REPUBLIC OF MALAWI

LILONGWE WATER BOARD

Lilongwe Water and Sanitation Project

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN REPORT

FOR

UPGRADING, REHABILITATION AND OPERATION OF THE WATER DISTRIBUTION NETWORKS IN THE CITY OF LILONGWE

September 2017

ACKNOWLEDGEMENTS

This Environmental and Social Management Plan for the upgrading, rehabilitation and operation of the proposed water distribution network in the City of Lilongwe has been prepared with support and consultation of many people. The study team is grateful to all of them. Specifically, the team members wish to extend their sincere gratitude to members of staff from Lilongwe Water Board, Lilongwe City Council, Ministry of Lands and Urban Development, Environmental Affairs Department and Community members in the project areas for providing valuable information that has assisted the consultants to prepare this report. It remains everybody's responsibility to ensure that the environment is managed sustainably.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS/ABBREVIATIONS

ADL	Airport Development Limited
AEC	Area Executive Committees
AIDS	Acquired Immune Deficiency Syndrome
CBOs	Community Based Organizations
CDR	Crude Death Rate
CDSS	Community Day Secondary School
CHAM	Christian Health Association of Malawi
CMCs	Catchment Management Committees
CSR	Corporate Social Responsibility
CWG	Compensation Working Group
CWPs	Communal Water Points
WB	World Bank
DC	District Commissioner
DEA	Director for Environmental Affairs
DEC	District Executive Committee
DESC	District Environmental Sub-committee
DFO	District Forestry Officer
EAD	Environmental Affairs Department
EDO	Environmental District Officer
EMA	Environment Management Act
ESAP	Environmental and Social Assessment Procedures
ESCOM	Electricity Supply Cooperation of Malawi
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FLWSP	First Lilongwe Water Supply Project
GI	Galvanized Iron
GoM	Government of Malawi
GRC	Gross Replacement Cost
HIV	Human Immunodeficiency Virus
ICU	Intensive Care Unit
IFC	International Finance Corporation
KCH	Kamuzu Central Hospital
LCC	Lilongwe City Council

LWB	Lilongwe Water Board
MAIWD	Ministry Agriculture Irrigation and Water Development
MAM	Minibus Association of Malawi
MGDS	Malawi Growth and Development Strategy
MIS	Management Information System
MK	Malawi Kwacha
Mm	Millimeters
MOTPI	Ministry of Transport and Public Infrastructure
MSEs	Medium and Small Enterprises
MTL	Malawi Telecommunication Network
NAC	National AIDS Commission
NEAP	National Environmental Action Plan
NEP	National Environmental Policy
NGOs	Non-Governmental Organizations
NSO	National Statistical Office
NWDP	National Water Development Program
OPs	World Bank's Operational Policies
OVIs	Objectively verifiable Indicators
PAPs	Project Affected Persons
PSC	Project Steering Committee
RAP	Resettlement Action Plan
RFP	Resettlement Framework Policy
RWG	Resettlement Working Group
SADC	Southern Africa Development Corporation
SEP	Socio-economic profile
SLWSP	Second Lilongwe Water Supply Project
STIs	Sexually Transmitted Infections
TA	Traditional Authority
TB	Tuberculosis
THAs	Traditional Housing Areas
TLWSP	Third Lilongwe Water Supply Project
TNM	Telecoms Network Malawi Limited
TORs	Terms of Reference
U$D	United States Dollar
UDHR	United Declaration of Human Rights

UNICEF	United Nations Children's Fund
uPVC	Un plasticized Polyvinyl chloride
US	United States
USAID	United States Agency for International Development
VDC	Village Development Committees
WHO	World Health Organization
WUA	Water Users Association

EXECUTIVE SUMMARY

1.0 Introduction

Malawi Government through Lilongwe Water Board (LWB) will upgrade and rehabilitate the existing water distribution networks in different parts of the City of Lilongwe to reduce water losses and to improve quality of services to meet the growing demand for water for both industrial and domestic uses. This document is an Environmental and Social Management Plan (ESMP) for the **water distribution network rehabilitation and upgrading sub-project, which** is part of the Lilongwe Water and Sanitation Project (LWSP). The cost of the sub-project is estimated at **USD35 million**. A full description of LWSP activities can be found in the project appraisal document which is publicly available on the internet.

The water source for the project remains Lilongwe River through Kamuzu dams 1 and 2. To ensure that implementation of the project activities satisfies the Environment Management Act of 1996 and the World Bank Environmental and Social Safeguards Policies/Standards and to make the project environmentally and socially sustainable, Lilongwe Water Board hired Environment and Natural Resources Management Consultants to develop this Environmental and Social Management Plan for the project.

The project will be implemented over a period of 2 years starting from 2018 in targeted areas of the City of Lilongwe covering all the three zones of Lilongwe Water Board distribution network, namely Southern, Central and Northern zones. Several activities will be carried out to implement the project and these will be grouped in four phases namely the planning, construction, demobilization, and operation and maintenance phases. In all, about 150 people, who will include supervisors, skilled and unskilled labors will be employed during the project construction phase.

2.0 Purpose of the environmental and social management plan

This Environmental and Social Management Plan (ESMP) has been prepared to identify the environmental and social impacts that will be generated by the activities of the project and mitigation actions that will be required to implement the project in accordance with the requirements of the Environment Management Act of 1996 and the World Bank Environmental and Social Framework. The ESMP provides an overview of the environmental and social baseline conditions on the direct impacted areas, summarizes the potential impacts associated with the proposed project and sets out mitigation as well as enhancement actions for the negative and positive impacts respectively. The ESMP will be utilized by the contractor, LWB, Environmental Affairs Department (EAD), the public and other relevant stakeholders and will form the basis of site-specific management plans that will be prepared by the contractor and sub-contractors as part of their construction methodology prior to works commencement.

Specifically, the ESMP was prepared to:

a) Outline the scope and the rationale of the proposed project;
b) Identify necessary statutory and regulatory approvals and licenses to be obtained from government licensing agencies to ensure that the project is in line with sound environmental and social management practices;
c) Assess the physical, biological and socio-economic conditions of the project impact areas;
d) Identify and assess significant/beneficial potential environmental and social impacts of the project;
e) Identify and recommend measures to manage the negative impacts and to enhance the positive impacts; and
f) Prepare an environmental and social monitoring plan for monitoring implementation of the environmental and social management plan (ESMP).

3.0 Methodology used to prepare the ESMP

The information which was used to prepare this ESMP was sourced through several methods, which included collection of information and documents related to the project components, field visits to the project sites, surveying the neighborhood, considering the performance of other existing water distribution networks in the country, literature review, professional judgment, discussions, meetings and interviews.

4.0 Project land requirements use and compensation

The proposed project will only cause temporary displacement and resettlement of the PAPs and their property. This is because the project will be implemented within the existing water distribution networks and will be aligned along the road reserves except where the pipelines cross the roads or pass through built up areas like market places and other residential areas, which will cause temporary disturbances especially during the construction phase. The disturbances will result into temporary loss of land and property; damage to road pavements; damage to concrete driveway; damage to different building structures; obstruction to passage on the roads; disruption of public service utilities; and temporary loss of business activities.

LWB will compensate all the project affected persons for the different losses that they will be incurred during construction and operation phases. In all, money amounting to **U$D 415,184.76** will be required to compensate the different PAPs.

5.0 Summary of key impacts

Several positive and negative impacts of the proposed project activities and their management measures were examined at all stages of the project taking into consideration the bio-physical and socio-economic environment. The main project activities that will bring about environmental and social impacts will be related to the construction and operation and maintenance phases of the project and are presented as follows:

5.1 Positive Impacts

1) Creation of employment opportunities for skilled and unskilled work force especially during construction phase

Enhancement Measures:

The Client should encourage the Contractor as much as possible to:

a) employ people from the surrounding communities; and

b) Women should also be given an equal employment opportunity as men, at least 40%.

2) Improved access to potable water by Lilongwe City residents and surrounding areas

Enhancement measure

LWB will put in place easy procedures for water connection to its residents and a routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks.

3 Reduced incidences of water borne (e.g. cholera and diarrhea) and water washed diseases (e.g. skin infection) due to improved availability of water

Enhancement measure

LWB will connect as many people as possible in all the areas where the distribution network will be operating.

4) Reduction in water losses as more people will be legally connected

Enhancement measure

LWB will put in place routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available to the residents throughout. Furthermore, LWB should improve their efficiency in connecting water to customers.

5) Increased economic activities within the project impact area

Enhancement measure

LWB will put in place routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available to the residents throughout. Furthermore, LWB should improve their efficiency in connecting water to customers.

6) Increase in government revenue through taxes

Enhancement measure

LWB will ensure that many people within the proposed network are connected to the water supply system. Furthermore, LWB will remit all the taxes in good time to government.

5.2 Negative Impacts

1) Possible disruption of public service utilities such as existing water networks

Mitigation Measures

The Contractor will be required to:

a) determine in advance before any construction activities are done the different infrastructures for other utility services;
b) repair the damaged utilities as quickly as possible to reduce the suffering the absence of a utility services will cause on the people

2) Construction related accidents

Mitigation Measures

The Contractor will be required to:

a) train the workers about the possible occupation hazards that may be associated with this type of work;
b) provide PPE such as helmets, boots, overalls etc.;
c) properly demarcate all the accident-prone sites especially when the rehabilitating the roads;
d) Introducing humps on the road to help reduce the speed of the vehicles;
e) Erecting warning signs showing that there is heavy machinery and construction vehicles using that road for people to be alert;

f) Providing workers with protective clothing;
g) Following health and safety regulations;
h) Training workers in the proper use and handling of heavy equipment and machinery including hand tools; and
i) Maintaining a first aid kit at the project site.

3) Disruption of traffic flow and public mobility

Mitigation Measures

To minimize disruption of traffic flow and public mobility, where the Contractor will be required to cut the roads to lay the pipes, the Contractor will be required to ensure that:

a) This is done during weekends when traffic is moderate;

b) Roads are cut on one lane first to allow road users to use the other lane; and

c) Laying down of pipes and backfilling is done immediately to lessen traffic disruption.

4) Possible damage to road pavement

Mitigation Measures

Where the Contractor will be required to cut the roads to lay the pipes, the Contractor will ensure that:

a) This is done during weekends when traffic is moderate;

b) Roads are cut on one lane first to allow the road users to use the other lane; and

c) Laying down of pipes and backfilling is done immediately to lessen traffic disruption.

5) Temporary disturbance of different business activities along the water distribution network

Mitigation Measures:

The Client will be required to prepare an inventory of all the people whose businesses will be affected and appropriate compensation packages prepared for their business.

6) Risk of social conflict

Mitigation measures: As mitigation measures, the developer will:

a) Educate the workers on the cultural sensitivities in the host communities;
b) Ensure that priority should be given to people from the local communities when recruiting project workers; and
c) Ensure that the local communities will be sensitized on the dangers of population influx on their cultural values, safety, etc.

7) Increased risk of illicit behavior and crime

Mitigation measure: Mitigation measure for such impacts will include social integration of migrant workers and local communities to ensure mutual and equal access to existing socio-economic opportunities. Deployment of social security staff and regular engagement of the local Police can ameliorate occurrence of mischiefs. Sensitization on security matters, formation of neighborhood watch groups, render support in establishing community police post. In addition, contractors will be encouraged to draft enforceable workers' "Codes of

Conduct" to deter from engaging in illicit behaviors. Identity cards/badges should also be provided to the workers for easy identification.

8) Influx of additional population ("followers")

Mitigation measures: As mitigation measures, the developer will:

a) Educate the workers on the cultural sensitivities and preferences of the host communities garnered during consultation with the community;
b) Advise the workers to identify themselves to the host communities during festivals;
c) Ensure that priority should be given to people from the local communities when recruiting project workers; and
d) Ensure that the local communities will be advised on how best to interact with and protect themselves from the workers to ensure their safety. s, , etc.

9) Impacts on community dynamics

Mitigation measures: As mitigation measures, the developer will:

a) Educate the workers on the cultural sensitivities in the host communities;
b) Ensure that workers are issued uniforms/IDs to help host communities identify them ;
c) Ensure that priority should be given to people from the local communities when recruiting project workers; and
d) Ensure that the local communities will be sensitized on the dangers of population influx on their cultural values, safety, etc. as necessary

10) Increased burden on and competition for public service provision

Mitigation measures: The Developer will ensure that he provides some public services, such as water to deal with the problem of increased burden and demand on social services.

11) Increased risk of communicable diseases and burden on local health services

Mitigation measures: As mitigation measures, the developer shall:

a) Sensitize all employs and the community at large on the dangers of contracting HIV/AIDS and STI and their prevention measures such as abstinence; and
b) Ensure availability of free condoms.

6.0 Monitoring program and complementary initiatives

Monitoring will include monitoring of the implementation of the mitigation measures for managing the negative impacts and enhancement measures for managing the positive impacts to assess their efficiencies and eventually develop other mitigation and enhancement measures if the expected results are not reached.

7.0 Institutional arrangements and capacity building requirements

This LWB will have a Project Implementation Unit to supervise and implement the project including the water distribution system rehabilitation and improvements that this ESMP covers. The PIU will have a leadership team and will have an Environmental and a Social Performance Specialist. The PIU will ensure that the ESMP measures are implemented by the Contractors. The Contractors will develop their own Health and Safety Plans before starting works and these will be reviewed and approved by PIU. The PIU will work with the Supervising Engineer

responsible for supervising the works and ensure mitigation measures and any necessary corrective actions are being followed for smooth execution of the works. Results of the monitoring will be used to improve project implementation, and provide information for project supervision. The Ministry of Lands, Ministry of Labour and Environmental Affairs Department all have legal mandates to observe project activities and enforce compliance with national laws and regulations.

As the mitigating and enhancement measures will be implemented for the multiple impacts, there will be need to provide the necessary training and capacity building programs to the PIU as well as the different water agencies and state institutions that will be responsible for environment and social actions (including monitoring important parameters over time as well as the implementation of mitigation and enhancement measures. The trainings will assist in building capacities of the agencies to be responsible for monitoring activities to effectively determine compliance of the project activities with national laws, regulations and guidelines.

8.0 Public consultations and disclosure requirements

Public consultation has been fully undertaken during field environmental and social impacts assessment exercises. Inputs from local populations and other stakeholders have been integrated. The ESMP report is available at the Lilongwe Water Board and the Environmental Affairs Department and other agencies for their comments.

9.0 Conclusion and recommendations of the study

Based on the ESMP studies conducted, the proposed sub-project project potentially has significant negative impacts which relate to the biophysical and socio-economic environment. The project will bring significant benefits in terms of fostering social economic growth and improved health standards in the project impact areas through easy access to improved potable water by Lilongwe City residents and surrounding areas, reduced incidences of water borne diseases (e.g. cholera and diarrhea) and water washed diseases (e.g. skin infection) due to improved availability of water, increase in government revenue through taxes, reduction in water losses as more people will be legally connected.

It is therefore recommended that the proponent of the project should adopt the recommendations advanced in this report. Adoption and implementation of the suggested measures will ensure that negative impacts are abated and positive impacts are enhanced.

CHAPTER 1 INTRODUCTION TO THE PROPOSED PROJECT

1.1 Introduction

Malawi Government through Lilongwe Water Board intends to upgrade, rehabilitate and operate water distribution networks in different parts of the city to reduce water losses and to improve quality of services to existing customers to meet the demand for water, which is growing annually and to make adequate, safe and clean water accessible to different consumers. When implemented, the project will also have significant gender dimensions as well, as in Malawi, women and children spend a considerable amount of time and energy on daily basis fetching for water for household uses. Improving water supply will therefore improve women and children's welfare, as safe water availability within easy reach will give them adequate time for more productive activities and leisure.

The project will be implemented for a period of 2 years starting in early 2019. In all about 150 people will be employed. The people to be employed will include 40% women and 60% men. The people will include supervisors, skilled and unskilled laborer's will be employed during the project construction phase.

The project is expected to cause various impacts to both the biophysical and socio-economic environment of the project impact area. Some of the impacts will be positive while others will be negative. To identify the different impacts and to come up with appropriate measures to manage the impacts. Lilongwe Water Board engaged Environment and Natural Resources Management Consultants to undertake an Environmental and Social Management Plan (ESMP) and a Resettlement Action Plan (RAP) study for the project, which determined different types of impacts, which the project will cause and measures to manage the impacts.

1.2 Project background

Demand for water supply in Lilongwe is increasing with the growing population, especially after 2005 when government ministries and organizations started moving their head offices to the capital city. Lilongwe City Council estimates that about 75 percent of the population was served by the Lilongwe Water Board in the 2012 up from 50 percent in 2013. Most of the distribution networks conveying water to the different communities in Lilongwe are in need of upgrading and rehabilitation. There are leakages and illegal connections which are resulting into more reduced water supply in different parts of the City. There is therefore an urgent need to upgrade and rehabilitate the water distribution networks in different parts of the city to reduce water losses and to improve quality of service to existing customers and to meet the demand for water, which is growing annually and to make adequate, safe and clean water accessible to different consumers.

Specifically, this ESMP covers the subproject activities that will:

a) Upgrade and rehabilitate the water supply networks to reduce water losses and to improve quality of services to supply water to additional residential as well as industrial areas in the City of Lilongwe;

b) Restore operations of the distribution networks to acceptable quality standards; and

c) Improve the efficiency and operational management of the networks

1.3 Nature and scope of the project

The proposed project will involve several activities, which will be carried out in four phases namely planning, construction, demobilization, and operation and maintenance phases.

Activities under **planning phase** include surveying the sites for upgrading, rehabilitation and operation of the proposed water distribution networks; identification and enumeration of Project Affected Persons (PAPs) and their property; valuation of the PAPs' property; preparation of designs documents for the project; conducting ESMP and RAP studies and preparation of the ESMP and RAP reports.

Activities under **construction phase** shall include site establishment; mobilization of workers; transportation of construction equipment; excavation of trenches in areas designated for water distribution networks; stockpiling of excavated materials; transportation of construction materials; construction of thrust blocks, anchor blocks and man holes for take-off points; laying down of pipes; backfilling of trenches; and restoration of broken roads, concrete drive ways and concrete pavements and other structures for public utilities. In all, pipes ranging from 50 – 800 mm will be installed and total distance to be covered by the rehabilitated distribution network will be 55.35 km.

Activities under **demobilization phase** will include laying off workforce employed during construction phase; demobilization of construction equipment; disposal of waste materials from construction sites; and disposal of surplus excavated earth.

Activities during **operation and maintenance phase** will include operation and maintenance of the water distribution network facilities.

These water distribution network rehabilitation activities are part of a larger set of activities to be financed by the World Bank including sanitation related investments under the Lilongwe Water and Sanitation Project. This ESMP governs the water distribution network rehabilitation activities while an Environmental and Social Management Framework will safeguard the sanitation related and water distribution expansion activities.

1.4 Project Proponent

The ESMP has been prepared on behalf of the Lilongwe Water Board, who is the proponent of the project. The following are the details of the project proponent:

Proponent Name: Lilongwe Water Board

Postal Address: Lilongwe Water Board, Madzi House, Area 3, Off Likuni Road, Post Office Box 96, Lilongwe, Malawi

Contact Person : Chief Executive Officer

1.5 Project Location

The project will be implemented in several residential as well as industrial areas in the City of Lilongwe covering all the three zones of Lilongwe Water Board distribution network, namely Southern, Central and Northern zones. Table 1.3 and Figure 1.1 provides details of the location of the water distribution networks that will be rehabilitated. The distribution networks will be developed within the road reserves. This way, the project will minimize the extent of land take and disturbances that it may cause.

Table 1.1 Details of the areas where the water distribution network will be rehabilitated

SOUTHERN ZONE	
Route 1	From Tsabango low level tank to Kamuzu Barracks
Route 2	From Kachere CCAP church through Majiga to CCDC and Matchansi
Route 3	From Chidzanja Road through Kaliyeka to Midland (Area 23)
Route 4	From Kum'bweza to Ngwenya
Route 5	From M1 to area 36
Route 6	From Ajawa Lodge to Phwetekere Market
Route 7	From Tsabango Tank through Namichimba Market
Route 8	From Chikungu to Katondo Market
CENTRAL ZONE	
Route 1	Area 47
Route 2	Chinsapo via Chimphangu to Mchinji Road
Route 3	Area 9
Route 4	Area 6 and 5
Route 5	Connecting the Paul Kagame road's roundabout to Kamuzu central round about
Route 6	Area 40 to area 16 (Reserve bank road to Ministry of Lands, Housing and Urban Development)
Route 7	From BICC to Area 6
Route 8	Area 10 to Area 43
Route 9	From BICC to Area 6
NORTHERN ZONE	
Route 1	From Kanengo tanks to Area 25 C via Area 25 A
Route 2	From Area 25A through Area 50 and 51 to Area 49
Route 3	Area 10 junction to Kauma
Route 4	Kanengo M1 to Area 30, Police

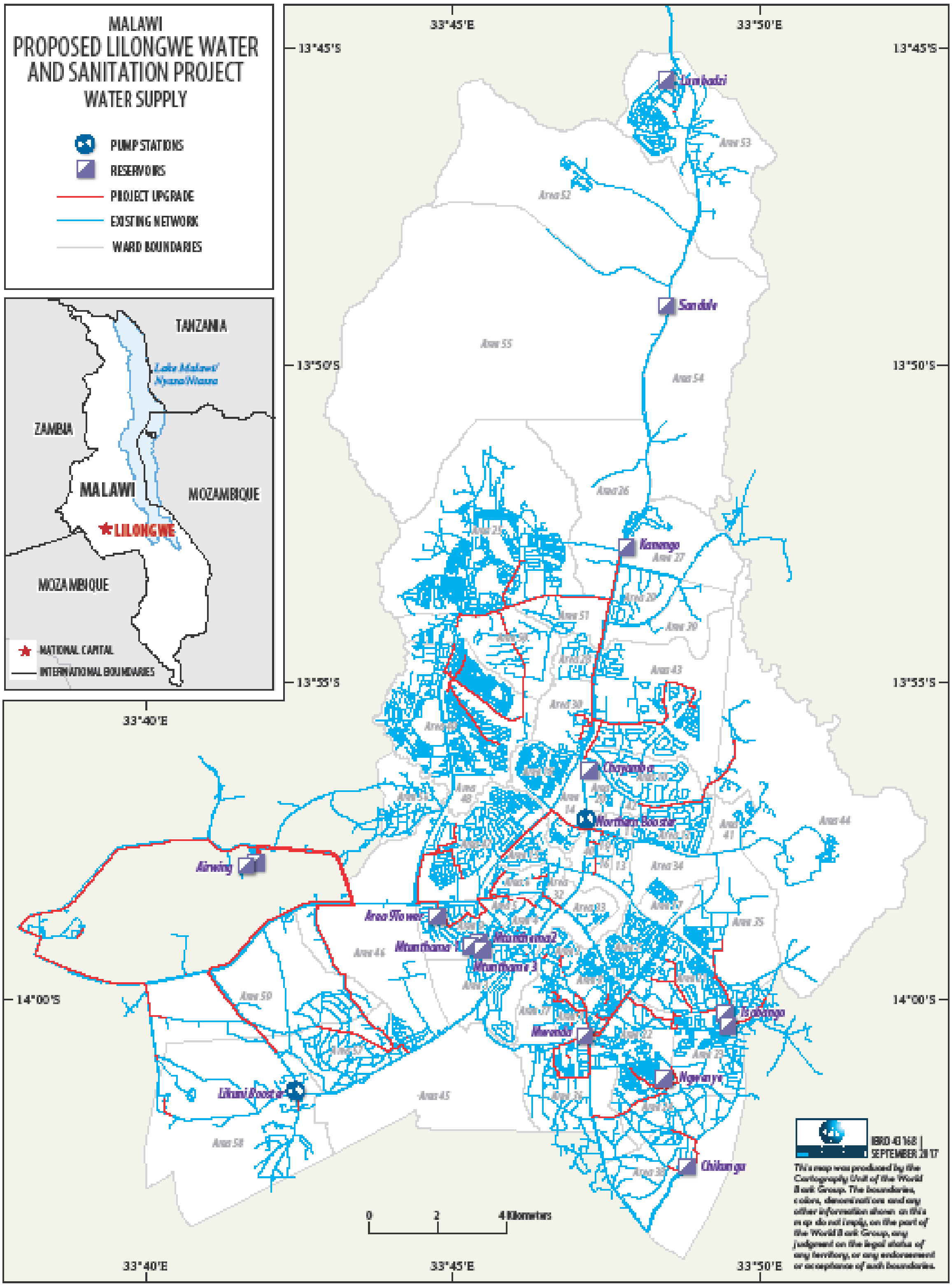


Figure 1.1 **Details of the location of the water distribution networks that will be rehabilitated**

1.6 Aim and objectives of the ESMP study

The Environmental and Social Management Plan (ESMP) has been prepared to identify the environmental and social impacts that will be generated by the activities of the project and mitigation actions that will be required to implement the project in accordance with the requirements of the Environment Management Act of 1996 and the World Bank Environmental and Social Framework. The ESMP provides an overview of the environmental and social baseline conditions on the direct impacted areas, summarizes the potential impacts associated with the proposed project and sets out the management measures required to manage any potential impacts. The ESMP will be utilized by the contractor to be commissioned by Lilongwe Water Board to implement the project and will form the basis of site-specific management plans that will be prepared by the contractor and sub-contractors as part of their construction methodology prior to works commencement.

Specifically, the ESMP was prepared to:

a) Outline the scope and the rationale for the proposed project;
b) Identify necessary statutory and regulatory approvals and licenses to be obtained from government licensing agencies to ensure that the project is in line with sound environmental and social management practices;
c) Assess the physical, biological and socio-economic conditions of the project impact area;
d) Identify and assess significant/beneficial potential environmental and social impacts of the project;
e) Identify and recommend measures to manage the negative and positive environmental and social impacts respectively; and
f) Prepare an environmental and social monitoring plan for monitoring implementation of the environmental and social management plan (ESMP).

1.7 Potential Users of the Environmental and Social Management Plan

The ESMP has been prepared for use by different stakeholders to be involved in the planning, implementation, management and monitoring of the proposed project activities. The users will include the Contractor, Lilongwe Water Board, Environmental Affairs Department, Lilongwe City Council, Ministry of Lands, ESCOM, Roads Authority and Malawi Telecommunications Limited (MTL). The plan contains useful information on policies and procedures to be adhered to, implementation modalities, analysis of potential environmental and social impacts and suggested mitigation measures at various stages of the project activities. Such information will be useful in planning, implementation, management and monitoring of implementation of project activities.

1.8 Methodology

The ESMP study for the proposed project was carried out in accordance with the Terms of Reference that were provided by the Lilongwe Water Board as provided in Annex 1. The study methodology that was used included:

a) Literature review;
b) Site visits; and
c) Stakeholder consultation.

1.8.1 Literature review

Literature review involved acquisition and review of documents, reports maps and drawings relevant to the project. Some of the documents reviewed included previous study reports such as ESIAs and ESMPs for water distribution networks in the city of Lilongwe; different national and international policies, legislation and regulation for developing water distribution networks. Examples of information obtained from the different documents included project design and implementation details; planned project activities and description; data on different physical, biological and social economic environment; policies, legislation and procedures to be adhered to, implementation modalities, analysis of potential environmental and social impacts and suggested mitigation measures at various stages of the project activities.

1.8.2 Field surveys

Field surveys included a preliminary field survey and baseline study. Preliminary field surveys were conducted in July 2017 to the project areas to appraise the community members living in the project impact areas of the coming of the project. Consultants and staff from Lilongwe Water Board participated in the activity. The preliminary field survey also served as an opportunity for the consultants to familiarize themselves with the proposed project areas and to properly plan for the ESMP studies.

Further field studies were also conducted. The studies concentrated on the biophysical and social economic environment of the project impact areas. The study on the physical environment determined the topography, soils and hydrology of the proposed project sites. The study further looked at the potential impacts the proposed project will have on the existing physical environment (topography, soils, and climate) within the project areas. The study on the biological environment determined the existing flora and fauna in the project areas that will be affected by the establishment and operation of the project.

1.8.3 Public consultation

Consultation with the Project Affected Persons (PAPs) formed an important feature of the ESMP study. The consultation meetings provided an opportunity for PAPs and other community members around the project areas to express their views on the proposed project activities as well as to raise any issues of concern relating to the project. The consultation meetings were conducted in built up places and market centres in the project area such as Katondo market in Area 38, Ngwenya Market in area 24, Zebra market in area 49, Kachere market (Chinsapo) in area 46 and at Senti market in area 50 whose summaries are provided in Table 1.2. Consultation meetings were held in these locations because implementation of project activities will have more temporary impacts in these areas.

In these meetings, general information about the project was discussed and a number of issues were raised pertaining to how the project will affect the different community members. Question and answers were used to guide the discussions. The consultation meetings were conducted in order to:

a) Inform them about the project;
b) Provide an opportunity for them to discuss their opinions and concerns;
c) Manage their expectations and misconceptions regarding the project;
d) Verify the significance of environmental, social and health impacts identified;
e) Get inputs on compensation issues;
f) Disseminate concepts of the proposed Project activities with a view to provoking Project interest amongst the communities; and

g) Promote sense of ownership for the Project; and informing the process of developing appropriate mitigation measures.

Table 1.2 Summary of the PAPs consultation meetings

	Katondo in Area 38	**Ngwenya Market in Area 24**	**Zebra market in Area 49**	**Kachere market (Chinsapo) in Area 46**	**Senti market in Area 50**
Date and time the meetings took place	21/07/2017 09:00hrs	21/07/2017 14:00hrs	22/07/2017 09:00hrs	22/07/2017 14:00hrs	23/07/2017 09:00hrs
Number of PAPs who attended the meeting	19	17	19	55	18
Issues discussed and details about how the project will address the issues	**Issue raised during the plenary discussion**		**Response provided to PAPs during meetings**		
1	PAPs were interested to know if the water would be for free or if people would pay for it		PAPs were informed that the water will be paid for and the project is just to upgrade the current water distribution network.		
2	PAPs wanted to know who will be compensated for loss of business in places where tenants would lose business and the building owners will have their structures temporarily closed		It was emphasized that if a structure will be affected, it will be the landlord who will be compensated and if the disturbance will cause temporary loss of business, the tenant will also be compensated.		
3	PAPs were keen to know when they should expect the project to start and its period		PAPs were informed that the project is expected to start in 2017 and will run for 2 years but it will be done in phases. Necessary communication will be made before the actual date of commencement to all PAPs. Nevertheless, compensation will be paid before any project activity starts.		
4	PAPs were interested to know how the upgrading of the water distribution network will improve the current problem of water scarcity in the city considering that Lilongwe is		The PAPs were informed that the upgrading will improve current water problems being experienced in Lilongwe as the project will reduce water losses and improve quality of service of water supply to the consumers		

	already experiencing water shortages even with limited connections	
5	PAPs were interested to know the size of the pipeline trench to be excavated	PAPs were informed that the trenches will be 0.5 m wide and 1.0 m deep
6	PAPs were also interested to know when the compensation will be paid to PAPs	PAPs were informed that the exact time was not known but will be soon before any project activity commences. Meaning no project activity shall be done before PAPs receive their compensations
7	PAPs were so keen to how long it will take to backfill the trenches relating to other areas like *Gaga* where similar exercise took about 3 months before the trenches were backfilled	The PAPs were informed that the trenches will be filled immediately after laying down the pipes
8	PAPs also wanted to know who would pay for the cost of new connections after disconnection due to the project activity	PAPs were informed that LWB shall meet all costs and will make sure that the reconnections are made as soon as the pipes are laid and the trenches are backfilled. This is to prevent additional disturbance of water unavailability to surrounding households and locations.
9	On Valuation approaches, PAPs were informed that valuation approach for all infrastructure will be by replacement cost	PAPs were in agreement with this method.
10	PAPs wanted to find out if the owners of the shops to be affected could be hired to excavate the trenches for the pipelines going through their shops and be paid for the services rendered to avoid hiring other people to excavate trenches through their shops who may end up stealing from them.	Participants at the meeting were informed that the point was valid, however the contractor will be in a better position to know how best to deal with that.
11	PAPs were also interested to know how details of the potential PAPs will be verified to avoid paying compensation to wrong people	Participants to the meeting were informed that the details of the PAPs will be verified during verification exercise.
12	PAPs wanted to know whether they would receive	It was highlighted that the task shall be handled by the office of the DC for Lilongwe who shall decide the mode of payment

	the compensation in a form of cash or cheque	regarding the fact some compensation might not really need a cheque. Nevertheless, prior communicated shall be made
13	PAPs wanted to know what will happen to business people who do not have structures but have some permanent places where they carry out their businesses	Participants were informed that such business people usually carry around their businesses with them to sell at places which are seen to be convenient. Such businesses will not be considered for compensation as they can always move to convenient places where their businesses will not be disturbed.
14	PAPs were interested to know the average compensation per PAP	PAPs were informed that compensation will depend on the temporary losses the different PAPs will suffer. The preliminary valuation that was already conducted would form basis for compensation.
15	PAPs also wanted to know if pipelines will follow existing pipelines	PAPs were informed that not in all cases. The proposed routes were opted in terms of the side of the road which will cause less or no damage and disturbance.
16	PAPs were interested to know the type of equipment to be used during excavation of trenches considering that the place is a market	PAPs were informed that in confined areas like markets and highly built up residential areas labourers instead of machines shall be used to excavate trenches so as to minimize disturbance. This shall also provide employment opportunity to the youth from surrounding areas.
17	PAPs wanted to know what LWB will do if the number of days for disturbance will not be equivalent to the compensation given since compensation will come before any project activity commences	The PAPs were informed that the project proponent will direct the contractor on how long the actual project activity should take so that the compensation is equivalent to the disturbance period.

Details of the meetings regarding dates, where the meetings took place, number of PAPs present and issues raised by PAPs at the meetings are provided in Annex 4. Different tools were used to collect different information for the study as presented in Annex 2 while a screening form to assess the different environmental and social impacts is provided in Annex 3. Figure 1.2 presents pictures of different public consultation meetings and minutes of the meetings and people present at the meetings are presented in Annex 4. Annex 5 presents a list of various stakeholders and governmental entities consulted and issues raised during the meetings while Annex 6 presents details of the Experts who conducted the study. It is important to note that the Environmental Affairs Department and Roads Authority were among those consulted.

Consultation meeting at Katondo

Consultation meeting at Kachele (Chinsapo)

Consultation meeting at Area 50 (Senti)

Consultation meeting at Zebra area 49

Figure 1.2 Pictures of different community consultation meetings

1.9 Existing Land Uses in the Project Area

The land use structure of Lilongwe City is contained in the Lilongwe Outline Zoning Scheme of 1986 and includes housing, commercial, industry, institutional, agriculture/forestry, open space, state house, government offices airport and undetermined. However, this scheme has not been implemented fully as planned due to the following reasons:

a) The plan has time consuming planning application process;

b) Inadequate implementation capability of the Lilongwe City Council; and

c) LCC's insufficient capability to control development.

The proposed project will not cause any permanent displacement of people, institutions and their property hence issues of resettlement will not arise. The pipelines for the water distribution networks and the associated facilities will be constructed along the road reserves except in places where the pipelines will cross the road and in highly built up places like market places and in some residential areas. In such places, the project will cause temporary disturbances, which shall include damage to road pavements, concrete driveways, different building structures; obstruction to passage on the roads; disruption of public services; and temporary loss of business activities. LWB will compensate all the project affected persons for the different losses arising from such disturbances.

In all, money amounting to U$D 415,184.76 will be used to pay for compensation of the three different categories outlined above. The PAPs themselves will decide how they will be compensated though most of them seemed to prefer monetary compensation as opposed to in kind compensation for the rehabilitation of their structures. In all 363 PAPs who include both institutions and individuals will be compensated accordingly. Some of the structures to be affected are shown in Figure 1.3 below:

Benches at Katondo

Stalls and hawkers at Kachele (Chinsapo)

Concrete pavement

Some bitumen roads that will be cut

Figure 1.3 Some of the structures that will be affected by the project

CHAPTER 2 DESCRIPTION OF PROJECT ACTIVITIES

2.1 Description of main project activities

The proposed project will involve upgrading, rehabilitation and operation of water distribution networks in different residential and industrial areas in the City of Lilongwe covering all the three zones of Lilongwe Water Board distribution networks, namely Southern, Central and Northern zones. Major activities of the project shall include site establishment; mobilization of workers; transportation of construction equipment; excavation of trenches in areas designated for water distribution networks; stockpiling of excavated materials; transportation of construction materials; construction of thrust blocks, anchor blocks and man holes for take-off points, air valves, scour valves and in line valves; laying down of new pipes; re-filling of trenches; and restoration of broken roads, concrete pavements, concrete pavements driveway and other structures for public utilities.

2.2 General design of project activities

The trenches where the different pipes will be laid will be 0.5 m wide and 1.0 m deep. In all, pipes ranging from 50 – 800 mm will be installed and total distance to be covered by the new distribution network will be 55.35 km. Several manholes measuring on average 2 m x 1.5 m will be constructed in places where there will be intakes, air valves, scour valve and inline valves. Details of the manholes to be constructed are as follows:

Southern Zones: 34 Manholes;

Central Zone: 18 Manholes; and

Northern Zone: 15 Manholes

The activities that shall be carried out to upgrade, rehabilitate and operate the water distribution networks in different residential and industrial areas of the City of Lilongwe shall be implemented in four phases namely planning and design, construction, demobilization, and operation and maintenance phases.

2.2.1 Planning and design phase

Activities under planning and design phase include surveying the sites for construction and operation of the proposed water distribution network; identification and enumeration of Project Affected Persons (PAPs) and their property; valuation of the PAPs' property; preparation of designs documents for the project; conducting ESMP and RAP studies; preparation of the ESMP and RAP reports; preparation of detailed lay out plans; preparation of tender documents for the Contractors; obtaining approvals under the Town and Country Planning Act and the By-Laws and obtaining all the approvals necessary for the construction and operation of the proposed water distribution network. The planning phase commenced in April 2016 and will be concluded in September 2017.

2.2.2 Construction phase

The project will be implemented for 2 years and construction activities will start from early 2019 and will include site establishment; mobilization of workers; transportation of construction equipment; excavation of trenches in areas designated for water distribution networks; stockpiling of excavated materials; transportation of construction materials; construction of thrust blocks, anchor blocks and man holes for take-off points; laying down of new pipes; re-filling of trenches; and restoration of broken roads, paved driveways and concrete pavements and other structures for public utilities. In all,

pipes ranging from 50 – 800 mm will be installed and the distribution network will cover 55.35 km. Details of the water distribution network to be constructed are provided in Table 2.1.

Table 2.1 Details of the proposed distribution network to be developed

Route	Route		Pipe Diameter (mm)	Distance (m)
SOUTHERN ZONE				
Route 1	From Tsabango low level tank to Kamuzu Barracks		500	2132
Route 1	From Tsabango low level tank to Kamuzu Barracks		300	1312
Route 1	From Tsabango low level tank to Kamuzu Barracks		200	91.46
Route 1	From Tsabango low level tank to Kamuzu Barracks		150	10.04
Route 2	From Kachere CCAP church through Majiga to CCDC and Matchansi		200	702.51
Route 2	From Kachere CCAP church through Majiga to CCDC and Matchansi		300	1914.68
Route 3	From Chidzanja Road through Kaliyeka to Midland (Area 23)		300	2270.9
Route 4	From Kum'bweza to Ngwenya		150	721.77
Route 4	From Kum'bweza to Ngwenya		300	690.81
Route 4	From Kum'bweza to Ngwenya		500	333.11
Route 5	From M1 to area 36		400	1177.13
Route 5	From M1 to area 36		500	42.94
Route 6	From Ajawa Lodge to Phwetekere Market		300	1195.36
Route 7	From Tsabango Tank through Namichimba Market		150	561.7
Route 7	From Tsabango Tank through Namichimba Market		300	967.29
Route 7	From Tsabango Tank through Namichimba Market		500	154.97
Route 8	From Chikungu to Katondo Market		300	2806.02
CENTRAL ZONE				
Route 1	Area 47		450	5910
Route 1	Area 47		450	2176.83
Route 2	Chinsapo via Chimphangu to Mchinji Road		450	8692.08
Route 2	Chinsapo via Chimphangu to Mchinji Road		300	422.78
Route 2	Chinsapo via Chimphangu to Mchinji Road		150	1539.89
Route 3	Area 9		450	5922.55
Route 3	Area 9		300	5.77
Route 3	Area 9		150	2.42
Route 4	Area 6 and 5	.	450	369.75
Route 4	Area 6 and 5		300	2886.90
Route 4	Area 6 and 5		150	545.46
Route 4	Area 6 and 5		50	10.437

Route 5	Connecting the Paul Kagame road's roundabout to Kamuzu central round about		300	764.49
Route 6	Area 40 to area 16 (Reserve bank road to Ministry of Lands, Housing and Urban Development)		400	1.236851
Route 6	Reserve Bank road		200	469.59
Route 6	Reserve Bank road		150	286.30
Route 7	From BICC to Area 6		450	3863.20
Route 7	From BICC to Area 6		300	160.98
Route 8	Area 10 to Area 43		800	119.03
From BICC to Area 6	Area 10 to Area 43		450	8.80
From BICC to Area 6	Area 10 to Area 43		300	2845.67
From BICC to Area 6	Area 10 to Area 43		150	1265.
NORTHERN ZONE				
Route 1	From Kanengo Tanks to Area 25 C via Area 25 A		600	6318.40
Route 1	From Kanengo Tanks to Area 25 C via Area 25 A		450	410.80
Route 1	From Kanengo Tanks to Area 25 C via Area 25 A		300	1715.50
Route 2	From Area 25A through Area 50 and 51 to Area 49	.	450	1234.72
Route 2	From Area 25A through Area 50 and 51 to Area 49		300	6932.80
Route 2	From Area 25A through Area 50 and 51 to Area 49		150	2522.70
Route 2	From Area 25A through Area 50 and 51 to Area 49		100	14.86
Route 3	Area 10 junction to Kauma		300	4946.055
Route 3	Area 10 junction to Kauma		150	1427.63
Route 3	Area 10 junction to Kauma		100	43.11
Route 4	Kanengo M1 to Area 30, Police		450	3817.16
Route 4	Kanengo M1 to Area 30, Police		300	967.6093
Route 4	Kanengo M1 to Area 30, Police		150	396.37

a) Construction workers

In all about 150 people will be employed. The people to be employed will include 40% women and 60% men. The people will include supervisors, skilled and unskilled laborer's. For the semiskilled and unskilled workers, the Contractor will be encouraged to employ the people affected by the project or from the local area as a way of making the project benefit the people.

b) Construction equipment and construction materials

Hoes, picks, wheelbarrows, an excavator, trencher or ditch witch for excavation will be used for the construction of the proposed project. Different raw materials will be required during construction phase. Materials such as soil, sand, gravel and quarry stone will be sourced from the surrounding communities. The contractor will obtain the necessary permits from different government regulatory authorities before extraction of the construction raw materials. The use of stabilized soil blocks and or concrete blocks for construction of different structures will be more environmentally friendly than

the use of burnt bricks, which contribute to deforestation. The project will also demonstrate to other contractors that stabilized soil blocks provide a practical alternative to burnt bricks though they are more expensive. This is because stabilized soil blocks and concrete blocks are stronger and long standing, do not lead to deforestation as burnt bricks do and that procurement of large quantities of cement for making the stabilized soil blocks and concrete blocks will contribute to increased growth of the local economy. Construction will be done by a private contractor and that Lilongwe Water Board will supervise the construction phase of the project to ensure that the contractor complies with the design standards.

2.2.3 Demobilization Phase

Decommissioning of the structures for the water distribution network is not expected to occur under the project, and potential future issues can be minimized by the avoidance of hazardous materials in the initial construction. The main activities to be undertaken during demobilization phase shall include laying off workforce employed during construction phase; demobilization of construction equipment; disposal of construction waste; and disposal of surplus excavated earth.

2.2.4 Operation and maintenance phase

Activities during operation and maintenance phase will include use of the upgraded, rehabilitated and expanded water distribution networks in different parts of the City of Lilongwe to distribute water to these areas to meet the demand for water, which is growing annually and to make adequate, safe and clean water accessible to different consumers. Furthermore, during the operation phase, the upgraded and rehabilitated water distribution networks may breakdown and will require periodic maintenance by digging trenches to remove the broken and old pipes to replace them with new ones.

CHAPTER 3 DESCRIPTION OF EXISTING ENVIRONMENT

A study of the existing environment for the proposed project area has been carried out on the physical, biological and socio-economic features in the project impact area. The study has provided a measure of the existing state of the environment against which future changes imposed by the project activities will be measured and monitored. The physical and biological factors considered included climate, topography and geology, soils, hydrology, flora and fauna and socio-economic factors among others. This Chapter presents the descriptions of the biophysical and socio-economic environment of Lilongwe City.

3.1 Biophysical Characteristics

3.1.1 Topography and Geology

The topography of Lilongwe is largely flat with an elevation ranging from 1,000 to 1,200 meters above sea level. The northern part of the city is undulating with several small streams flowing eastwards. In the past these drainage lines were retained as open spaces, however with pressure for land in the more affluent north they have been developed. This has an impact on the flood levels and groundwater. Lilongwe and Lingadzi are the two main rivers flowing through the City.

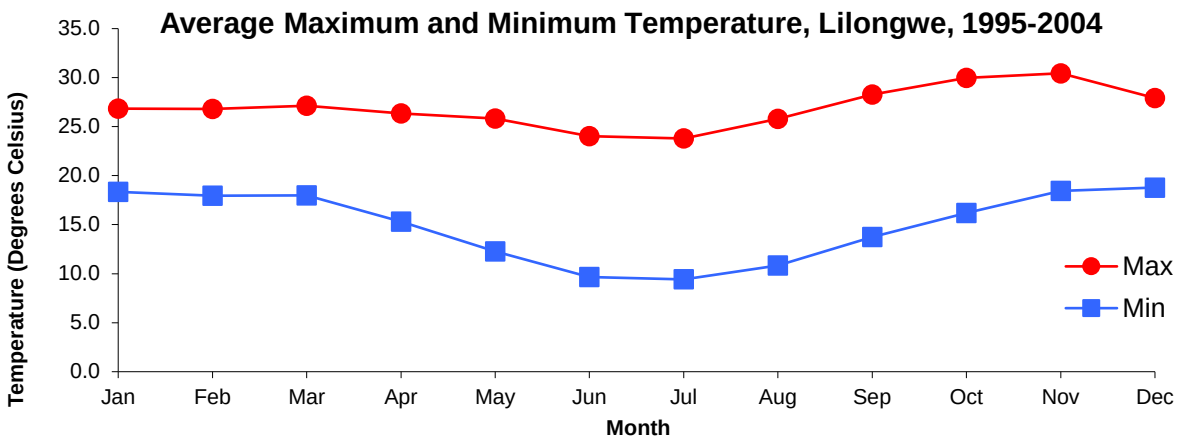
The geology of the project area is dominated by crystalline precambrian to Lower Palaeozoic rocks that have been affected by the polycyclic Mozambique orogeny (Carter and Bennett, 1973) and generally referred to as the Basement Complex (Carter and Bennet, 1973). Pelitic to semi-pelitic rocks including banded hornblende-biotite gneisses with intercalations of marbles, calc-silicate gneisses, quartzites and mica schists cover much of the country.

3.1.2 Soil

The type of soils for Lilongwe is ferruginous mixed with lithosols including the project zone of influence. These soils are less exposed to the risk of erosion due to their deep sub layer which encourages infiltration of runoff. Erosion surfaces are commonly seen in the project areas due to a considerable loss of land cover over the past few years due to agricultural and other development activities.

3.1.3 Climate

Like the rest of the country, the city is characterized by two distinctive seasons. The dry and cool season is from April to October while from November to March it is hot and wet. Average maximum temperatures range from 23.4 degrees Celsius in July to 32 degrees Celsius in October. In October and November, temperatures more than 30 degrees Celsius are not uncommon. The lowest temperatures are experienced in July with the monthly average minimum temperatures ranging from 9.5 to 18.9 degrees Celsius. Figure 3.1 gives temperature data for Chitedze Research Station, which represents the temperature details of Lilongwe.



Source: Chitedze Research Station, February, 2012.

Figure 3.1 Temperature data for Chitedze Research Station and the City of Lilongwe

Tables 3.1 and 3.2 present annual rainfall data and average rainfall data, which ranges from 808mm to 1, 080mm while Table 3.3 presents average monthly rainfall. January is the wettest month with an average of 239 mm of rain for the period 2004 to 2010. The months of February and December also experience a lot of rains with an average of 200mm and 194mm over the period 2004 – 2010. February, 2010 recorded the highest rainfall of 322.4mm. May to October is the driest period of the year with virtually no rain at all recorded over the seven-year period of 2004 – 2010.

Table 3.1 Annual rainfall data in mm (Chitedze, Lilongwe)

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	**Ave**
Total	478	1,023	768	1,156	1,285	668	987	787	1,038	776	**897**
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Total	613	826	986	863	808	938	730	851	722	578	**791**

Table 3.2 Average monthly rainfall in mm (Chitedze, Lilongwe)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1995 / 2004	249	209	151	38	2	1	0	0	1	11	61	179
2005 / 2013	239	200	123	31	1	0	0	0	0.2	5.5	82	194

The recent trends in rainfall have been generally a reduction in the total amount with the average for the last 10 years 100mm less than the previous 10 years. The rainy seasons are also characterised by dry spells of 2 – 4 weeks in late January and February. In discussions with the brick makers on site they said that there was very little water in the stream during the rainy season last year (2014 – '15) which is explained by the figure of 578mm, 214mm less than normal / average.

3.1.4 Flora and fauna

Lilongwe City has a Herbarium and Botanic Garden covering 75 ha and has naturally growing indigenous trees. The trees are preserved and researched, while exotic trees covering a small part of the area are propagated and planted for research. Other forms of biodiversity are also preserved such as animals, birds, shrubs and flowers. The Botanic Gardens has a large natural woodland with a wide variety of natural tree species that add beauty to the area. The natural trees are also playing a very important role in conserving the water resources, providing habitat to some animals and birds and also prevent soil erosion.

Lilongwe City has a nature sanctuary called the Lilongwe Nature Sanctuary, which covers an area of over 137 hectares. It is home to a wealth of biodiversity and is important for the conservation of different fauna and flora. The Sanctuary is managed by the Ministry of Tourism and Wildlife. The Sanctuary houses a Wildlife Centre, which serves as an education and a wild animal rehabilitation centre. Some of the fauna in the sanctuary include Common Duiker, Bush Buck, Porcupine, Velvet Monkey, Bush Pig, Pangolin, Hedgehog, Bats, Rodents, Nile crocodile, African Python, Tortoise, Monitor Lizard and Birds.

Lilongwe City has also some wetlands commonly known as dambos. Some of these are being threatened by farmers growing of horticultural plants. Such plants alter the natural dambo ecosystem which serves as habitat to small animals, birds and insects. The cultivation also encourages soil erosion during rainy season and reduces water table during the dry season. However, some of the areas that have not been cultivated are rich in biodiversity such as small animals, rodents, reptiles, birds and flowers. Barred Owl, eastern black swallowtail butterflies, gopher tortoises, bats, frogs, pythons and dragonflies are common in dambos. These areas are not expected to be impacted by subproject activities. The subproject activities covered by this ESMP is not expected to impact any protected areas in Lilongwe.

The proposed development of the Lilongwe Water Distribution Networks is planned to pass along the road reserve which generally have little or no vegetation at all. In very few places trees will be affected details of which have been presented in the compensation schedule. However, in some sections there are exotic trees like Gmelina, flower gardens and grass, which will in most cases be avoided. The trees were planted by Lilongwe City Council to add beauty to the city and, in some cases, act as wind breaks.

3.1.5 Hydrology

The City of Lilongwe has a number of rivers and streams that provide water for various uses but the most notable ones are Lilongwe, Lingadzi, Nankhaka and Chankhandwe. The Lilongwe River is the biggest and longest of all and is the main source of water utilised by Lilongwe Water Board, supplying water to almost 80% of City residents. It runs from the west to the east of the city and is a tributary to Linthipe River that empties its water in the beautiful Lake Malawi. A few fish species and crocodiles are also found in this river. Some residents fish in the river.

Of late, the catchment area for Lilongwe River, Dzalanyama Forest Reserve, is experiencing serious pressure due to massive deforestation. Each day tons and tons of wood and charcoal are being ferried

to Lilongwe City for domestic use and burning bricks. However, the project activities will not harm Dzalanyama Forest Reserve directly as the project activities will use environmentally friendly soil stabilized blocks or cement bricks instead of burnt bricks which cause deforestation. Figure 3.2 provides details of the Dzalanyama Forest Reserve.

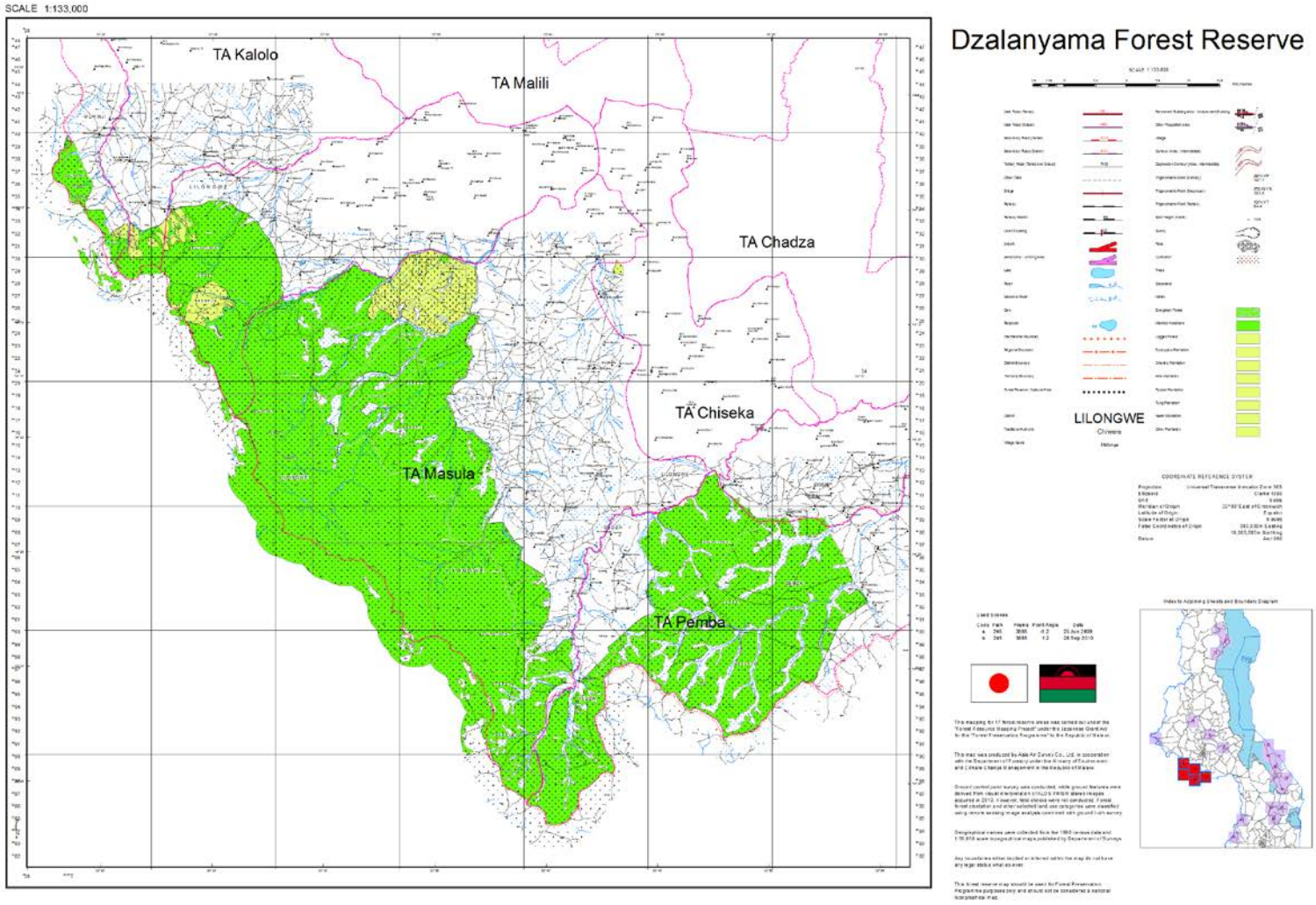


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Figure 3.2 Map of Dzalanyama Forest Reserve

3.2 Socio-economic environment

3.2.1 Population and settlement

Considering that the activities for the proposed project will cover all the three zones of Lilongwe Water Board distribution network in the city of Lilongwe, namely Southern, Central and Northern zones, the socio-economic study for the project considered the population in all the three zones of Lilongwe Water Board distribution network. Lilongwe is the fastest growing urban area in the country. It has an area of approximately 728,000 Ha. According to the UN-Habitat Lilongwe Urban Profile 2015, Lilongwe has a population of 1,077,116. The City had a population of only 19,425 in 1966 which means that it has grown over 55 times in the last 50 years. The population growth has had a corresponding increase in the population density, from 43 persons per square kilometre in 1966 to 1,479 persons per square kilometre in 2015, which has exerted so much pressure on the requirements for water distribution network to service the residents in the city and surrounding areas. Table 3.3 gives details of the Lilongwe City Population, Growth Rate and Density (1966-2015).

Table 3.3 Population and density figures for Lilongwe, 1966 – 2015

Year	Population	Growth Rate (%)	Density	Area sq. km
1966	19,425		49	
1977	98,251	15.9	251	390
1987	223,318	8.5	568	390
1998	440,471	6.4	1,121	390
2008	674,448	4.3	1,702	396
2015	1,077,116	8.5	1,479	728

Source: Draft Lilongwe Urban Structure Plan, 2010 and UN-Habitat Lilongwe Urban Profile

Malawi's population was estimated at 13.1 million in 2008 with population prospects of 14.9 million in 2010. As of 1 January 2016, the population of Malawi was estimated to be 17 473 734 people. This is an increase of 3.06 % (518 491 people) compared to population of 16 955 243 the year before. The major source of demographic data in the project impact area was obtained from Lilongwe central, north and sourthern zones.

Table 3.4 shows that among the urban zones, Northern Zone (Areas 52 and 55) has the lowest density of only 2.4 persons per hectare, while Southern Zone (Areas 22, 23, 24, 36 & 38) has the highest density of 50.8 persons per hectare. The immediate catchment area of the study area (Central Zone), is low density in character with only 4.4 persons per hectare.

Table 3.4 Lilongwe City Population and Density by Urban Zone

Urban Zone	Areas	Total Population	Total Land Area (ha)	Density
Alimaunde (Northern Zone)	52&55	18,876	7,919	2.4
Lumbadzi (Northern Zone)	53&54	23,942	3,265	7.3
Mvunguti (Northern Zone)	25,26&27	71,698	4,121	17.4
Kanengo (Northern Zone)	28,29,39,50&51	45,957		
Maliya (Northern Zone)	49&56	62,187	1,693	36.7
Chimutu (Central Zone)	3,6,9,18,47,15&48	30,801	2,665	11.6
Nyama (Central Zone)	10, 12, 30&43	10,175	2,326	4.4
Tsabango (Southern Zone)	35,41&44	33,729	4,324	7.8
City Centre (Central Zone)	11,13,14,16,17, 19,20,31,32,33,34 , 40 &42	5,109	1.612	3.2
Old Town (Southern Zone)	1,2,3,4,5,7,8,21&3 7	124,431	1,644	75.7
Chinsapo (Central Zone)	45,46,57&58	88,453	5,055	17.5
Ngwenya (Southern Zone)	22,23,24,36&38	154,971	3,051	50.8

Source: Draft Lilongwe Urban Structure Plan, 2010

3.2.2 Age structure

The population of the City is mostly comprised of the youth with 48 % under the age of 18. The country as a whole has a young population with (<25 years) accounting for 65 % of the population and older persons (65 years +) accounting for only 4 percent of the population. The age structures for Lilongwe city are 0-14 years: 46.9% (male 4,056,810/female 4,100,841), 15-24 years: 20.2% (male 1,748,919/female 1,765,212), 25-54 years: 27.1% (male 2,329,952/female 2,371,274), 55-64 years: 3.1% (male 256,034/female 280,997) and 65 years and over: 2.7% (male 206,923/female 260,506) (2014 est).

3.2.3 Land Ownership and Administration

Land in the city is managed by five major landlords, namely: The Commissioner for Lands, Malawi Housing Corporation, Lilongwe City Council, Airport Development Limited (ADL), Press Properties, and private individuals and companies.

The Commissioner for Lands is responsible for public land which has been subdivided and offered for development under leasehold titles that are usually for 99 years or shorter terms. The Malawi Housing Corporation owns public freehold land for purpose of subdivisions in residential and commercial development in the city. The Lilongwe City Council has assumed the administration of Traditional Housing Areas (THAs) in the City. Airport Development Limited is a statutory corporation responsible for airport development activities and land administration particularly in Areas 53, 54 and 55. Press Properties have been responsible for demarcation, servicing and allocation of plots in Area 9 (part), such plots are sold out to prospective LWBs.

The Commissioner for Lands owns the site to be developed into an amusement park on plot number 1220, Area 47, City of Lilongwe. LWB has entered a legally binding agreement on the conditions for the development of the area into a recreational park.

3.2.4 Land Tenure

The title to land in Malawi is recognized by the Land Act and consists of three tenure categories: customary, private and public. Customary land is held, occupied or used under customary laws and is administered by traditional leadership. This is the most predominant tenure category and constitutes about 65% of all the land in Malawi. Public land is the land which is occupied, used or acquired by government, and any land which reverts to the government on termination, surrender or falling-in of freeholds or leaseholds. This category constitutes approximately 21% of the land in Malawi. The third land category is the private land which is owned, held or occupied under a freehold title, or a leasehold title, or a certificate of claim or which is registered as private land under the Land Act. It constitutes about 14% of the land in Malawi. Freehold land is a superior form of land tenure under English Law from which leaseholds are created. Leasehold interests are determined by a given number of years. Freehold and leasehold land can be created from customary or public land.

3.2.5 Land Use

Table 3.5 is a summary of the land use structure of the Lilongwe City as contained in the Lilongwe Outline Zoning Scheme of 1986 and details of the same are shown in Figure 3.3.

Table 3.5 Land Allocation - Outline Zoning Scheme in 1986

Land Use			**Area (ha)**	**Percent**
Housing	Permanent	Low Density	2,005	5.9
		Medium Density	1,855	5.5
		High Density	1,135	

	Traditional	High Density	6,740,	
	Total		11,735	
Commercial			295	0.9
Industry			2,050	6.0
Institutional			2,300	6.8
Agriculture/ Forestry			7,990	23.5
Open Space			1,060	3.1
State House			560	1.6
Government Offices			155	0.5
Airport			1,340	3.9
Undetermined			6,545	19.2
Total			34,030	100

Source: Lilongwe Outline Zoning Scheme (OPC, 1986)

This scheme has not been implemented as envisaged by the Lilongwe Outline Zoning Scheme. Reasons cited for the failure include: time consuming planning application process, inadequate implementation capability of the Lilongwe City Council and LCC's insufficient capability to control development

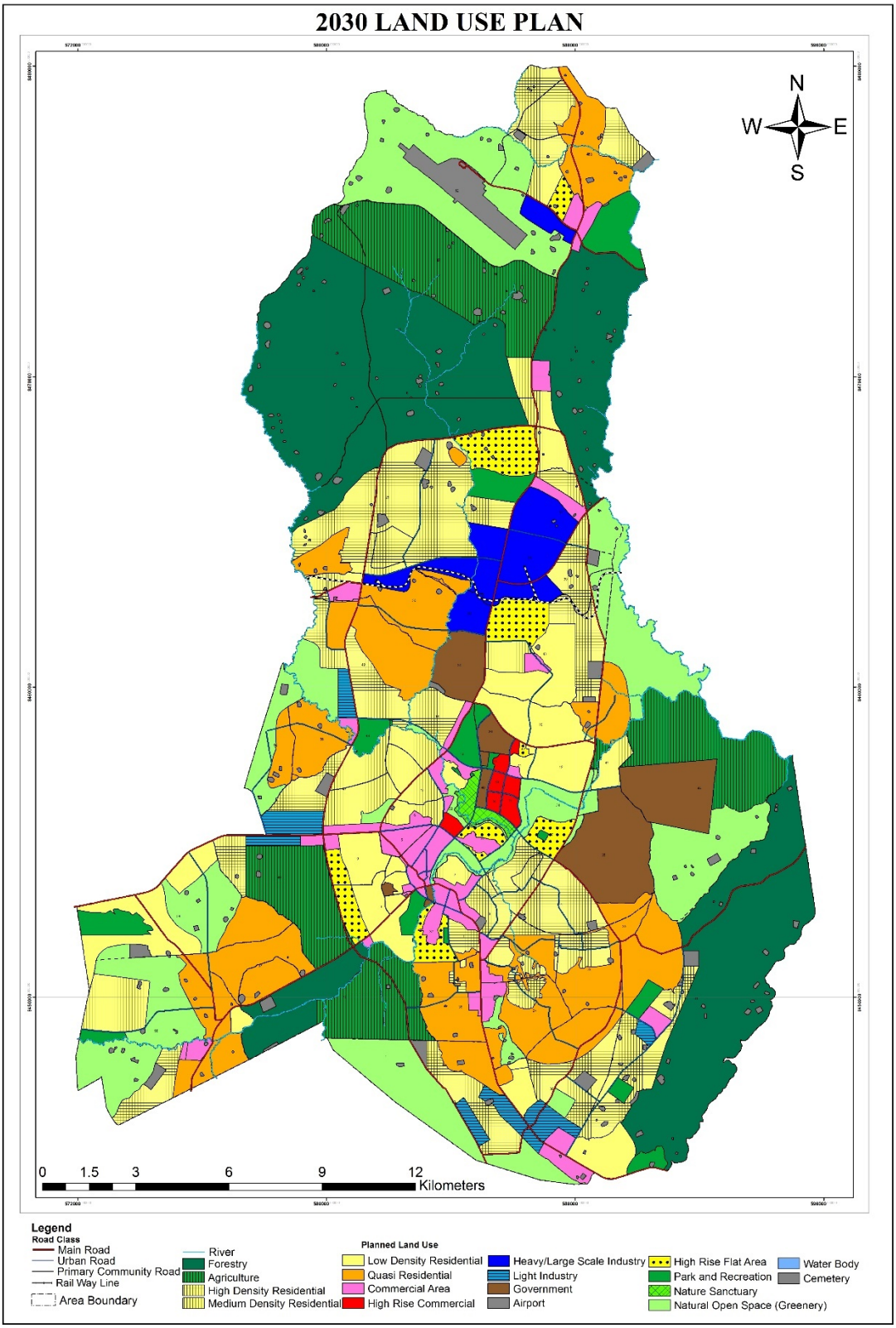

Figure 3.3 Land use structure of the Lilongwe City

3.2.6 Poverty Rate, Household Income and Expenditure

The population of Lilongwe has grown as villagers, including young orphaned children, from the surrounding rural areas have relocated to the capital in search of jobs and the quality of life enjoyed by government officials, NGO and other international workers, and expatriates. Despite the highly visible class differences, most of the city's residents go about their lives in relative harmony.

Up to 24.6 percent of the City's population is classified as ultra-poor, living on less than a dollar per day. The ultra-poor cannot even afford potable water of their own connection as they cannot have excess income to pay for water bills. Expansion of the water distribution networks will assist the ultra-poor to access potable water through water kiosks, as they can afford at least to pay for a bucket or two of water per day. The poor category comprising of those with annual earnings of less than MK16, 165.00 makes 8.8 percent of the total population. At the national level 22.4 percent and 52.4 percent are categorized as ultra-poor and poor respectively.

According to findings of Integrated Housing Survey of 2004-2005, the major source of income of the city population is salaries/wages and enterprises come a close second. The same survey indicated that close to 50 percent of the total income is used to purchase food stuff while 24.2 percent of the monthly income is used to cover housing, utilities and furnishings and 18.2 percent is for expenses related to transport, communication and recreation.

These findings have an implication on the issue of affordability as the majority of the city residents are low income earners and spend a large proportion of their earnings on food and housing.

3.2.7 Employment

According to 2008 Census, the number of economically active persons was at 260,000. Out of these, 100,000 persons were working in the formal sector.

3.2.8 Gender analysis and mainstreaming

Sections 20 and 41 of the Constitution of Malawi uphold the principle of equal rights for men and women and prohibit any discrimination based on gender or marital status.The Republic of Malawi ratified the Convention on the Elimination of All Forms of Discrimination against Women in 1987. Malawi signed the Optional Protocol in 2000, but has yet to proceed with ratification. It ratified the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa in 2005. Malawi has achieved gender parity with respect to primary school enrolments, which indicates an improvement in attitudes towards girls' education.

The city treats gender and HIV/AIDS as crosscutting issues in all programmes being implemented with the Department of Health taking the lead in the implementation of Gender and HiV/aiDS initiatives. HIV/AIDS rates stood at about 15 percent in 2007 down from about 25 percent in 1996. Other institutions that have contributed to efforts to tackle HIV/AIDs include the National AIDS Commission (NAC) and local development and humanitarian organizations.

The 2010 sex distribution of the district population reveals that there are more males than females in the project area that are likely to be affected. This is attributed to the nature of works involved in the area

such as welding, tyre fitting, garage services, chicken business, butchering services, farm procedure and shops.

Nationally, women constitute 51.4 % of the labour force. However, they tend to participate in a limited range of income-earning activities, predominantly agriculture. In recent years there been an increase in the number of women involved in agriculture. Women employment includes work in homes (daily chores), on family farms/gardens and doing small businesses.

3.2.9 Education and Literacy

Literacy is defined as the ability to read and write. Specifically this analysis classifies all those who can read and write in Chichewa or English or any other language as being literate. Among males, almost 76 percent is literate while half of females are literate.

Education services are provided by the government. By the year 2020, Lilongwe Urban Education district will provide quality and relevant education to its learners to enable them acquire relevant knowledge, skills, expertise and competencies to perform effectively as citizens of Malawi.

3.2.10 Health and Sanitation (including HIV and AIDS Prevalence Rate

The main challenges facing the health sector include high cases of malaria, high HIV/ AIDS prevalence rates, high shortage of equipment and health facilities, shortage of qualified medical staff in the hospitals and clinics, limited capacity, and poor sanitation and hygiene.

Lilongwe has the full range of diseases including cholera, typhoid, tuberculosis (TB), measles, infectious hepatitis, malaria, and HIV/AIDS. Malaria is the leading cause of morbidity and mortality in the City, especially among children under five years old. Malaria accounts for 40 percent of all outpatient visits to health facilities. Pneumonia and diarrhea are the other leading causes of death in children under five years old. Despite the continuing presence of these diseases, on the whole, Malawi's health conditions appear to be improving. The impact areas are mainly affected by malaria, pneumonia, diarrhoea, common injuries, chicken pox outbreaks and HIV/AIDS. Malaria is still the biggest health challenge with over 206,830 cases reported in the city. Most of the malaria cases were reported in the low-income areas and the informal settlements.

Lilongwe has a lot of people from different areas with different interests, most of these people come to the city with different types of diseases, others are referred from Lilongwe rural health centres to Lilongwe urban main hospitals such as Kamuzu Central Hospital and Bwaila clinic. The majority of people are not satisfied with the quality of healthcare.

3.2.11 Socio-economic Activities

While the nation of Malawi is primarily a rural culture with most of the population living in rural areas, recent famines and high levels of unemployment have created higher levels of migration to the cities. According to 2008 Census, the number of economically active persons was at 260,000. Out of these, 100,000 persons were working in the formal sector. The tertiary sector is the largest accounting for 78 percent of the jobs in the formal sector, primary sector accounts for 13 percent while the remaining 9 percent of the formal employment is in the secondary sector. 76 percent of Lilongwe's population live in informal settlements while poverty stands at 25 percent and unemployment is at 16 percent. The civil

service employs about 27 percent of all formal workers while 40 percent work in the private sector and 2 percent are self-employed. Those that are working earn little money and are usually below the poverty line.

3.2.12 Water Supply

3.2.12.1 Development of water facilities for Lilongwe Water Board

Development of water facilities for Lilongwe Water Board started long before 1966. In order to meet the water demand for Lilongwe City and the surrounding areas, LWB has implemented several major projects in three phases. The first phase was the First Lilongwe Water Supply Project (FLWSP). This phase, which was completed in 1966, included construction of Kamuzu Dam I with raw water storage capacity of 4,500,000 m^3.

The second phase was the Second Lilongwe Water Supply Project (SLWSP). This phase, which was completed in 1992, included construction of Kamuzu Dam II with raw water storage capacity of 9,200,000 m^3.

The third phase was the Third Lilongwe Water Supply Project (TLWSP), which started in 1994 with the development of a Master Plan on water supply status for the Board and resulted in commencement of construction works in 1998. The major components of the project included raising Kamuzu Dam II by 5 m, which increased the raw water storage capacity from 9.2 to 19.8 million m^3. The raising of height for Kumuzu Dam-II was considered as stage 1 of the TLWSP and was meant to meet the water demand up to year 2005. Details of the raw water reservoir (dams) are provided in Table 3.7.

Table 3.7 Details of Raw Water Reservoirs (Dams) for Lilongwe Water Board

Reservoir	Location	Year of construction	Maximum depth (m)	Volume at TWL (m^3)
Kamuzu Dam I	Malingunde	1966	20	4.5×10^6
Kamuzu Dam II	Msinja/Masula	1992 1999	28 33	9.2×10^6 19.8×10^6

3.2.12.2 Population and Water Demand Projection

Per the 2008 population census by the National Statistical Office (NSO), the City of Lilongwe had a total population of 669,021. The projected average population growth rate for the city up to 2015 was 5.49%. The high population growth rate is because of the increased influx of people from the rural areas, expansion of the city at its peripherals, high birth rate and reduced mortality due to improved health services (NSO, 2008). Table 3.8 provides details of the projected water demand for Lilongwe City up to 2025. The demand has been presented in three scenarios as high where population growth is estimated at 4%, medium where population growth has been estimated at 3.5% and low where the population growth has been estimated at 3.0%.

Table 3.8 Projected water demand for Lilongwe City up to year 2025

Demand Scenarios per population growth	2000	2005	2010	2015	2020	2025
	m^3 /day	m^3 /day	m^3 /day	m^3 /day	m^3 /day	m^3 /day
High Demand (4.0%)	39,809	50,470	66,112	87,323	109,006	135,873
Medium Demand (3.5%)	39,809	49,832	62,869	74,435	87,786	103,101
Low Demand (3.0%)	39,809	51,584	58,815	66,564	75,353	85,326

Source: Water Resource Development Study Plan, 2000

More recent water demand assessments suggest that LWB needs to augment its production capacity in the medium to long term, even under the most conservative scenarios. Current peak water demand is estimated at 130,000 m^3/day, and this is projected to increase to 170,000 m^3/day by 2025 and 220,000 m^3/day by 2035 (see Figure 3.4 below). At present, there are two existing water treatment works with a combined design production capacity of 125,000 m^3/day. However, on average, the plants are operating at 70 percent capacity producing an average of about 90,000 m^3/day – of which about 32,400 m^3/day (36%) is unaccounted for. The low production efficiency is due to a combination of factors: low yields from the Kamuzu dam system during the dry season; poor raw water quality; inefficiencies in the existing treatment processes; and limitation in the hydraulic capacity of the distribution network.

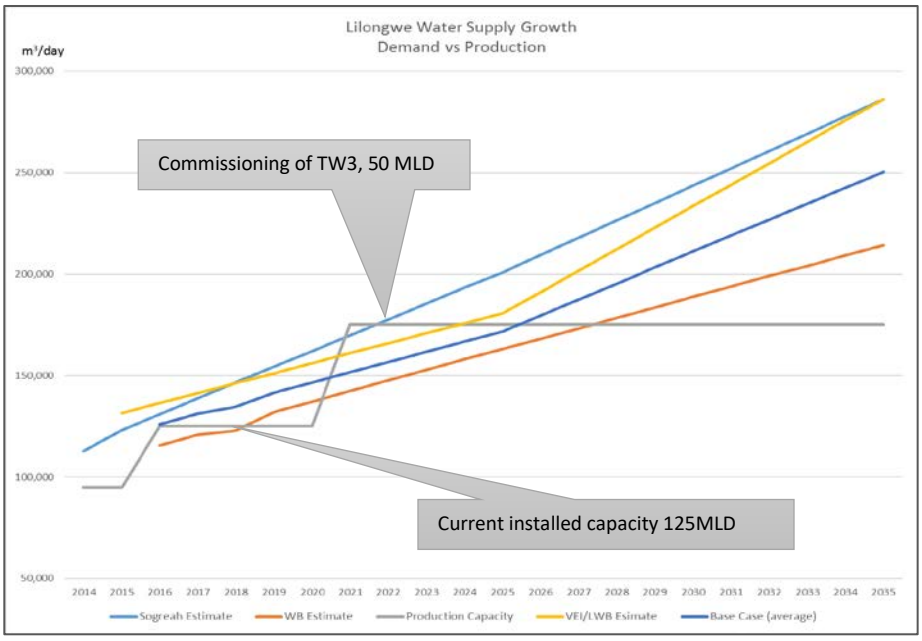

Figure 3.3: Recent Water Demand Projection Vs Production

LWB plans to raise the height of Kamuzu Dam 1 (KD1)[1] by 7m to increase abstraction capacity, which would enable full utilization of the installed production capacity and allow for an additional 50,000 m^3/day expansion in water production capacity (TW3), reaching a total production capacity of 175,000 m^3/day – enough to meet projected 2025 demand. Beyond 2025 however, the city will need a new water source.

To increase water supply to meet the growing demand for water in the city, LWB intends to establish new raw water sources at Diamphwe, Lake Malawi and underground water from Air Wing, which will result in increased water availability that Lilongwe Water Board will need to distribute to more consumers in the City and the surrounding areas, which will require water distribution system upgrading and construction of more storage reservoirs. The quality of groundwater in Malawi is highly dependent on aquifer lithology and is highly variable spatially. Table 3.9 provides details of borehole water quality for the Air Wing Lilongwe.

Table 3.9 Borehole water quality test results from Air Wing

Parameter	Units	Results				WHO guideline values f drinking water
		BH 1 (i)	BH 1 (ii)	BH 2	BH 3	
Bicarbonate (HCO_3^{2-})	mg/l	219.5	241.5	258.5	148.8	-
Chloride (Cl^-)	mg/l	14.4	14.4	16.3	20.1	<600
Sulphate (SO_4^{2-})	mg/l	95	100	210	235	<400
Nitrates (No_3^-)	mg/l	0.7	0.7	0.9	0.9	<45
Fluoride (F^-)	mg/l	0.02	0.04	0.12	0.14	<1.5
Sodium (Na^+)	mg/l	16.7	16.9	18.3	17.3	<200
Potassium (K^+)	mg/l	3.73	3.68	4.38	4.03	-
Calcium (Ca^{++})	mg/l	81.7	71.3	134.5	94.5	<200
Magnesium (Mg^{++})	mg/l	6.3	11.7	5.8	22.4	<150
Iron (Fe^{++}	mg/l	0.00	0.00	0.00	0.22	<1.0
Manganese (Mn^{++})	mg/l	ND	ND	ND	ND	<0.50
Conductivity	µs/m	549	542	778	712	-
Total Dissolve Solids (TDS)	mg/l	384	379	545	498	<1000
Total Hardness	mg/l	230	226	370	328	<500
Alkalinity	mg/l	180	198	212	122	50 – 400
Phosphates	mg/l	1.36	1.56	1.27	1.65	-
pH	pH units	6.9	6.9	6.8	6.5	6.5 – 8.5
Turbidity	NTU	2.4	2.4	1.6	4.7	<5
Suspended Solids	mg/l	5.4	5.6	4.4	6.2	<25
Fecal coliforms	CFU/100ml	0	0	0	0	0

Note: ND = Not done due to technical issues

[1] KD1 raising is financed by EIB and it is at works procurement stage. ESIA and RAP were completed for the KD1 raising.

The results in Table 3.9 show that water from boreholes at the Air Wing in Lilongwe is fit for human consumption. If LWB is to supplement its water supply sources for domestic use, then the water must be drawn from the Air Wing.

Irrespective of where the water comes from, LWB will need to invest beforehand in the distribution network to improve its hydraulic capacity, reduce losses, and expand the reach of the network to serve more customers.

3.2.12.3 Lilongwe Water Supply and Coverage

Water supply coverage in Lilongwe is estimated at 70 percent of the population. Expansion of water supply network to different parts of the city is constrained partly by the availability of developed water sources and by the presence of old water distribution networks in the city, which is resulting in more water losses. The need to upgrade, rehabilitate and operate new water supply networks has become urgent and imminent now with the demand for water in many parts of the city and the surrounding areas growing annually. It is therefore important that the Board works on reducing water losses and improving quality of services to supply water to the existing customers.

3.2.13 Wastewater Management

The Lilongwe City Council (LCC) is responsible for providing sewerage and sanitation services in the City. The City derives its authority to do so from the Public Health Act (34:01) of 1996. Houses in the traditional housing areas largely depend on pit latrines for disposal of human waste. In those houses, household wastewater is discharged untreated and seeps underground. Human waste also seeps underground from pit latrines affecting the quality of underground water.

In Lilongwe, 19.8% use septic tanks. When full, septic tanks are emptied and the contents transported to disposal ponds. The ordinary or conventional dug-out pit latrine, with or without a superstructure of either logs or a concrete slab over the pit, is the dominant fecal-disposal measure. A standard pit latrine may be 3 m deep and is designed to last up to 10 years. About 71% of the city's population uses pit latrines. There are some VIP (ventilated improved pit) latrines, which have a concrete slab, permanent superstructure and a pipe to remove odor and keep out flies and only 9% of Lilongwe's population is served by a sewerage system.

For permanent residential units, septic tanks are required and designs need to be approved by the planning authority. There is no regulation on septic tank de-sludging and people remove sewage at their own convenience.

The Draft Lilongwe Urban Structure Plan estimated that the total sewerage generation is around 5,280 cubic meters per day which is less than the current treatment plant capacity. There are seven treatment plants in the City namely: Kauma 1 and 2, Kanengo North pond, Kanengo South pond, KIA pond, Chipasula Secondary School, Kamuzu Barracks. Only 9% of the city is attached to the sewage system.

3.2.14 Solid Waste Management and Sanitation

Lilongwe City Council (LCC) is in charge of waste management in the city. The Cleansing Services within the LCC is responsible for waste collection and disposal. Waste management is largely focused towards planned areas. The informal urban areas, which include over 60 percent of the urban population, have little access to waste management services provided by the LCC, mostly serving the markets.

A survey done by the University of Malawi indicated that generation varies between 3.3. and 3.7 kg per household in high density areas, 5.2 and 6.8 kg per household in medium density areas and between 6.7 and 14.2 kg per household in low density areas. It is estimated that the city generates about 335 tons of solid waste per day. Per the annual report of reporting services (2007-08), annual collection is 31,431.78 tons translating to an average daily collection of 86 tons per day. Thus, the current collection is less than 30 percent of daily generation. Collection from medium and high income areas is regular, while in low income areas, households dispose the waste either in waste pits within their plot or in skips located in the neighborhoods. In low and medium density, residential areas, garbage is collected once a week and for high density residential areas, waste skips are placed in strategic locations. Waste is collected by skip carriers once a week. There is limited waste collection from informal areas due to problems of accessibility resulting into garbage being dumped everywhere as shown in Figure 3.4.

Figure 3.4 Waste Disposal in Lilongwe City

The proposed project is located within a high-income area that is served by the City Assembly. However, due to distance from the development to the dumpsite it is recommended that waste requiring removal is minimized by activities within the site, e.g. composting of organic material and recycling of combustible material. There is need for appropriate on site garbage storage facilities.

At household level, most families, because of lack of knowledge on the use waste as manure or on separation as noted above, have the option either to bury filled pits and dig a new one (31%), or burn the

waste (6.2%) when pits are full. Very few (4.1 %) would use the waste as manure on their gardens. A block leader in Mgona, to emphasize the shortage of land in his area, told enumerators that he had asked his neighbours to dispose of all their solid wastes at his premises to bury a large drain so that his land increases in size. Those surveyed who did not respond to this question (25.4%) may include those disposing of waste on road- or river-sides, open areas and skip sites

The construction site wastes and building materials must be properly managed and disposed of to reduce the risk of pollution in elements such as soil, ground water and air.

3.2.15 Transport

Minibuses are the most common means of public transport in Lilongwe as shown in Figure 3.5.

Figure 3.5 Some mode of transport in the City of Lilongwe

An average of about 40 percent of the population rely on minibuses to transport them from one location to another. Taxi services are available but they are too expensive for the poor majority. Bicycle taxis are also increasing in popularity in the peri-urban and low-income areas. However, the current roads infrastructure is inadequate to support the growing number of vehicles leading to increased traffic congestion and a lot of time wasted in traffic jams. The city has one international airport and railway station. Many people however still walk to their various places of work resulting in a high number of

pedestrians. However, the absence of footpaths creates conflict between motorists and pedestrians and has resulted in a high increase in road accidents. The local authorities need to provide adequate transport infrastructure such as footpaths, bicycle paths, safe pedestrian crossings and flyovers, and well-protected bus lay-bys.

The Road Traffic Directorate in the Ministry of Transport and Public Infrastructure provides the legal framework for the transport industry. It administers regulatory provisions governing motor vehicle administration, driver licensing, operator authorization, permit control and other related traffic management controls.

The road network in the City comprises main, secondary and minor roads. MI forms the north-south trunk axis. Secondary and (minor) urban roads extend from M1 to main urban development areas and settlements, especially in the southern part of the city. The total road length is approximately 585 km. Overall, the main and secondary roads are well developed in terms of pavement condition.

The traffic survey carried by the Japanese International Cooperation Agency (JICA) Team indicates that traffic volumes in the city vary between 1,200 and 27,000 cars per day. The most serious bottleneck point is between the Lilongwe Town Hall roundabout and the Old Town in Area 1 where the daily traffic volume is 27,000 cars per day. The traffic volumes of other sections are within the road capacities.

3.2.16 Energy and Electricity

The Electricity Supply Commission of Malawi (ESCOM) is the sole provider of electricity in Malawi. Currently its installed capacity is 302MW (95% hydro; 5% diesel) whilst available capacity is only 265MW against an estimated demand of 295MW. Planned investment in Kapichira-II hydropower plant and the interconnection of Malawi‘s electricity grid with Mozambique in 2011 should help reduce capacity shortages and load shedding and improve supply reliability. However, demand is growing fast and is projected to reach 325 MW, 478 MW and 757 MW for years 2010, 2015 and 2020 respectively. Given the expected load growth, the planned investment will not be sufficient to meet the projected demand. As such this would lead to more load shedding, discouragement of business investment, and would undermine economic development and efforts to reduce poverty. It would also damage attempts to widen access to electricity among Malawi‘s population.

Energy sources in Lilongwe include electricity, fuel wood and paraffin. The Electricity Supply Commission of Malawi supplies electricity in most parts of the city. In Lilongwe, only 26 percent of residents are connected to electricity. The electricity supply infrastructure is old and worn out resulting in frequent power outages and high maintenance costs. Further, the cost of electricity supply is high and inaccessible to the poor. The high reliance on charcoal and firewood for cooking and lighting, mainly by the urban poor, is the major cause of deforestation. The Electricity Supply Commission of Malawi needs to research on new alternatives to improve energy supply, such as solar power. The majority of the population cannot access electricity, hence they use fuel wood for heating and cooking; there is also a high demand for firewood for brick curing. Almost 74% of the population in the city use fuel wood in form of charcoal and firewood.

3.2.17 Cultural, Ancestral framework and Local customs and traditions

Records have it that there is mixing of cultures in Lilongwe city, as a result of co-existence of the major tribes Mang'anja, Chewa, Ngoni, Senga, Tumbuka, Yao and foreigners. Almost all the areas in the study area are ethnically mixed, reflecting a regional trend with significant numbers of settlers from other parts of Malawi. Chichewa is the most common language that is used; other languages spoken are mang'anja, yao and tumbuka. All the tribes have beliefs such as witchcraft and evil spirits/ supernatural gods. All people in the area have different beliefs according to their customs and norms. There are no people that are considered indigenous according to World Bank OP 4.10 definition in the project area or Malawi as a whole. Annex 7 provides details for Chance Find Procedures, which outline what needs to be done should the project come across archaeological sites, historical sites, remains and objects, including graveyards or individual graves during excavations or construction.

3.2.18 Monuments and Buildings

In terms of specific places of cultural and historical interest, Lilongwe has a few, including original mission stations and centres of excellence for handicrafts however, the project will not interfere with any monuments or buildings and no cultural heritage is expected to be affected by the rehabilitation and upgrading of existing water pipelines. Chance Find Procedures will be used by the project in case any unexpected physical cultural resources are found.

3.2.19 Religion and sacred sites

Most religions have a Christian base, with only 14 % following animism and Gule wamkulu, and 1% being Muslim in Lilongwe city. There are a variety of churches; however, the main church following was with the Church of Central African Presbyterian (CCAP), the African Abraham Church, and Catholicism.

There are a number of sacred sites in the city which include grave yards but none of the grave yards will be affected by the project.

3.2.20 Local Settlements

A number of factors were considered when selecting the proposed project site. The networks will follow the already established water way for Lilongwe Water Board which are usually in road reserves. However, there might be a few diversions due to other reasons. Land Use and Settlement and Practices in the Proposed Project Area will be used.

The most common challenges faced by residents in the settlements surveyed have been grouped into six categories, as outlined in Figure 3.6.

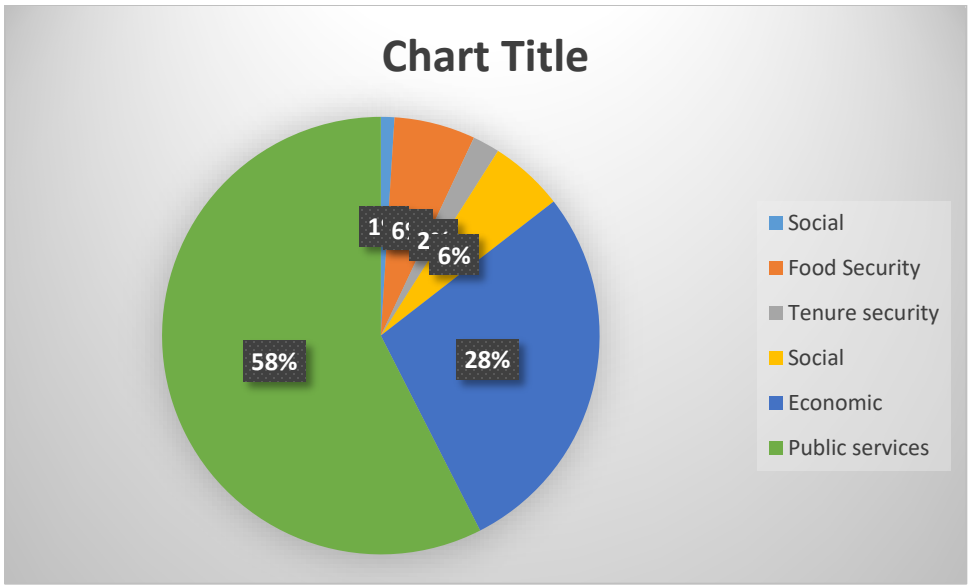

Figure 3.6 Most common types of challenges faced in the settlements surveyed

Accessing public services is the most prevalent (57.5%) challenge, while economic challenges such as accessing finance are second most common. The below charts provide further details on types of economic and public services access challenges residents in the settlements face. However, it is anticipated that there would be negative and positive impacts. Some of the positive socio-economic impacts that the study identified included:

a) Increased water production and hence reduced water shortage;

b) Increased employment opportunities for the local people;

c) Creation of market for goods and services due to availability of running water;

d) Increased economic activities within the project area;

e) Increased economic development in the country;

f) Increased tax revenues for the Government though payment of water; and

g) Improved living and welfare standards of people of Lilongwe

3.2.21 Resettlement and compensation

The proposed project will not cause any permanent displacement of people, institutions and their property hence issues of resettlement will not arise. The pipelines for the water distribution networks and the associated facilities will be constructed along the road reserves except in places where the pipeline will cross the road and in highly built up places like market places and in some residential areas. In such places, the project will cause temporary disturbances, which shall include damage to road pavements, concrete driveway, different building structures; obstruction to passage on the roads; disruption of public

services; and temporary loss of business activities. LWB will compensate all the project affected persons for the different losses arising from such disturbances.

Consultation with stakeholders showed that there will be three types of compensations to the PAPs, which shall include:

a) Monetary compensation to the PAPs who will experience temporary disturbance/loss of business for the whole period that they will lose business;

b) Monetary compensations to the PAPs who will experience permanent loss of property such as trees and structures belonging to different PAPs that shall be destroyed as a whole or experience partial damage; and

c) "In-kind" compensation through a Contractor, LWB will replace damaged infrastructures such as damaged road pavements; damaged concrete driveway; damaged different building structures; and disruption of public service.

In all, money amounting to U$D 415,184.76 will be used to pay for compensation. Details of the compensation schedule are provided in Annex 7 while Table 3.9 provides a summary of details of the items on which compensation will be paid.

Table 3.10 Summary of the compensation details

Description of Disturbance	Frequency	Amount (MK)	Amount (U$D)
Concrete Driveway Cut	113	109,553,498.60	149,052.38
Tarmac Road Section Cut	41	159,600,000.00	217,142.86
Business Disturbed	150	26,631,500.00	36,233.33
Trees, Crops and Grass & Flower Lawn	11	2,499,000.00	3,400.00
Structures to be Demolished	2	6,722,800.00	9,146.67
Mtl Manholes	2	154,000.00	209.52
Total	**363**	**305,160,798.60**	**415,184.76**

3.2.22 World Bank Grievance Redress Mechanism for communities and individuals

Communities and individuals who are not necessarily PAPs but living in the project area can be negatively affected by the project activities. These communities and individuals can submit their complaints to the existing project level Grievance redress committee established under the project or directly to the World Bank (WB) Grievance Redress Service (GRS) since the project will be supported by the WB. The GRS ensures that complaints received are promptly reviewed to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's

independent Inspection Panel which determines whether harm occurred, or could occur, because of non-compliance to the WB policies and procedures.

Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond.

3.2.23 Establishment of the Grievance Redress Committee

The project investment will have a Grievance Redress Committee (GRC) established for handling grievances related to environmental and social concerns. The committee will be established as soon as the project is approved before implementation of the RAP. The GRC will be ad hoc institutions established primarily for the sub project investment and will have no legal mandate and will follow the Grievance Redress Process provided in Table 3.10. The GRC will be established under the guidance of the District Commissioner of Lilongwe District and will be composed of the following:

a) Project Affected Communities or Individuals representation;
b) Lilongwe Water Board;
c) District Environmental Officer;
d) Representatives from Ministry of Labour;
e) Contractor/Engineers;
f) Women and Youth Representatives; and
g) Representation of active NGOs or CBOs in project area.

Table 3.11 Grievance Redress Process

Process	Description	Time Frame	Other information
Identification of grievance	Face to face; phone; letter, e-mail; recorded during public/community interaction; others	1 Day	Email address; hotline number
Grievance assessed and logged	Significance assessed and grievance recorded or logged (i.e. in a log book)	4-7 Days	Significance criteria: Level 1 –one off event; Level 2 – complaint is widespread or repeated; Level 3- any complaint (one off or repeated) that indicates breach of law or policy or this ESMP provisions
Grievance is acknowledged	Acknowledgement of grievance through appropriate medium	7-14 Days	
Development of response	Grievance assigned to appropriate party for resolution Response development with input from management/ relevant stakeholders	4-7 Days 7-14 Days	
Response signed off	Redress action approved at appropriate levels	4-7 Days	Project staff to sign off
Implementation and communication of response	Redress action implemented and update of progress on resolution communicated to complainant	10-14 Days	
Complaints Response	Redress action recorded in grievance log book Confirm with complainant that grievance can be closed or determine what follow up is necessary	4-7 Days	
Close grievance	Record final sign off of grievance If grievance cannot be closed, return to step 2 or refer to sector minister or recommend third-party arbitration or resort to court of law.	4-7 Days	Final sign off on by LWB Project Management Unit Manager in liaison with Lilongwe City Council

CHAPTER 4 REVIEW OF RELEVANT POLICIES, LEGAL AND ADMINISTRATIVE FRAMEWORK

4.1 Malawi's environmental regulatory framework

Malawi has over the years, developed a number of policies and legislative frameworks to guide environmentally and socially sustainable development in various sectors of the economy through mainstreaming of environmental and social issues in project planning and implementation. These include the Constitution of the Republic of Malawi of 1995; different policies and pieces of legislation. Besides, Malawi also uses different international procedures, policies and guidelines where national laws, policies, procedures, guidelines and legislation are falling short to guide sustainable development.

This chapter therefore outlines the policies, legislative and administrative framework relevant to guide implementation of activities of the proposed project.

4.1.1 Policy framework

The Constitution of the Republic of Malawi, 1995, in section 2.1.2 provides for setting up of various national policies to guide implementation of different project activities in the country. Some of the policies relevant to the activities of the proposed project are discussed below.

4.1.1.1 National Environmental Policy, 2004

The National Environmental Policy, 2004, aims at narrowing the gap between the degradation of the environment and depletion of the natural resources on one hand and development on the other. The Policy promotes sustainable social and economic development through sound management of the environment and natural resources. The policy seeks, among other things, to:

a) Secure for all persons now and in the future an environment suitable for their health and wellbeing;

b) Promote efficient utilization and management of the country's natural resources and encourage, where appropriate long-term self-sufficiency in food, fuel wood and other energy requirements;

c) Facilitate the restoration, maintenance and enhancement of the ecosystems and ecological processes essential for the functioning of the biosphere and prudent use of renewable resources;

d) Integrate sustainable environment and natural resources management into the decentralized governance systems and ensure that the institutional framework for the management of the environment and natural resources supports environmental governance in local government authorities;

e) Enhance public education and awareness of various environmental issues and public participation in addressing them; and

f) Promote local community, NGO and private sector participation in environment and natural resources management.

The activities of the proposed project shall among other things involve clearing, excavation and levelling of soil, transportation of materials, and construction of manholes and the associated structures, which will have the potential to cause occupational harm and pollution of the environment and soil degradation. The implication of the policy is that the project has to put in place measures to reduce adverse impacts arising from the activities of the project and that implementation of the activities of this project has to take sustainability issues on board.

4.1.1.2 National Water Policy (2005)

The overall policy goal is sustainable management and utilization of water resources, in order to provide water of acceptable quality in sufficient quantities. It aims at ensuring efficient and effective provision of potable water and sanitation that meets the basic needs of every Malawian. The proposed project is in line with the policy goal as it aims at improving water distribution to different consumers in the City of Lilongwe as well as the surrounding areas in order to provide safe and adequate water to the consumers. Lilongwe Water Board will therefore be required to implement the project activities in accordance with the provisions of this policy.

Furthermore, activities of the proposed project have the potential to negatively affect the water resources. It is therefore recommended that implementation of the activities of the proposed project should minimize pollution of the public water thereby promoting public health and hygiene and environmental sustainability.

4.1.1.3 Republic of Malawi Gender Policy, 2008

Malawi Government appreciates that gender inequality is a significant constraint to socio-economic growth and poverty reduction. The policy specifies that Government has a responsibility to integrate gender into the development, design, implementation, and monitoring of different development programs.

According to this Policy, Government of Malawi is expected to implement a constitutional obligation of building a society where men, women, boys and girls equally and effectively participate in and benefit from different development processes. The proposed project will benefit women more when implemented as it will have significant gender dimensions as well. Instead of spending a considerable amount of time and energy on daily basis fetching for water for household uses, women will be able to improve their living conditions just as men as the availability of water within easy reach will give them adequate time for more productive activities and leisure. Furthermore, the project will ensure that wherever there are any employment opportunities, women will be given equal chances as men for employment. Deliberate effort will also be made to ensure that among the employees, 40% should be women.

4.1.1.4 National Sanitation Policy, 2008

The National Sanitation Policy provides a broad framework and policy guidelines to enhance and support sanitation coverage in the country through formulation of sanitation strategies, plans and programs at all levels for improving the quality of life of the people of Malawi and the physical environment necessary for health life. The primary focus of the policy is on the safe disposal of excreta away from the dwelling units and work places by using a sanitary latrine and includes creation of an open defecation free environment along with the safe disposal of liquid and solid wastes and the promotion of health and hygiene practices in the country.

For any social and economic development to take place, adequate sanitation in conjunction with good hygiene and safe water are essential. Lack of clean water and poor sanitation causes many diseases and the spread of diseases. It is estimated that inadequate sanitation is responsible for 4.0 percent of deaths and 5.7 percent of disease burden worldwide. A number of studies have also shown that improvements in drinking water and sanitation (WASH) lead to decreased risks of waterborne diseases such as diarrhea. Such improvements might include for example use of water filters, provision of high-quality piped water and sewer connections.

The present project is therefore in support of the National Sanitation Policy as in intends to upgrade, rehabilitate, expand and operate water distribution networks in different parts of the city of Lilongwe in order to make adequate, safe and clean water accessible to the city residents and different institutions there by improving the health and wellbeing of the city residents.

4.1.1.5 National Land Policy, 2002

The project will cause loss of land and property; damage to road pavements; damage to concrete driveway; damage to different building structures; obstruction to passage on the roads; and disruption of public service utilities. The land belongs to different individuals and institutions, which they are currently using for different livelihood activities. The policy guides land management and administration in Malawi. It introduces major reforms intended for land planning, use, management and tenure and provides clear definition of land ownership categories (Section 4); addressing issues of compensation payment for land (Section 4.6). The policy has provisions for environmental management, urban management of solid and liquid wastes, protection of sensitive areas, agricultural resource conservation and land use, community forests and woodland management.

The National Land Policy has a few sections which briefly makes reference to matters relating to land acquisition. It alludes to necessity of having provisions in the land law that would give the Government the opportunity to acquire any piece of land required for public services following guidelines such as:

a) Clearly spelling out or specifying the purposes for which Government may require the land to prevent possible abuse of the power of eminent domain;
b) Payment of compensation in the event of the repossession of a leasehold interest on Government land, to be limited to the negotiated value of improvements made by the leaseholder; and
c) No compensation to be paid for the land, when the private user rights granted as a result of the lease are terminated.

The Land Policy recognizes Government's duty to protect the free enjoyment of legally acquired property rights on land and a landholder's entitlement to fair and adequate compensation where the Government acquires property for public use. It further stipulates that compensation valuation for customary land, at the time of acquisition by the Government, be based on the open market value of the land and all improvements carried out on the land.

The Policy notes that the inadequacy of compensation is always a direct result of excluding certain items or qualities from the factors considered when determining the value; and delays in payment of compensation.

While this remains a policy document only and therefore not as binding as the legislation, it is significant in that it reflects the approach of the state to land management. Besides, given that this policy is later in time to the Constitution, it is arguable that the policy considers constitutional dictates unlike the previous pieces of legislation. Project management therefore need to have regard to the policy direction. The proposed project will not require some land close to residential as well as market areas and will cause temporary disturbance of peoples' business and loss of land for different socio-economic activities. Thus, issues of compensation will arise.

4.1.1.6 Malawi National HIV/AIDS Policy (2003)

Once the project is implemented, the project area will experience a very high rate of influx of people some seeking employment and others plying different types of trade. The social interactions that will result thereafter and the increased money circulation in the area will result into increased cases of relationships between members of opposite sex, which is likely to result into increased cases of HIV and AIDS and other sexually transmitted diseases. The Malawi National HIV and AIDS policy was adopted by government in 2003 to prevent HIV infections, reduce vulnerability to HIV, improve the provision of treatment, care and support for people living with HIV and AIDS and mitigate the socio-economic impact of HIV and AIDS on individuals, families, communities and the nation.

Chapter 7 of the Policy observes that in workplaces unfair discrimination against people living with HIV and AIDS has been perpetuated through practices such as pre-employment HIV and AIDS testing, dismissal for being HIV and AIDS positive and the denial of employee benefits if known to be infected. HIV and AIDS affects every workplace. Absenteeism and death impact on productivity, employee benefits, production costs and workplace morale.

As a way of implementing the Malawi National HIV and AIDS policy, the project proponent will implement an HIV and AIDS workplace policy and prevention, treatment, care, support and impact mitigation program as one way of effectively reducing and managing the impact of HIV and AIDS in the work place. Furthermore, the developer will employ more people from the project area to ensure that workers continue to live with their families hence no temptation to indulge in temporary casual relationships.

4.1.1.7 Guidelines for Environmental Impact Assessment (1997)

The Environment Management Act and the EIA Guidelines provide for the administrative framework of the EIA process. The EIA process is managed by the Director of Environmental Affairs. The Director of Environmental Affairs works with other line Ministries/agencies and stakeholders. Under section 26 of the Environment Management Act, a prescribed project cannot receive the required authorization to proceed from the relevant licensing authority unless the Director has issued a certificate that an EIA is not required or that he has approved the project based on an EIA report.

The Director is empowered under the Act to require changes to a project to reduce environmental impact and to reject a project, if, in his view, the project will cause significant and irreparable injury to the environment. A person not satisfied with the decision of the Director may appeal to the Environmental Appeals Tribunal.

The Director relies upon the advice of the Technical Committee on the Environment established under section 16 of the Environment Management Act to make his determination. Through this committee, member agencies are informed about projects being appraised; participate in reviews of project briefs, EIA ToRs and EIA reports; develop project approval terms and conditions; develop and monitor project auditing conditions; and recommends courses of action to the Director. The Director is not bound by the advice of the Committee to arrive at any action that may be considered necessary.

Institutional responsibilities for the co-ordination, planning, administration, management and control of development and environmental issues are fragmented among many agencies, ministries and organizations. The major institutions to be involved in this project shall include:

a) Environmental Affairs Department;
b) Lilongwe District Councils;
c) Ministry of Lands;
d) Ministry of Agriculture, Irrigation and Water Development;
e) Water Resources Board;
f) Ministry of Health;
g) Ministry of Labour and Vocational Training;
h) Ministry of Local Government and District Administration;
i) Department of Physical Planning.

During the preparation of the EIA report, these major institutions and/or their documents were consulted for their technical advice, expert knowledge and concerns or future programs as related to the project.

4.1.2 Legal Framework

The section provides a review of the key national legislation pertinent to the construction and operation of the proposed project. LWB intends to develop and operate the proposed project in line with all relevant national laws. Details of the legal frameworks considered are presented in the sections that follow.

4.1.2.1 The Constitution of Republic of Malawi, 1995

The Constitution of the Republic of Malawi (1995) is the supreme law of the land. It contains, among other things, principles of national policy in Section 13. The section sets out a broad framework for sustainable environmental and social management at various levels in Malawi. Among other issues, the section provides for environmental and social issues under Principles of National Policy. Section 13 (d) of the Constitution provides that the state shall actively promote the welfare and development of the people of Malawi by progressively adopting and implementing policies and legislation aimed at managing the environment responsibly in order to:

a) Prevent the degradation of the environment;
b) Provide a health living and working environment for the people of Malawi;
c) Accord full recognition to the rights of future generations by means of promoting environmental and social protection and sustainable development of natural resources;
d) Conserve and enhance the biological diversity of Malawi; and
e) Enhance the quality of life in rural communities with the aim of attaining sustainable development.

The Constitution further provides for a framework for the integration of environmental and social consideration into any development programs. The implication of this provision is that Government, its cooperating partners and the private sector have a responsibility of ensuring that development programs and projects are undertaken in an environmentally and socially responsible manner. Hence the preparation of this ESMP.

4.1.2.2 Environment Management Act, 1996

The Environment Management Act (1996) makes provision for the protection and management of the environment and the conservation and sustainable utilization of natural resources. Sections 24, 25 and 26 of the EMA provide the legal framework for managing the Environmental Impact Assessment (EIA) process. - Section 24 outlines activities that require an EIA before they can be implemented. A prescribed list of Projects for which EIA is mandatory is provided in Malawi's Guidelines for EIA, 1997. The proposed Project is a prescribed Project under the Environment Management Act and therefore requires an ESIA study before it can be implemented.

Section 26 (3) of the EMA provides that "a licensing authority shall not issue any license under any written law with respect to a project for which an environmental and social assessment is required under EMA unless the Director has certified in writing that the project has been approved by the Minister under EMA or that an environmental and social assessment is not required under EMA."

The Environment Management Act and the EIA Guidelines provide for the administrative framework of the EIA process. The EIA process is managed by the Director of Environmental Affairs. The Director of Environmental Affairs works with other line Ministries/agencies and stakeholders. Under section 26 of the Environment Management Act, a prescribed project cannot receive the required authorization to proceed from the relevant licensing authority unless the Director has issued a certificate that an EIA is not required or that he has approved the project based on an EIA report.

The Director is empowered under the Act to require changes to a project to reduce environmental impact and to reject a project, if, in his view, the project will cause significant and irreparable injury to the environment. A person not satisfied with the decision of the Director may appeal to the Environmental Appeals Tribunal.

The Director relies upon the advice of the Technical Committee on the Environment established under section 16 of the Environment Management Act to make his/her determination. Through this committee, member agencies are informed about projects being appraised; participate in reviews of project briefs, EIA ToRs and EIA reports; develop project approval terms and conditions; develop and monitor project auditing conditions; and recommends courses of action to the Director. The Director is not bound by the advice of the Committee to arrive at any action that may be considered necessary.

Institutional responsibilities for the co-ordination, planning, administration, management and control of development and environmental issues are fragmented among a number of agencies, ministries and organizations. The major institutions to be involved in this project shall include:

a) Environmental Affairs Department;
b) Lilongwe District Councils;
c) Ministry of Lands;
d) Ministry of Agriculture, Irrigation and Water Development;
e) Water Resources Board;
f) Ministry of Health;
g) Ministry of Labour and Vocational Training;
h) Ministry of Local Government and District Administration;
i) Department of Physical Planning.

During the preparation of the EIA report, these major institutions and/or their documents were consulted for their technical advice, expert knowledge and concerns or future programs as related to the project.

4.1.2.3 Lands Acquisition Act No. 21 of 1979 and Lands Acquisition (Amendment) Act No. 9 of 2017

The Lands Acquisition Act No. 21 of 1979 was enacted to provide for the acquisition of land. The Lands Acquisition (Amendment) Act No. 9 of 2017 has amended some provisions of the Lands Acquisition Act, the main one being that the Amendment Act now provides for the acquisition and compensation of land in the citation.

Section 3 of the Act read with the Amendment Act empowers the Minister responsible for lands whenever he/she is of the opinion that it is desirable or expedient in the interests of Malawi, to acquire land for public utility, either compulsorily or by agreement, and pay compensation as may be agreed or determined under the Act.

Sections 5-7 of the Act provide for the issuing of notices upon the persons who are possessed of an interest in the land. According to section 12 of the Amended Act when a notice to acquire land has been issued and published, the land shall revert to the Government as public land within 2 months of the publication of the notice.

Section 9 as amended provides for the payment of compensation. It provides that where any land is acquired by the Minister under this Act the Minister shall pay in respect thereof appropriate compensation agreed or determined in accordance with the provisions of this Act. The Amendment Act further provides that compensation shall be paid in one lump sum; therefore, the assumption is that compensation shall only be monetary.

Amended provisions relating to assessment of appropriate compensation provide that an assessment is to be done by an independent valuer appointed by the Minister, unless the parties agree otherwise. The Amendment to the Act also provides information on the grounds on which compensation can be calculated which include; loss of occupational rights, loss of land, costs of professional advice and disturbances which are a natural and reasonable consequence of the disposition of land. The Amendment has inserted substantive provisions on matters to be taken into consideration in assessing compensation for alienated land under section 10A.

Section 11 of the Act deals with the effect of payment of the compensation and states that a person who has been paid compensation for land cannot make further claims in respect of the land. However, this does not prevent any subsequent proceedings against the person to whom the same was awarded by any person claiming to have a better right to the compensation or the right to a share thereof.

The Act has some implications on the proposed project considering that the proposed project will cause temporary loss of property and business and will also cause some temporary displacement of people and their businesses.

4.1.2.4 The Land Act, 2016

The Land Act, 2016, which repealed the Land Act of 1965, is the principal legislation dealing with land tenure, land use and land transfer. The Commissioner of Lands is responsible for the administration of the Act. Section 7 of the Act recognizes two categories of land namely; public land and private land. Public land is defined as land as held in trust for the people of Malawi and managed by Government, a local government authority and a Traditional Authority. Private land is defined as all land which is owned, held or occupied under a freehold title, leasehold title or as a customary estate or which is registered as private land under the Registered Land Act. The Act recognizes that every person has a natural dependency on land and that it is therefore important that Government provides for secure and equitable access to land as a multipurpose resource and an economic assert by defining issues of security of tenure.

The Land Act outlines some procedures to be followed for land acquisition by individuals or Government including issuance of formal notices to persons with existing land interests to payment of compensation however most provisions relating to acquisition of land are in the Land Acquisition Act as amended. The Act has some implications on the proposed project considering that the proposed project will cause temporary loss of property and business and will also cause some temporary displacement of people and their businesses.

4.1.2.5 Water Works Act (No. 17 of 1995)

This Act mandates the constitution of Water Boards, power and its duties for water supply and sewerage system in their areas. The various boards were established in Malawi and Lilongwe Water Board was established in 1947 and it was reconstituted as a parastatal organization by an Act of Parliament, Water Works Act No. 17 of 1995. The Board is mandated to supply potable water to the City of Lilongwe and the surrounding areas. Its clients include domestic, institutional, industrial as well as commercial customers. Hence the present project is within the mandate of the Board.

The Act also empowers water boards to make by-laws for regulation of water use and prevention of pollution. The proposed project intends to develop the water distribution network within the city of Lilongwe and the surrounding areas, which in a way supports the provisions of the Act. The project will take due consideration of the protection of the environment, the reservoirs the water will be abstracted from, and Lilongwe Water Board Treatment Works against siltation pollution and damage.

4.1.2.6 Water Resources Act (2013)

The Act governs water rights, water abstraction, pollution control, building of dams and water resource planning and development. The Act further prohibits any person to divert, dam, store, abstract or use public water for any other purpose except in accordance with the provisions of this Act. Part VIII, Section 89 (1) of the Act makes it an offence for any person to interfere with, alter the flow of or pollute or foul any public water. The Act defines pollution or fouling of public water to mean the discharge into or near public water or in a place where public water is likely to flow, of any matter or substance likely to cause injury whether directly to public health, livestock, animal life, fish, crops orchards or gardens which such water is used or which occasions, or which is likely to occasion, a nuisance.

The Developer will ensure that activities of the project do not pollute water in the nearby streams and surface water.

4.1.2.7 Occupational Safety, Health and Welfare Act (1997)

The Occupational Safety, Health and Welfare **Act** makes provision for the regulation of the conditions of employment in workplaces regarding the safety, health and welfare of persons employed therein; for the inspection of certain plant and machinery, and the prevention and regulation of accidents occurring to persons. The Act also places a duty of care on contractors throughout the project and similarly, the workers have a duty to take reasonable care of their own safety and health. The Act provides for the need for a fire protection system, fire detection and alarm. The developer must ensure that there is adequate protection for the workers who will be on site as required by the law.

The duty of ensuring safety, health, and welfare of workers is on the employer. However, every employee is required to take reasonable care for his/her own safety and that of other workers. The key provisions relevant to the project under discussions are as follows;

i) Section 13(1) places a duty on every employer to ensure the safety, health and welfare of all his employees at work;

ii) Section 51(1) mandates that manufacturers, importers and suppliers of hazardous substances used at workplaces shall provide sufficient information on such substances as well as the precautions to be taken; and

iii) Section 81 (7) stipulates that where the use of hazardous chemicals is likely to penetrate the skin and cause rash, skin contact with hazardous chemical shall be avoided and personal hygiene and the type of clothing worn shall be such as to enable rapid removal of any chemical from skin contact.

Considering that the project being proposed will involve a lot of labour force and heavy machinery, the Occupational Safety, Health and Welfare Act is important in safeguarding the health and welfare of all workers. The developer must ensure that there is adequate protection for the workers who will be on site as required by the Act.

In compliance to the requirements of the Act, the developer will establish an Occupational Safety, Health and Welfare Policy and program to be implemented by the company. Furthermore, will be provided with appropriate PPE (such as First Aid kits, work place clothes, industrial boots and fire-fighting equipment) and measures will be put in place to ensure that these are used.

4.1.2.8 Town and Country Planning Act, 1988

The Town and Country Planning Act (cap 23.01), is a principal act for regulating land use planning and physical developments in Malawi. The aim of regulating land uses is to enhance orderly spatial physical growth of human

settlements activities. In addition, the law promotes orderly physical planning in order to enhance optimum use of land and service infrastructures, regulate traffic flow protect and conserve fragile environmental systems in space. These objectives are achieved by guiding physical developments and structures within planning areas. The control of developments is regulated under various sections in part V of the Town and Country Planning Act. Section 40 basically prescribes environmental and socio-economic screening for large scale projects such as industrial developments before it can be granted planning permissions under this act. Normally this screening is undertaken by local assemblies and LWB of proposed large projects before they can be sanctioned under this act.

4.1.2.9 Local Government Act, 1998

The Act, as read with Section 146 of the Constitution, provides the mandate to the local assemblies in planning, administration, and implementation of various development programs in their areas. It further provides for environmental functions, which include urban management, local planning, local afforestation programs, control of soil erosion, and appropriate management of solid and liquid waste. Lilongwe District Council where the project will be implemented was consulted with respect to their mandate at the district level and how the proposed project would comply with their planning requirements.

4.1.2.10 Public Health Act, 1982

The Public Health Act requires developers to provide sanitary and health facilities in work places to promote health and well-being of the primary occupants and to avoid harmful effects of waste on public health.

The Environmental and Social Management Plan recognizes the importance of practicing improved hygiene and use of improved sanitary facilities for sustainable livelihood. The developer will comply with the requirements of this Act by constructing sanitary facilities and waste disposal facilities and will ensure good hygiene practices during project construction phase, some of which have been mainstreamed in this Environmental and Social Management Plan (ESMP).

4.1.2.11 Gender Equality Act, 2013

The Act was developed to ensure that men, women, boys and girls equally and effectively participate in and benefit from different development processes. The Act was put in place to assist to:

a) promote gender equality, equal integration, influence, empowerment, dignity and opportunities for men and women in all functions of society;
b) prohibit and provide redress for sex discrimination, harmful practices and sexual harassment; and
c) provide for public awareness on promotion of gender equality.

Considering that the project will employ a number of people both during construction and operation phases of the project, both the Developer and the Contractor will be expected to apply provisions of this Act. The project will ensure that wherever there are any employment opportunities, 40% of the employees shall be women.

4.1.2.12 Employment Act, 2010

The Employment Act is the main labour law. The Act establishes, reinforces and regulates minimum standards of employment with the purpose of ensuring equity necessary for enhancing industrial peace and accelerated economic growth and social justice. The Act prohibits forced labour and child labour as well as discrimination against any employee or prospective employee on the grounds of race, colour, sex, language, religion, political or other opinion, nationality, ethnic or social origin, disability, property, birth, marital or other status or family

responsibilities in respect of recruitment, training, promotion, terms and conditions of employment, termination of employment or other matters arising out of the employment relationship. It also encourages equal pay to employees.

Part V of the Act outlines the types of contracts that may be entered with employees, particulars of employment and how they may be terminated. Part V provides information on hours of work, weekly rest and leave. The Act specifically states that except for guards and shift workers no employees may work for more than forty-eight hours during any week, and no employees may work for more than six consecutive days (excluding overtime) without a period of rest, comprising at least twenty-four consecutive hours. The Act also contains provisions on overtime, payment for working on public holidays, annual leave, sick leave and maternity leave.

Wages are dealt with in Part VII of the Act. The types of wages to be paid depend on the terms of the employment contract. An employee whose wages are fixed by the hour, day or week; or calculated solely on a piece-work or task-work basis should be paid not less often than once a week or fortnight. An employee whose wages are fixed monthly should be paid not less than once a month. The Act also sets out the kinds of payments that are prohibited including promissory notes, vouchers or coupons.

Issues relating to discipline and dismissal are dealt with in Part VIII of the Act which describes the kinds of disciplinary action that can be taken including a written warning; suspension; and demotion. The Act also explains the actions that justify a dismissal but also explains what unfair and constructive dismissal is and the remedies for unfair dismissal.

The developer will ensure that there is adherence to the provisions of the Employment Act and that necessary procedures are put in place and followed in employing, remunerating and where necessary dismissing employees and terminating employment.

4.2 The World Bank Safeguard System

The existing national policies, laws and regulations regarding land acquisition and compensation are consistent with the provisions of different regional and international instruments such as the World Bank Policy on Involuntary Resettlement. LWB will therefore comply with the different national, regional and international instruments when implementing different activities of the proposed project. Furthermore, Malawi is a signatory to various international treaties, agreements and conventions, which aim at conserving the environment and different natural resources. This Section therefore outlines the policies, legislative and administrative framework relevant to guide implementation of activities of the proposed project. Some of the important instruments that are relevant to the project include:

The proposed Project is being developed with support from the World Bank therefore this ESMP was conducted in accordance with the policies and safeguard procedures of the World Bank. During project preparation of this report, the Consultants examined the implications of the proposed project for a series of World Bank Safeguard policies, which include:

a) Environmental Assessment;
b) Natural Habitats;
c) Forestry;
d) Physical Cultural Resources;
e) Involuntary Resettlement;
f) Projects in Disputed Areas; and
g) Safety of Dams.

The most applicable policies to the project are Environmental Assessment, Natural Habitats, Physical Cultural Resources, and Involuntary Resettlement. Environmental Assessment Operational Policy/Bank Procedure (OP/BP) 4.01 applies because the works for the project will have environmental and social implications. Therefore, an environmental assessment must be conducted to determine the scope of such impacts and an Environmental and Social Management Plan developed to avoid, manage and mitigate those impacts.

Trenching activities associated with rehabilitation/expansion of the distribution network may have minimal impacts on natural habitats such as wetlands and rivers during the construction phase; therefore, Natural Habitats OP/BP 4.04 applies.

The project activities will have no impacts on any known physical cultural resources in accordance with Physical Cultural Resources OP/BP 4.11. The project areas are already impacted from the construction of existing water pipelines and treatment works, road network and residential areas such that the chance of encountering any new physical cultural resources are very remote. However, the project ESMF will incorporate chance-find procedures for construction contracts (Annex 5).

It is important to note that there are no Indigenous Peoples in the project area as defined by Indigenous Peoples OP/BP 4.10. Some of the distribution network rehabilitation/expansion works will be in densely populated areas of the city, possibly including informal settlements. In accordance with Involuntary Resettlement OP/BP 4.12, the project is thus expected to disturb settlements, requiring land acquisition leading to temporary or permanent resettlement, and is likely to disrupt livelihood activities. However, no major resettlement is expected in the project. This is because the pipelines will be aligned along the road reserves except where the pipelines will cross the roads or pass through built up areas like market places and other residential areas, which will cause temporary disturbances especially during the construction phase. The disturbances will result in loss of land and property; damage to road pavement; damage to concrete driveway; damage to different building structures; obstruction to passage on the roads; disruption of public service utilities; and temporary loss of business activities. The study showed that 363 households/businesses will be impacted by the project activities. A draft Resettlement Action Plan (RAP) has been prepared to mitigate these impacts.

The Bank classifies projects according to level of risk and potential social and environmental impacts. These categories are:

a) **Category A** – Projects with potential significant adverse social or environmental impacts which are diverse, irreversible or unprecedented;
b) **Category B** – Projects with potential limited adverse social or environmental impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and
c) **Category C** – Projects with minimal or no social or environmental impacts.

Lilongwe Water Board commissioned the Environment and Natural Resources Management Consultants firm to prepare this Environmental and Social Management Plan (ESMP) and the RAP for the project to satisfy Malawi Environmental Laws and World Bank safeguards policies and standards. No major significant or irreversible negative environmental and social impacts are envisaged since the project will invest in activities that support rehabilitation and improvements of infrastructure and service delivery. This project is therefore categorized as a “B” project in accordance with the World Bank Operational Policy 4.01 Environmental Assessment (January 1998) and requires the preparation and implementation of this Environmental and Social Management Plan (ESMP).

4.3 Summary of the licenses that need to be obtained for this project

Table 4.1 provides a list of statutory requirements that will have to be obtained prior to project commencement.

Table 4.1 List of statutory licenses required for in implementation and operations of the proposed Project

List of statutory approvals or licenses to be obtained	Regulatory framework.	Responsible Department	Responsible officer Officer
1. Environmental impact assessment certificate To guide the synchronization of environmental management practices.	Environment Management Act (Cap 60:02)	Environmental Affairs Department	Director of Environmental Affairs
2. Work Place Registration Certificate. To guide on procedures on workers environmental health, safety during project implementation and operations.	Occupational Health, Safety and Welfare Act (Cap 55:01)	Ministry of Labour and Vocational Training	Director of Occupational Health, Safety and Welfare.

CHAPTER 5 PROJECT ALTERNATIVES ANALYSIS

5.1 Do-Nothing /'Without Project' Option

The Do-Nothing/ 'Without Project' Option entails that the proposed development fails to be implemented. In case this happens, positive impacts associated with the proposed project will not be realized. The positive impacts of the proposed project include improved access to adequate safe water supply to the Lilongwe City residents and support of the Malawi Government initiative to achieve the Sustainable Development Goals (SDGs). However, from an environmental management perspective, this alternative will be beneficial in the sense that any potential negative impacts associated with the project will be avoided. The "Do Nothing Option" should not be adopted, as the Lilongwe City are currently facing critical water shortage due to limited water distribution network, low water levels in the service dams namely Kamuzu Dam I and II and an increased demand for potable water due to urbanisation.

5.2 Develop the proposed project

The "Develop the proposed project" option is recommended as a better option than the "Do-Nothing/Without Project" option. The anticipated benefits of implementing the project include:

a) Upgrading and rehabilitation of the Lilongwe City network to reduce water loss and to improve quality of water supply to meet potable water demand and to reach un-served areas;
b) Improved access to adequate safe water supply to the Lilongwe City residents;
c) Ensured sustainability of service provision; and
d) Supporting the Malawi Government initiative to achieve the Sustainable Development Goals (SDGs).

5.3 Different technologies alternatives

This section looks at different technologies alternatives that have to be considered during the planning, design, construction and operation phases of this project. The alternatives to be considered are discussed as follows:

5.3.1 Alternative Excavation Methods

During the construction phase of the project, there will be a lot of excavation works for the pipeline. It is anticipated that some structures will be disturbed or destroyed. Some of the excavation methods that can be considered are as follows;

a) Using Excavator, Trencher or Ditch Witch

The use of an excavator, trencher or ditch witch for excavation is one of the options that can be considered during the planning, design and construction phases of the project. The advantages and disadvantages of this method include the following:

Advantages

i) Fast operation hence less time will be taken to complete the project; and
ii) Less labour will be involved hence less labour related conflicts.

Disadvantages

i) Loss of potential employment opportunity since few people will be employed as labourers;
ii) It requires some space for the machine to operate so in some confined areas like markets, which could result into destroying some property hence high compensation costs; and
iii) It is easy to destroy other utilities like cables

b) Using labour

Advantages

i) Creation of employment during the construction phase;
ii) Less working space is required so it is easy to work in confined areas with minimal disturbance; and
iii) The chance of destroying utilities is minimal.

Disadvantages

i) It is difficult or impossible in some cases to manually excavate hard or rocky soils;
ii) It takes longer to undertake the same tasks manually as compared to using a machine; and
iii) Construction workers will likely be exposed to health and safety hazards like dust.

A careful analysis of the two excavation methods concludes that it will be cost-effective to use both methods during the construction phase of this project. The best way to utilise the two methods is to use labour method in confined areas like markets while the excavator can be used where there is no chance of destroying properties that can attract compensation and reconstruction.

5.3.2 Alternative to Passing Pipeline through Culvert

The option to pass the pipeline through an existing culvert is an attractive option since breaking of the tarmac and other paved driveways will be avoided hence avoiding inconveniencing traffic and also associated reconstruction costs. However, it is important to note that culverts are specifically designed to drain a specific discharge so passing a pipe through it will compromise its capacity. Culverts are usually de-silted during the rainy season for the sole reason of maintaining their capacity to drain the water. Ideally it can be the better option to avoid passing the pipeline through the culvert but it is difficult to do so in practice. In view of this, some considerations must be made during planning, design and construction to address this challenge. These can include the following:

a) Consider designing and construction of a wide inlet drain to the culvert so that it can contain the backflow water due to the reduced capacity of the culvert. Otherwise the backflow water will overtop the road surface hence compromise the strength of the road and safety to the road users when driving along such roads.
b) Depending on the topography, consider diverting water to the existing drainage network or constructing mitre drains.
c) In situations where there are more than one culvert lines close by, consider using a series of smaller pipes to cross the road. For instance, there are three culvert locations and a 450mm pipeline is intended to cross the road, consider crossing the 150mm pipeline at each of the three culvert locations and connect them back to the 450 mm on the other side of the road.

5.3.3 Alternatives to Pipeline crossing the side drain

It is likely that in some situations the pipeline will cross a side drain of the road, if the pipe is big it will obstruct water flow. This can result in the drainage water overtopping onto the road. In this case, arrangements will be made to widen the drains to maintain is normal drainage capacity.

5.3.4 Alternatives to Pipeline crossing the road

In some cases, it will be impossible to avoid breaking the road and pass the pipelines through. In that case, the following considerations shall apply:

a) Alternative routes for traffic must be identified and the general public should be informed in advance. In addition, appropriate signage must be installed to guide traffic flow.
b) In case that there are no alternative traffic routes, the contractor can work on a single lane while traffic is allowed on the other lane. Appropriate signage must be installed to guide traffic flow.
c) Another alternative is to consider working during the night since the traffic flow will below.

5.3.5 Alternatives to building materials for Associated Civil and Building Works

This project is expected to involve some civil and building works. These works include thrust blocks, anchor blocks and man holes. Different choices on the building materials will be made. The choice of building materials is a key determinant of the durability of the built structures, the cost of building the structures and the damage that can be impacted on the environment. Three options, use of burnt bricks, stabilized soil blocks and concrete bricks can be considered as follows:

a) Use of burnt bricks

In Malawi, use of burnt bricks is cheap because they are locally made and can be close to the project site. The traditional fired/burnt bricks are made from soil that is mixed with water, dried in the sun there after baked using wood fuel.

Disadvantage of burnt bricks

Firewood and soil is required to produce burnt bricks. This can lead to destruction of natural forest and land degradation due to formation of borrow pits. Lilongwe Water Board is facing forest destruction and land degradation in Dzalanyama Catchment. The Lilongwe Water Board will avoid supporting deforestation in the Dzalanyama Forest Reserve by prohibiting Contractors from using burnt bricks on its projects.

Advantages of burnt bricks

i) Bricks are strong and durable;

ii) They require low maintenance cost;

iii) Have excellent thermal mass i.e. in winter they keep the buildings warmer while in summer they keep the buildings cooler; and

iv) They are fire resistant.

b) Stabilized soil blocks (SSB)

Stabilized soil blocks are made by mixing soil and cement in appropriate proportions. The process requires skilled labour because the strength of the bricks depends on the mixture and quality of soil used.

Disadvantage of SSB

The use of soils for a large project can lead to borrow pits which can lead to ponding and creation of breeding grounds for disease vectors. However, the cost is lower than the cement blocks.

Advantages of SSB

i) SSB allows users to produce uniform blocks of greater strength than typical fired blocks that provide better thermal insulation;

ii) The total cost of building a structure with SSB is 20%-30% cheaper than building with fired bricks because far less mortar is required;

iii) SSB can be made on site so transportation costs are minimized;

iv) SSB are environmentally friendly because they are cured in the sun as such do not contribute to deforestation as compared to fired/burnt bricks; and

v) The bricks have an appealing aesthetic with an elegant profile and uniform size that doesn't require plastering.

c) Concrete blocks

Concrete blocks are made from a mixture of quarry dust and cement to which water has been added. Like SSB, the mixture is compacted using a manual machine to ensure strength and quality.

Disadvantage of concrete blocks

The bricks are usually expensive due to increased costs of cement.

Advantages of Concrete blocks

i) Like SSB, concrete blocks allow users to produce uniform blocks of greater strength;

ii) Concrete blocks can be made on site so transportation costs are minimized;

iii) Because Concrete blocks are cured in the sun, there is no fuel needed thereby helping to curb deforestation as such they are environmentally friendly like SSB;

iv) Concrete blocks are strong and durable; and

v) Concrete blocks are fire resistant.

After analysing the different building materials, it is recommended that SSB and concrete blocks be considered for construction of the manholes and other building works for the project. Lilongwe Water Board will have to consider Contractors who will indicate that they will use SSB and concrete blocks for construction of the different infrastructure for the project as opposed to those who will indicate burnt bricks.

CHAPTER 6 IMPACT IDENTIFICATION AND ASSESSMENT

6.1 Identification of potential impacts

The rehabilitation, upgrading and operation of the proposed water distribution network in the City of Lilongwe is expected to generate a range of impacts in the different project areas on biophysical and socio-economic environment. Some of the impacts are expected to be positive while others will be negative. The main purpose of this chapter is to identify the potential biophysical and socio-economic impacts that the proposed project is likely to cause; assess their extent and significance; and propose measures to manage the impacts. The positive impacts if properly enhanced will contribute towards social and economic development of the project areas and Malawi. The negative impacts will be properly managed in order to prevent their effects on the biophysical and socio-economic environmental in the project areas. Specifically, the chapter is aimed at the following:

a) Predict the potential environmental and social impacts that will arise from implementation of the proposed project;

b) Assess the possible extent /severity of the predicted impacts (both positive and negative);

c) Assess the significance of the predicted impacts; and

d) Recommend measures for managing the impacts.

6.1.1 Methodology of impact identification

Impact identification was done by analyzing the proposed project activities and determining their influence on the baseline environmental and social characteristics of the proposed project locations. The environmental characteristics of the project include biophysical (topography, soils, climate, rainfall, water resources, flora and fauna) and social characteristics (demography, settlement, land administration and tenure, economic activities, infrastructures and services, and HIV and AIDS).

The following activities were undertaken to determine the different impacts that the project is likely to cause:

a) The routes of the proposed water distribution network were studied and analyzed in order to identify the environmental and social issues to be considered;

b) Site investigations were conducted in the areas of project influence especially the surrounding areas where the pipeline network is proposed to pass to identify the environmental and social issues to be considered;

c) Screening of the anticipated potential and significant impacts of the project, in accordance with the project stages of planning and design, construction, operation and maintenance and decommissioning; and

d) Assessment of environmental and social impacts to describe the positive and negative impacts, both direct and indirect as identified at each stage of the project cycle.

The methodology adopted for impact identification mainly considered the environmental and social impacts at various phases of the project and the activities to be undertaken at each phase. The following phases were considered:

a) **Planning Phase** – Activities under planning and design phase include surveying the sites for construction and operation of the proposed water distribution network; identification and

enumeration of Project Affected Persons (PAPs) and their property; valuation of the PAPs' property; preparation of designs documents for the project; conducting ESMP and RAP studies; preparation of the ESMP and RAP reports; preparation of detailed lay out plans; preparation of tender documents for the Contractors; obtaining approvals under the Town and Country Planning Act and the By-Laws and obtaining all the approvals necessary for the construction and operation of the proposed water distribution network from the City Council and other service providers such as the Roads Authority and Malawi Telecommunications Limited (MTL).

b) **Construction Phase** – For this phase, the main activities include site establishment; mobilization of workers; transportation of construction equipment; excavation of trenches in areas designated for water distribution networks; digging of foundation; stockpiling of excavated materials; construction of thrust blocks, anchor blocks and man holes for take-off points; laying down of new pipes; re-filling of trenches; transportation of construction materials; and restoration of broken roads, paved driveways and concrete pavements and other structures for public utilities pipe installation, and pressure testing.

c) Demobilization Phase – The main activities under this phase include laying off workforce employed during construction phase; demobilization of construction equipment; disposal of construction waste; and disposal of surplus excavated earth.

d) Operation and Maintenance Phase – The main activities during this phase include supplying of water to the people, maintaining the pipe in case of pipe burst, and excavation and backfilling after maintaining the pipes

Furthermore, the impacts were identified by considering project activities including inputs and outputs in the various project phases outlined above and how these would affect various components of the environment. The steps undertaken were:

a) Assessment of baseline conditions

The purpose of assessing baseline conditions was to understand the existing situation as this is the basis for determining changes that may occur because of the proposed project.

b) Assessment of project inputs associated with the proposed project

Project inputs were examined to determine the potential changes and impacts that would be created through the application of project inputs.

c) Assessment of project activities that will be undertaken

Project activities were examined to identify the impacts that the activities would bring on the environment.

d) Assessment of project outputs associated with the proposed project

Project outputs were examined to determine the potential changes and impacts that would happen because of the outputs.

e) Determination of environmental impacts

Based on the above steps, the environmental impacts of the project were identified.

The Leopold matrix was also used to identify several potential environmental impacts that can arise from construction and operation of the proposed water distribution network. Following from the Leopold matrix, a table outlining the list of impacts and their sources was developed as seen in Table 6.1.

Table 6.1: Impacts identified

Phase	Impact/Component	Environmental and Social Impact	Source of Impact
Planning Phase	**Positive Impact**		
	Socio-economic	Creation of temporary employment opportunities for experts in various disciplines	surveying the sites for water distribution network, identification and enumeration of Project Affected Persons (PAPs) and their property; valuation of the PAPs' property; preparation of designs documents for the project; conducting ESMP and RAP studies; preparation of the ESMP and RAP reports; preparation of detailed lay out plans; and preparation of tender documents for the Contractors.
		Source of Government revenue through taxes	Government will be deducting taxes from people employed at the planning stage especially consultants to do different studies
	Negative Impact		
	Socio-economic	Anxiety about loss of property and temporary loss of business	Presence of surveyors and other experts in the project area
Construction Phase	**Positive Impacts**		
	Socio-economic impacts	Creation of temporary employment opportunities for skilled and un skilled work force	Construction of infrastructure for the water distribution network and rehabilitation of broken roads and concrete pavement driveways
		Creation of a market for goods and services	• Influx of people to the area will create a market for goods and services; • Demand for construction materials e.g. cement, sand, aggregate stone and gravel etc
		Skills transfer to local communities, skilled and unskilled workforce in brick laying	Construction of manholes and other infrastructure for the water distribution network and rehabilitation of broken roads and concrete pavement driveways, and plumbing, etc.
		Source of Government revenue through taxes	Government will be deducting taxes from construction workers
		Alternative livelihoods for the local community	A good number of the local community members will be employed at the construction site and will be earning a salary.

Phase	Impact/Component	Environmental and Social Impact	Source of Impact
		Increased income generation to local people, especially women and youth by selling food stuffs to construction Workers	• Influx of people to the area will create a demand for goods and services; • Demand for food
	(2) Negative Impacts		
	Socio-economic	Occurrence of water use conflict	Contractor will draw water from the nearby rivers for construction activities
		Possible damage to road Pavement	Some pipelines will have to cross the roads. Where there are no culverts roads may be cut during excavation
		Possible disruption of public service utilities	Excavation of trenches may damage other utilities
		Construction related accidents	Some construction equipment e.g. an excavator and construction vehicles
		Disruption of traffic flow and public mobility	When cutting roads for pipelines
		Potential labour influx	People from faraway places and beyond will flock to the different project sites in search of employment and business opportunities
	Flora	Loss of vegetation	Land clearing in some places for construction activities by removing trees and other vegetation. Also the production of burnt bricks to be used in construction activities. Burnt bricks will not be used in this project.
	Water resources	Soil erosion and sedimentation of storm water drainage /watercourses	Removal of trees and other vegetation and excavation works will make the soils loose hence making them susceptible to soil erosion through runoff
	Water resources	Pollution of water resources	Poor management and disposal of petrochemicals, domestic and industrial waste and construction materials will cause pollution of water resources
	Air	Air pollution due to dust	Clearing of trees and other forms of vegetation, movement of construction equipment and heavy trucks and machinery and soil excavation will result into increased dust emissions dust
	Air	Creation of noise nuisance and vibration	Excavators and increased vehicular movements

Phase	Impact/Component	Environmental and Social Impact	Source of Impact
		Increased noise levels	Operation of excavators in some places, increased traffic to and from the project site and other construction activities such as rehabilitation of the broken road pavements, which will require heavy machinery
	Land	Generation of solid waste	Solid waste that will result from excavated pipes, trenches excavation and other domestic wastes may result in the impairment of the local traffic in the vicinity of the construction sites; risk of traffic accidents.
	Land	Creation of borrow pits	The project will require some gravel material during rehabilitation of damaged roads and pavements whose extraction will create borrow pits
	Livelihoods	Temporary disturbance of different business activities along the water distribution network	Excavation and laying down of pipes in the water distribution network
		Loss of property	Routing of the water distribution network will in some places result into temporary disturbance of businesses
	Health	Increased incidences of HIV/AIDS and STIs	Influx of people seeking jobs, supplying various goods and services to the area and the resultant disposable income and interactions may result in sexual activities between workers and community members
	Health	Health and safety risks	Vehicular accidents due to increased traffic and traffic jams in some places and accidents from operation of construction machinery especially excavators and machinery for road rehabilitation and general construction works
		Creation of breeding grounds for mosquitoes, which may spread malaria	Trenches for laying pipes once dug and when left for a long time unfilled will create mosquito breeding grounds
Operation Phase	**(1) Positive Impacts**		
	Socio-economic impacts	Improved access to potable water by Lilongwe City residents and surrounding areas	Most residents of the city will have an easy access to potable water by Lilongwe City residents and surrounding areas
	Socio-economic	Increase in government revenue through taxes	When more people are connected to piped water, more revenue will be collected by Lilongwe Water Board, which will result into more taxes

Phase	Impact/Component	Environmental and Social Impact	Source of Impact
	Health	Reduced incidences of water borne (e.g. cholera and diarrhoea) and water washed diseases (e.g. skin infection) due to improved availability of water and improved hygiene and sanitation conditions among the local residents	Availability of piped water in more areas of the city
	Water	Reduction in water losses as more people will be legally connected	With the availability of the water distribution network in the vicinity of many residential areas of the city, many people will be connected legally.
	Socio-economic	Increased economic activities within the project impact area	With the availability of potable water in most of the residential and industrial areas, some businesses which could not operate due to absence of potable will now operate
	Socio-economic	Contribution to increased opportunities for foreign investments	With the availability of potable water in most of the residential and industrial areas, some businesses which could not operate due to absence of potable will now operate
		Improving the welfare of women and children	Women and children will have more time for productive activities other than fetching water
	(2) Negative Impacts		
	Water	Water resource depletion	With the limited raw water storage capacity at the Kamuzu Dams 1and 2, there expansion of the distribution network means increased consumption in the amount of water which will result into ore rationing
	Socio-economic	Unplanned induced urbanization of neighbouring residential areas	Availability of potable water
	Water	Increased losses of the water resources	Increased distribution networks will also result into increased in vandalism of pipes and fittings
	Water	Wasted water, decreased water quality in the system resulting in safety issues and increased energy usage	Water system leaks can reduce the pressure of the water system compromising its integrity and ability to protect water quality (by allowing contaminated water to leak into the system) and increasing the demands on the source water supply, the quantity of chemicals, and the amount of power used for pumping and treatment.

Phase	Impact/Component	Environmental and Social Impact	Source of Impact
	Water	Harm to receiving waters.	Water pipe flushing results in the discharge of flushed water, which may be high in suspended solids, residual chlorine, and other contaminants that can harm receiving waters.
Decommissioning Phase	**(1) Positive Impacts**		
	Safety and health	Reduced number of workers exposed to health and safety risks	Completion of construction
		Reduced risks to accidents	Reduced traffic congestion
		Reduced noise and vibration levels	Removal of construction vehicles and excavators and other construction equipment when rehabilitating the broken roads
		Cleaner environment	Removal of construction rubble
	(1) Negative Impacts		
	Socio-economic	Loss of employment by Contractor's work force	Completion of construction
		Increased of construction waste from the demolished structures	Demolished structures after construction activities will generate a lot of rubble which will require proper disposal
		Loss of business opportunities	A number of businesses will stop to operate as there will be limited construction activities once the power plant becomes operational

6.2 Impacts assessment

After identifying the positive and negative the proposed project will have on the biophysical and socio-economic environment, further analysis was conducted to determine the extent and significance of the impacts. The aspects that were considered were magnitude, significance, probability of occurrence and duration of impacts which have been properly explained.

6.2.1 Magnitude

Magnitude is a measure of the general degree, extensiveness, or scale of impacts. The magnitude was scored at four levels i.e. household level, local level, regional level and national level.

6.2.2 Significance

This is a measure of the importance of a particular action on the environmental factor in the specific instance under consideration. This was scored using values ranging from +3 to - 3 with a score of 1 representing a low/minimal significance, 2 moderate significance and 3 representing a high significance. Impacts of negative significance were assigned a minus (-) sign and impacts of positive significance are given a plus (+) sign.

6.2.3 Probability of occurrence

Provides an estimate of the probability of an impact occurring before mitigation is applied. The impacts were considered as:

a) Possible (impact may occur but it is not probable);

b) Probable (the impact is very likely to occur); and

c) Definite (impact is unavoidable).

6.2.4 Duration

Refers to the period over which an impact may occur, from once-off to continuous for the life of the project. Duration of impacts was considered in terms of the following criteria: Short term (less than 5 years); Medium term (between 5 and 10 years) and Long term (over 10 years). For purposes of this analysis an impact matrix was prepared and is provided in Table 6.2.

Table 6.2 Impact scoring matrix with significance levels

Environmental Impact	**Probability of Occurrence** **Possible** (impact may occur but it is not probable); **Probable** (the impact is very likely to occur); and **Definite** (impact is unavoidable)	**Duration of impact** **Short term** (less than 5 years); **Medium term** (between 5 and 10 years) **Long term** (over 10 years)	**Magnitude of impact** **Household level** – affecting an individual/family **Local level** – affecting a municipality/township, district **National level** – affecting the country	**Significance of impact (-3 to +3)** - High significance, +/- 3 - Medium significance, +/- 2 - Low significance, +/-1 - (+) denotes positive impact (-) denotes negative impact
PLANNING PHASE				
Positive Impacts				
Creation of temporary employment opportunities for experts in various disciplines and people in the project area	Definite	Short term	Local and national level	+2
Source of Government revenue through taxes	Definite	Short term	Local and national level	+2
				+4
Negative Impacts				
Anxiety about loss of property and temporary loss of business	Definite	Short term	Local level	-1
				-1
CONSTRUCTION PHASE				
Positive Impacts				

Environmental Impact	**Probability of Occurrence** **Possible** (impact may occur but it is not probable); **Probable** (the impact is very likely to occur); and **Definite** (impact is unavoidable)	**Duration of impact** **Short term** (less than 5 years); **Medium term** (between 5 and 10 years) **Long term** (over 10 years)	**Magnitude of impact** **Household level** – affecting an individual/family **Local level** – affecting a municipality/township, district **National level** – affecting the country	**Significance of impact (-3 to +3)** - High significance, +/- 3 - Medium significance, +/- 2 - Low significance, +/-1 - (+) denotes positive impact (-) denotes negative impact
Creation of temporary employment opportunities for skilled and un skilled work force like brick laying and other jobs for people in the project area	Definite	Short term	Local and national level	+2
Creation of a market for goods and services	Definite	Long term	Local and national level	+2
Skills transfer to local communities, skilled and unskilled workforce participating in brick laying	Definite	Long term	Local and national level	+1
Source of Government revenue through taxes	Definite	short term	National level	+2
Alternative livelihoods for the local community	Probable	Short term	Local level	+2
Increased income generation to local people, especially women and youth by selling food stuffs to construction Workers	Probable	Short term	Local level	+2
				+11

Environmental Impact	Probability of Occurrence **Possible** (impact may occur but it is not probable); **Probable** (the impact is very likely to occur); and **Definite** (impact is unavoidable)	Duration of impact **Short term** (less than 5 years); **Medium term** (between 5 and 10 years) **Long term** (over 10 years)	Magnitude of impact **Household level** – affecting an individual/family **Local level** – affecting a municipality/township, district **National level** – affecting the country	Significance of impact (-3 to +3) - High significance, +/- 3 - Medium significance, +/- 2 - Low significance, +/-1 - (+) denotes positive impact (-) denotes negative impact
Negative Impacts				
Occurrence of water use conflict	Definite	Short term	Local level	-1
Possible damage to road Pavement	Definite	Short term	Local level	-1
Possible disruption of public service utilities such as water	Probable	Short term	Local level	-1
Construction related accidents	Probable	Short term	Local level	-1
Disruption of traffic flow and public mobility	Definite	Short term	Local level	-2
Creation of breeding grounds for mosquitoes, which may spread malaria	Probable	Short term	Local level	-1
Creation of noise nuisance and vibration	Definite	Short term	Local level	-1
Loss of vegetation	Probable	Long term	Local level	-1
Soil erosion and sedimentation of storm water drainage /watercourses	Probable	Short term	Local level	-1
Pollution of water resources	Probable	Short term	Local level	-1
Air pollution due to dust	Definite	Short term	Local level	-1

Environmental Impact	**Probability of Occurrence** **Possible** (impact may occur but it is not probable); **Probable** (the impact is very likely to occur); and **Definite** (impact is unavoidable)	**Duration of impact** **Short term** (less than 5 years); **Medium term** (between 5 and 10 years) **Long term** (over 10 years)	**Magnitude of impact** **Household level** – affecting an individual/family **Local level** – affecting a municipality/township, district **National level** – affecting the country	**Significance of impact (-3 to +3)** - High significance, +/- 3 - Medium significance, +/- 2 - Low significance, +/-1 - (+) denotes positive impact (-) denotes negative impact
Increased noise levels	Definite	Short term	Local level	-1
Generation of solid waste and waste from excavated pipes and old pipes	Probable	Short	Local level	-1
Creation of borrow pits	Probable	Short term	Local level	-1
Temporary disturbance of different business activities along the water distribution network	Definite	Short term	Local level	-1
Temporary loss of property	Definite	Long term	Local level	-1
Potential Labour Influx Impacts	Definite	Long term	Local level	-2
				-19
OPERATION PHASE				
Positive Impacts				
Improving the welfare of women and children	Definite	Long term	Local level	+3

Environmental Impact	**Probability of Occurrence** **Possible** (impact may occur but it is not probable); **Probable** (the impact is very likely to occur); and **Definite** (impact is unavoidable)	**Duration of impact** **Short term** (less than 5 years); **Medium term** (between 5 and 10 years) **Long term** (over 10 years)	**Magnitude of impact** **Household level** – affecting an individual/family **Local level** – affecting a municipality/township, district **National level** – affecting the country	**Significance of impact (-3 to +3)** - High significance, +/- 3 - Medium significance, +/- 2 - Low significance, +/-1 - (+) denotes positive impact (-) denotes negative impact
Improved access to potable water by Lilongwe City residents and surrounding areas	Definite	Long term	Local level	+3
Increase in government revenue through taxes	Definite	Long term	Local and national level	+3
Reduced incidences of water borne (e.g. cholera and diarrhoea) and water washed diseases (e.g. skin infection) due to improved availability of water and improved hygiene and sanitation conditions among the local residents	Definite	Long term	Local level	+3
Reduction in water losses as more people will be legally connected	Definite	Long term	Local level	+2
Increased economic activities within the project impact area	Definite	Long term	Local level	+3

Environmental Impact	**Probability of Occurrence** **Possible** (impact may occur but it is not probable); **Probable** (the impact is very likely to occur); and **Definite** (impact is unavoidable)	**Duration of impact** **Short term** (less than 5 years); **Medium term** (between 5 and 10 years) **Long term** (over 10 years)	**Magnitude of impact** **Household level** – affecting an individual/family **Local level** – affecting a municipality/township, district **National level** – affecting the country	**Significance of impact (-3 to +3)** - High significance, +/- 3 - Medium significance, +/- 2 - Low significance, +/-1 - (+) denotes positive impact (-) denotes negative impact
Contribution to increased opportunities for foreign investments	Definite	Long term	Local and national level	+2
				+20
Negative Impacts				
Water resource depletion	Probable	Short term	Local level	-1
Unplanned induced urbanization of neighbouring communities	Probable	Long term	Local level	-1
Increased losses of the water resources	Probable	Long term	Local level	-1
				-3
DEMOBILIZATION PHASE				
Positive impacts				
Reduced number of workers exposed to health and safety risks	Definite	Short term	Local level	+2
Reduced risks to accidents	Probable	Short term	Local level	+2
Reduced noise and vibration levels	Probable	Short term	Local level	+2

Environmental Impact	**Probability of Occurrence** **Possible** (impact may occur but it is not probable); **Probable** (the impact is very likely to occur); and **Definite** (impact is unavoidable)	**Duration of impact** **Short term** (less than 5 years); **Medium term** (between 5 and 10 years) **Long term** (over 10 years)	**Magnitude of impact** **Household level** – affecting an individual/family **Local level** – affecting a municipality/township, district **National level** – affecting the country	**Significance of impact (-3 to +3)** - High significance, +/- 3 - Medium significance, +/- 2 - Low significance, +/-1 - (+) denotes positive impact (-) denotes negative impact
Cleaner environment	Probable	Short term	Local level	+2
				+8
Negative Impacts				
Loss of employment by Contractor's work force	Definite	Long term	Local level	-1
Increased construction waste from the demolished structures	Definite	Short term	Local level	-1
Loss of business opportunities	Definite	Short term	Local and National level	-1
				-3

From the impact scoring matrix, the positive impacts (+43) outweigh the negative impacts (-25) giving the project a net positive impact. However, to maximize this benefit, there is a requirement to mitigate the negative impacts and enhance the positive ones. An Environmental Management Plan for managing the project effects to ensure that the project is environmentally sound has been prepared.

6.3 Description of Environmental and Social Impacts and their Mitigation Measures

6.3.1 Impacts from Design and Planning Phase

The planning and design phase of the proposed project will involve surveying, preparation of maps, detailed layout of pipe lines and construction plans.

Positive Impacts

a) Creation of temporary employment opportunities for experts and people in the project areas in various disciplines

The planning and design phase will provide temporary employment to consultants and people in the project areas to participate in different activities during project planning and design.

Enhancement measures

The project should be allowed to be undertaken and where possible the client should offer employment opportunities to Malawians. Where skills at local level are available, the Contractor should employ people from the project areas and extend employment opportunities to women as well, where possible, 40% of the employees should be women.

b) Source of Government revenue

The planning and design phase will offer temporary employment to a number of people in the project areas. Government will be deducting taxes from people employed by the project during planning stage.

Enhancement measures

The project should be allowed to be undertaken. Taxes should be deducted from different employees and be remitted to Government in good time.

Negative Impacts

a) Anxiety about temporary loss of property and different businesses

the presence of surveyors and other experts in the project area will cause anxiety among the community members in the project area about temporary loss of property and different businesses.

Mitigation Measure:

The Client through the Consultants and Contractors should conduct many sensitization meetings in the project area to explain to the community members what the project is all about, its benefits, how it will affect them and how they will be taken care of to minimize any suffering to arise from the project activities.

6.3.2 Impacts from Construction Phase

Positive Impacts

a) Creation of temporary employment opportunities for skilled and unskilled work force

In all, about 150 people will be offered temporary employment to undertake excavation of trenches, construction of manholes, laying down of pipes, backfilling and rehabilitation of broken roads and concrete pavement driveways and other activities.

Enhancement Measures:

The Client should advise the Contractor as much as possible to:

i) employ people from the project area; and

ii) Give women equal employment opportunities as men. The project will ensure that 40% of the workforce should be women.

b) Creation of a market for goods and services

Construction of infrastructure for the water distribution network and other facilities will require different types of materials which the Contractor will be required to procure for the project. The materials will include cement, sand, quarry, and pipes. This will create an opportunity for traders who will be selling different materials to the project.

Enhancement Measure:

The Client will advise the Contractor to:

i) Purchase different construction materials from suppliers from the project areas as much as possible; and

ii) Hire trucks to transport construction materials from the local transporters to transport different construction materials.

c) Skills transfer to local communities and skilled and unskilled workforce in brick laying

The project will assist to build the capacity of as many people as possible through construction of different infrastructure for the water distribution network and rehabilitation of broken roads and concrete pavement driveways, and plumbing. In this way the project will assist to build skills and capacity of many people in the project areas and beyond.

Enhancement Measures:

The Client will encourage the Contractor as much as possible to:

i) employ people from the project areas; and

ii) Give women equal employment opportunities as men. Women will comprise 40% of the workforce.

d) Source of Government revenue through taxes

Construction phase will offer temporary employment opportunities to a number of people. The employer will be deducting taxes from the employees and the deducted money will be remitted to government in good time.

Enhancement measures

The Client will implement the project and where possible the Contractor shall deduct taxes from the employees and the money will be remitted to Government in good time.

e) Alternative livelihoods for the local community

Construction activities will offer a number of temporary employment opportunities. A good number of the community members in the project area including women, 40%, will be employed during construction phase and will be earning a salary.

Enhancement Measures:

The Client will advise the Contractor as much as possible to:

i) employ people from the project areas; and

ii) Give women equal employment opportunities (40%) as men.

f) Increased generation of income by the people in the project area, especially women and the youth by selling food stuffs to construction workers

The presence of construction workers in the project area will create an opportunity for small scale businesses. Men, women and the youths will sale different food stuffs and refreshments to the project workers.

Enhancement Measures:

The community leaders in the project areas will designate where different people will be selling their commodities to the project workers.

Negative Impacts

a) Water use conflict

The Contractor will be drawing water from the nearby rivers and streams for construction activities. Where water levels will be lower, the Contractor will be ponding the water as a way of conserving the water for construction activities. In this way, the downstream users will be denied an opportunity to use water from the rivers and streams in the project areas for different domestic and agriculture activities.

Mitigation Measures

The Contractor will be required to source water for construction activities from Lilongwe River where water is available throughout the year rather than treated water from LWB, which will be expensive.

b) Possible damage to road pavements

Some of the pipelines will be required to cross the roads. Where there are no culverts, the roads will be cut during excavation to create passage for the pipelines. This will result into damaging the roads in the city.

Mitigation Measures

Where the Contractor will be required to cut the roads in order to lay the pipes, the Contractor will ensure that:

i) Roads are only cut in areas where the Contractor will lay pipes;

ii) Roads are only cut during weekends when traffic is moderate;

iii) Roads are only cut on one lane first to allow the road users to use the other lane;

iv) Laying down of pipes and backfilling is done immediately to lessen traffic disruption;

v) Rehabilitate the broken sections of the roads will be considered as a priority; and

vi) Roads cutting and rehabilitation activities should be done after peak hours.

c) Possible disruption of public service utilities

There is a high probability that excavation of trenches for laying down the pipes will cause damage to other utilities as most of the infrastructure for the different utilities such as existing water pipes, telephone cables, internet cables are also laid along the road reserve.

Mitigation Measures

The Contractor will be required to:

i) determine in advance before any construction activities are done the different infrastructures for other utility services;

ii) inform the community members in the project area in advance about the days and times when disruption of certain services will occur; and

iii) repair the damaged utilities as quickly as possible to reduce the suffering the absence of a particular utility services will cause on the people

d) Construction related accidents

Construction areas are usually associated with different types of occupation hazards as some construction equipment e.g. an excavator and construction vehicles may cause accidents in the case of construction.

Mitigation Measures

The Contractor will be required to:

i) train the workers about the possible occupation hazards that may be associated with this type of work;

ii) provide PPE such as helmets, boots, overalls etc;

iii) have first aid facilities in all the project sites; and

j) properly demarcate and secure all the accident prone sites such as open pits and trenches especially when the rehabilitating the roads with appropriate signage including complaint contacts.

e) Disruption of traffic flow and public mobility

Some of the pipelines will be required to cross the roads. Where there are no culverts, the roads will be cut during excavation to create passage for the pipelines. This will result into damaging the roads in the city, thereby causing disruption of traffic flow.

Mitigation Measures

Where the Contractor will be required to cut the roads in order to lay the pipes, the Contractor will ensure that:

i) Roads are only cut in areas where the Contractor will lay pipes;

ii) Roads are only cut during weekends when traffic is moderate;

iii) Roads are only cut on one lane first to allow the road users to use the other lane;

iv) Laying down of pipes and backfilling is done immediately to lessen traffic disruption;

v) Rehabilitate the broken sections of the roads will be considered as a priority; and

vi) Roads cutting and rehabilitation activities should be done after peak hours.

f) Creation of noise nuisance and vibration

Operation of heavy construction machineries and vehicle movements especially during excavation and rehabilitation of the broken roads will generate a lot of noise and vibration which could be a nuisance to workers and people staying close to the project site. Noise and vibration can create stress and can be a hazard within the project site since it can make communication among the workers to become difficult of or hear warning signs.

Mitigation Measures

The Contractor will be required to:

i) Provide a time table to the people in the project area and the workers about the times heavy machinery will be used to make them psychologically ready;

ii) Work within 8:00 am – 5:00 pm;

iii) use such machinery only during day time; and

iv) Provide ear protection materials for the workers in noisy areas.

g) Air pollution due to dust

Clearing of trees and other forms of vegetation, movement of construction equipment and heavy trucks and machinery and soil excavation and backfilling of trenches will result into increased dust emissions.

Mitigation Measures

The Contractor will be required to:

i) Apply water regularly on the access earth roads in the project areas to suppress dust;

ii) Control the speed of construction vehicles to reduce generation of dust; and

iii) Provide PPE to the labourers that will be involved in excavation.

h) Soil erosion and sedimentation of storm water drainage /watercourses

Removal of trees and other vegetation and excavation works will make the soils loose hence making them susceptible to soil erosion through runoff. The soil will be exposed once the vegetation has been cleared resulting in soil erosion.

Mitigation Measures

Carrying out construction works during the dry season from May to September;

i) Soil Contamination

Construction works will involve use of heavy machinery such as excavators, tippers and vehicles especially for the roads rehabilitation. Oil and fuel spills from these machines could contaminate soils within the project site.

Mitigation Measures

i) Construction vehicles should be serviced on time to keep them in good condition to avoid fuel leaks;

ii) Construction vehicles should be serviced by recommended dealers to ensure that they are properly serviced; and

iii) Servicing areas for vehicles should have impermeable surfaces.

j) Increase in accident/incidences

There is high chance that the incidences of accidents will increase due to excavators working in the road reserve, breaking a road to pass a pipeline through it and lots of labourers working together.

Mitigation Measure:

i) Introducing humps on the roads to help reduce the speed of the vehicles;

ii) Construction vehicles should be serviced by recommended dealers to ensure that they are properly serviced;

iii) Erecting warning signs showing that there is heavy machinery and construction vehicles using that road for people to be alert;

iv) Providing workers with protective clothing;

v) Following health and safety regulations;

vi) Training workers in the proper use and handling of heavy equipment and machinery including hand tools; and

vii) Maintaining a first aid kit at the project site.

k) Temporary disturbance of different business activities along the water distribution network

In some places, routes for the proposed water distribution network will fall within market places and in places where people are doing different business activities. During the project construction period, the places will be busy and people doing different businesses will be disturbed and will lose some income and will need to be compensated.

Mitigation Measures:

The Client will:

i) prepare an inventory of all the people whose businesses will be affected;

ii) prepare an inventory of all the businesses which will be affected;

iii) work out and prepare appropriate compensation packages for the different businesses that will be disturbed; and

iv) pay the PAPs appropriate compensation of the temporary losses of their businesses.

v) advise PAPs of construction schedule in advance with sufficient notice, provide information on traffic disturbances, alternate routes, provide appropriate signage with warnings and contact information for making complaints.

l) Temporary loss of property

Routing of the water distribution network will in some places pass through some individuals' property or institutional property, which will require to be demolished. The owner of the property will require to be compensated.

Mitigation Measures:

The Client will:

i) prepare an inventory of all the people whose property will be temporarily be affected;

ii) prepare an inventory of all the property which will be temporarily affected;

iii) work out and prepare appropriate compensation packages for the different property that will be disturbed; and

iv) pay the PAPs appropriate compensation of the temporary losses of their property.

m) Creation of borrow pits

The project will require some gravel material during rehabilitation of damaged roads and pavements whose extraction will create borrow pits. Some borrow pits will be opened up on some pieces of land. Use of such land will mean loss of cultivable land for farmers and therefore contribute to food insecurity. If the borrow pits are left unattended to, children and animals will fall into the pits. Furthermore, if these pits will be left open, water will collect in them and become the breeding grounds for mosquitoes.

Mitigation

As mitigation measures, the Contractor will be required to existing borrow pits since new borrow pits cannot be opened specifically for this project.

n) Increased generation of solid waste including excavated and broken pipes

Construction activities will generate mounds of excavated soil, solid wastes from materials such as unused concrete mix, and broken bricks. Besides, the project will also produce some solid waste in a form of excavated and broken pipes and other solids from the construction site.

Mitigation: The contractor shall:

i) Dispose of construction waste and excavated and broken pipes at area 38 waste management facility;

ii) Use construction waste as fill material; and

iii) Dispose of domestic waste in bins and finally dispose of at dumpsite.

o) Potential Labour Influx Impacts

The activities of the proposed project or project components will have a greater potential to trigger labour influx impacts. This is because people from faraway places and beyond will flock to the different project sites in search of employment and business opportunities. Their presence in the project impact area may lead to negative impacts on the host communities specifically when problematic social behaviour is culturally tolerated or even accepted, nationally or locally. Some of the common categories of social risk to be associated with labour influx for the proposed project and its components include:

1) Risk of social conflict

Cause and Comments: The implementation of the project and sub-project components activities in the different project areas will result into increased influx of people to the project impact areas. The people will be flocking to the area to look for employment and business opportunities. Conflicts may arise between the local community and the construction workers, which may be related to religious, cultural or ethnic differences, or based on competition for local resources. Tensions may also arise between different groups within the labour force, and pre-existing conflicts in the local community may be exacerbated. Ethnic and regional conflicts may be aggravated if workers from one group are moving into the territory of the other; however, workers are expected to be drawn from Lilongwe itself so few ethnic differences are expected.

Mitigation measures: As mitigation measures, the developer will:

i) Educate the workers on the cultural sensitivities in the host communities;

ii) Ensure that priority should be given to people from the local communities when recruiting project workers; and
iii) Ensure that the local communities will be sensitized and advised on how to deal with the impacts from workers on their cultural values, safety, etc.

2) Construction related accidents

Construction sites are usually associated with different types of occupation hazards as some construction equipment e.g. an excavator and construction vehicles may cause accidents in the case of construction.

Mitigation Measures

The Contractor will be required to:

i) train the workers about the possible occupation hazards that may be associated with this type of work;

ii) provide PPE such as helmets, boots, overalls, etc; and

iii) properly demarcate, secure and post signage at all accident prone sites such as pits and open trenches including when rehabilitating the roads.

3) Increased risk of illicit behaviour and crime

Cause and Comments: Although not expected due to the availability of workers already living in Lilongwe, an influx of workers and service providers into communities may increase the rate of crimes and/or a perception of insecurity by the local community. Such illicit behaviour or crimes can include theft, physical assaults, substance abuse, Gender Based Violence (GBV), Violence Against Children (VAC), prostitution and human trafficking. Local law enforcement may not be sufficiently equipped to deal with the temporary increase in local population.

Mitigation measure: Mitigation measure for such impacts will include consultation with PAPs to determine needs, potential sore spots and any other issues related to worker/community relations to ensure access to existing socio-economic opportunities and peaceful coexistence. Deployment of social security staff and regular engagement of the local Police can ameliorate occurrence of mischiefs. Sensitization on security matters, formation of neighbourhood watch groups, render support in establishing community police post. In addition, contractors will be encouraged to draft enforceable workers' "Codes of Conduct" to deter from engaging in illicit behaviours. Identity cards/badges should also be provided to the workers for easy identification.

4) Influx of additional population ("followers")

Cause and Comments: Especially in projects with large footprints and/or a longer timeframe, people can migrate to the project area in addition to the labour force, thereby exacerbating the problems of labour influx. These can be people who expect to get a job with the project, family members of workers, as well as traders, suppliers and other service providers (including sex workers), particularly in areas where the local capacity to provide goods and services is limited.

Mitigation measures: As mitigation measures, the developer will:

i) Educate the workers on the cultural sensitivities in the host communities;
ii) Advise the workers to identify themselves to the host communities during festivals;
iii) Ensure that priority should be given to people from the local communities when recruiting project workers; and
iv) Ensure that the local communities will be advised on the dangers of population influx on their cultural values, safety, etc. and how best to protect themselves.

5) Impacts on community dynamics

Cause and Comments: Depending on the number of incoming workers and their engagement with the host community, the composition of the local community, and with it the community dynamics, may change significantly. Pre-existing social conflict may intensify as a result of such changes.

Mitigation measures: As mitigation measures, the developer will:

i) Hold consultations with the local communities affected by works in order to elicit their preferences and concerns.
ii) Educate the workers on the cultural sensitivities in the host communities;
iii) Advise the workers to identify themselves to the host communities during festivals;
iv) Ensure that priority should be given to people from the local communities when recruiting project workers; and
v) Ensure that the local communities will be educated on the dangers of population influx on their cultural values, safety, etc. and how best to protect themselves.

6) Increased burden on and competition for public service provision

Cause and Comments: The presence of construction workers and service providers (and in some cases family members of either or both) can generate additional demand for the provision of public services, such as water, electricity, medical services, transport, education and social services. This is particularly the case when the influx of workers is not accommodated by additional or separate supply systems.

Mitigation measures: The Developer will ensure that he provides some public services, such as water to deal with the problem of increased burden and demand on social services.

7) Increased risk of communicable diseases and burden on local health services

Cause and Comments: The influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health resources. Workers with health concerns relating to substance abuse, mental issues or STDs may not wish to visit the project's medical facility and instead go anonymously to local medical providers, thereby placing further stress on local resources. Local health and rescue facilities may also be overwhelmed and/or ill-equipped to address the industrial accidents that can occur in a large construction site.

Mitigation measures: As mitigation measures, the developer shall:

i) Sensitize all employs and the community at large on the dangers of contracting HIV/AIDS and STI and their prevention measures such as abstinence; and
ii) Ensure availability of free condoms.

p) Creation of breeding grounds for mosquitoes, which may spread malaria

Cause: Trenches for laying pipes once dug and when left for a long time would be a mosquito breeding ground thereby contributing to spread of malaria.

Mitigation Measure: The Contractor will lay the pipes and fill the trenches immediately after digging them to avoid them become breeding grounds for mosquitoes.

6.3.3 Impacts during demobilization

Positive impacts

a) Reduced exposure to health and safety risks

Once construction activities are finished, worker will no longer be exposed to different health and safety risks.

b) Reduced risks to accidents

Once construction activities are finished, worker will no longer be exposed to different health and safety risks.

c) Reduced noise and vibration levels

Removal of construction vehicles and excavators and other construction equipment when rehabilitating the broken roads.

d) Cleaner environment

This will come about as a result of removal of construction rubble and damaged construction equipment from the site.

Negative impacts

a) Loss of employment by the Contractor's workforce

All temporary construction workers will be laid off once construction works are completed. This will mean loss of income and source of livelihood.

Mitigation measures:

The Contractor should:

i) Inform the construction workers of the duration for the construction phase so that they plan in advance;

ii) Educate the labour force on the need to save part of their income; and

iii) Pay severance benefits to all laid off workers according to the provisions of the labour laws.

b) Loss of income by goods and service providers

Goods and service providers that will be earning income from goods and services provided to the project during project construction phase will lose business.

Mitigation: The Contractor will provide advance warning of the completion of construction activities to goods and service providers.

c) Increased generation of waste from demolished temporary structures, excavated old and broken pipes

Mitigation: The contractor will:

i) Arrange to have the construction waste, excavated and broken pipes safely disposed of at designated waste disposal sites; and

ii) Revegetate areas that were cleared.

6.3.4 Impacts from Operation and Maintenance Phase

Positive Impacts

a) Improved access to potable water by Lilongwe City residents and surrounding areas

Once the construction activities are finalized, most residents of the city will have an easy access to potable water, which will be reliable as well.

Enhancement measure

LWB will put in place easy procedures for connection and a routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks. Furthermore, LWB should improve their efficiency in connecting water to customers at a reasonable fee. Besides, LWB needs to have attractive tariff for the water in order to get many people connected.

b) Creation of employment

Once the construction activities are finalized, most residents of the city will have an easy access to potable water, which will be reliable as well. Furthermore, due to availability of potable water in many areas, a number of water kiosks will be built and some people will be employed to manage the same.

Enhancement measure

LWB will employ more people to assist in the routine supervision to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available throughout.

c) Increase in government revenue through taxes

Once the water distribution network become operational, most residents of the city will have an easy access to potable water, which will be reliable as well. Furthermore, due to availability of potable water in many areas, a number of people will be connected resulting into increased revenue for Lilongwe Water

Board which will translate into increased taxes. Furthermore, LWB should improve their efficiency in connecting water to customers at a reasonable fee. Besides, LWB needs to have attractive tariff for the water in order to get many people connected.

Enhancement measure

LWB will ensure that many people within the proposed network are connected to the water supply system. Furthermore, LWB will remit all the taxes in good time to government.

d) Reduced incidences of water borne (e.g. cholera and diarrhoea) and water washed diseases (e.g. skin infection) due to improved availability of water

Once the water distribution network become operational, most residents of the city will have an easy access to potable water, which will be reliable as well. Furthermore, due to availability of potable water in many areas, a number of people will be connected. The residents will no longer use un safe water for domestic activities.

Enhancement measure

LWB will put in place routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available to the residents throughout. Furthermore, LWB should improve their efficiency in connecting water to customers at a reasonable fee. Besides, LWB needs to have attractive tariff for the water in order to get many people connected.

e) Reduction in water losses as more people will be legally connected

With the availability of the water distribution network in the vicinity of many residential areas of the city, many people will be connected legally.

Enhancement measure

LWB will put in place routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available to the residents throughout. Furthermore, LWB should improve their efficiency in connecting water to customers at a reasonable fee. Besides, LWB needs to have attractive tariff for the water in order to get many people connected.

f) Increased economic activities within the project impact area

With the availability of potable water in most of the residential and industrial areas, some businesses which could not operate due to absence of potable will now operate.

Enhancement measure

LWB will put in place routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available to the residents throughout. Furthermore, LWB should improve their efficiency in connecting water to customers at a reasonable fee. Furthermore, LWB should improve their efficiency

in connecting water to customers at a reasonable fee. Besides, LWB needs to have attractive tariff for the water in order to get many people connected.

g) Contribution to increased opportunities for foreign investments

With the availability of potable water in most of the residential and industrial areas, some businesses which could not operate due to absence of potable will now operate.

Enhancement measure

LWB will put in place routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available to the residents throughout. Furthermore, LWB should improve their efficiency in connecting water to customers at a reasonable fee. Furthermore, LWB should improve their efficiency in connecting water to customers at a reasonable fee. Besides, LWB needs to have attractive tariff for the water in order to get many people connected.

Negative Impacts

a) Water loss

With the limited raw water storage capacity at the Kamuzu Dams 1and 2, there expansion of the distribution network means increased consumption in the amount of water which will result into ore rationing.

Enhancement measure

LWB will put in place routine supervision programs to check leaks and illegal connection to the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks.

b) Increased losses of the water resources

With the increased water distribution network, chances are that the level of vandalism of pipes and fittings will also increase. Some people will be vandalizing the pipes and fittings either to sell or access free water.

Mitigation Measures:

i) Sensitizing the residents on the dangers of vandalizing the pipes and fitting;

ii) LWB will have to work with community policing and police to curb this malpractice;

iii) LWB will have to continuously be supervising for leakages and vandalized pipes; and

iv) Residents should be encouraged to report any burst pipes and leakages.

c) Operational and maintenance related accidents

During operational and maintenance phase, excavation and laying of pipes to replace the broken pipes using heavy duty equipment will be associated with different types of occupation hazards as some equipment e.g. an excavator and construction vehicles may cause accidents in the case of construction.

Mitigation Measures

The Contractor will be required to:

i) train the workers about the possible occupation hazards that may be associated with this type of work;

ii) provide PPE such as helmets, boots, overalls etc; and

iii) properly label all the accident-prone sites especially when rehabilitating the roads.

CHAPTER 7 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

7.1 Environmental and Social Management Plan

Lilongwe Water Board, as the implementing agency of this project, will have a Project Implementation Unit (PIU) implementing the series of activities in the Lilongwe Water and Sanitation Project. In addition to the other professionals in the Unit, there will be a full-time Environment Specialist and a full-time Social Specialist to lead implementation of this ESMP, RAP and the other safeguard instruments for the other components of the project such as the sanitation activities. The budget for this ESMP's safeguards implementation including compliance monitoring activities have been reflected in the ESMP cost estimate.

The purpose of impact mitigation is to look for alternative and better ways of implementing the proposed project or associated activities so that the negative impacts are eliminated or minimized, while benefits are enhanced. Impact mitigation requires that the full extent of the anticipated environmental and social problems is understood. In view of this, this section presents mitigation measures resulting from the impacts identified.

Mitigation measures require a successful impact management plan implemented at the correct time and in a correct way. This usually requires a clearly written and agreed plan of action for managing impacts so that these are kept within the limits of acceptability. The monitoring plan describes how and who will carry out the monitoring activities for addressing the negative environmental issues.

This section aims to coordinate the environmental policies, plans, programs and decisions of the various parties involved in the project, which exercise functions that affect the environment. Environmental and Social monitoring is an important component of the ESMP. It provides the information for periodic review and refinement modification of the ESMP as necessary, ensuring that environmental and social protection is optimized at all project phases. Through monitoring, unwanted environmental and social impacts are detected early and remedied effectively. It will also validate the impacts predicted earlier on and the effectiveness of the proposed mitigation measures. Lastly, it will also demonstrate compliance with national and World Bank requirements. The ESMP aims to minimize the duplication of procedures and provide consistency in the protection of the environment.

The smooth and uncomplicated execution of the ESMP requires:

a) Environmental and Social Monitoring and Enforcement; and

b) Institutional Measures.

Construction for works is planned to start sometime in early 2019. Therefore, this ESMP will be approved, finalized and included in the bidding and contract documents before any construction begins for these works. Most of the environmentally related work and physical activity for this project will actually be executed by contractors to LWB. Therefore, the contractors will be required to prepare their own site-specific Construction ESMP (CESMP) and Health and Safety Plan based on this ESMP before commencing any civil works. The contractor/s will be obligated to take all reasonable steps to protect the environment (both on and off the site of works) and to limit damage and nuisance to people and property resulting

from pollution, noise and other results of its/their project-related activities. Further, the contractor/s is/are obligated to ensure that emissions, surface discharges and effluent from its/their project activities shall not exceed the values stated in the Specification or prescribed by applicable Laws or standards (including Malawian laws or World Bank EHS or other agreed standards). Finally, the contractor/s will be required to have an Environment, Health and Safety Specialist to implement the CESMP and Health and Safety Plan.

Table 7.1 presents the log matrix of the ESMP for the construction, operation and decommissioning phases of the proposed water distribution network project.

Table 7.1 Proposed Environmental and Social Management Plan

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
IMPACTS FROM PLANNING AND DESIGN PHASE				
POSITIVE IMPACTS				
1	Creation of temporary employment opportunities for experts in various disciplines	The project should be allowed to be undertaken and where possible the client should offer the works contracts to Malawian Contractors and Consultants. Where skills at local level are available especially for the unskilled labour, the Contractor should employ people from the local community	Lilongwe Water Board	N/A
2	Source of Government revenue	The project should be allowed to be undertaken and where possible taxes should be deducted and remitted to Government in good time.	Lilongwe Water Board	N/A
NEGATIVE IMPACTS				
1	Anxiety about loss of property and temporary loss of business to pave way for the project	The Client through the Consultants and Contractors should conduct many sensitization meetings and awareness campaigns in the project area to explain to the community members what the project is all about, its benefits, how it will affect them and how they will be taken care of to minimize any suffering to arise from the project activities.	Lilongwe Water Board	Budget in the Consultancy for preparation of the ESMP
IMPACTS DURING CONSTRUCTION PHASE OF THE PROJECT				
POSITIVE IMPACTS				
1	Creation of temporary employment opportunities for skilled and unskilled work force	The Client should encourage the Contractor as much as possible to: • employ people from the surrounding communities; and • Give women equal employment opportunities as men and ensure that among the employees, 40% are women.	LWB /Contractor	N/A
2	Creation of a market for goods and services	The Client will advise the Contractor to: • Buy locally manufactured materials where possible;	LWB /Contractor	NA

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
		• Purchase different construction materials from suppliers from the local communities as much as possible; and • Hire trucks to transport construction materials from the local transporters to transport different construction materials.		
3	Skills transfer to local communities, skilled and unskilled workforce such as brick laying when constructing manholes	The Client will encourage the Contractor as much as possible to: i) employ people from the surrounding communities; and **ii)** Give women equal employment opportunities as men. Among the employees, 40% should be women	LWB /Contractor	NA
4	Source of Government revenue through taxes	The project should be allowed to be undertaken and where possible taxes should be deducted and remitted to Government in good time.	LWB /Contractor	N/A
5	Alternative livelihoods for the local community	The Client will advise the Contractor as much as possible to: i) employ people from the surrounding communities; and ii) Give women equal employment opportunities as men.	LWB /Contractor	N/A
6	Increased income generation by the community members in the project area especially women and youth by selling food stuffs to construction workers	The community leaders in the project area will designates different sites as market places where different people will be selling their merchandize to the construction workforce. Besides, employment of people from the project areas will make the people financially sound.	LWB /Contractor	N/A
NEGATIVE IMPACTS				
1	Water use conflict	The Contractor will be required to source water for construction activities from Lilongwe River where water is available throughout the year rather than treated water from LWB, which will be expensive.	Contractor and EDO	N/A

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
2	Possible damage to road Pavement	Where the Contractor will be required to cut the roads in order to lay the pipes, the Contractor will ensure that: i) Roads are only cut in areas where the Contractor will lay pipes; ii) Roads are only cut during weekends when traffic is moderate; iii) Roads are only cut on one lane first to allow the road users to use the other lane; iv) Laying down of pipes and backfilling is done immediately to lessen traffic disruption; v) Rehabilitate the broken sections of the roads will be considered as a priority; and vi) Roads cutting and rehabilitation activities should be done after peak hours.	Contractor	Cost in the Contractors Contract
3	Possible disruption of water supply to other areas	The Contractor will be required to: i) determine in advance before any construction activities are done the different water distribution pipes before installation of the new pipes; ii) Warn the people in the project areas in advance about the water disruption times for them to plan ahead; and iii) repair the damaged water distribution pipes as quickly as possible to reduce the suffering the absence of a particular utility services will cause on the people	Contractor/EDO	Cost in the compensation schedule and Contra tors fee
4	Construction related accidents	The Contractor will be required to: i) put in place a proper plan in case of accident to provide a readily available vehicle (or ambulance) and determine in advance a clinic/hospital for treatment; ii) train the workers about the possible occupation hazards that may be associated with this type of work; iii) provide PPE such as helmets, boots, overalls etc; and	Contractor	10,000.00

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
		iv) Properly demarcate and secure all the accident-prone sites such as pits and trenches especially when works involve roads.		
5	Disruption of traffic flow and public mobility	Where the Contractor will be required to cut the roads in order to lay the pipes, the Contractor will ensure that: i) Roads are only cut in areas where the Contractor will lay pipes; ii) Roads are only cut during weekends when traffic is moderate; iii) Roads are only cut on one lane first to allow the road users to use the other lane; iv) Laying down of pipes and backfilling is done immediately to lessen traffic disruption; v) Rehabilitate the broken sections of the roads will be considered as a priority; and vi) Roads cutting and rehabilitation activities should be done after peak hours.	Contractor	Cost in the Contractors Contract
6	Creation of noise nuisance and vibration	The Contractor will be required to: i) Provide the times during day time construction activities will be taking place as being between 8:00 am and 5:00 pm; ii) use such machinery only during day time; and **iii)** Provide ear protection materials for the workers in noisy areas.	Contractor	7,000.00
7	Air pollution due to dust	The Contractor will be required to: i) Apply water regularly on the access earth roads to the construction sites to suppress dust; ii) Control the speed of construction vehicles to reduce generation of dust; and iii) Provide PPE to the labourers that will be involved in excavation.	Contractor	14,000.00

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
8	Soil erosion and sedimentation of storm water drainage /watercourses	The Contractor will be required to: i) carry out construction works during the dry season from May to September; ii) Stockpile the excavated soil away from water courses and drainage systems; and iii) Lay down pipes and fill the excavated trenches as quickly as possible	Contractor	-
9	Soil Contamination	i) Construction vehicles should be in good condition to avoid fuel leaks; ii) All vehicles should be serviced by recognized dealers; and iii) Servicing areas for vehicles should have impermeable surfaces.	Contractor	14,000.00
10	Increase in accident/incidences	i) Introducing humps on the road to help reduce the speed of the vehicles; ii) Erecting warning signs before the start of the works showing that there is heavy machinery and construction vehicles using that road for people to be alert; iii) Providing workers with protective clothing; iv) Training workers in the proper use and handling of heavy equipment and machinery including hand tools; and v) Maintaining a first aid kit at the project site.	Contractor	12,000.00
11	Increase in the spread of HIV/AIDS and other sexually transmitted diseases	i) Sensitizing workers on the dangers of indulging in unprotected sex; ii) Development of a workplace HIV/AIDS project because the project period of 2 years is long has been included as a mitigation measure; and iii) Distributing condoms to construction workers;	Contractor	7,000.00

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
12	Temporary disturbance of different business activities along the water distribution network	LWB will: a) prepare an inventory of all the people whose businesses will be affected; b) value all the PAPs affected assets; and c) compensate appropriately all the affected people for their temporary loss of business.	LWB	Cost embedded in the compensation schedule
13	Loss of property	LWB will be required to prepare an inventory of all the people whose property will be affected and appropriate compensation packages prepared for their property.	LWB	Cost embedded in the compensation schedule
14	Creation of borrow pits	As mitigation measures, the Contractor will be required to undertake the following: i) prepare a separate borrow ESMP for a new borrow pit site; ii) For new pits, where possible, open borrow pits in areas away from productive land so that prime land is preserved from degradation that will require extensive reclamation; iii) Compensate all the affected PAPs; and iv) Restore sites to acceptable condition including closing all borrow pits after construction works are completed.	Contractor	Cost in the project document
15	Increased generation of solid waste including excavated and old pipes	The contractor shall: i) Dispose of construction waste at designated waste disposal site in area 38; ii) Take waste pipes to plastic product manufacturing companies for recycling; iii) Use construction waste as fill material; and iv) Dispose of domestic waste in bins and finally dispose of at dumpsite in area 38.	Contractor	8,000.00

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
16	Deforestation resulting from use of burnt bricks	Contractors will be advised to use cement blocks for all construction activities	LWB and Contractors	None
17	Risk of social conflict	• Educate the workers on the cultural, safety and other sensitivities and preferences of the host communities as necessary; • Ensure that priority should be given to people from the local communities when recruiting project workers; and • Ensure that the local communities are sensitized on the dangers of population influx on their cultural values, safety, etc.	Contractor	3,000
18	Increased risk of illicit behavior and crime	• social integration of migrant workers and local communities to ensure mutual and equal access to existing socio-economic opportunities; • Deployment of social security staff and regular engagement of the local Police can ameliorate occurrence of mischief; • Sensitization on security matters; and • Formation of neighborhood watch groups, render support in establishing community police post. • Drafting of enforceable workers' "Codes of Conduct" by contractor to deter illicit behavior	Contractor and Local Leaders	3,500
19	Impacts on communities	• Educate the workers on the cultural sensitivities and preferences of the host communities; • Ensure that priority should be given to people from the local communities when recruiting project workers; and • Ensure that the local communities will be educated on the dangers of workers on their cultural values, safety, etc. and advised on how to avoid them.	Contractor	2,000

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
		• Consult with communities that will be affected by works to determine their preferences for timing, location, aesthetics, etc. as possible • Provide appropriate notice for works schedule, signage and other measures that can provide contact information for complaints and safety to communities that will be impacted by works, traffic or road accessibility changes.		
20	Increased burden on and competition for water supply as the area project areas will be accommodating extra people as a result of construction workers	Provision of extra water supply points and water bowsers to supply water for the construction workers	LWB	2,500
21	Increased risk of sexually transmitted diseases such as HIV/AIDS	• Sensitize all employees and the community members on the dangers of contracting HIV/AIDS and STI and their prevention measures such as abstinence; and • Ensure availability of free condoms.	Contractor	2,300
22	Increased risk of child labour	The contractor will only engage workers that are over 18 years old	LWB	No cost
23	Creation of breeding grounds for mosquitoes, which may spread malaria	The Contractor will lay the pipes and fill the trenches immediately after digging them or take other measures to avoid them become breeding grounds for mosquitoes	Contractor	Part of construction budget
	IMPACTS FROM DEMOBILIZATION PHASE			
	POSITIVE IMPACTS			
1	Reduced exposure to health and safety risks	Once construction activities are finished, worker will no longer be exposed to different health and safety risks.	Contractor/LWB	-

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
2	Reduced risks to accidents	Once construction activities are finished, worker will no longer be exposed to different health and safety risks.	Contractor/LWB	-
3	Reduced noise and vibration levels	Removal of construction vehicles and excavators and other construction equipment when rehabilitating the broken roads.	Contractor/LWB	-
4	Cleaner environment	This will come about as a result of removal of construction rubble and damaged construction equipment from the site.	Contractor/LWB	10,000.00
	NEGATIVE IMPACTS			
1	Loss of employment by the Contractor's workforce	• Informing workers of project duration when employing them • Educating the labour force on the need to save part of their wages • Paying severance benefits to all laid off workers per the provisions of the labour laws.	Contractor	Part of Contractors' costs
2	Loss of income by goods and service providers	The Contractor will provide advance warning of the completion of construction activities to goods and service providers.	Contractor	-
3	Increased generation of waste from demolished temporary structures and excavated old and broken pipes	The contractor will: i) Arrange to have the construction waste, waste from demolished temporary structures and excavated old and broken pipes safely disposed of at a designated waste disposal site at Area 38; and ii) Revegetate areas that were cleared.	Contractor	7,000.00
	IMPACTS FROM OPERATION PHASE			
	POSITIVE IMPACTS			
1	Improved access to potable water by Lilongwe City residents and surrounding areas	LWB will put in place easy procedures for connection and a routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks.	LWB	Part of operational budget for the Water Board

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
2	Creation of employment	a) LWB will employ more people to assist in the routine supervision to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available throughout. b) LWB will pay its employees competitive salaries to ensure that the employees remain motivated and even have pension scheme for the employees; and c) Among the employees, LWB will employ 40% women	LWB	Part of operational budget for the Water Board
3	Increase in government revenue through taxes	LWB will ensure that many people within the proposed network are connected to the water supply system. Furthermore, LWB will deduct taxes from its employees and remit all the taxes in good time to government.	LWB	Part of operational budget for the Water Board
4	Reduced incidences of water borne (e.g. cholera and diarrhoea) and water washed diseases (e.g. skin infection) due to improved availability of water	a) LWB will come up with affordable connection fees to ensure that many people are connected and do not look for alternative sources of water; and b) LWB will connect as many people as possible in all the areas where the distribution network will be operating.	LWB	Part of operational budget for the Water Board
5	Reduction in water losses in distribution network	a) Routine supervision in distribution network; and b) Strict penalties to illegal connections	LWB	Part of operational budget for the Water Board
6	Increased economic activities within the project impact area	c) Routine supervision in distribution network; and Strict penalties to illegal connections	LWB	Part of operational budget for the Water Board
7	Contribution to increased opportunities for foreign investments	• LWB will ensure that it charges reasonable connection fees and the water tariffs remain reasonable; • Furthermore, LWB should improve their efficiency in connecting water to customers.	LWB	Part of operational budget for the Water Board

Item	Potential Impact	Recommended Enhancement/Mitigation Measure	Responsible Authority	Costs (U$D)
NEGATIVE IMPACTS				
1	Increased losses of the water resources	i) Sensitizing the residents on the dangers of vandalizing the pipes and fitting; ii) LWB will work with community policing and police to curb these malpractices; iii) LWB will have routine supervision of leaks and vandalized pipes and carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks; iv) Residents should be encouraged to report any burst pipes and leakages; and v) LWB to identify new sources of raw water to supplement the current sources	LWB	12,000.00
2	Increased risk of work related accidents during excavation of trenches and repair of broken pipes	The Contractor will be required to: i) train the workers about the possible occupation hazards that may be associated with this type of work; ii) provide PPE such as helmets, boots, overalls etc; and iii) Properly label all the accident-prone sites especially when the rehabilitating the roads.	Developer/Contractor	10,000.00
3	Increased risk of sexually transmitted diseases such as HIV/AIDS	• Sensitize all employees both for the newly recruited and old employees on the dangers of contracting HIV/AIDS and STI and their prevention measures such as abstinence; and • Ensure availability of free condoms.	LWB	10,300.00

7.2 Environmental and Social Monitoring Plan

The Environmental and Social Monitoring Plan is vital because it is used to check if the mitigation measures prescribed in the management plan are being implemented. It provides parameters to be monitored, indicators to be used for monitoring, means of verification that mitigation/enhancement measures were implemented, frequency of monitoring and assigns responsibility for monitoring. Specifically, the environmental and social monitoring plan is prepared in to:

a) ensure that mitigation and benefit enhancement measures have been adopted and are effective;

b) identify any unforeseen negative impacts and propose appropriate mitigation measures; and

c) provide information on the actual nature and extent of key impacts and effectiveness of mitigation and benefit enhancement measures, which through feedback mechanism can improve the planning and execution of future, similar projects.

The monitoring shall be performed in all stages of project implementation to verify impact prediction and to ensure that adverse impacts are minimized. During the construction phase, for example, the environmental and social monitoring will comprise of two activities:

a) Review of Contractor's plans, methods statement, and temporary works design and arrangements to ensure that environmental and social protection measures specified in the contract documents are adopted and Contractor's proposals provide acceptable levels of impact control; and

b) Systematic observation of all site activities and the Contractor's offsite facilities to ensure that the contract requirements relating to environmental and social matters are being complied with, and that mitigation measures for unforeseen impacts are identified.

The monitoring activities will be comprised of visual observation during site inspection and will be carried out by LWB. Site inspections will take place with emphasis on early identification of any environmental and social problem and the initiation of suitable remedial action. Where remedial actions have been required on the part of the Contractor, further checks will need to be made to ensure that these are actually being implemented to the agreed schedule and in the required form. All sites where construction will be taking place will be formally inspected from an environmental and social view point on a regular basis. However, in addition to visual observation there shall be informal questioning of members of the local communities and their leaders who live near the project since they may be aware of matters which are unsatisfactory but may not be readily apparent or recognized during normal site inspection visits.

The monitoring activities will also be integrated with other construction supervision activities to be carried out by LWB. LWB will decide on the appropriate course of action to be taken in cases where unsatisfactory reports are received from the field staff regarding environmental and social matters. In case of relatively minor matters, advice to the Contractor on the need for remedial action may suffice, but in all serious cases, LWB will issue a formal instruction to the Contractor to take remedial action, depending on the extent of delegated powers.

LWB shall supervise construction activities of the proposed project and shall oversee the implementation of the environmental and social monitoring plan. The budget for this ESMP's safeguards implementation including compliance monitoring activities have been reflected in the ESMP cost estimate.

The Contractor shall be responsible for the on-the-ground implementation of many of the environmental and social mitigation measures under the supervision of LWB. This is to ensure that technical and environmental clauses are followed and well implemented by the Contractor.

LWB's job will include enforcement of mitigation measures. Therefore, there must be feedback from monitoring to ensure that the Contractor implements mitigation measures. In this regard, the Contractor will submit a monthly report to LWB specifying that:

a) All previously notified failures to comply with the mitigation measures have been rectified; and

b) All newly notified requirements have been fulfilled and all mitigation measures specified in the tender document have been implemented.

LWB will then submit the report to the Environmental Affairs Department within a reasonable period not exceeding 30 days from receipt.

To ensure that the environmental and social management plan for the proposed project is implemented, an environmental and social monitoring plan has been prepared as outlined in Table 7.2. Stakeholders that have been assigned a responsibility in the monitoring plan need to budget for their participation in the monitoring exercise. This urges LWB to implement the management plan so that implementation of the project does not contribute to environmental degradation in the project area or impinge on the welfare of employees and local communities. LWB will closely follow up on the contractors to ensure that all environmental and social measures and obligations are implemented in a satisfactory manner.

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Table 7.2 Environmental and Social Monitoring Plan

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
IMPACTS FROM PLANNING AND DESIGN PHASE							
POSITIVE IMPACTS							
1	Creation of temporary employment opportunities for experts in various disciplines	The project should be allowed to be undertaken and where possible the client should offer the works contracts to Malawian Contractors and Consultants. Where skills at local level are available, the Contractor should employ people from the local community especially for the unskilled labour	No. of local Consultants, Contractors and local people employed	Employment records	Once, on commencement of different assignments	Lilongwe Water Board	N/A
2	Source of Government revenue	The project should be allowed to be undertaken and where possible taxes should be deducted and remitted to Government in good time.	Frequency of timely tax payments	Tax certificates	Monthly	Lilongwe Water Board and MRA	N/A
NAGATIVE IMPACTS							
	Anxiety about loss of property and temporary loss of	The Client through the Consultants and Contractors should conduct many meetings in the project area to explain to the community members what the project is	Number of people and types of businesses to be affected by the project	An inventory of the PAPs and their property	During planning stage of the project	Client	Within the budget for planning phase

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
	business to pave way for the project	all about, its benefits, how it will affect them and how they will be taken care of to minimize any suffering to arise from the project activities.					
IMPACTS DURING CONSTRUCTION PHASE OF THE PROJECT							
POSITIVE IMPACTS							
1	Creation of temporary employment opportunities for skilled and unskilled work force	The Client should encourage the Contractor as much as possible to: • employ people from the surrounding communities; and • Give women equal employment opportunities as men.	Number of people employed from the surrounding communities and Number of women employed	Employment records	During construction phase	Ministry of Labour	7,000.00
2	Creation of a market for goods and services	The Client will advise the Contractor to: • Purchase different construction materials from suppliers from the local communities as much as possible; and	• No. of local people supplying materials • Number of local transporters	Records of suppliers	Monthly	LWB	6,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		• Hire trucks to transport construction materials from the local transporters to transport different construction materials.	ferrying material				
3	Skills transfer to local communities, skilled and unskilled workforce	The Client will encourage the Contractor as much as possible to: i) employ people from the surrounding communities; and ii) Give women equal employment opportunities as men.	Number of people employed from the surrounding project communities and Number of women employed	Employment Records	During construction phase	Ministry of Labour	8,000.00
4	Source of Government revenue through taxes	The project should be allowed to be undertaken and where possible taxes should be deducted and remitted to Government in good time.	Number of people paying tax	Tax certificates	Monthly	Contractor, MRA, LWB	
5	Alternative livelihoods for the local community	The Client will advise the Contractor as much as possible to: i) employ people from the surrounding communities; and	Number of people employed from the project surrounding communities and Number of women employed	Employment Records	During construction phase	Contractor, LWB	8,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		ii) Give women equal employment opportunities as men.					
6	Increased income generation by the local people, especially women and youth by selling food stuffs to constructio n workers	The traditional leaders in the project area will designates different sites as markets where different people will be selling their merchandize to the construction workforce	Number of local people selling goods at the project site	Records	Monthly	Lilongwe City Council	6,000.00
NEGATIVE IMPACTS							
1	Water use conflict	Should the water levels go low in the different rivers where the Contractor will be collecting water, the Contractor will be encouraged to pond the water while ensuring that an environmental flow is maintained and that the downstream users have	No. of cases recorded	Conflict records	During construction phase	Contractor/ Lilongwe EDO	6,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		enough water for domestic as well as enough water for agriculture activities					
2	Possible damage to road Pavement	Where the Contractor will be required to cut the roads in order to lay the pipes, the Contractor will ensure that: i) This is done during weekends when traffic is moderate; ii) Roads are cut on one lane first to allow the road users to use the other lane; and iii) Laying down of pipes and backfilling is done immediately to lessen traffic disruption.	No. of road pavements damaged	Inspections	During construction phase	Lilongwe City Council.	4,000.00
3	Possible disruption of public service utilities	The Contractor will be required to: i) determine in advance before any construction activities are done the different infrastructures for other utility services; ii) repair the damaged utilities as quickly as possible to reduce the suffering the absence of a	Number of public service utilities disrupted	Records	Once on commencement	Contractor	4,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		particular utility services will cause on the people					
4	Construction related accidents	The Contractor will be required to: i) train the workers about the possible occupation hazards that may be associated with this type of work; ii) provide PPE such as helmets, boots, overalls etc; and iii) properly label all the accident-prone sites especially when the rehabilitating the roads.	No. of accidents involving workers reported; and No. of accidents involving the community members reported	Accident Records	During Construction phase	Ministry of Labour and EAD	2,000.00
5	Disruption of traffic flow and public mobility	In order to minimize disruption of traffic flow and public mobility, where the Contractor will be required to cut the roads in order to lay the pipes, the Contractor will be required to ensure that: i) Inform PAPs of changes with adequate notice. ii) This is done during weekends when traffic is moderate;	Time it takes for traffic to move from one point to another	Records	During construction phase	Lilongwe City Council	3,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		iii) Roads are cut on one lane first to allow road users to use the other lane; and iv) Laying down of pipes and backfilling is done immediately to lessen traffic disruption.					
6	Creation of noise nuisance and vibration	The Contractor will be required to: i) Provide a time table to the local communities and the workers about the times heavy machinery will be used to make them psychologically ready; ii) use such machinery only during day time; and iii) Provide ear protection materials for the workers in noisy areas. iv) Adhere to noise levels as outlined in the World Bank Environmental Health and Safety General Guidelines for Construction.	• Level of noise and vibration recorded; and • Number of people complaining about noise and vibration	Records on complaints about noise	During construction phase	Lilongwe City Council and EAD	7,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
7	Air pollution due to dust	The Contractor will be required to: i) Apply water regularly on the access earth roads to the construction sites to suppress dust; ii) Control the speed of construction vehicles to reduce generation of dust; and iii) Provide PPE to the labourers that will be involved in excavation.	Level of different pollutants in the air	Records	During construction phase	Contractor	8,000.00
8	Soil erosion and sedimentation of storm water drainage /watercourses	Carrying out construction works during the dry season from May to September;	Number of gullies recorded	records	During construction phase	Contractor EDO	5,000.00
9	Soil Contamination	i) Construction vehicles should be in good condition to avoid fuel leaks; and ii) Servicing areas for vehicles should have impermeable surfaces.	Level of contaminants in the soil	Records	During construction phase	Contractor	16,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
10	Increase in accident/incidences	i) Introducing humps on the road to help reduce the speed of the vehicles; ii) Erecting warning signs showing that there is heavy machinery and construction vehicles using that road for people to be alert; iii) Providing workers with protective clothing; iv) Following health and safety regulations; v) Training workers in the proper use and handling of heavy equipment and machinery including hand tools; and vi) Maintaining a first aid kit at the project site.	Number of accidents involving workers; Number of accidents involving community members; Number of complains raised	Records	During construction phase	Min. of Labour	7,000.00
11	Increase in the spread of HIV/AIDS and other sexually transmitted diseases	i) Sensitizing workers on the dangers of indulging in unprotected sex; ii) Distributing condoms to construction workers;	• Number of new cases recorded; • Number of Sensitization meetings carried out	• Records	Biannual	DHO for Lilongwe	4,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
			• Number of condoms distributed				
12	Temporary disturbance of different business activities along the water distribution network	The Client will be required to prepare an inventory of all the people whose businesses will be affected and appropriate compensation packages prepared for their business.	Number of business activities disturbed	Records	During construction phase	Contractor	8,000.00
13	Loss of property	The Client will be required to prepare an inventory of all the people whose property will be affected and appropriate compensation packages prepared for their property.	An inventory of the PAPs and property likely to be affected by the project; Number of PAPs complaining about compensation packages	Inspection	During construction phase	Ministry of Lands	8,000.00
14	Creation of borrow pits	As mitigation measures, the Contractor will be required to undertake the following: i) For new pits, where possible, open borrow pits in areas away from productive land so that	- No. of borrow pits to be rehabilitated	Inspection	After r construction)	Project Manager and Contractor	20,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		prime land is preserved from degradation that will require extensive reclamation. i) Carry out land clearing and topsoil removal as two separate operations. All topsoil should be heaped up and stockpiled in defined areas of the borrow pit, in order to facilitate its full reuse and subsequent redistribution on the terrain. During extraction of materials the Contractor should prevent the creation of depressions where stagnant water may accumulate and should, if the latter cannot be fully avoided, provide appropriate drainage at any stage of his operations; and ii) Re-instatement of any borrow pit should preferably take place successively according to					

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		the progress of material extraction at the respective site so as to allow for a possibly short period of exposure and an early completion of the landscaping measures, in support of a possibly early re-establishment of a natural vegetation cover and the minimization of soil erosion and fertility loss.					
15	Increased generation of solid waste, waste from demolished temporary structures and excavated old and broken pipes	The contractor shall: i) Dispose of construction waste, waste from demolished temporary structures and excavated old and broken pipes at designated waste disposal site; ii) Take waste pipes to plastic product manufacturing companies for recycling; iii) Use construction waste as fill material; and	Amount of solid waste per week	Inspection	During construction phase	Contractor and EAD	7,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		iv) Dispose of domestic waste in bins and finally dispose of at dumpsite.					
16	Deforestation resulting from use of burnt bricks	Contractors will be prohibited from using burnt bricks for construction works	Number of structures constructed using unburnt bricks	Physical inspection of bricks used and/or examination of procurement or other relevant records	2 or more times during construction period as necessary	Supervising Engineer, LWB Environmental and Social Specialist	
17	Risk of social conflict	• Educate the workers on the cultural sensitivities in the host communities; • Ensure that priority should be given to people from the local communities when recruiting project workers; and • Ensure that the local communities are sensitized on the dangers of population influx on their cultural values, safety, etc.	• Number of conflicts recorded and resolved • Number of sensitization meetings held • Number of locals employed through the project	Records	Twice per year	District Social Welfare Office	2,500

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
18	Increased risk of illicit behaviour and crime	• social integration of migrant workers and local communities to ensure mutual and equal access to existing socio-economic opportunities; • Deployment of social security staff and regular engagement of the local Police can ameliorate occurrence of mischiefs; Sensitization on security matters; and • Formation of neighbourhood watch groups, render support in establishing community police post. • Drafting of enforceable workers' "Codes of Conduct" by contractor	• Number of crimes recorded • Number of Security staff hired • Number of neighbourhood watch groups formed • Number of complaints received from communities	Records	Three times per year	police stations in the project areas	4,000
19	Impacts on community dynamics	• Hold consultations with PAPs to determine their preferences, inform them of planned works and traffic disruptions	• Number of sensitization and consultation meetings held • Number of locals recruited by the contractor	Records	Three times per year	Contractor	6,000

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		• Educate the workers on the cultural sensitivities in the host communities; • Ensure that priority should be given to people from the local communities when recruiting project workers; and • Ensure that the local communities will be sensitized and advised on how to protect themselves and report any illicit activities from workers, etc. • Functioning Grievance Redress Mechanism to capture and resolve complaints	• Number and type of complaints received • Number and type of complaints filed with the Grievance Redress Committee • • Number and records of complaints resolved	Contract requirement, records	Daily, monthly, yearly	Contractor, Supervising Engineer, LWB	

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
20	Increased burden on and competition for public service provision	Provision of extra services to carter for extra people in the area such as extra taps for public water supply	• Number of people requiring a particular service • Number/type of extra service provided	Inspection on the different services that are provided in the project areas	Three times per year	LWB	2,500
21	Increased risk of communicable diseases such as HIV/AIDS	• Sensitize all employs and the community at large on the dangers of contracting HIV/AIDS and STI and their prevention measures such as abstinence; and • Ensure availability of free condoms.	• Number of sensitization meetings held • Number of condoms distributed	Inspection on the diseases workers will be suffering from	Three times per year	Health facilities in the project areas	3,000
22	Increased risk of child labour	The contractor will engage workers that are aged more than 18 years	Number of children employed	Inspection of the labor force employed	Three times per year	District Labour Office	6,000.00
23	Creation of breeding grounds for mosquitoes, which may spread malaria	The Contractor will lay the pipes and fill the trenches immediately after digging them to avoid them become breeding grounds for mosquitoes	Period it will take to lay pipes and refill trenches	Inspection of the excavated trenches	Twice every month	District Health Officer	20,000.00
IMPACTS FROM DEMMOBILIZATION PHASE							

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
	POSITIVE IMPACTS						
1	Reduced exposure to health and safety risks	Once construction activities are over, the Contract will lay off all workers and demobilize all equipment	Number of new exposures to health and safety risks	Inspections	Once upon decommissioning	Contractor Project Manager	7,000.00
2	Reduced risks to accidents	Once construction activities are over, the Contract will lay off all workers and demobilize all equipment	Number of accidents recorded	Inspections	Once upon decommissioning	Contractor Project Manager	7,000.00
3	Reduced noise and vibration levels	Once construction activities are over, the Contract will lay of all workers and demobilize all equipment	Level of noise recorded	Inspections	Once upon decommissioning	Contractor Project Manager	7,000.00
4	Cleaner environment	Once construction activities are over, the Contract will lay off all workers and demobilize all equipment	Amount of waste accumulating	Inspections	Once upon decommissioning	Contractor Project Manager	7,000.00
	NEGATIVE IMPACTS						
1	Loss of employment by the Contractor's workforce	• Informing workers of project duration when employing them • Educating the labour force on the need to save part of their wages • Paying severance benefits to all laid off workers according to the	Amount of severance benefits paid to workers	Records	Once on decommissioning	Contractor Project manager Min. of Labour	7,000.00

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		provisions of the labour laws.					
2	Loss of income by goods and service providers	The Contractor will provide advance warning of the completion of construction activities to goods and service providers.	Level of income lost	Records	Once	Contractor Project manager Min. of Labour	N/A
3	Increased generation of waste from demolished temporary structures	The contractor will: i) Arrange to have the construction waste safely disposed of at designated waste disposal sites; and ii) Revegetate areas that were cleared.	Amount of waste	Records	Once	Contractor Project Manager	5,000.00
IMPACTS FROM OPERATION PHASE							
POSITIVE IMPACTS							
1	Improved access to potable water by Lilongwe City residents and surrounding areas	LWB will put in place easy procedures for connection and a routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks.	No. of areas serviced with potable water	Inspection	Annually	Lilongwe Water Board	Part of their operational budget

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
2	Creation of employment	LWB will employ more people to assist in the routine supervision to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available throughout.	No. of local people employed No. of women employed	Records	Annually	LWB	Part of their operational budget
3	Increase in government revenue through taxes	LWB will ensure that many people within the proposed network are connected to the water supply system. Furthermore, LWB will remit all the taxes in good time to government.	Number of people people/institutions connected, number of pipelines maintained	Records and inspections	Annually	LWB	Part of their operational budget
4	Reduced incidences of water borne (e.g. cholera and diarrhoea) and water washed diseases (e.g. skin infection) due to	LWB will connect as many people as possible in all the areas where the distribution network will be operating.	No. of people and institutions connected and number of pipelines maintained	Records and inspection	Annually	LWB	Part of their operational budget

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
	improved availability of water						
5	Reduction in water losses as more people will be legally connected	LWB will put in place routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available to the residents throughout. Furthermore, LWB should improve their efficiency in connecting water to customers.	No. of people and institutions connected and number of pipelines maintained	Records and inspection	Annually	LWB	Part of their operational budget
6	Increased economic activities within the project impact area	LWB will put in place routine supervision programs to check leaks of the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks and that water is available to the residents throughout. Furthermore, LWB should improve their efficiency in connecting water to customers.	No. of areas with potable water, people and institutions connected and number of pipelines maintained	Records and inspection	Annually	LWB	Part of their operational budget

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
7	Contribution to increased opportunities for foreign investment	LWB will ensure that many individuals as well as institutions/industries are connected to potable water.	No. of areas with potable water, people and institutions connected and number of pipelines maintained	Records and inspection	Annually	LWB	Part of their operational budget
NEGATIVE IMPACTS							
1	Water loss	LWB will put in place routine supervision programs to check leaks and illegal connection to the distribution network and to carry out routine maintenance of any broken pipes to ensure that the board does not lose water through leaks.	No. of areas with potable water, people and institutions connected and number of pipelines maintained	Records and inspection	Annually	LWB	Part of their operational budget
2	Increased losses of the water resources	i) Sensitizing the residents on the dangers of vandalising the pipes and fitting; ii) LWB will have to work with community and police to curb this malpractice;	No. of areas with potable water, people and institutions connected and number of pipelines maintained	Records and inspection	Annually	LWB	Part of their operational budget

Item	Potential impact	Recommended Enhancement/Mitigation Measure	Monitoring Indicator	Means of Verification	Frequency of monitoring	Responsible Authority	Costs (U$D)
		iii) LWB will have to continuously monitor for leakage and vandalised pipes; and iv) Residents should be encouraged to report any burst pipes and leakages.					
3	Operational And Maintenance Related accidents	The Contractor will be required to: i) train the workers about the possible occupation hazards that may be associated with this type of work; ii) provide PPE such as helmets, boots, overalls etc; and iii) properly label all the accident prone sites especially when rehabilitating the roads.	Number of accidents recorded	Records	Twice per year	Ministry of Labor and Vocational Trading	10,000.00

CHAPTER 8 CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

From the ESMP studies conducted, the proposed project will bring significant benefits in terms of fostering economic growth and improved health standards in the project impact area through easy access to potable water by the public. The proposed project will have significant positive impacts which relate to improved access to potable water by Lilongwe City residents and surrounding areas, reduced incidences of water borne (e.g. cholera and diarrhea) and water washed diseases (e.g. skin infection) due to improved availability of water, increase in government revenue through taxes, reduction in water losses as more people will be legally connected.

Despite the numerous benefits that the project will bring to the people in the City of Lilongwe and Malawi. The project will also trigger some negative impacts which relate to the biophysical and socio-economic environment. The impacts relate to issues pertaining to anxiety about loss of property and temporary loss of business, water use conflict, damage to road and driveway pavements, disruption of public service utilities, construction related accidents, disruption of traffic flow and public mobility, creation of noise nuisance and vibration, air pollution due to dust, temporary disturbance of different business activities along the water distribution network, and water resource depletion.

It should be noted, however, that despite the above potential negative impacts, it is possible with adequate design and implementation measures advanced in this report to mitigate the negative environmental and social impacts and reduce them to acceptable levels. It is recommended that strict monitoring measures will be instituted both from an engineering and environmental and social point. This will ensure that the project adheres to acceptable practices and standards.

8.2 Summary of Positive and Negative Impacts

8.2.1 Summary of key positive impacts

A summary of the key positive impacts identified in the EIA study are indicated below:

a) Improved access to potable water by Lilongwe City residents and surrounding areas;

b) Creation of employment;

c) Increase in government revenue through taxes;

d) Reduced incidences of water borne (e.g. cholera and diarrhoea) and water washed diseases (e.g. skin infection) due to improved availability of water;

e) Reduction in water losses as more people will be legally connected;

f) Increased economic activities within the project impact area; and

g) Increased income generation by the local people, especially women and youth by operating water kiosks.

8.2.2 Summary of key negative impacts

The following is a summary of the main negative impacts and recommended measures to minimize or eliminated the impacts:

a) Anxiety about loss of property and temporary loss of business;
b) Water use conflict;
c) Possible damage to road Pavement;
d) Possible disruption of public service utilities;
e) Construction related accidents;
f) Disruption of traffic flow and public mobility;
g) Creation of noise nuisance and vibration;
h) Air pollution due to dust;
i) Soil erosion and sedimentation of storm water drainage /watercourses;
j) Soil Contamination;
k) Increase in accident/incidences;
l) Increase in the spread of HIV/AIDS and other sexually transmitted diseases;
m) Temporary disturbance of different business activities along the water distribution network;
n) Loss of property;
o) Water resource depletion;
p) Increased labour influx impacts;
q) Unplanned induced urbanization of neighboring communities; and
r) Increased losses of the water resources.

8.3 Overall Recommendation

It is the consultant's view that the project be allowed to proceed on condition that the measures proposed in this ESMP Report are fully implemented.

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ANNEX 1: MINUTES OF STAKEHOLDER CONSULTATION MEETINGS IN THE PROJECT AREAS

ANNEX 1.1 MINUTES OF THE STAKEHOLDERS' CONSULTATION MEETING WITH POTENTIAL PROJECT AFFECTED PERSONS (PAPS) HELD AT AREA 38-KATONDO ON 21 JULY, 2017 FOR LILONGWE WATER BOARD DISTRIBUTION NETWORK PROJECT

NO.	MINUTES
1.0	**Opening Remarks** 1.1. Mr. J. Matumba the market Vice Chairperson opened the meeting with a word of prayer and welcomed the consultation team and potential PAPs to the meeting; 1.2. He requested the consulting team to introduce itself and to brief the gathering why they had requested for the meeting.
2.0	**Objectives of the meeting** 2.1 Mr. L. Kampira of Environment and Natural Resources Management Consultants on behalf of the Consulting team informed the people gathered at the meeting that the meeting was organized in order to: a) Inform them about the project; b) Provide an opportunity for them to discuss their opinions and concerns; c) Manage their expectations and misconceptions regarding the project; d) verify the significance of environmental, social and health impacts identified; e) get inputs on compensation issues; f) disseminate concepts of the proposed Project activities with a view to provoking Project interest amongst the communities; and g) promote sense of ownership for the Project; and informing the process of developing appropriate mitigation measures. 2.2 During the meeting, general information about the project was discussed and a number of issues were raised pertaining to how the project will affect the PAPs. Question and answers were used to guide the discussions.
3.0	**Briefing on the project** 3.1 Mr. Kampira briefed the PAPs that LWB intends to upgrade, rehabilitate and expand its pipeline distribution network so as to improve access to portable water in the city. He informed the gathering that the pipes will be laid along the roads in the road reserves. He also advised the gathering that according to the laws of Malawi, people are not allowed to build either houses or shops in the road reserve, though that's not the case in most areas. He highlighted that during the project implementation some people and business premises shall be temporarily disturbed especially those residing or conducting business along the proposed route for the pipelines. He emphasized that the pipelines will pass through a route with minimal disturbance and along the road reserve. However, he informed them that in built up places like markets and other residential areas labourers instead of machines shall be used to excavate trenches so as to minimize disturbance.

NO.	MINUTES	
	The PAPs were further informed that where disturbance will be unavoidable, LWB shall compensate the affected persons for temporary loss of business or structures. He further clarified that compensation will only be paid where construction activities will disturb business and where a structure will be destroyed. He informed the PAPs that a preliminary valuation was already conducted and that would form a basis for compensation. Thereafter, the floor was opened for the potential PAPs to comment or seek clarifications relating to the briefing or the project in general.	
4.0	**ISSUE RAISED DURING THE PLENARY DISCUSSION**	**RESPONSE**
A	PAPs were interested to know if the water would be for free or if people would pay for it	The system is for water that will be paid for and is just to upgrade the current system. Following the project however, some kiosks will be constructed for communal consumption, where individuals will buy water for their home use.
B	PAPs wanted to know who will be compensated for loss of business in places where tenants would lose business, will the landlords equally be compensated	It depends on who owns what. It was emphasized that if a structure will be affected, it will be the landlord who will be compensated. But if the disturbance will only be temporary loss of business, it will be the tenant who will be compensated. If the disturbance will affect both temporary loss of business and the structure, then both the landlord and the tenant will be compensated.
C	PAPs were also keen to know when they should expect the project to start and its period	The project is expected to start in early 2019 and will run for five years but it will be done in phases. Necessary communication will be made before the actual date of commencement to all PAPs. Nevertheless, compensation will be paid before any project activity starts.
D	PAPs were also interested to know how this pipeline upgrading might improve the current problem of water scarcity in the city considering that Lilongwe is already experiencing water shortages even with limited connections	It was indicated that Diamphwe multipurpose dam is underway which is bigger than Kamuzu Dams 1 and 2. Another additional option is that of abstracting water from Lake Malawi. Both these new water sources will have large volume of water which Lilongwe Water Board will need to distribute to consumers. Hence important that the boards starts expanding its distribution network.
E	On Compensation, three ways of compensating the PAPs were discussed:	PAPs preferred cash compensation as opposed to in kind compensation

NO.	MINUTES	
	a) Monetary compensation to the PAPs who will experience temporary disturbance/loss of business for the whole period that they will lose business; b) Monetary compensations to the PAPs who will experience permanent loss of property such as trees that shall be destroyed as a whole or experience partial damage; and c) "In-kind" compensation where Lilongwe Water Board through a Contractor, will replace damaged infrastructures such as damaged road pavements; damaged concrete driveway; damaged building structures; and disruption of public service	
5.0	**Closing Remarks** The Chairperson asked the PAPs to make sure that they all participate in the verification exercise which will take place soon during the implementation of the RAP and attend the subsequent meetings on the same. Mr. S. Phiri of Environment and Natural Resources Management Consultants thanked all PAPs for their availability, attention and interaction, saying it was very necessary for them to get to understand how the project will be implemented and how it will affect them. He also emphasized on the point that all PAPs shall be verified and compensated accordingly before the actual project activity commences. He also requested them to help with the signing of the minutes once they are developed particularly the leaders, a copy of which will be left with them for future use and another copy will be submitted to LWB for official use. He lastly urged them to keep attending the subsequent meetings on the project in order to ensure smooth implementation of the project. The meeting was closed with a word of prayer.	

ATTENDANCE			
NAME	**POSITION**	**ORGANISATION**	**CONTACT**
Mr. L. Kampira	Team Leader	Environment and Natural Resources Management Consultants	0999 916 036/ 0888 771 836
Mr. S. Phiri	Water Resources Expert	Environment and Natural Resources Management Consultants	0999 808 612
Ms. A. Kaudzu	Assistant Project Coordinator	Environment and Natural Resources Management Consultants	0884 062 701
Mr. I. Mwale	Assistant Surveyor	Lilongwe Water Board	0991 433 250
Josiah Matumba	Vice Chairperson	Area 38-Katondo Market	0993 951 602
Major Yusuf	Chairperson	Area 38-Katondo Market	0993 496 701
Mphatso Mpaya	Potential Project Affected Person	Area 38-Katondo Market	
Catherine Magombo	Potential Project Affected Person	Area 38-Katondo Market	
Enita Pitala	Potential Project Affected Person	Area 38-Katondo Market	
Felista Mkoka	Potential Project Affected Person	Area 38-Katondo Market	
Alfred Champepa	Potential Project Affected Person	Area 38-Katondo Market	
Edesi Lemani	Potential Project Affected Person	Area 38-Katondo Market	
Matthews Innocent	Potential Project Affected Person	Area 38-Katondo Market	
Rashid Kwinje	Potential Project Affected Person	Area 38-Katondo Market	
Hassan James	Potential Project Affected Person	Area 38-Katondo Market	
I.S. Khombe	Potential Project Affected Person	Area 38-Katondo Market	
Prosper Banda	Potential Project Affected Person	Area 38-Katondo Market	
Imedi Milli	Potential Project Affected Person	Area 38-Katondo Market	

ATTENDANCE			
NAME	**POSITION**	**ORGANISATION**	**CONTACT**
H. Makiyi	Potential Project Affected Person	Area 38-Katondo Market	
Ishmaela M'bwana	Potential Project Affected Person	Area 38-Katondo Market	
Catherine Paulo	Potential Project Affected Person	Area 38-Katondo Market	
Beatrice Andrea	Potential Project Affected Person	Area 38-Katondo Market	
Grace Molande	Potential Project Affected Person	Area 38-Katondo Market	

ANNEX 1.2 MINUTES OF THE STAKEHOLDERS' CONSULTATION MEETING WITH POTENTIAL PROJECT AFFECTED PERSONS (PAPS) HELD AT NGWENYA MARKET ON 21 JULY 2017 FOR LILONGWE WATER BOARD DISTRIBUTION NETWORK PROJECT

NO.	MINUTES
1.0	**Opening Remarks** 1.1 Mr. Mtunda the market chairperson opened the meeting with a word of prayer and welcomed the consultation team and potential PAPs to the meeting; 1.2 He requested the consulting team to introduce itself and to brief the gathering why they had requested for the meeting.
2.0	**Objectives of the meeting** 2.1 Mr. L. Kampira of Environment and Natural Resources Management Consultants on behalf of the Consulting team informed the people gathered at the meeting that the meeting was organized in order to: a) Inform them about the project; b) Provide an opportunity for them to discuss their opinions and concerns; c) Manage their expectations and misconceptions regarding the project; d) verify the significance of environmental, social and health impacts identified; e) get inputs on compensation issues; f) disseminate concepts of the proposed Project activities with a view to provoking Project interest amongst the communities; g) promote sense of ownership for the Project; and informing the process of developing appropriate mitigation measures. 2.2 During the meeting, general information about the project was discussed and a number of issues were raised pertaining to how the project will affect the PAPs. Question and answers were used to guide the discussions.
3.0	**Briefing on the project** 3.1 Mr. L. Kampira briefed the PAPs that Lilongwe Water Board (LWB) intends to upgrade, rehabilitate and expand its pipeline distribution network so as to improve access to portable water in the city. He informed the gathering that the pipes will be laid along the roads in the road reserves. He also advised the gathering that according to the laws of Malawi, people are not allowed to build either houses or shops in the road reserve, though that's not the case in most areas. He highlighted that during the project implementation some people and business premises shall be temporarily disturbed especially those residing or conducting business along the proposed route for the pipelines. He emphasized that the pipelines will pass through a route with minimal disturbance and along the road reserve. However, he informed them that in built up places like markets and other residential areas labourers instead of machines shall be used to excavate trenches so as to minimize disturbance. The PAPs were further informed that where disturbance will be unavoidable, LWB shall compensate the affected persons for temporary loss of business or structures. He further clarified that compensation will only be paid where construction activities will disturb business and where a structure will be destroyed. He informed the PAPs that a preliminary valuation was already conducted and that would form a basis

NO.	MINUTES	
	for compensation. Thereafter, the floor was opened for the potential PAPs to comment or seek clarifications relating to the briefing or the project in general.	
4.0	**ISSUE RAISED DURING THE PLENARY DISCUSSION**	**RESPONSE**
A	PAPs were interested to know the size of the pipeline trench to be excavated	The trenches will be 0.5 m wide and 1.0 m deep
B	PAPs were also interested to know when the compensation will be paid to PAPs	Exact time not known but will be soon before any project activity commences. Meaning no project activity shall be done before PAPs receive their compensations
C	PAPs were so keen to how long it will take to backfill the trenches relating to other areas like *Gaga* where similar exercise took about 3 months before the trenches were backfilled	The PAPs were informed that the trenches will be filled immediately after laying the pipes
D	PAPs also wanted to know landlords will be helped in cases where loss of business to tenants means loss of business to landlords,	That would be possible but it depends on the duration of the project. However, this project shall only cause temporal disturbance (1-4 days) with compensation attached to it as such we do not expect any tenant to vacate the premise unless for other reasons.
E	PAPs also wanted to know who would pay for the cost of new connections after disconnection due to the project activity	It was highlighted that LWB shall meet all costs and will make sure that the reconnections are made as soon as the pipes are laid and the trenches are backfilled. This is to prevent additional disturbance of water unavailability to surrounding households and locations.
F	PAPs were also keen to know how some people of the opposite side of the road who will also be affected with dust for instance, would be considered	To prevent dust emission, the areas to be excavated will be sprinkled with water first
G	On Compensation, three ways of compensating the PAPs were discussed: a) Monetary compensation to the PAPs who will experience temporary disturbance/loss of business for the whole period that they will lose business; b) Monetary compensations to the PAPs who will experience permanent loss of property such as trees that shall be destroyed as a whole or experience partial damage; and	PAPs preferred cash compensation as opposed to in kind compensation

NO.	MINUTES	
	c) "In-kind" compensation where Lilongwe Water Board through a Contractor, will replace damaged infrastructures such as damaged road pavements; damaged concrete driveway; damaged building structures; and disruption of public service	
5.0	**Closing Remarks** Chairperson asked the PAPs to make sure they all attend the proceeding meetings. Mr. S. Phiri thanked all PAPs for their availability, attention and interaction, saying it was very useful. Then he requested them to help with the signing of the minutes once they are developed particularly the leaders, a copy of which will be left with tem for future use and another copy will be submitted to LWB for official use. The meeting was closed with a word of prayer.	

ATTENDANCE			
NAME	**POSITION**	**ORGANISATION**	**CONTACT**
Mr. L. Kampira	Team Leader	Environment and Natural Resources Management Consultants	0999 916 036/ 0888 771 836
Mr. S. Phiri	Water Resources Expert	Environment and Natural Resources Management Consultants	0999 808 612
Ms. A. Kaudzu	Assistant Project Coordinator	Environment and Natural Resources Management Consultants	0884 062 701
Mr. I. Mwale	Assistant Surveyor	Lilongwe Water Board	0991 433 250
Mr. Mtunda	Chairperson	Ngwenya market	
Chisomo Ganizani	Project Affected Person	Ngwenya market	
Alinafe Kamunda	Project Affected Person	Ngwenya market	
Dr Wademba	Project Affected Person	Ngwenya market	
Phillip Namangale	Project Affected Person	Ngwenya market	
Haswell Mtongola	Potential Project Affected Person	Ngwenya market	
Alinet Kamudya	Potential Project Affected Person	Ngwenya market	
Chrissy Bulawayo	Potential Project Affected Person	Ngwenya market	
Mr Jekapu	Potential Project Affected Person	Ngwenya market	
Yosofi Visatsi	Potential Project Affected Person	Ngwenya market	
Cecilia Petulo	Potential Project Affected Person	Ngwenya market	
Clement Saulosi	Potential Project Affected Person	Ngwenya	
Moses Chiponda	Potential Project Affected Person	Ngwenya	
Akuzike Ganizani	Project Affected Person	Ngwenya	
Victor Katalama	Project Affected Person	Ngwenya	
Kelvin Million	Project Affected Person	Ngwenya	
Weluzani Benisoni	Project Affected Person	Ngwenya	
Adam Kananji	Project Affected Person	Ngwenya	

ANNEX 1.3 MINUTES OF THE STAKEHOLDERS' CONSULTATION MEETING WITH POTENTIAL PROJECT AFFECTED PERSONS (PAPS) HELD AT AREA 49-ZEBRA MARKET ON 22 JULY 2017 FOR LILONGWE WATER BOARD DISTRIBUTION NETWORK PROJECT

NO.	MINUTES
1.0	**Opening Remarks** 1.1 Mr. D. Mwale the market chairperson opened the meeting with a word of prayer and welcomed the consultation team and potential PAPs to the meeting; 1.2 He requested the consulting team to introduce itself and to brief the gathering why they had requested for the meeting.
2.0	**Objectives of the meeting** 2.1 Mr. S. Phiri of Environment and Natural Resources Management Consultants on behalf of the Consulting team informed the people gathered at the meeting that the meeting was organized in order to: a) Inform them about the project; b) Provide an opportunity for them to discuss their opinions and concerns; c) Manage their expectations and misconceptions regarding the project; d) verify the significance of environmental, social and health impacts identified; e) get inputs on compensation issues; f) disseminate concepts of the proposed Project activities with a view to provoking Project interest amongst the communities; g) promote sense of ownership for the Project; and informing the process of developing appropriate mitigation measures. 2.2 During the meeting, general information about the project was discussed and a number of issues were raised pertaining to how the project will affect the PAPs. Question and answers were used to guide the discussions.
3.0	**Briefing on the project** 3.1 Mr. S. Phiri of Environment and Natural Resources Consultants briefed the PAPs that Lilongwe Water Board (LWB) intends to upgrade, rehabilitate and expand its pipeline distribution network so as to improve access to portable water in the city. He informed the gathering that the pipes will be laid along the roads in the road reserves. He also advised the gathering that according to the laws of Malawi, people are not allowed to build either houses or shops in the road reserve, though that's not the case in most areas. He highlighted that during the project implementation some people and business premises shall be temporarily disturbed especially those residing or conducting business along the proposed route for the pipelines. He emphasized that the pipelines will pass through a route with minimal disturbance and along the road reserve. However, he informed them that in built up places like markets and other residential areas labourers instead of machines shall be used to excavate trenches so as to minimize disturbance. The PAPs were further informed that where disturbance will be unavoidable, LWB shall compensate the affected persons for temporary loss of business or structures. He further clarified that compensation will only be paid where construction activities will disturb business and where a structure will be destroyed. He informed the PAPs that a preliminary valuation was already conducted and that would form a basis

NO.	MINUTES	
	for compensation. Thereafter, the floor was opened for the potential PAPs to comment or seek clarifications relating to the briefing or the project in general.	
4.0	**ISSUE RAISED DURING THE PLENARY DISCUSSION**	**RESPONSE**
A	PAPs were interested to know the type of equipment to be used during excavation of trenches considering that the place is a market	It was indicated that in confined areas like markets and highly built up residential areas labourers instead of machines shall be used to excavate trenches so as to minimize disturbance. This shall also provide employment opportunity to the youth from surrounding areas.
B	PAPs were also interested to know why is it that they are being considered for compensation when most of them are illegally operating their businesses within the road reserves	This is so because according to policies of World Bank who are also funding the project; every affected person as long as that person will be disturbed on their legal or illegal resident or business place needs to be compensated as any disturbance will affect their livelihood.
C	PAPs were also keen to know what LWB will do if the number of days for disturbance will not be equivalent to the compensation given since compensation will come before any project activity commences	The full project team is also composed of designers who will be able to direct the contractor on how long the actual project activity should take so that the compensation is equivalent to the disturbance period.
D	PAPs were also keen to know when they should expect the project to start and its period	They were informed that project is expected to start in early 2019 2017 and will run for five years but it will be done in phases. Necessary communication will be made before the actual date of commencement to all PAPs. Nevertheless, compensation would be granted before any project activity starts.
e	On Compensation, three ways of compensating the PAPs were discussed: a) Monetary compensation to the PAPs who will experience temporary disturbance/loss of business for the whole period that they will lose business; b) Monetary compensations to the PAPs who will experience permanent loss of property such as trees that shall be destroyed as a whole or experience partial damage; and	PAPs preferred cash compensation as opposed to in kind compensation

NO.	MINUTES	
	c) "In-kind" compensation where Lilongwe Water Board through a Contractor, will replace damaged infrastructures such as damaged road pavements; damaged concrete driveway; damaged building structures; and disruption of public service	
5.0	**Closing Remarks** Mr. S. Phiri appreciated the PAPs for the collaborative and interactive meeting held. He also encouraged them to keep attending similar expected future meetings so that they are all updated about any development regarding the project. The meeting ended with a word of prayer.	

ATTENDANCE			
NAME	**POSITION**	**ORGANISATION**	**CONTACT**
Mr. L. Kampira	Team Leader	Environment and Natural Resources Management Consultants	0999 916 036/ 0888 771 836
Mr. S. Phiri	Water Resources Expert	Environment and Natural Resources Management Consultants	0999 808 612
Ms. A. Kaudzu	Assistant Project Coordinator	Environment and Natural Resources Management Consultants	0884 062 701
Mr. A. Chapalika	Assistant Surveyor	Lilongwe Water Board	0999 426 244
Dziyanjanani Mwale	Chairperson	Area 49-Zebra market	0995 530 780
Mr. Major Fanuel	Project Affected Person	Area 49-Zebra market	
Vincent Banda	Project Affected Person	Area 49-Zebra market	
Elizabeth Guba	Project Affected Person	Area 49-Zebra market	
Jummah Yassin	Project Affected Person	Area 49-Zebra market	
Esther Mwiwa	Project Affected Person	Area 49-Zebra	
Queen Soko	Project Affected Person	Area 49-Zebra	
Limbani White	Project Affected Person	Area 49-Zebra	
Osman Maluwa	Project Affected Person	Area 49-Zebra	
Kumbukani Phiri	Project Affected Person	Area 49-Zebra	
Livinity Moyo	Project Affected Person	Area 49-Zebra	
Ezekiel Sandramu	Project Affected	Area 49-Zebra	
Hardwell Chigoneka	Project Affected Person	Area 49-Zebra market	
Frank Alli	l Project Affected Person	Area 49-Zebra market	
Maxwell Kadammanja	Project Affected Person	Area 49-Zebra market	
Isaac Banda	Project Affected Person	Area 49-Zebra market	
Abdul Kosmas	Project Affected Person	Area 49-Zebra market	
Mike Banda	Potential Project Affected Person	Area 49-Zebra market	

ANNEX 1.4 MINUTES OF THE STAKEHOLDERS' CONSULTATION MEETING WITH POTENTIAL PROJECT AFFECTED PERSONS (PAPS) HELD AT AREA 46-CHINSAPO KACHERE MARKET ON 22 JULY 2017 FOR LILONGWE WATER BOARD DISTRIBUTION NETWORK PROJECT

NO.	MINUTES
1.0	**Opening Remarks** 1.1 Mr. J. Matumba the market Vice Chairperson opened the meeting with a word of prayer and welcomed the consultation team and potential PAPs to the meeting; 1.2 He requested the consulting team to introduce itself and to brief the gathering why they had requested for the meeting.
2.0	**Objectives of the meeting** 2.1 Mr. Phiri of Environment and Natural Resources Management Consultants on behalf of the Consulting team informed the people gathered at the meeting that the meeting was organized in order to: a) Inform them about the project; b) Provide an opportunity for them to discuss their opinions and concerns; c) Manage their expectations and misconceptions regarding the project; d) verify the significance of environmental, social and health impacts identified; e) get inputs on compensation issues; f) disseminate concepts of the proposed Project activities with a view to provoking Project interest amongst the communities; g) promote sense of ownership for the Project; and informing the process of developing appropriate mitigation measures. 2.2 During the meeting, general information about the project was discussed and a number of issues were raised pertaining to how the project will affect the PAPs. Question and answers were used to guide the discussions.
3.0	**Briefing on the project** 3.1 Mr. Phiri briefed the PAPs that Lilongwe Water Board (LWB) intends to upgrade, rehabilitate and expand its pipeline distribution network so as to improve access to portable water in the city. He informed the gathering that the pipes will be laid along the roads in the road reserves. He also advised the gathering that according to the laws of Malawi, people are not allowed to build either houses or shops in the road reserve, though that's not the case in most areas. He highlighted that during the project implementation some people and business premises shall be temporarily disturbed especially those residing or conducting business along the proposed route for the pipelines. He emphasized that the pipelines will pass through a route with minimal disturbance and along the road reserve. However, he informed them that in built up places like markets and other residential areas labourers instead of machines shall be used to excavate trenches so as to minimize disturbance. The PAPs were further informed that where disturbance will be unavoidable, LWB shall compensate the affected persons for temporary loss of business or structures. He further clarified that compensation will only be paid where construction activities will disturb business and where a structure will be destroyed. He informed the PAPs that a preliminary valuation was already conducted and that would form a basis

NO.	MINUTES	
	for compensation. Thereafter, the floor was opened for the potential PAPs to comment or seek clarifications relating to the briefing or the project in general.	
4.0	**ISSUE RAISED DURING THE PLENARY DISCUSSION**	**RESPONSE**
A	PAPs wanted to find out if the owners of the shops to be affected could be hired to excavate the trenches for the pipelines going through their shops and be paid for the services rendered to avoid hiring other people to excavate trenches through their shops who may end up stealing from them.	Participants at the meeting were informed that the point was valid, however the contractor will be in a better position to know how best to deal with that.
B	PAPs were also interested to know how details of the potential PAPs will be verified to avoid paying compensation to wrong people	Participants to the meeting were informed that the details of the PAPs will be verified during verification exercise.
C	PAPs wanted to know whether they would receive the compensation in cash or cheque	It was highlighted that the task shall be handled by an administrator who shall decide the mode of payment regarding the fact some compensation might not really need a cheque. Nevertheless, prior communicated shall be made
D	PAPs wanted to know what will happen to business people who do not have structures but have some permanent places where they carry out their businesses	Participants were informed that such business people usually carry around their businesses with them to sell at places which are seen to be convenient. Such businesses will not be considered for compensation as they can always move to convenient places where their businesses will not be disturbed.
E	On Compensation, three ways of compensating the PAPs were discussed: a) Monetary compensation to the PAPs who will experience temporary disturbance/loss of business for the whole period that they will lose business; b) Monetary compensations to the PAPs who will experience permanent loss of property such as trees that shall be destroyed as a whole or experience partial damage; and c) “In-kind” compensation where Lilongwe Water Board through a Contractor, will replace damaged infrastructures such as	PAPs preferred cash compensation as opposed to in kind compensation

NO.	MINUTES	
	damaged road pavements; damaged concrete driveway; damaged building structures; and disruption of public service	
5.0	**Closing Remarks** Chairperson asked the PAPs to make sure they all attend the future expected similar Meetings. Mr. S. Phiri thanked all PAPs for their availability and contributions. He also requested them to help with the signing of the minutes once they are developed particularly the leaders, a copy will be left with the team for future use and another copy will be submitted to LWB for official use. He lastly urged them to keep attending the proceeding meetings on the project matter in order not to ensure smooth implementation of the project. The meeting was closed with a word of prayer.	

ATTENDANCE			
NAME	**POSITION**	**ORGANISATION**	**CONTACT**
Mr. L. Kampira	Team Leader	Environment and Natural Resources Management Consultants	0999 916 036/ 0888 771 836
Mr. S. Phiri	Water Resources Expert	Environment and Natural Resources Management Consultants	0999 808 612
Ms. A. Kaudzu	Assistant Project Coordinator	Environment and Natural Resources Management Consultants	0884 062 701
Mr. I. Mwale	Assistant Surveyor	Lilongwe Water Board	0991 433 250
Lucy Mbizi	Chairperson	Area 46-Chinsapo	0991 928 555
Dimon Masiku	Area 38-Katondo Market	Area 46-Chinsapo	
Willy Kapala	Project Affected Person	Area 46-Chinsapo	
Rabson Kalilangwa	Project Affected Person	Area 46-Chinsapo	
Alick Kaunde	Project Affected Person	Area 46-Chinsapo	
Gift Kapalepale	Project Affected Person	Area 46-Chinsapo	
John Sitolo	Project Affected Person	Area 46-Chinsapo	
Mrs. Ngwena	Project Affected Person	Area 46-Chinsapo	
Mr. Govati	Project Affected Person	Area 46-Chinsapo	
Andrew Braim	Project Affected Person	Area 46-Chinsapo	
Mr. Kondwani	Project Affected Person	Area 46-Chinsapo	
Elizabeth Kajawa	Project Affected Person	Area 46-Chinsapo	
Mary Skinala	Project Affected Person	Area 46-Chinsapo	
Mr. Salanje	Project Affected Person	Area 46-Chinsapo	
Leniya Kachepa	Project Affected Person	Area 46-Chinsapo	
Mr. Mbenjere	Project Affected Person	Area 46-Chinsapo	
Mr. Bandawe	Project Affected Person	Area 46-Chinsapo	
Mrs. Kenya	Project Affected Person	Area 46-Chinsapo	
Precious Folayitoni	Project Affected Person	Area 46-Chinsapo	
Joseph Nyozeka	Project Affected Person	Area 46-Chinsapo	
Mr. Bonomali	Project Affected Person	Area 46-Chinsapo	
Mrs. Mazira	Project Affected Person	Area 46-Chinsapo	
Mrs. Masiye	Project Affected Person	Area 46-Chinsapo	
Mr. Osman	Project Affected Person	Area 46-Chinsapo	
Flora Mkumbira	Project Affected Person	Area 46-Chinsapo	
Idah Magaloni	Project Affected Person	Area 46-Chinsapo	

ATTENDANCE			
NAME	**POSITION**	**ORGANISATION**	**CONTACT**
Getrude Namgumuli	Project Affected Person	Area 46-Chinsapo	
Shikujuwa Ganizani	Project Affected Person	Area 46-Chinsapo	
Christina Limitedi	Project Affected Person	Area 46-Chinsapo	
Brenda Mawira	Project Affected Person	Area 46-Chinsapo	
Ethel Banda	Project Affected Person	Area 46-Chinsapo	
Mary Kandammanja	Project Affected Person	Area 46-Chinsapo	
Martha Mwase	Project Affected Person	Area 46-Chinsapo	
Stovas J. Palapandu	Project Affected Person	Area 46-Chinsapo	
Lucy Mbizi (Chairperson)	Project Affected Person	Area 46-Chinsapo	
Hannah Kachipande	Project Affected Person	Area 46-Chinsapo	
Styvelia Mpuwa	Project Affected Person	Area 46-Chinsapo	
Edina Mkukula	Project Affected Person	Area 46-Chinsapo	
Estelle Mhango	Project Affected Person	Area 46-Chinsapo	
Patricia Palapandu	Project Affected Person	Area 46-Chinsapo	
Esther Chibuli	Project Affected Person	Area 46-Chinsapo	
Rose Kathumba	Project Affected Person	Area 46-Chinsapo	
Safiyatu Milinda	Project Affected Person	Area 46-Chinsapo	
Mercy Mpate	Project Affected Person	Area 46-Chinsapo	
Virginia Kavekanji	Project Affected Person	Area 46-Chinsapo	
Margret Banda	Project Affected Person	Area 46-Chinsapo	
Jessie Gwetse	Project Affected Person	Area 46-Chinsapo	
Charity Mazengela	Project Affected Person	Area 46-Chinsapo	
Farress Lusiyano	Project Affected Person	Area 46-Chinsapo	
Juliana Namkuza	Project Affected Person	Area 46-Chinsapo	
Lufina Tembo	Project Affected Person	Area 46-Chinsapo	
Monica Kanyenga	Project Affected Person	Area 46-Chinsapo	
Janet Saimoni	Project Affected Person	Area 46-Chinsapo	
Beatrice Mwenyemasi	Project Affected Person	Area 46-Chinsapo	
Joyce Solomoni	Project Affected Person	Area 46-Chinsapo	

ANNEX 1.5 MINUTES OF THE STAKEHOLDERS' CONSULTATION MEETING WITH POTENTIAL PROJECT AFFECTED PERSONS (PAPS) HELD AT AREA 50 MARKET ON 23 JULY 2017, 2016 FOR LILONGWE WATER BOARD DISTRIBUTION NETWORK PROJECT

NO.	MINUTES	
1.0	**Opening Remarks** 1.1 Village Head Nyemba opened the meeting with a word of prayer and welcomed the consultation team and potential PAPs to the meeting; 1.2 He requested the consulting team to introduce itself and to brief the gathering why they had requested for the meeting.	
2.0	**Objectives of the meeting** 2.1 Mr. Phiri of Environment and Natural Resources Management Consultants on behalf of the Consulting team informed the people gathered at the meeting that the meeting was organized in order to: a) inform them about the project; b) provide an opportunity for them to discuss their opinions and concerns; c) manage their expectations and misconceptions regarding the project; d) verify the significance of environmental, social and health impacts identified; e) get inputs on compensation issues; f) disseminate concepts of the proposed project activities with a view to provoking project interest amongst the communities; g) promote sense of ownership for the project; and informing the process of developing appropriate mitigation measures. 2.2 During the meeting, general information about the project was discussed and a number of issues were raised pertaining to how the project will affect the PAPs. Question and answers were used to guide the discussions	
3.0	**Briefing on the project** 3.1 Mr. S. Phiri briefed the PAPs that Lilongwe Water Board (LWB) intends to upgrade, rehabilitate and expand its pipeline distribution network so as to improve access to portable water in the city. He informed the gathering that the pipes will be laid along the roads in the road reserves. He also advised the gathering that according to the laws of Malawi, people are not allowed to build either houses or shops in the road reserve, though that's not the case in most areas. He highlighted that during the project implementation some people and business premises shall be temporarily disturbed especially those residing or conducting business along the proposed route for the pipelines. He emphasized that the pipelines will pass through a route with minimal disturbance and along the road reserve. However, he informed them that in built up places like markets and other residential areas labourers instead of machines shall be used to excavate trenches so as to minimize disturbance. The PAPs were further informed that where disturbance will be unavoidable, LWB shall compensate the affected persons for temporary loss of business or structures. He further clarified that compensation will only be paid where construction activities will disturb business and where a structure will be destroyed. He informed the PAPs that a preliminary valuation was already conducted and that would form a basis for compensation. Thereafter, the floor was opened for the potential PAPs to comment or seek clarifications relating to the briefing or the project in general.	
4.0	**ISSUE RAISED DURING THE PLENARY DISCUSSION**	**RESPONSE**

NO.	MINUTES	
a	PAPs were interested to know the average compensation per PAP	It was clarified that compensation will depend on the loss the different PAPs will suffer. The preliminary valuation that was already conducted would form basis for compensation.
b	PAPs were also interested to know how long it will take for the destroyed structures to be brought back to shape	The following options were suggested: **Option 1:** If the PAP opts for cash compensation. This will give the PAP the liberty to start reconstruction soon after the project is completed on his or her affected structure. The amount of compensation shall be based on the preliminary valuation already conducted. In case where one mismanages their cash compensation, LWB will not be liable for reconstruction or any further compensation other than valuated. **Option 2:** If the PAP opts for a hired contractor to do the reconstruction which might take relatively longer period because the contractor will need to wait for the whole activity in that area to be completed. The PAPs would have to be compensated for the whole period that their structures are damaged by the project activities and are not in use.
c	PAPs also wanted to know if pipelines will follow existing pipelines	Not in all cases. The proposed routes were opted in terms of the side of the road which will cause less or no damage and disturbance.
d	PAPs were keen to appreciate where LWB intends to abstract the water understanding that we do not have enough water in Kamuzu dams 1 and 2	It was highlighted that LWB is planning to source water from Diamphwe multipurpose dam as well as Lake Malawi. As such, this project is to get prepared before abstraction from the two sources becomes a reality.
e	PAPs were also keen to know when they should expect the project to start	The project is expected to start in early 2019 and will run for five years but it will be done in phases. Necessary communication will be made before the actual date of commencement to all PAPs. Nevertheless, compensation would be granted before any project activity starts.
f	On Compensation, three ways of compensating the PAPs were discussed: e) Monetary compensation to the PAPs who will experience temporary disturbance/loss of business for the whole period that they will lose business; f) Monetary compensations to the PAPs who will experience permanent loss of property such as trees that shall be destroyed as a whole or experience partial damage; and	PAPs preferred cash compensation as opposed to in kind compensation

NO.	MINUTES	
	g) "In-kind" compensation where Lilongwe Water Board through a Contractor, will replace damaged infrastructures such as damaged road pavements; damaged concrete driveway; damaged building structures; and disruption of public service	
5.0	**Closing Remarks** Village Head Nyemba welcomed the project but requested LWB to live by its word in terms of compensation. He also requested that LWB should consider extending its distribution network to newly established locations following newly developed roads. Lastly, he had reservations if all this project will be implemented because similar projects have failed due to political interference. Mr. S. Phiri thanked all for their coming and contributions. He also encouraged them to keep attending similar expected future meetings so that they are all updated about any development regarding the project. He lastly, requested them to help with the signing of the minutes once they are developed particularly the leaders, a copy of which will be left with tem for future use and another copy will be submitted to LWB for official use. The meeting was closed with a word of prayer.	

ATTENDANCE			
NAME	**POSITION**	**ORGANISATION**	**CONTACT**
Mr. L. Kampira	Team Leader	Environment and Natural Resources Management Consultants	0999 916 036/ 0888 771 836
Mr. S. Phiri	Water Resources Expert	Environment and Natural Resources Management Consultants	0999 808 612
Ms. A. Kaudzu	Assistant Project Coordinator	Environment and Natural Resources Management Consultants	0884 062 701
Mr. A. Chapalika	Assistant Surveyor	Lilongwe water Board	0999 426 244
Harold Nkhunga	Chairperson	Area 50 market	0881 801 089/0993 308 020
Mr. J. Binali	Secretary	Area 50 market	0993 532 246
B. Nawera	Project Affected Person	Area 50 market	
Edina Biziwiki	Project Affected Person	Area 50 market	
Christopher Kadzombe	Project Affected Person	Area 50 market	
Mrs. Mussa	Project Affected Person	Area 50 market	
Mrs. Noya	Project Affected Person	Area 50 market	
Levison Nyemba (VH)	Project Affected Person	Area 50 market	
Chikondi Nkhoma	Project Affected Person	Area 50 market	
Mr. Evance Chimenya	Project Affected Person	Area 50 market	
Umali John	Project Affected Person	Area 50 market	
Mussa Robert	Project Affected Person	Area 50 market	
Amoni Tsamba	Project Affected Person	Area 50 market	
Mrs. Mtambo	Project Affected Person	Area 50 market	
Mr. Mtambo	Project Affected Person	Area 50 market	
Mr. Mandala	Project Affected Person	Area 50 market	
Ms. Fanezi William	Project Affected Person	Area 50 market	
Mrs. Misomali	Project Affected Person	Area 50 market	

ANNEX 2 LIST OF STAKEHOLDER CONSULTED DURING THE STUDY

Name	Position	Organization	Comment
Eng. Alfonso Chikuni	Chief Executive Officer	Lilongwe Water Board	We consider the project as a priority as we want to reach out to as many people as possible in the city of Lilongwe with potable water. We intend to implement the project to meet the growing water demand of the Lilongwe City residents but also within applicable laws and regulations
T. Mbale – Luka	Director	Environmental Affairs Department	The project is a good initiative. It will assist many city residents as well as institutions to access potable water. LWB should ensure that the necessary laws and policies pertaining to the environment are adhered to when implementing the project.
Sinosi Maliano	Project Implementation Unit Manager	Lilongwe Water Board	We intend to implement the project to meet the growing water demand of the Lilongwe City residents but also within applicable laws and regulations
Mr. Charles Kachingwe	Water Quality and Environmental Manager	Lilongwe Water Board	We intend to implement the project to meet the growing water demand of the Lilongwe City residents but also within applicable laws and regulations
Mrs. P. Kutengule	Safeguard Specialist	Lilongwe Water Project	We consider the project our priority number one. We plan to ensure that the project activities are implemented while following all the necessary laws and policies
Mr. H. Kamela	Development Control Manager	Lilongwe City Council	The project is a welcome development. However, it needs to follow planning regulations
Mr. Allan Kaziputa	Environmental and Social Performance Officer	Roads Authority	The development is fine and welcome. However, considering that in some places some roads will be cut to allow for pipelines to cross the roads, LWB should work hand in hand with us to manage such places so as not to disturb traffic for a long period.
Mr. Rex Kanjedza	Senior Water Resources Officer	Ministry of Agriculture, Irrigation and	The project is good and timely. The Board plans to expand its source of raw water from Diamphwe and Land Malawi and will end up with more

		Water Development	water which it will need to distribute to different consumers. Hence expansion of the distribution network is good initiative
Mr A.D. Kwanjana	Dep. Director for Cleansing Services	Lilongwe City Council	The project is a good initiative as it will assist many people in the city to access potable water hence reducing the incidences of waterborne diseases. LWB will need to comply with the city's requirements in waste management to avoid littering.
Abel Kawonga R. D. Mkandawire Chrissy Chiumia T. Chirambo Hon. John Bande	Area 47 Residents	Central Zone	The project is welcome because it will assist to improve water distribution in the area. However since the project will cause some damages to pavements, there is need for LWB to plan for compensating for the damaged structures
Frank Ali Maxwel Masina Patricia Tebulo King Chitseko Kanthu Kambalame Tole	Area 49 Residents	Northern Zone	The project is welcome because it will assist to improve water distribution in the area. However since the project will cause some damages to pavements, there is need for LWB to plan for compensating for the damaged structures
Richard Timothy Peter MacDonald Kemiasi Gwaza	Area 23 Residents	Southern Zone	The project is welcome because it will assist to improve water distribution in the area. However since the project will cause some damages to pavements, there is need for LWB to plan for compensating for the damaged structures

ANNEX 3 DESIGNATIONS AND QUALIFICATIONS OF THE EXPERTS

The following personnel list was responsible for the conducting of EIA study for the project:

3.1 Lyson Kampira: (MSc. Environmental Science, Bachelor of Education Science (Hons)) Mr. Kampira is an experienced Environmental and Social Impact Assessment expert and will be the Team Leader for the Assignment. He is a seasoned Environmental and Social Impact Assessment expert with More than 10 years of practical experience in ESIA studies and environmental management in General. He has successfully conducted a number of ESIA. In all, he has successfully conducted and led more than 20 ESIA studies and has prepared more than 20 ESIA reports and Environmental and Social Management Plans for different developmental projects ranging from irrigation, road infrastructure, hydropower generation, mining, industrial development, infrastructure developments and water and sanitation which have been approved by the Environmental Affairs Department.

3.2 George MB Kaggiah: (BSc, Civil Engineer and MSc Strategic Management)

Mr. Kaggiah is Registered Engineer and Fellow of Institution of Engineers in Kenya, UK and Malawi. He has extensive experience in consultancy services in Kenya, Swaziland, Mozambique and Malawi and has been in charge of various development projects such as: Irrigation and Drainage Schemes; Civil Works (Dams, Micro Hydro Power Stations, Intakes, Retaining Walls, Dykes, etc); Water Supply (Urban and Rural Supplies); Buildings & Infrastructure (Industrial, Commercial, & Residential Buildings and Estates); Transportation (Roads, Railways, Airfield, Bridges, jetties); Sewerage and Sanitation (onsite and offsite disposal); and Waste management and pollution control (Industrial Waste, Municipal Solid Waste, Pollution Control etc).

Mr. Kaggiah has over 26 years postgraduate experience with leading consulting firms as a professional Civil Engineer in civil engineering projects specialized in infrastructure, water supply and sanitation engineering. He also has extensive experience as senior resident engineer, projects engineer, team leader involved in project planning, preliminary and detailed design, tender documentation, contract supervision, administration, and management.

3.3 Martna Chimzimu: (Bachelor of Arts in Social Science) - Majoring in Sociology with minors Political Science & Administrative Studies

Ms. Chimzimu is a seasoned Social Development Expert with wide experience in Environment and Natural Resources Management, Climate Change, Gender and HIV/AIDS management. She has more than 5 years' experience in conducting socio-economic surveys and preparation of social impact assessment and mitigation plans. She has vast experience in public consultation.

3.4 Stanley Phiri (B.Sc. in Irrigation Engineering)

Mr. Phiri is a Water Resources (Irrigation) Expert. He specialised in Hydrology; and Water Resources. Mr. Phiri has wide professional experience in the water sector; irrigation, water supply, disaster risk management, environment and climate change management and related water disciplines of water, sanitation and hygiene. This includes water resources policy reforms for complex water demands for urban and rural water supply, Sustainable Environmental Management of Water Schemes, Designing of Water Infrastructures and Rural

Development, Surface and Groundwater Hydrology, Catchment Analysis and Management, Hydrological Modelling and Water Management, Rural Water Supply and Construction Management.

ANNEX 4 CHANCE FIND PROCEDURE FOR THE WATER DISTRIBUTION NETWORK REHABILITATION

Introduction

Chance Find Procedure is a step by step procedure which outlines what needs to be done when projects come across archaeological sites, historical sites, remains and objects, including graveyards or individual graves during excavations or construction. This procedure relates to OP/BP 4.11- Physical Cultural Resources. This Policy addresses physical cultural resources which are defined as movable or immovable objects, sites, structures that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below the ground.

Chance Find Procedures for Water Distribution Network Rehabilitation

If the implementers of the water distribution network rehabilitation component discover archaeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavations or construction, the implementers will carry out the following steps:

a) Stop the construction or excavation activities in the area of the chance find;

b) Delineate the discovered site or area;

c) Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Department of Antiquities take over;

d) Notify the Social Specialist of Lilongwe Water Project Implementation Unit or the Project Manager who in turn will notify the responsible officer in the Departments of Antiquities immediately (within 24 hours or less);

e) Responsible officer from the Department of Antiquities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;

f) Decisions on how to handle the finding shall be taken by the responsible authorities at the Department of Antiquities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;

g) Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Department of Antiquities to Lilongwe Water Board; and

h) Construction work could resume only after permission is given from the responsible local authorities or department responsible for culture or antiquities concerning safeguard of the heritage.

ANNEX 5 COMPENSATION SCHEDULE FOR THE PAPS

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
TREES	MANGO	LARGE	3.00	75,000.00	30,000.00	105,000.00	142.86
ROAD	TARMAC	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
DRIVEWAY	CONCRETE	5.000	2.00	1,385,000.00	554,000.00	1,939,000.00	2,638.10
SUGARCANE	-	LARGE	8.00	15,000.00	6,000.00	21,000.00	28.57
TOMATOES (GROWING)	-	LARGE	120.00	600,000.00	240,000.00	840,000.00	1,142.86
TREES	MOLINGA	LARGE	1.00	30,000.00	12,000.00	42,000.00	57.14
TOMATOES (GROWING)	-	LARGE	120.00	600,000.00	240,000.00	840,000.00	1,142.86
CAR WASH	-	-	1.00	20,000.00	8,000.00	28,000.00	38.10
STRINGS (LINYA) PRODUCING & SELLING	-	-	1.00	170,000.00	68,000.00	238,000.00	323.81
ROAD	TARMAC	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
DRIVEWAY	CONCRETE	5.000	1.00	692,500.00	277,000.00	969,500.00	1,319.05
TREES	ACCACIA	LARGE	1.00	20,000.00	8,000.00	28,000.00	38.10
FURNITURE SHOP	-	-	1.00	75,000.00	30,000.00	105,000.00	142.86

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
VEGETABLE BENCH	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14
FURNITURE SHOP	-	-	1.00	300,000.00	120,000.00	420,000.00	571.43
MINISHOP	-	-	1.00	40,000.00	16,000.00	56,000.00	76.19
BARBARSHOP	-	-	1.00	15,000.00	6,000.00	21,000.00	28.57
MINISHOP	-	-	1.00	45,000.00	18,000.00	63,000.00	85.71
CHIPS SHOP	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
MINISHOP and CEMENT VERANDA	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
MINISHOP	-	-	1.00	160,000.00	64,000.00	224,000.00	304.76
VEGETABLE BENCH	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
GARAGE & WELDING SHOP	-	-	1.00	150,000.00	60,000.00	210,000.00	285.71
CHARCOAL AND FIREWOOD	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
SECOND HAND CLOTHES BENCH	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14
SUGARCANE (SELLING)	-	-	1.00	75,000.00	30,000.00	105,000.00	142.86
MTL MAN HOLE	-	-	1.00	50,000.00	20,000.00	70,000.00	95.24
SECOND HAND CLOTHES BENCH	-	-	1.00	50,000.00	20,000.00	70,000.00	95.24
STRUCTURE	SHOP - plastered, cement, CIR, painted	67.800	1.00	4,712,000.00	1,884,800.00	6,596,800.00	8,975.24

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
ELECTRICAL SHOP	-	-	1.00	20,000.00	8,000.00	28,000.00	38.10
GROCERY SHOP	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14
GRASS FENCE	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
DRIVEWAY	CONCRETE		-	692,500.00	277,000.00	969,500.00	1,319.05
METAL WORKSHOP	-	-	1.00	800,000.00	320,000.00	1,120,000.00	1,523.81
GROCERY SHOP	-	-	1.00	120,000.00	48,000.00	168,000.00	228.57
GROCERY SHOP	-	-	1.00	80,000.00	32,000.00	112,000.00	152.38
GROCERY SHOP	-	-	1.00	95,000.00	38,000.00	133,000.00	180.95
GROCERY SHOP	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
STATIONERY	-	-	1.00	25,000.00	10,000.00	35,000.00	47.62
BARBARSHOP	-	-	1.00	70,000.00	28,000.00	98,000.00	133.33
TAILORINGSHOP	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
TAILORINGSHOP	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
GROCERY SHOP	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14
GROCERY SHOP	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14
GROCERY SHOP	-	-	1.00	45,000.00	18,000.00	63,000.00	85.71

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
SALOON	-	-	1.00	15,000.00	6,000.00	21,000.00	28.57
SALOON	-	-	1.00	15,000.00	6,000.00	21,000.00	28.57
BUTCHERY	-	-	1.00	25,000.00	10,000.00	35,000.00	47.62
GROCERY SHOP	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
ELECTRICAL SHOP	-	-	1.00	12,500.00	5,000.00	17,500.00	23.81
STATIONERY	-	-	1.00	15,000.00	6,000.00	21,000.00	28.57
VEDIO SHOW ROOM	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
FURNITURE SHOP	-	-	1.00	300,000.00	120,000.00	420,000.00	571.43
VEGETABLE BENCH	-	-	1.00	15,000.00	6,000.00	21,000.00	28.57
GROCERY SHOP	-	-	1.00	150,000.00	60,000.00	210,000.00	285.71
DIP TANK	BRICK AND PLASTERED	3.375	1.00	30,000.00	12,000.00	42,000.00	57.14
TREES	MANGO	LARGE	1.00	25,000.00	10,000.00	35,000.00	47.62
TREES	ORIENAMENTAL	LARGE	2.00	15,000.00	6,000.00	21,000.00	28.57
SECOND HAND CLOTHES BENCH	-	-	1.00	450,000.00	180,000.00	630,000.00	857.14
SECOND HAND CLOTHES BENCH	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14
SUGARCANE (SELLING)	-	-	1.00	8,000.00	3,200.00	11,200.00	15.24
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
SECOND HAND CLOTHES BENCH	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
VEGETABLE BENCH	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
MANDAZI SELLING	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
SALOON	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
MANDAZI	-	-	1.00	15,000.00	6,000.00	21,000.00	28.57
TYRE FITTING	-	-	1.00	25,000.00	10,000.00	35,000.00	47.62
FURNITURE SHOP	-	-	1.00	350,000.00	140,000.00	490,000.00	666.67
METAL WORKSHOP	-	-	1.00	250,000.00	100,000.00	350,000.00	476.19
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
SHOP	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
MTL MAN HOLE	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
CLOTHES (SECOND HAND)	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
TARMAC	-	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
CHIPS SHOP	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14
TARMAC RAOD	-	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
GARAGE	-	-	1.00	150,000.00	60,000.00	210,000.00	285.71
WELDING WORKSHIP	-	-	1.00	250,000.00	100,000.00	350,000.00	476.19
WELDING WORKSHIP	-	-	1.00	250,000.00	100,000.00	350,000.00	476.19
WELDING WORKSHIP	-	-	1.00	70,000.00	28,000.00	98,000.00	133.33
WELDING AND GARAGE	-	-	1.00	120,000.00	48,000.00	168,000.00	228.57
WELDING	-	-	1.00	200,000.00	80,000.00	280,000.00	380.95
WELDING	-	-	1.00	150,000.00	60,000.00	210,000.00	285.71
WELDING	-	-	1.00	692,500.00	277,000.00	969,500.00	1,319.05
WELDING GARAGE	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
TYRE FITTING & SALES	-	-	1.00	45,000.00	18,000.00	63,000.00	85.71
GARAGE & SPARE PARTS SALES	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
TARMAC	-	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
TARMAC	-	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
GARAGE	-	-	1.00	150,000.00	60,000.00	210,000.00	285.71
FURNITURE SHOP	-	-	1.00	250,000.00	100,000.00	350,000.00	476.19
FURNITURE SHOP	-	-	1.00	350,000.00	140,000.00	490,000.00	666.67
TARMAC	-	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
CAR WASH	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
TYRE DEALER & PANCTURE REPAIR	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
WELDING WORKSHIP	-	-	1.00	692,500.00	277,000.00	969,500.00	1,319.05
GARAGE	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
GARAGE	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
GARAGE	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
GARAGE	-	-	1.00	125,000.00	50,000.00	175,000.00	238.10
GARAGE	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
TYRE FITTER (SALES)	-	-	1.00	40,000.00	16,000.00	56,000.00	76.19
GARAGE	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
GARAGE	-	-	1.00	75,000.00	30,000.00	105,000.00	142.86

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
WELDING	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
GARAGE	-	-	1.00	692,500.00	277,000.00	969,500.00	1,319.05
GARAGE	-	-	1.00	15,000.00	6,000.00	21,000.00	28.57
GARAGE	-	-	1.00	692,500.00	277,000.00	969,500.00	1,319.05
SPARES' SHOP	-	-	1.00	20,000.00	8,000.00	28,000.00	38.10
GARAGE	-	-	1.00	40,000.00	16,000.00	56,000.00	76.19
TARMAC	0.001	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
TYRE FITTING	-	-	1.00	5,000.00	2,000.00	7,000.00	9.52
CHICKEN BENCH	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
CHICKEN BENCH	-	-	1.00	120,000.00	48,000.00	168,000.00	228.57
CHICKEN BENCH	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
CHICKEN BENCH	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
CHICKEN BENCH	-	-	1.00	20,000.00	8,000.00	28,000.00	38.10
CHICKEN BENCH	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
CHICKEN BENCH	-	-	1.00	25,000.00	10,000.00	35,000.00	47.62
CHICKEN BENCH	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
BUILDERS SHOP	-	-	1.00	692,500.00	277,000.00	969,500.00	1,319.05
BUILDERS SHOP	-	-	1.00	450,000.00	180,000.00	630,000.00	857.14
SALOON	-	-	1.00	40,000.00	16,000.00	56,000.00	76.19
PUB	-		1.00	600,000.00	240,000.00	840,000.00	1,142.86
BUILDERS SHOP	-	-	1.00	600,000.00	240,000.00	840,000.00	1,142.86
VEGETABLE BENCH	-	-	1.00	60,000.00	24,000.00	84,000.00	114.29
BARBARSHOP	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
ELECTRICAL SHOP	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
POPCORN BENCH	-	-	1.00	20,000.00	8,000.00	28,000.00	38.10
HARDWARE SHOP	-	-	1.00	10,000.00	4,000.00	14,000.00	19.05
PHOTOSTUDIO	-	-	1.00	30,000.00	12,000.00	42,000.00	57.14
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
FURNITURE SHOP	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43
FURNITURE SHOP	-	-	1.00	90,000.00	36,000.00	126,000.00	171.43

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
CONCRETE DRIVEWAY	-	5	1	692,500.00	277,000.00	969,500.00	1,319.05
vegetable and glocery shop			1.00	50,000.00	20,000.00	70,000.00	95.24
Restaraunt			1.00	90,000.00	36,000.00	126,000.00	171.43
Bar			1.00	300,000.00	120,000.00	420,000.00	571.43
Pork braii			1.00	45,000.00	18,000.00	63,000.00	85.71
Mini Pack Restaurant			1.00	70,000.00	28,000.00	98,000.00	133.33
glocery shop			1.00	90,000.00	36,000.00	126,000.00	171.43
Saloon			1.00	15,000.00	6,000.00	21,000.00	28.57
service provider shop (printing, photocopying etc)			1.00	15,000.00	6,000.00	21,000.00	28.57
flower bed		20.0	1.0	40,000.00	16,000.00	56,000.00	76.19
flower bed		20.0	1.0	40,000.00	16,000.00	56,000.00	76.19
grass Lawn		20.0	1.0	40,000.00	16,000.00	56,000.00	76.19
grass Lawn		20.0	1.0	40,000.00	16,000.00	56,000.00	76.19
concrete drive way	-	20.0	1.0	692,499.00	276,999.60	969,498.60	1,319.05
concrete drive way	-	-	1.0	692,500.00	277,000.00	969,500.00	1,319.05
grass Lawn		20.000	1.00	40,000.00	16,000.00	56,000.00	76.19
Tress	Acacia	large	2.00	20,000.00	8,000.00	28,000.00	38.10

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
Hedges		mediu m	20.00	160,000.00	64,000.00	224,000.00	304.76
food mart			1.00	15,000.00	6,000.00	21,000.00	28.57
concrete drive way		5	1	692,500.00	277,000.00	969,500.00	1,319.05
charcoal and freezes business			1.00	4,000.00	1,600.00	5,600.00	7.62
concrete drive way	SOUTHREN ZONE	1.000	1.00	692,500.00	277,000.00	969,500.00	1,319.05
potato roadside business			1.00	12,000.00	4,800.00	16,800.00	22.86
Tarmac road	near Lilongwe Technical College	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.0 0	5,428.57
Tarmac road	Junction to Socoal Islamic Development	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.0 0	5,428.57
Tree	Gmelina	large	1.00	25,000.00	10,000.00	35,000.00	47.62
Concrete drive way		5	1	692,500.00	277,000.00	969,500.00	1,319.05
concrete drive way		5	1	692,500.00	277,000.00	969,500.00	1,319.05
concrete drive way		5	1	692,500.00	277,000.00	969,500.00	1,319.05
tarmac road	near Assemblies of God church	1	0.001	2,850,000	1,140,000.00	3,990,000.0 0	5,428.57
tarmac road	opposite Lilongwe Mosque	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.0 0	5,428.57

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
tarmac road	Bombey street	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
tarmac road	Zomba street	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
concrete drive way		5	1	692,500.00	277,000.00	969,500.00	1,319.05
concrete drive way		5	1	692,500.00	277,000.00	969,500.00	1,319.05
tarmac road	upper Biwi near bottles	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
new tarmac road	Malangalanga turn	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
Eucaluyptus poles	Katondo Market		1.00	60,000.00	24,000.00	84,000.00	114.29
Sugarcane sellers	Katondo Market		1.00	15,000.00	6,000.00	21,000.00	28.57
Fish bench	-	0.001	1.00	30,000.00	12,000.00	42,000.00	57.14
Tomato bench	-	0.001	1.00	10,000.00	4,000.00	14,000.00	19.05
Tomato bench	-	0.001	1.00	10,000.00	4,000.00	14,000.00	19.05
Fish and charcoal bench	-	0.001	1.00	35,000.00	14,000.00	49,000.00	66.67
Mandazi bench	-	0.001	1.00	10,000.00	4,000.00	14,000.00	19.05
Mandazi bench	-	0.001	1.00	10,000.00	4,000.00	14,000.00	19.05
Mobile tearoom and sweet potatoes	-	0.001	1.00	25,000.00	10,000.00	35,000.00	47.62

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
Sugarcane sellers	-	0.001	1.00	15,000.00	6,000.00	21,000.00	28.57
Sugarcane sellers	-	0.001	1.00	15,000.00	6,000.00	21,000.00	28.57
Sugarcane sellers	-	0.001	1.00	15,000.00	6,000.00	21,000.00	28.57
Sugarcane sellers	-	0.001	1.00	15,000.00	6,000.00	21,000.00	28.57
selling eggs and zigege	-	0.001	1.00	17,500.00	7,000.00	24,500.00	33.33
Restaraunt	-	0.001	1.00	90,000.00	36,000.00	126,000.00	171.43
Restaraunt	-	0.001	1.00	85,000.00	34,000.00	119,000.00	161.90
Fish bench	-	0.001	1.00	30,000.00	12,000.00	42,000.00	57.14
Fish bench	-	0.001	1.00	30,000.00	12,000.00	42,000.00	57.14
Tomato bench	-	0.001	1.00	20,000.00	8,000.00	28,000.00	38.10
Irish potato bench	-	0.001	1.00	55,000.00	22,000.00	77,000.00	104.76
HAWKER	-	0.001	1.00	50,000.00	20,000.00	70,000.00	95.24
HAWKER	-	0.001	1.00	100,000.00	40,000.00	140,000.00	190.48
HAWKER	-	0.001	1.00	100,000.00	40,000.00	140,000.00	190.48
Hardware	-	0.001	1.00	8,500.00	3,400.00	11,900.00	16.19
Carpentry and Welding	-	0.001	1.00	80,000.00	32,000.00	112,000.00	152.38
CHICKEN BENCH	-	0.001	1.00	60,000.00	24,000.00	84,000.00	114.29

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
produce shop	-	0.001	1.00	55,000.00	22,000.00	77,000.00	104.76
HAWKER	-	0.001	1.00	7,000.00	2,800.00	9,800.00	13.33
produce shop	-	0.001	1.00	50,000.00	20,000.00	70,000.00	95.24
Fish bench	-	0.001	1.00	12,000.00	4,800.00	16,800.00	22.86
Charcoal bench	-	0.001	1.00	7,500.00	3,000.00	10,500.00	14.29
BUTCHERY	-	0.001	1.00	15,000.00	6,000.00	21,000.00	28.57
Frying irish potato	-	0.001	1.00	15,000.00	6,000.00	21,000.00	28.57
produce bench	-	0.001	1.00	15,000.00	6,000.00	21,000.00	28.57
produce bench	-	0.001	1.00	25,000.00	10,000.00	35,000.00	47.62
produce bench	-	0.001	1.00	10,000.00	4,000.00	14,000.00	19.05
produce bench	-	0.001	1.00	12,500.00	5,000.00	17,500.00	23.81
cooking oil bench	-	0.001	1.00	15,000.00	6,000.00	21,000.00	28.57
BUTCHERY	-	0.001	1.00	60,000.00	24,000.00	84,000.00	114.29
FRYING PORK	-	0.001	1.00	30,000.00	12,000.00	42,000.00	57.14
FRYING PORK	-	0.001	1.00	30,000.00	12,000.00	42,000.00	57.14
PORK BUTCHERY	-	0.001	1.00	70,000.00	28,000.00	98,000.00	133.33
FRYING PORK	-	0.001	1.00	30,000.00	12,000.00	42,000.00	57.14

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
BUTCHERY	-	0.001	1.00	65,000.00	26,000.00	91,000.00	123.81
BUTCHERY	-	0.001	1.00	65,000.00	26,000.00	91,000.00	123.81
BUTCHERY	-	0.001	1.00	65,000.00	26,000.00	91,000.00	123.81
BUTCHERY	-	0.001	1.00	65,000.00	26,000.00	91,000.00	123.81
BUTCHERY	-	0.001	1.00	65,000.00	26,000.00	91,000.00	123.81
GROCERY SHOP	-	0.001	1.00	50,000.00	20,000.00	70,000.00	95.24
ELECTRONICS SHOP	-	0.001	1.00	30,000.00	12,000.00	42,000.00	57.14
CHICKEN BENCH	-	0.001	1.00	25,000.00	10,000.00	35,000.00	47.62
MAIZE AND IRISH POTATO SHOP	-	0.001	1.00	140,000.00	56,000.00	196,000.00	266.67
Mandazi bench	-	0.001	1.00	10,000.00	4,000.00	14,000.00	19.05
Tarmac road	Chilinde parish to CCDC	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
Tarmac road	near Glitters Camp	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
Tarmac road	Majiga close to Puma filling station	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
selling fish of all kind (representing 10 women)	Malichero market		11.00	150,000.00	60,000.00	210,000.00	285.71
selling broilers and layers	Namichimba market		30.00	692,500.00	277,000.00	969,500.00	1,319.05

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
selling broilers and layers	Namichimba market		40.00	150,000.00	60,000.00	210,000.00	285.71
selling maize	Namichimba market		10.00	90,000.00	36,000.00	126,000.00	171.43
selling dish and assorted	Namichimba market		1.00	50,000.00	20,000.00	70,000.00	95.24
selling sacks (in season)	Namichimba market		50.00	20,000.00	8,000.00	28,000.00	38.10
goat butchery	Namichimba market		1.00	150,000.00	60,000.00	210,000.00	285.71
goat butchery	Namichimba market		1.00	150,000.00	60,000.00	210,000.00	285.71
goat butchery	Namichimba market		1.00	150,000.00	60,000.00	210,000.00	285.71
goat butchery	Namichimba market		1.00	150,000.00	60,000.00	210,000.00	285.71
goat butchery	Namichimba market		1.00	150,000.00	60,000.00	210,000.00	285.71
VEGETABLE BENCH	Namichimba market		1.00	70,000.00	28,000.00	98,000.00	133.33
farm products	Namichimba market		1.00	50,000.00	20,000.00	70,000.00	95.24
farm products	Namichimba market		1.00	50,000.00	20,000.00	70,000.00	95.24
farm products	Namichimba market		1.00	80,000.00	32,000.00	112,000.00	152.38
Cobra	Majiga		1.00	31,000.00	12,400.00	43,400.00	59.05
Sandals and bracelets manufacturing and selling	Majiga		1.00	30,000.00	12,000.00	42,000.00	57.14
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
TARMAC	0.001	1	1	2,850,000	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC		1	1.00	2,850,000	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
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CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
Tarmac		1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
TARMAC		1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC		0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC		1	0.001	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC	at parliament round about	1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC		1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
TARMAC	At Kadzamira,s residence1	1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
TARMAC	At Chitukuko	1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
TARMAC	At Mchinji round about	1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
TARMAC	At Petroda Filling Station	2	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
TARMAC	At KCH round about	1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
TARMAC	0pp. Mahindra House	1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
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CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC		1	0.001	2,850,000	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
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CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC	OPP. NSARU DEPOT	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
TARMAC	OPP. PACIFIC VILLAGE	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
TARMAC	Madidi Lodge Turn off.	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
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CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY	LOGS	5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC	LWB Tower	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		1	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC	Road to Madidi Lodge	0.001	1.00	2,850,000.00	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
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CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
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CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
TARMAC		0.001	1	2,850,000	1,140,000.00	3,990,000.00	5,428.57
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
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CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
CONCRETE DRIVEWAY		5	1	692,500.00	277,000.00	969,500.00	1,319.05
HARDWARE SHADE			1.00	190,000.00	90,000.00	280,000.00	380.95
				TOTAL		**305,160,798.60**	**415,184.76**

DESCRIPTION OF DISTURBANCE	FREQUENCY	AMOUNT (MK)	AMOUNT (USSD)
CONCRETE DRIVEWAY CUT	113	109,553,498.60	149,052.38
TARMAC ROAD SECTION CUT	41	159,600,000.00	217,142.86
BUSINESS DISTURBED	150	26,631,500.00	36,233.33
TREES, CROPS AND GRASS & FLOWER LAWN	11	2,499,000.00	3,400.00
STRUCTURE TO BE DEMOLISHED	2	6,722,800.00	9,146.67
MTL MANHOLES	2	154,000.00	209.52
TOTAL		**305,160,798.60**	**415,184.76**

TYPE OF PROPERTY/BUSINESS DISTURBED	DESCRIPTION	SIZE	QUANTITY	ESTIMATED VALUE	DISTURDANCE 25%	TOTAL	TOTAL IN USSD
TOTAL NUMBER OF PAPS		363					
NOTE THAT THE DOLLAR HAS BEEN PEGGED AT 1 DOLLAR TO MK735							