○ Regular maintenance of construction machinery to minimise accidents during construction period. ○ Safety, Health and Environment (SHE) induction course ○ Comply with the Occupation Health and *Safety* Act (2003) by provision of safety gears.	○ Contractor ○ City council/ Contractor	Short-term (Construction phase)	1,000

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
	○ Adequate signage and availability of First Aid Kit			
Operation phase				
Interference to local hydrology	○ Good design and engineering practice ○ Efficient drainage system ○ Selection of proper outfall point so as to avoid flooding at the discharge point	○ City council/ Contractor	Long-term	1,000
Total Cost				**11,000**

Table 8.3: Environmental and Social Management Plan (ESMP) for the feeder drains at Duga and Mabawa

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
Construction phase				
Land degradation, Soil Erosion and loss of natural habitat	○ Retain mature trees ○ Hand cut trees to local community through LGAs ○ Effect compensation to the affected land ○ Stockpile topsoil ○ Design cut and fill to minimize material import ○ Reinstate borrow pits & quarries ○ Avoid unnecessary ground clearing ○ Provide adequate drainage channels	City council/ Contractor	Design and construction phases	1,000
Soil and water pollution	○ In case of accidental spillage, the contractor shall exercise every effort in order to minimize the associated risks. ○ Practice Good housekeeping.	○ City council/ Contractor	During Construction and operation	N/A

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
	○ The use of silt fences and hay bales to remove suspended solids from surface water runoff ○ The use of silt curtains to minimize sediment suspension and transport while working near water crossings.			
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.	○ City council/ Contractor	During Design and Construction	N/A
Loss of definite materials and Land degradation	○ Where construction materials such as gravel and stones are to be obtained from village lands, the material shall be purchased and this will be officially negotiated with villagers and/or village government in order to avoid conflict. ○ All borrow pits and quarries shall be rehabilitated and proper landscaping done after completion of the road construction. ○ The topsoil shall be stock piled for later use in reinstating the pit. ○ 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.	○ Contractor/ City council/ Contractor	During Mobilization, Construction and after construction	500
Noise pollution	○ Provide working/protective gears to workers ○ Proper choice of equipment which offer environmental advantages	○ City council/ Contractor	Construction and operation	1,000

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
			phase	
Air pollution	○ Watering working sections (especially near human habitation) ○ Proper choice of equipment which offer environmental advantages	City council/ Contractor	Construction and operation phase	1,000
Vibration	○ Advance notice to local communities ○ Proper location of quarry sites	○ City council/ Contractor	Construction and operation phase	1,000
Loss of definite materials and Land degradation	○ Where construction materials such as gravel and stones are to be obtained from village lands, the material shall be purchased and this will be officially negotiated with villagers and/or village government in order to avoid conflict. ○ All borrow pits and quarries shall be rehabilitated and proper landscaping done after completion of the road construction. ○ The topsoil shall be stock piled for later use in reinstating the pit. ○ 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.	○ Contractor/Cons City council	During Mobilization, Construction and after construction	1,300
Noise pollution	○ Provide safety working gear to workers ○ Proper choice of equipment which offer environmental advantages	○ City council	Construction and operation phase	1,000
Air pollution	○ Watering working sections (especially near	○ City council/		1,000

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
	human habitation) o Proper choice of equipment which offer environmental advantages	Contractor	Construction and operation phase	
Vibration	o Advance notice to local communities o Proper location of quarry sites	o City council	Construction and operation phase	1,000
Increased Spread of HIV/AIDS	o Safety, Health and Environment (SHE) induction course o Support HIV/AIDS campaigns o Provision of condoms	o City council communities	Construction and operation phase	2,300
Safety and health risks	o Regular maintenance of construction machinery to minimise accidents during construction period. o Provide safety working gear to workers o Safety, Health and Environment (SHE) induction course o Comply with the Occupation Health and *Safety* Act (2003) by provision of safety gears. o Adequate signage and availability of First Aid Kit	City council	Short-term (Construction phase)	1,500
Operation phase				
Interference to local hydrology	o Good design and engineering practice o Efficient drainage system o Selection of proper outfall point so as to avoid flooding at the discharge point	o City council	Long-term	3,000
Noise, vibration and air pollution	o Good design practice o Proper selection of equipment to reduce noise o Soil covers on the waste to avoid air pollution.	o City council	Operation phase	1,000
Increased Crime	o Provision of security for people and property in the	o City council	Operation phase	-

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
	facilities o The government to establish a police station in or near the commuter bus stand/lorry parking area o Gate entrance fees at the commuter bus station/parking area will minimize unnecessary movement into the area.	communities		
Increased generation of waste (solid and liquid)	o Provision of dust bins around the commuter bus station and Trucks parking area for collection of waste. o Retail mobile vendors to be restricted inside facilities o All permanent business owners/vendors inside the commuter bus station/trucks parking area to pay for solid waste and waste water collection costs, o Polluters to be penalised, the city to set penalty rates for pollution offences. o Construction of a proper sewerage system for collection of waste water from the commuter bus station/parking area.	o City council/contractor	Operation phase	1,700
Population Influx	o Provision must be made in the project budget for undertaking HIV/AIDS awareness campaigns. o The City to guide proper use of existing resources such as land, water, energy etc. o Existing land use plans to be made public and followed.	o City council/contractor	Operation phase	1,800

Impact	Mitigation measure	Responsible institution	Mitigation Time frame	Estimated cost (US $)
Soil and water pollution	○ Proper handling of waste especially near water course ○ Watering the surface to minimize dust deposition into water courses ○ Encase of spillage, proper soil remediation to be followed, depending on the type/amount of spillage	○ City council/ Contractor	Operation phase	900
Loss of income to vegetation growers in Duga and Mabawa	○ The community to allowed to continue use the area adjacent to the storm drains for growing vegetation, ○ The council to organize the community so that they can start other income generating activities ○ Establish some small group business and SACCOS to assist people access loans to enable them run small businesses	City council/ Contractor	Long-term	-
Total Cost				**20,700**

9.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

9.1 Environmental and Social Monitoring

The overall objective of monitoring is to evaluate whether the mitigation measures designed into the proposed infrastructure sub-projects have been successful in such a way that the pre-infrastructure sub-project environmental and social conditions have been restored, improved upon or whether they are worse than before.

Monitoring of anticipated environmental and social impacts in the receiving environments is important. It helps to determine the effects of sub-project activities on the environments enhancing the understanding of *cause-effect* relationships between human activities and environmental changes, and verifies the accuracy of predictions about the environmental impacts. It also ensures compliance with regulatory measures and understanding of the degree of implementation of ESMP and its effectiveness. The monitoring results are also used extensively during environmental auditing. The ESMP for the sub-projects are shown in Table 9.1 to Table 9.

- *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 arising from the construction activities
Operation stage	Monitoring at this stage is meant to check on the impacts that might arising from normal use of the infrastructure
Decommissioning	Decommissioning is not anticipated in the foreseeable future. However, if this will happen, it may entail change of use (functional changes) or demolition triggered by change of land use

Table 9.1: Environmental and Social Monitoring Plan for Roads

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
Pre construction stage								
Air quality	SO_2	Once before the construction starts	Project site	mg/kg (hourly)	Detector tubes	0.1	City council/ Env. Supervisor	500
	NO_x		Project site	µg/nm^3 (24 hrs)	Detector tubes	150		500
	PM_{10}		Project site	µg/nm^3 hourly)	Mini-Vol Sampler	0.15		500
	CO_2		Project site	ppm (1hr)	Detector tubes	35		500
Noise Baseline	Noise level		Project site	dBA (equivalent)	Noise meter	55		500
Water pollution		Once before the construction work starts	Water Bodies water bodies near the project sites				City council/ Env. Supervisor	
	Nitrate			mg/l	Sampling and analysis (Spectrophotometer)	30		400
	Lead			mg/l	Sampling and analysis (AAS)	0.05		400
	Sulphate			mg/l	Sampling and analysis (Spectrophotometer)	600*		400
	Turbidity			NTU	Sampling and analysis (Spectrophotometer)	35		100
	Hydrocarbons			Mg/l	Sampling and analysis (HPLC)			600
	pH			-	pH meter	6.5-9.2		100
Loss of access to services	Baseline information on availability of services		Along the project roads	Type/extent of services	Measuring and Observation	-		-
Compensation	Rate of compensation for land and	Once before the construction	Project site	Once before construction	File records and inquiry.	-	Contractor / City council/	-

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
	properties	starts		begins				
Construction stage								
Air pollution	SO_2	Three times a year	Project site	mg/kg (hourly)	Detector tubes	0.1	Contractor / City council/ Env. Supervisor	1500
	NO_x	Three times a year	Project site	µg/nm^3 (24 hrs)	Detector tubes	150		1500
	PM_{10}	Three times a year	Project site	µg/nm^3 hourly)	Mini-Vol Sampler	0.15		1500
	CO_2	Three times a year	Project site	ppm (1hr)	Detector tubes	35		1500
Noise pollution	Noise level	Three times a year	Project site	dBA (equivalent)	Noise meter	55		1500
Water pollution	Nitrate	Three times a year		mg/l	Sampling and analysis (Spectrophotometer)	30	Contractor/ City council/ Env. Supervisor	1200
	Lead	Three times a year	Water Bodies water bodies near the project sites	mg/l	Sampling and analysis (AAS)	0.05		1200
	Sulphate	Three times a year		mg/l	Sampling and analysis (Spectrophotometer)	600*		1200
	Turbidity	Three times a year		mg/l	Sampling and analysis (Spectrophotometer)	30		300
	Hydrocarbons	Twice a year		mg/l	Sampling and analysis (Spectrophotometer)			1200
	pH	Three times a year			pH Meter	6.5-9.2		300

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
Soil erosion		Three times during the construction period	project area	Level of erosions	Site inspection	_	City environmental officer/ Contractor	1,000
Interference to local hydrology	Hydrometric	Three times during the construction period construction period	Water Bodies water bodies near the project sites	Flooding levels	Volumetric measurements	-	Envi. Supervisor City Council/Contractor	800
Vibration	Vibration levels	Three times a year	Project sites and all borrow pits	Number	Vibration meter	-	Contractor	1,000
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	-	City Health officers	700
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	-	City councils	N/A
Safety and health risks	Number and type of safety equipment such as mask, helmet gloves and ear plugs. Health and sanitation facilities in camps.	Once a year	Project site	Number of safety measures provided	Records, inquiries and inspection	-	NEMC City Council/ Contractor	1,000

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
Dust	Water sprinkling	Twice a week	Project site	Frequency of water sprinkling	Inquiries and observation	Minimum dust emission	Contractor	Included in the contract lamp sum
Operation stage								
	Parameter	**Monitoring frequency**	**Sampling Area**	**Measurement Units**	**Method**	**Target level/ Standard**	**Responsibility for monitoring**	**Annual costs estimates (Tshs)**
Air pollution	SO_2	Twice a year	Project site	mg/kg (hourly)	Detector tubes	0.1	Contractor Env. Section of city the council	1000
	NO_x	Twice a year	Project site	µg/nm^3 (24 hrs)	Detector tubes	150		1000
	Dust pollution (PM_{10})	Twice a year	Project site	µg/nm^3 hourly)	Mini-Vol Sampler	0.15		1000
	CO_2	Twice a year	Project site	ppm (1hr)	Detector tubes	35		1000
Noise pollution	Noise level	Twice a year	Project site	dBA (equivalent)	Noise meter	55	Contractor/ Env. Section of city the council	1000
Water pollution	Nitrate	Twice a year				30	Contractor/ Env. Section of the council	800
	Lead	Twice a year	Water Bodies water bodies near the project sites	mg/l	Sampling and analysis (Spectrophotometer)	0.05		800
	Sulphate	Twice a year		mg/l	Sampling and analysis (AAS)	600*		800
	Turbidity	Twice a year		mg/l	Sampling and analysis (Spectrophotometer)	30		300
	Hydrocarbons	Twice a year		mg/l	Sampling and analysis (Spectrophotometer)			1200
	pH	Twice a year			pH Meter	6.5-9.2		200
Soil erosion	erosion	Twice during	project area	Level of	Site inspection	-	Env. Section	2000

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
		operation period		erosions			of city the council	
Safety of human beings	Road accidents and roads signs	Twice a year for the project life span	Project site	Road signs and number of accidents	Records, inquiries and inspection	Zero accident and sufficient no of road signs	Traffic police / City council	1200
Total monitoring costs								**35,700**

Table 9.2: Environmental and Social Monitoring Plan for the Storm water Drains

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
Pre-construction stage								
Air quality	SO_2	Once before the construction starts	Project site	mg/kg (hourly)	Detector tubes	0.1	City council/ Env. Supervisor	500
	NO_x		Project site	µg/nm^3 (24 hrs)	Detector tubes	150		500
	PM_{10}		Project site	µg/nm^3 hourly)	Mini-Vol Sampler	0.15		500
	CO_2		Project site	ppm (1hr)	Detector tubes	35		500
Noise Baseline	Noise level		Project site	dBA (equivalent)	Noise meter	55		500
Construction stage								
	Parameter	**Monitoring frequency**	**Sampling Area**	**Measurement Units**	**Method**	**Target level/ Standard**	**Responsibility for monitoring**	**Annual costs estimates (USD)**
Air pollution	SO_2	Three times a year	Project site	mg/kg (hourly)	Detector tubes	0.1	Contractor City council/ Env. Supervisor	1500
	NO_x	Three times a year	Project site	µg/nm^3 (24 hrs)	Detector tubes	150		1500
	PM_{10}	Three times a year	Project site	µg/nm^3 hourly)	Mini-Vol Sampler	0.15		1500
	CO_2	Three times a year	Project site	ppm (1hr)	Detector tubes	35		1500
Noise pollution	Noise level	Once in a year	Project site	dBA (equivalent)	Noise meter	55		1500

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
Interference to local hydrology	Hydrometric	Once during rain season in the construction period	Water Bodies water bodies near the project sites	Flooding levels	Volumetric measurements	-	Env. Supervisor / City Council/Contractor	1,000
Vibration	Vibration levels	Three times a year	Project sites and all borrow pits	Number	Vibration meter	-	Contractor	1,000
Frequency of illness of construction workers	illness of construction workers	Once during the construction period	Project site	Number of cases	Health records	-	City Health officers	1,000
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	-	City councils	N/A
Safety and health risks	Number and type of safety equipment such as mask, helmet gloves and ear plugs. Health and sanitation facilities in camps.	Once a year	Project site	Number of safety measures provided	Records, inquiries and inspection	-	NEMC/ City Council/ Contractor	2,000
Dust	Water sprinkling	Twice a week	Project site	Frequency of water sprinkling	Inquiries and observation	Minimum dust emission	Contractor	Included in the contract lamp sum

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
Operation stage								
	Parameter	**Monitoring frequency**	**Sampling Area**	**Measurement Units**	**Method**	**Target level/ Standard**	**Responsibility for monitoring**	**Annual costs estimates (Tshs)**
Loss of income	Current income Vs income before the project	Twice in the first year of operation	Project site	Income (Tshs)	Questionnaires	-	City council	300
Interference to local hydrology	Hydrometric	Twice during rain season in the operation period	Water Bodies water bodies near the project sites	Flooding levels	Volumetric measurements	-	Env. Section of the city council/Contractor	1,500
Soil erosion	Extent of erosion	Twice during operation period	project area	Level of erosions	Site inspection	-	Env. Section of the city council	2,000
Total monitoring costs								**19,300**

Table 9.3: Environmental and Social Monitoring Plan for Commuter bus stand &Lorry parking area drains

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
Pre construction stage								
Air quality	SO_2	Once before the construction starts	Project site	mg/kg (hourly)	Detector tubes	0.1	City council	500
	NO_x		Project site	µg/nm^3 (24 hrs)	Detector tubes	150		500
	PM_{10}		Project site	µg/nm^3 hourly)	Mini-Vol Sampler	0.15		500
	CO_2		Project site	ppm (1hr)	Detector tubes	35		500
Noise Baseline	Noise level		Project site	dBA (equivalent)	Noise meter	55		500
Water pollution		Once before the construction work starts	Water bodies near the project sites				City council	
	Nitrate			mg/l	Sampling and analysis (Spectrophotometer)	30		400
	Lead			mg/l	Sampling and analysis (AAS)	0.05		400
	Sulphate			mg/l	Sampling and analysis (Spectrophotometer)	600*		400
	Turbidity			NTU	Sampling and analysis (Spectrophotometer)	35		100
	Hydrocarbons			Mg/l	Sampling and analysis (HPLC)			600
	pH			-	pH meter	6.5-9.2		100
Loss of access to services	Baseline information on availability of services		Along the project roads	Type/extent of services	Measuring and Observation	-		-
Compensation	Rate of	Once before				-	City	-

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
	compensation for land and properties	the construction starts	Project site	Once before construction begins	File records and inquiry.		council/Contractor	
Construction stage								
	Parameter	**Monitoring frequency**	**Sampling Area**	**Measurement Units**	**Method**	**Target level/ Standard**	**Responsibility for monitoring**	**Annual costs estimates (USD)**
Air pollution	SO_2	Three times a year	Project site	mg/kg (hourly)	Detector tubes	0.1	Contractor / City council/ Env. Supervisor	1500
	NO_x	Three times a year	Project site	µg/nm^3 (24 hrs)	Detector tubes	150		1500
	PM_{10}	Three times a year	Project site	µg/nm^3 hourly)	Mini-Vol Sampler	0.15		1500
	CO_2	Three times a year	Project site	ppm (1hr)	Detector tubes	35		1500
Noise pollution	Noise level	Three times a year	Project site	dBA (equivalent)	Noise meter	55		1500
Water pollution	Nitrate	Three times a year		mg/l	Sampling and analysis (Spectrophotometer)	30	Contractor/ City council/ Env. Supervisor	1200
	Lead	Three times a year	All water bodies near the project sites	mg/l	Sampling and analysis (AAS)	0.05		1200
	Sulphate	Three times a year		mg/l	Sampling and analysis (Spectrophotometer)	600*		1200
	Turbidity	Three times a year		mg/l	Sampling and analysis (Spectrophotometer)	30		300
	Hydrocarbons	Twice a year		mg/l	Sampling and analysis (Spectrophotometer)			1200
	pH	Three times a			pH Meter	6.5-9.2		300

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
		year						
Soil erosion		Three times during the construction period	project area	Level of erosions	Site inspection	_	City environmental officer/ Contractor	1,000
Interference to local hydrology	Hydrometric	Three times during the construction	Water Bodies water bodies near the project sites	Flooding levels	Volumetric measurements	-	Envi. Supervisor City Council/Contractor	800
Vibration	Vibration levels	Three times a year	Project sites and all borrow pits	Number	Vibration meter	-	Contractor	1,000
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	-	City Health officers	700
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	-	City councils	N/A
Safety and health risks	Number and type of safety equipment such as mask, helmet gloves and ear plugs. Health and sanitation facilities in	Once a year	Project site	Number of safety measures provided	Records, inquiries and inspection	-	City Council/ Contractr /NEMC	1,000

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
	camps.							
Dust	Water sprinkling	Twice a week	Project site	Frequency of water sprinkling	Inquiries and observation	Minimum dust emission	Contractor	Included in the contract lamp sum
Operation stage								
	Parameter	**Monitoring frequency**	**Sampling Area**	**Measurement Units**	**Method**	**Target level/ Standard**	**Responsibility for monitoring**	**Annual costs estimates (Tshs)**
Air pollution	SO_2	Twice a year	Project site	mg/kg (hourly)	Detector tubes	0.1	Contractor/ Env. Section of the city council	1000
	NO_x	Twice a year	Project site	µg/nm^3 (24 hrs)	Detector tubes	150		1000
	Dust pollution (PM_{10})	Twice a year	Project site	µg/nm^3 hourly)	Mini-Vol Sampler	0.15		1000
	CO_2	Twice a year	Project site	ppm (1hr)	Detector tubes	35		1000
Noise pollution	Noise level	Twice a year	Project site	dBA (equivalent)	Noise meter	55	Contractor/ Env. Section of the city council	1000
Water pollution	Nitrate	Twice a year				30	Contractor/ Env. Section of the city council	800
	Lead	Twice a year	Water bodies near the project sites	mg/l	Sampling and analysis (Spectrophotometer)	0.05		800
	Sulphate	Twice a year		mg/l	Sampling and analysis (AAS)	600		800
	Turbidity	Twice a year		mg/l	Sampling and analysis (Spectrophotometer)	30		300

Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimates (USD)
	Hydrocarbons	Twice a year		mg/l	Sampling and analysis (Spectrophotometer)			1200
	pH	Twice a year			pH Meter	6.5-9.2		200
Soil erosion	Level of erosion	Twice during operation period	Project area	Level of erosions	Site inspection	-	City council	1,000
Safety of human beings	Road accidents and roads signs	Twice a year for the project life span	Project site	Road signs and number of accidents	Records, inquiries and inspection	Zero accident and sufficient no of road signs	Traffic police / City council	1200
Total monitoring costs								**33,400**

9.2 Role and Responsibilities during ESMP Implementation

The Project Coordinator in the President's Office - Regional Administration and Local Government (PO - RALG) will be responsible for the overall monitoring and quality assurance of TSCP AF. While the City council through Technical Support Team (TST) shall be responsible for ESMP implementation, the Project Team in PO RALG will have a quality assurance and monitoring role including all safeguards aspects. Furthermore, the City council will submit all safeguards progress and monitoring reports to the PO - RALG.

PO RALG will also be responsible for contracting and managing the IESMC who will monitor the environmental and social performance in all sub-projects in the City. The IEMC's costs are therefore part of the PO RALG budget, and do not form part of the ESMP implementation costs in the Council.

A summary of the roles and responsibilities of the key parties and their relationships with regard to the implementation of ESMP:

- The Tanga City authority has the responsibility of ensuring that the contractor abides by the existing regulations and specifications.
- 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.
- IESMC will be responsible for environmental and social monitoring which includes (i) support to the EST/TST for implementing supervision and monitoring, and (ii) reporting on the implementation through periodic monitoring reports. The relationship, roles and responsibilities of the EST, TST, CSC, and IESMC are outlined in Figure 9.1 and Table 9.4.

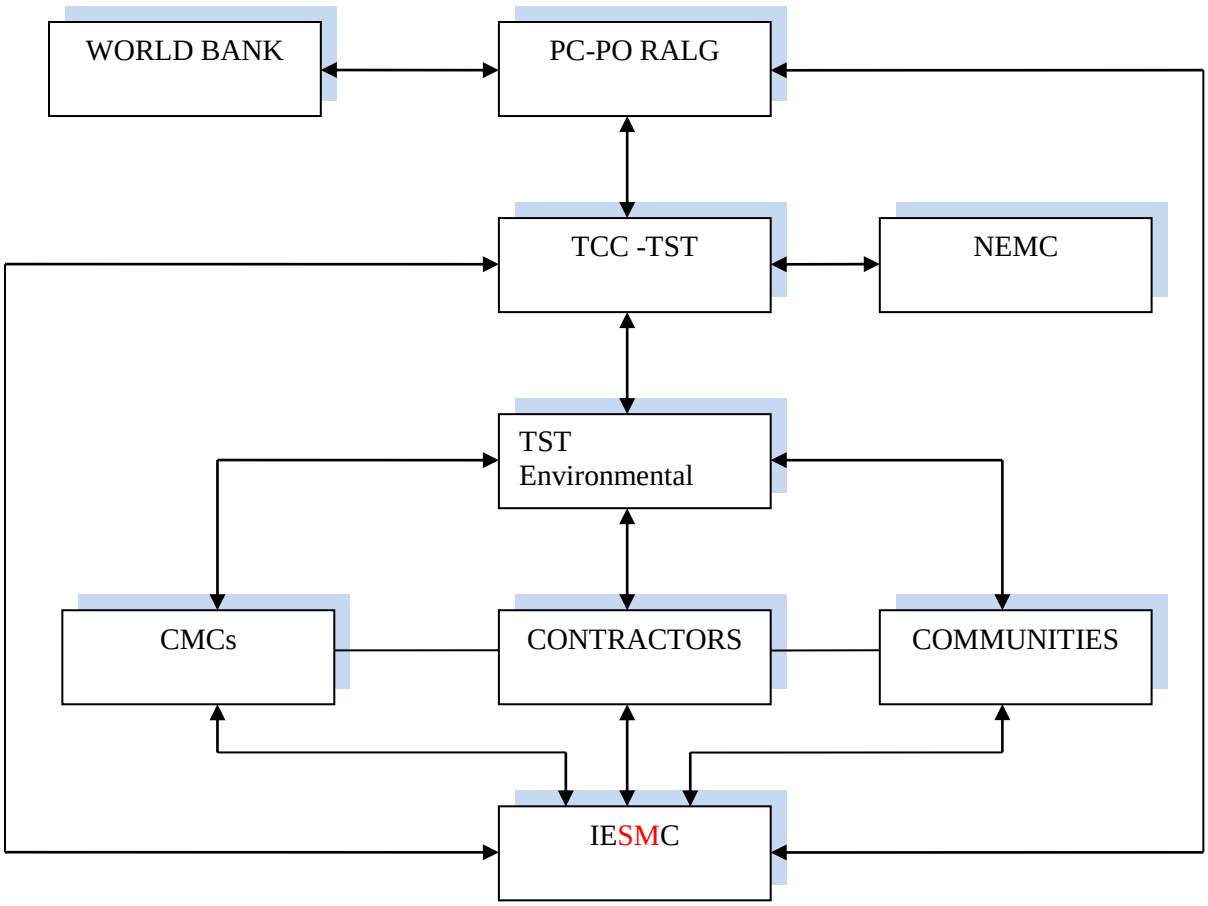

Figure 9.1: Environmental and Social Management Organization Chart for TCC

Table 9.4: Role and Responsibilities of Key Parties for ESMP Implementation

Organ	Roles and Responsibilities
TCCC-TST/ ESTs	-Responsible for implementing the ESMP during the detailed design and construction stages. ESMP implementation during operation stage is the responsibility of the City council. The council -TST will set up an Environmental and Social Management Team to ensure timely and effective implementation of the ESMP, including preparation of reports on safeguard compliance as required by Government and WB.
	– Responsible for ensuring that the relevant sections in the bidding and contract documents for all construction works are in compliance with the ESMP; this means they contain the requirements of the ECOPs and site-specific ESMPs.
	– Responsible for communicating with relevant local, regional and national departments; and with the agencies responsible for implementing and supervising ESMP, especially with the National Environmental Management Council (NEMC), and with the concerned wards/Sub-wards during planning, monitoring, management and operation.
	– Will coordinate with community organizations to encourage them to actively participate in the planning, management, and implementation of the project, including monitoring of the contractor's performance.
	– To ensure effective monitoring and timely implementation of the ESMP, City council -TST/ESMT will hire national environmental consultants to assist them with carrying out and monitoring the ESMP implementation.
	– In the course of supervising and monitoring the contractors' performance, City council -TST will be responsible for: (a) checking project implementation indicators relating to the environment; (b) conducting unscheduled, surprise inspections to ensure that mitigation measures are being implemented as required in construction contract by contractor; (c) reviewing the periodic reports of the Construction Supervision Consultant (CSC) to ensure compliance with mitigation measures and ESMPs; and (d) based on the periodic reports by CSC and IESMC, preparation of reports on environmental compliance of subprojects, to be submitted to WB and NEMC (this will be part of the submission of progress report to WB every six months).

Organ	Roles and Responsibilities
	– Coordinate closely with relevant supply utilities i.e. TAUWASA and the Environmental Management department (sanitation and solid waste management) to monitor their interaction with the project during operation and maintenance phase.
Construction Supervision Consultant (CSC)	-Responsible for monitoring the safeguard performance of the contractors during site clearance and construction, including oversight of the self-monitoring to be conducted by contractor. With regard to environmental safeguards, the CSC's main responsibility will include, but not be limited to, the following:
	– Assist IESMC to establish, collect and provide information essential environmental indicators, on-site and for the construction works.
	– Ensure that all work comply with the approved ESMPs, as set out in documents for environmental impact mitigation and monitoring.
	– Monitor the implementation of mitigation measures by the contractors, propose and deploy any necessary supplementary measures in time to improve mitigation measures to fully meet the environmental management and safety requirements of project.
	– Prepare action plans and/or propose urgent solutions to cope with environmental problems, emergency situations and damage that occurred during construction
	– Recommend the Tanga City council -TSTs to suspend partially or completely construction work if labour safety and environmental protection requirements of the contract are not being complied with.
	– Organize regular discussions with relevant parties, agencies and other stakeholders to provide information about implementation plans to increase people's awareness of the need for environmental protection and management during construction process.
Construction Contractor	Responsibilities with respect to all aspects of the works, including the environmental aspects, are set out in the contract documents, signed with the Tanga City council -TST.

Organ	Roles and Responsibilities
	– Construction contractors are responsible for carrying out environmental impact mitigation measures and for complying with the approved ESMP when implementing construction contracts. When preparing the "Contractors ESMP", the contractor will study the project's approved ESIA report and propose a construction method that includes environmental mitigation and monitoring measures that are in line with the approved ESMP.
	– Contractor's ESMP will be submitted to Tanga City council -TST and CSC for review, as well as to IEMC, as deemed necessary. Changes, if any, will be evaluated for their feasibility and for legal issues (laws, decrees, circulars and other regulations) before suitable adjustments are approved for specific cases on-site.
	– During the construction work, the construction contractors will be closely supervised by Tanga City council -TST, CSC, IESMC, environmental authorities and the local community for their compliance with the ESMP.
Independent Environmental Monitoring Consultant (IEMC)	The IESMC will be responsible for assisting the Tanga City council -TST with the ESMP implementation. This also includes advising the CSC, contractors and communities on environmental compliance, and on carrying out the monitoring program in accordance with regulations, procedures and policies of the Government and the WB, respectively. After the detailed implementation of the environmental monitoring programs was discussed by the Tanga City council -TST and World Bank supervision staff, the IEMC will be responsible for quarterly checking, and for supporting the Tanga City council -TST staff to supervise overall project activities to ensure that uniform environmental policies of the Government and World Bank are applied and supervised during project implementation. The IEMC will be responsible for: (1) providing training and capacity building for construction management Tanga City council -TST/ESMT staff, including field engineers and/or consultants (CSC), in supervising the ESMP implementation by the contractors; (2) ensuring active participation of the local communities and schools in the project areas, (3) monitoring of environmental parameters to assess the overall impacts of the project, and (4) establish the environmental training program

Organ	Roles and Responsibilities
	– Ensuring that the approved ESMP and all other relevant project legal agreements related to environmental safeguards are fully applied and complied with during project implementation.
	– Assessing the effectiveness of mitigation measures which are applied by contractors and CSC during project implementation; providing proposals and recommendations to the Tanga City council -TSTs on improvements needed to meet the safeguard requirements.
	– Reporting periodically (every 3 months) to the Tanga City council -TSTs on actual ESMP performance during project implementation.
	– Establishing standard procedures, methods and forms to assist the Tanga City council -TSTs and CSC to assess contractors' progress in implementing the required impact mitigation and monitoring measures.
	– Assisting the Tanga City council -TSTs' environmental staff to review and check that relevant environmental sections (based on the ESMP) have been included in the bid packages and construction contract documents to ensure compliance with environmental policies and impact mitigation and monitoring requirements.
	– Measuring, taking samples and monitoring periodically the key environmental parameters, i.e. once every 3 months.
	– Assistance with the preparation of documents and implementation of training programs in environmental monitoring and supervision for contractors, CSC and relevant staff of the Tanga City council -TST (environmental staff and coordinators of contract packages).
	– Via Tanga City council -TST, discussing with relevant enterprises, as necessary, to find suitable solutions for unexpected risks relating to environmental sanitation.

9.3 Institutional arrangements and reporting procedures

The purpose of environmental and social monitoring is to quantitatively measure the environmental and social effects of the road, drainage and vehicle parking sub-projects in the City of Tanga. The environmental and social monitoring program will operate through the pre-construction, construction, and operation phases. It will consist of a number of activities, each with a specific purpose, key indicators, and significance criteria.

The Tanga City Council and the project design consulting firm assisted by environmental and social specialists, will be responsible for reviewing the civil works contracts in accordance with the ESIA report; coordinating the implementation of the ESMP among the contractors, local environmental authorities (e.g., Ward Development Committees; monitoring the implementation of the ESMP and the civil works contracts in collaboration with NEMC and PO-LGRG; and, preparing annual environmental progress reports.

The monitoring of mitigation measures during the design and construction will be carried out by an Environmental/Social Specialist. He/she will conduct mitigation monitoring as part of the regular works inspections. The responsibility for mitigation monitoring during the operation phase will lie with the Environmental Section in City Councils.
City council will provide PO-RALG and NEMC with reports on environmental compliance during implementation as part of their annual progress reports and annual environmental monitoring reports. Depending on the implementation status of environmentally sensitive areas of the project, NEMC will perform annual environmental reviews in which environmental concerns raised by the project will be reviewed alongside project implementation.

9.4 Capacity Building Program

During consultation with the TCC technical staff it was revealed that the Department of Works no staff specifically dedicated to implementation of Environmental and Social Safeguards relevant to civil works. The City has a section of Environment in the Urban Development Department, and in the Health Department who are responsible for overseeing environmental issues in the city. Each department has at least one environmental officer who solely deals with environmental issues on daily basis. It was also found-out that staff members still need a detailed knowledge on environmental and social safeguards requirements for sub-projects implementation and operation phases. Lack of such a capacity presents a risk to the implementation of safeguards requirements as contained in the ESMP and ESMoP as required by the WB safeguards policies. It is, therefore, necessary to address this weakness through capacity building. It is proposed to provide capacity building through technical assistance that

will support the City authority during the implementation of the ESMP. The technical assistance will provide the necessary support to the TCC in its work with contractors as well as other entities involved in the implementation of the ESMP.

The technical assistance will include support from experts and training that will cover: (i) general knowledge of safeguards requirements and sub-projects procedures, and (ii) important specific knowledge in safeguards procedures and requirements for project staff, consultants, and national contractors. This will include, for example, assistance with the preparation of documents and implementation of training programs on environmental and social management and environmental and social monitoring for contractors and relevant staff of TCC (TST) to do their tasks. It will also include assisting TCC environmental and social staff with the review of contract documents to ensure compliance with ESMP. It will also provide general environmental guidance as requested by TCC to enhance overall project implementation and performance.

Given the nature, locations, and scale of construction, it is anticipated that the safeguards technical assistance support and training will be provided during project implementation. PO-RALG in collaboration with the WB safeguards specialists will provide technical support in the capacity building program as found appropriate.

Proposed Training Programs

Table 9.5 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 for the implementation of safeguards for the TCC training. Trained staff with the support of the Technical Assistance team 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 TCC and the Technical Assistance team for the implementation of safeguards during project implementation based upon a reassessment of needs and the status of safeguards implementation.

- *Target groups for the training:* TCC -TST, PO-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 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 TCC staff will continue until year end of 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 9.5: Training needs for Environmental Management in Tanga City

Department	Section	Total no of technical staff	No of staff to be trained	Type of training needed
Engineering	Roads (and drainage)	08	04	• Training/mentoring in relevant skills in project design and supervision. • Environmental Management in construction works
Urban Planning	Environment	02	02	• Training in conducting EIA, monitoring and Environment auditing skills. • Environmental Management in construction works
Health and Sanitation Department	Health	18	04	• Short training in term training in EIA approaches in solid waste and liquid waste management, landfill management, solid waste recycling techniques, approaches of PPP in solid and liquid waste management.
Engineering	Water	04	02	• Clean water management and wells management • Environmental Management in construction works
Total	**All Sections**	**34**	**12**	

10.0 DECOMMISSIONING AND DEMOBILIZATION PLAN

10.1 Decommissioning

Decommissioning of the roads with side-drains, commuter bus stand and the lorry parking as well as the storm drainage systems at Duga and Mabawa is not anticipated in the foreseeable future. This is mainly because the sub-project areas will need the facilities for permanent terms. However, if decommission must happen, it may entail change of use (functional changes) or demolition triggered by change of land use.

10.2 Demobilization of the project

10.2.1 Introduction

Upon completion of the contracted works, the Contractor shall remove all tools, materials and other articles from the construction area. Should the Contractor fail to take prompt action to this end, the City Council, at its option and without waiver of such other rights as it may have, upon sixty (60) calendar days notice, may treat such items as abandoned property. The Contractor shall also clean areas where he worked, remove foreign materials and debris resulting from the contracted work and shall maintain the site in a clean, orderly and safe condition.

Materials and equipment shall be removed from the site as soon as they are no longer necessary to minimize the demobilization work after completion of the project. Before the final inspection, the site shall be cleared of equipment, unused materials and rubbish so as to present a satisfactory clean and neat appearance.

All the camp sites will be built as temporary structures and these will also include the use of movable structures such as movable containers. All the temporary structures will be demolished after accomplishing the contracted jobs.

10.2.2 Impacts of the Demobilization of project

- Loss of jobs and Resettlement
- Air, water and soil pollution
- Noise pollution
- Closing down of borrow pits

-Loss of jobs and resettlement

The last mentioned impact is more social – economical. The local population that will be employed in the sub-projects during construction of roads, drains and vehicle parking facilities will lose jobs immediate after the closure of the sub-projects. The loss of jobs will have far reaching negative impacts. Resettlement is certainly for those who will migrate to the areas along the road as job seekers after the secession of the sub-projects.

Mitigation

Establish some small group business and SACCOS to assist people access loans to enable them run small businesses.

Monitoring

- The social response to the problem of unemployment and,
- Settlement pattern of people resuming their previous life after termination of work.

- Air, water and soil pollution

During the demobilization movement of heavy duty equipments might contribute to air pollution as the result of operation of the vehicles and equipments. This may also be accompanied by the soil and water pollution that might result from spillage of oil and fuel.

Mitigation

- Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

- The effects of the emission will be minimal due to intensified vegetative cover that will be provided in the area.

Monitoring

- Motoring various parameters in air, water and soil such as Dust, CO_2, SO_2, Nitrate, Sulphates, Lead, oils and petroleum, hydrocarbons etc.

-Noise pollution

The problem of the noise pollution caused by the demobilization will have little impact since this will be done once.

Mitigation

- Use machines with silencer or with low levels of noise.

Monitoring

- Monitor the levels of noise (dBA)

- Closing down of borrow pits and quarry site

All the borrow pits and quarry site need to be reinstated to minimise the erosion problems, un-aesthetic environment and creation of mosquito breeding stations.

Mitigation

- Back fill the borrow pits with top soils stockpiled along the project road
- Modify the borrow pits which doesn't present a threat of turning out to be breeding station of mosquitoes to a dam for collection of rainwater to be used as reliable water sources in the project areas.
- Replanting of vegetations on the banks of the borrow pits to minimise the erosion

Monitoring

- Soil erosion
- Conditions of the abandoned borrow pits
- Growth of the vegetation replanted on the borrow pits

It can be concluded that the primary objective of the demobilization exercise is to clean up the project site to a condition suitable for use by the community. All potentially harmful contaminants at the site will be thoroughly removed, treated and disposed of in an environmentally acceptable manner. With the implementation of the precautionary and mitigation measures recommended in the ESIA report, the demobilization of the project will comply with all environmental standards and legislation.

12.0 CONCLUSION AND RECOMMENDATIONS

The ESIA team has revealed potential environmental implications of the proposed sub-projects in Tanga city in that the nature of the works require a full ESIA as stipulated in the National EIA and Audit Regulations (2005), the Environmental Assessment and Management Guidelines for the Roads Sector and the World Bank's OP 4.12.

The ESIA study results have shown that some limited negative environmental implications of the project. In general, the core urban infrastructure will have high socio-economic benefits to the people of Tanga City and adjoining regions as well. The associated negative impacts, to a large extent can be 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 especially those linked to land, water and air pollution. Implementing these mitigation measures would increase environmental soundness of the project.

It can therefore be concluded that, the sub-projects in Tanga 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 ESIA.
However, the City Council is committed in implementing all the recommendations given in the ESIA and further carrying out the environmental auditing and monitoring schedules.

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ANNEXES

ANNEX 1: LIST OF STAKEHOLDERS CONSULTED

ESIA FOR PROPOSED ADDITIONAL SUB-PROJECTS IN TANGA CITY UNDER THE TANZANIA STRATEGIC CITIES PROJECT (TSCP)
STAKEHOLDERS CONSULTATION FORM

DATE	NAME	ORGANISATION	POSITION	CONTACT	SIGNATURE
18/11/2014	JUMANNE T. MALANGE	TANGA CC	CITY DIRECTOR	0754226142	
18/11/2014	Kizito L. Nkuli	TANGA CC	City Sanitation Officer	0754890552	
18/11/2014	JOSEPH E. MMBAGA	TANGA CC	WMO	0713919290	
18/11/2014	SHERIA SALAME	TANGA	WEO	0713988828	
18/11/2014	RAMADHANI BADI	TCC	WEO	0716885817	
18/11/2014	ARAFAT KANTH	TCC	TSCP-CIC	0718262100	
18/11/2014	STRATON TOBIAS	TCC	CLO	0713-309289	
18/11/2014	Aveline Kapologwe	TCC	AgCECON	0715080545	

ANNEX 2: MINUTES OF MEETINGS