ENVIRONMENTAL AND SOCIAL ASSESSMENT

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

FOR

KENYA POWER'S LAST MILE CONNECTIVITY PROGRAMME

PREPARED BY

SAFETY, HEALTH & ENVIRONMENT DEPARTMENT (SHE)-KPLC

AUGUST 2014

The Environmental and Social Management Framework (ESMF) has been prepared by Environment and Social Unit, Safety, Health and Environment Department (SHE), Kenya Power, Nairobi. The ESMF has been prepared based on an overall environmental and social assessment, which includes (i) the general baseline at project areas (ii) Evaluation of potential environmental and social impacts of different project components and subcomponents and (iii) Assessment of environmental practices in different ongoing and completed projects.

The ESMF provides the guidelines for the preparation of all mitigation plans (such as Environmental and Social Management Plans, Construction Management Plan and Compensation Action Plans) to respond to the anticipated project impacts, once the route and specific household metering locations are identified.

KENYA POWER'S ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK- LAST MILE CONNECTIVITY PROGRAMME

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LIST OF ACRONYM

AfDB	Africa Development Bank
AIDS	Acquired Immunodeficiency Syndrome
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMCA	Environmental Management Act – 1996
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESSF	Environmental and Social Screening Form
HIV	Human Immunodeficiency Virus
IP	Indigenous People
KPLC	Kenya Power
NEC	National Environment Council
OP	Operational Procedure
RAP	Resettlement Action Plan
RoW	Right of Way
RPF	Resettlement Policy Framework
PCB	polychlorinated biphenyl
PIT	Project Implementation Team
SHE	Safety, Health & Environment
ToR	Terms of Reference
UN	United Nations
UNCLOS	UN Convention on the Law of the Sea
WB	World Bank
WRMA	Water Resources Management Authority

EXECUTIVE SUMMARY

Objectives of the Environmental and Social Management Framework

The Environmental and Social Management Framework (ESMF) seeks to institute a consistent and effective environmental and social screening process for application in all KPLC distribution and transmission and transmission component projects at local and national levels. Specifically, the following are the objectives of the ESMF:

- To ensure that all projects are screened for potential adverse environmental and social impacts and appropriate mitigation and monitoring measures, including cost estimates, are identified and implemented by qualified personnel at the local and national levels;
- To support and empower Kenya Power and Lighting Company officers to carry out the environmental and social screening process as outlined in this Framework, including the implementation and monitoring of mitigation measures of all projects as necessary.

Legal Framework

A number of legislations, policies and instruments are available to support environmental management and the Environmental Impact Assessment process in Kenya. The Environmental Management Coordination Act and other sectoral sections in other legislations are the key instruments that cover environmental management in all the sectors of development. The Environmental Impact Assessment Guidelines prescribe the process, procedures and practices for conducting an EIA and preparing the EIA reports. In addition to these instruments, there are sector specific policies and legislations that prescribe the conduct for managing the environment.

However, the national legislation does not include procedures for screening smaller-scale investments for potential adverse environmental and social impacts. To close this gap between national legislation and the Bank's OP 4.01 Environmental Assessment which requires that all investments proposed for Bank-financing are screened for potential adverse environmental and social impacts and appropriate environmental work be carried out based on the screening results, this ESMF is being prepared. Based on the screening results, the sub-project will either prepare a separate EA report; implement simple mitigation measures, or may not require any environmental work.

KPLC Support in Screening Process

Through this ESMF that all projects will be screened for potential adverse environmental and social impacts. Based on the screening results, each subproject will include local costs o implementing and monitoring the mitigation measures. This will be done through involvement of National Environment Management Authority and KPLC Environment Unit in coordination with the Project Implementation Team (PIT). This will be complimented by the availability of District Environmental Officers who are the environmental custodians.

Capacity Building for KPLC Staff

KPLC has a functional Safety, Health and Environment (SHE) department. The SHE staff will be included in Project Implementation Team (PIT). KPLC PIT staff with help from regional staff will be involved day to day in the implementation of the environmental screening process for projects. The subcomponent on strengthening KPLC PIT staff will include support for capacity building in environmental and social management as regards the rehabilitation and construction of distribution

network lines for last mile connectivity. Selected KPLC staffs are proposed to undergo training in environmental management systems and impact assessment, implementation of the environmental and social screening process outlined in this ESMF, SESA, hazardous waste management and pollution control and occupational safety and Health as part of capacity building.

The ESMF build on experience gained under previous projects in KPLC which underlines the fact that environmental and social screening processes should be an integral part of a service delivery sub-project cycle. It is also based on the understanding of the environment and what constitutes degradation. Issues related to water resources, de-forestation and loss of fertile soils have been rated as important as far as the environment is concerned.

The project cycle for each project that requires each activity will be screened for potential adverse environmental and social effects and that this process will be integrated as a routine activity within the project cycle processes.

Screening Process

The environmental and social screening process will take place once sub-project identified prior to implementation process for the entire Last Mile Connectivity Distribution Project. This section identifies and illustrates the specific steps to be involved in the environmental and social screening process leading towards the review and approval of the institution's sub projects from environmental and social management aspects. The steps followed incorporate the requirement of both, relevant national laws and AfDB's triggered Operational Safeguards policies. Kenya Power as an implementing agency for the Last Mile Connectivity project will screen the sub projects per Lot to identify adverse environmental and social impacts using the screening form provided. Then the institution will introduce into the sub project design the required measures to mitigate impacts identified from use of the screening form and checklist before submission of the sub project design to the respective implementing units for review and clearance.

In addition to the Environmental and Social Screening Form, an Environmental and Social Checklist will be prepared and availed to facilitate the identification of simple mitigation measures for Last Mile Connectivity distribution projects not requiring a separate EA report. Main features of the checklists will include; a detailed description of the activities to be undertaken, potential negative effects (environmental and social concerns), mitigation measures to be undertaken and the organization/person responsible for each activity, and monitoring responsibilities, and cost estimates.

Proposed Mitigation Measures

After environmental and social screening, mitigation measures will be identified for each negative impact identified during the screening process – with a particular focus on the safe disposal of PCB and creosote-treated poles, Safety of workers and Public, loss of vegetation and property. The Mitigation measures will be implemented by the contractor based on LOT specific ESMP to develop by contractor with monitoring done by KPLC PIT, KPLC's Environment and Social Unit, and regional staff.

Potential Impacts of Proposed Mitigation Measures

Even though the magnitude of environment degradation at a single project site may not be adverse but shall require adequate mitigation measure, efforts on mitigation will have the following positive impacts:

- Knowledge gained through training on environmental degradation and importance of mitigation will be used in other projects by KPLC.
- Soil erosion will be reduced due to the soil conservation measure that will be instituted at every sub-project regardless of its nature.
- Actual planting of trees as a replacement of vegetation that were cleared to pave way for construction
- Tree planting will directly contribute to elimination of carbon dioxide in the air hence reducing ozone layer depletion.
- The use of Environmental Guidelines for Contractors will ensure that environmentally and socially sustainable construction techniques are applied, and construction sites and camp sites are properly managed.

Conclusion and Recommendations

This ESMF requires that the implementation of this project should ensure procedures for environmental and social screening, planning, review and approval prior to implementation of sub-projects to be financed under the Project are followed; furthermore, appropriate roles and responsibilities, for managing and monitoring environmental and social concerns related to sub-projects should also be followed.

1 CHAPTER ONE: INTRODUCTION

1.1 Background

The Government of Kenya has pledged to stimulate economic growth and accelerate job creation to improve the economic wellbeing of Kenyans. Among the many interventions to achieve this is expansion of the power distribution system to be within reach and thus enable more Kenyans connect to the grid at affordable cost and hence initiate economic activities at the micro-economic level. The current trend of network expansion driven by customer demand is approaching saturation. In the foreseeable future there is a likelihood of the annual connectivity stagnating at the 300,000-400,000 level. To jumpstart and accelerate connectivity, a new thinking is needed as happened in 2004.

To reduce the cost burden of increased connectivity on KPLC, as well as reduce the amount paid by the customer to connect to the grid, the strategy proposed is to extend the distribution network to as near the customer as possible using external or government funding. This can initially be achieved by extending the low voltage network on existing and other upcoming distribution transformers to reach households lying within transformer protection distance (maximization). This model would involve building low voltage lines both single phase and three phase (to a small extent) along rural access roads.

KPLC has a total of 35,000 distribution transformers spread across the country. The transformers were installed for various reasons, i.e., for new customers, reinforcement of existing transformers due to load growth, reinforcement to reduce length of the low voltage lines hence improve transformer protected distances, etc. As such majority of the transformers will be having varied lengths of the low voltage network emanating from them, some of which will be passing in close proximity to ready and potential customers.

Data collected from KPLC regions indicates that the company has potential to connect approximately 472,002 households that are within 600 meters of the transformers through individual service lines. Of these households, some will be within developed areas, majority of who will be reached by a service cable drop or a pole or two, whereas in the expansive zones in the peri-urban and rural areas, construction of a 600m low voltage line for a single customer will not be an exception. Based on an average of two spans (@ 50m) single phase LV line, 30m service cable drop (10% of the service drops assumed to be three phase), 40km return transport and implementation by labour and transport contractors, the projected cost of connecting all these households is approximately USD 685million (KShs. 58.2Billion).

In the financial year 2011/2012, KPLC connected 307,000 customers to the grid after implementing 123,000 maximization projects. In effect each maximization project generated approximately 2.496 customers.

With data collected from the field showing that there exist approximately 472,002 households within reach of distribution transformers, implementation of the network to reach them will result in connection of approximately 1.2million customers.

The AfDB has proposed to fund the project to the tune of US$ 153.4 million (exclusive of taxes, Levies and duties). With this in mind, a criterion has been proposed to define which parts of the country will benefit from the fund. **T**he number of customers to be reached with the proposed funding is 200,000 at a total cost of USD 153.4million.

Following the requirements for environmental managements in most KPLC projects, an environmental and social management framework (ESMF) has been prepared to provide a mechanism to carryout appropriate environmental and social assessment in line with the AfDB safeguard policies and Government of Kenya (GoK) legislation.

1.2 ESMF Requirement

This Environmental and Social Management Framework (ESMF) is an assessment tool for the works and activities under the Kenya Power's Last Mile Connectivity Project Grant which the Kenya of Government has sought from the Africa Development Bank. The capital works will contribute to improving the reliability of power supplies by reducing the frequency and duration of power supply interruptions in the 47 Counties. KPLC plans to use the AfDB money to strengthen the power distribution network in the entire County, to improve the network efficiency and reliability, and to meet growing and new demands for electricity. Planning and design of the network upgrade is underway by KPLC and its Engineers which include upgrading and installing new transformers, up-rating and extending the existing distribution lines and installing a new dispatch /systems control room. The proposed works to be co-financed by the AfDB Credits include –maximum utilization of existing Transformers to improve electricity access to low end customers or households.

The African Development Bank (AfDB) environmental assessment policy requires the borrower to prepare an Environmental and Social Management Framework (ESMF) that is to establish the mechanism whereby a Kenya Power will assess the environmental and social impacts of its proposed activities before undertaking them, and to set out, in general, the mitigation, monitoring and institutional measures to be taken during implementation and operation of the program to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable minimal levels.

1.3 Purpose of ESMF

The purpose of the ESMF is to provide a procedure for environmental and social assessment of the proposed KPLC projects. ESMF was selected because even though the footprint of the project is known, design and other details about the investment are not available prior to appraisal of the project. It will guide KPLC in determining the appropriate level of environmental and social assessment required for current and future projects and in preparing the necessary environmental and social mitigation measures for these projects during the preconstruction, construction and operational phases.

1.4 Objectives of the ESMF

The objective of this ESMF is to ensure that the implementation of the HFP, of which the sub-project sites are unknown at this stage, will be carried out in an environmentally and socially sustainable manner. The ESMF will provide the project implementers with an environmental and social screening process that will enable them to identify, assess and mitigate potential environmental and social impacts of sub-project activities, including through the preparation of a site-specific Environmental Impact Assessment (EIA) where applicable.

The screening results will indicate whether additional environmental and/or social assessment will be needed or not. Thus, the ESMF is designed to ensure an appropriate level of environmental and social management, which could range from the application of simple mitigation measures (through the environmental checklists) to the preparation of an EIA Report (according to Tanzania's Environmental Impact Assessment & Audit Regulations of 2005). More specifically, the objectives of ESMF are:

- To establish clear procedures and methodologies for the environmental and social screening, planning, review, approval and implementation of sub-projects to be financed under the Project;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to sub-projects;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF;
- To establish the Project funding required to implement the ESMF requirements; and
- To provide practical information resources for implementing the ESMF.

The screening process has been developed because the locations and types of subprojects to be funded under the Last Mile Connectivity are not yet known fully identified and designed and therefore potential impacts cannot be accurately identified. However, Kenya Power has been running such projects hence the impacts are well known from experience. Thus, it is expected that most sub-project activities will have short-term, site-specific,

confined and reversible negative environmental and social impacts that can be managed through well-defined simple mitigation and monitoring measures. It will be the responsibility of the PIT to ensure that the requirements of the ESMF are implemented. Where ESMF approvals are required under national legislation, the responsible authority is the National Environmental Management Authority (NEMA).

1.5 Environmental and social screening

The objective of this Environmental and Social Screening Process (the screening process) is to ensure that the projects are designed and implemented in an environmentally and socially sustainable manner, taking into account Kenya's relevant sector legislation as well as the donors' Safeguard Policies.
KPLC PIT - with help of regional staff - will be responsible for completing the Environmental and Social Screening Form, and based on the screening results, the appropriate level of environmental work will be determined by KPLC's Environment unit and carried out by qualified KPLC staff. The screening process has been developed because the locations and types of the distribution and transmission component for the projects which are not known prior to the appraisal of the parent project, and therefore potential adverse localized environmental and social impacts cannot be precisely identified. Furthermore, Kenya's environmental legislation does not provide for the environmental and social screening of small-scale projects, such as those included in the distribution and transmission component of KPLC Projects, whereas the EMCA and other international legislations and donors' safeguard policies like on Environmental Impact Assessment requires that all projects are screened for potential adverse environmental and social impacts to determine the appropriate mitigation measures.

1.6 Level of Environmental Work

The appropriate level of environmental work could range from the application of simple mitigation measures (using the Environmental and Social Checklist); to the preparation of a comprehensive EIA Report; to no environmental work being required. The environmental and social screening process is consistent with Kenya's environmental policies and laws as discussed in this Framework, as well as with other international legislations like for the WB, JICA and AFDB safeguard policies on Environmental Assessment.

It is expected that the project will have limited negative environmental and social impacts. However, potential localized adverse environmental and social impacts that would require proper mitigation and possibly the preparation of a comprehensive EIA might not occur. The Environmental and Social Screening Form will enable project implementers to identify, assess and mitigate potential negative environmental and social impacts; and to ensure proper mitigation and it is important to note that it is very unlikely to prepare any comprehensive EIA and or Resettlement Action Plan (RAP) since the project will mainly entail last mile connectivity.

1.7 Coordination of Environmental and Social Screening at KPLC

It will be of critical importance during the implementation of the Last Mile Connectivity component to be coordinated closely by KPLC environment unit to ensure that the investments are consistent with those being implemented in the energy sectors. This will be achieved by ensuring the involvement of the County Environmental Officers in the evaluation of environmental impacts.

1.8 Preparation and Use of this Framework

This ESMF has been prepared by KPLC based on previous experience on projects that have been handled. The ESMF provides a guide to be used within existing Government Policy regulations for environment and social processes and other international legislation by the donors like AFDB among others. This ESMF will be a living document that will be subject to periodic review to address specific concerns raised by stakeholders, and emerging policy requirements. It will complement the Environmental Impact Assessment and Environmental Audits guidelines provided for operationalization of provisions of the Environmental Management and Coordination Act of 1999 which guides environmental protection and management.

1.9 Potential Users of the ESMF

This framework has been prepared as a reference document for use by key stakeholders who will be involved in the planning, implementation, management and operation of the proposed Last Mile Connectivity Project for

KPLC and future power projects both donor and government funded. As a reference material, the framework would be useful to the following proposed project key stakeholders:

- AfDB as the Funding and development partner
- Senior government officials responsible for policy making and project & development planning;
- Government extension workers in the various ministries; and
- Non-governmental organizations involved in natural resource management.
- Kenya Power as the implementing agency;
- Central government and County officials responsible for environmental planning and management including NEMA;
- Politicians and local traditional leaders;
- Sector Environmental management Coordinators
- County Environmental Management Officers and Committees;
- The private sector;
- Planners and engineers for the preparation of plans and designs of the subproject activities; and
- Engineers and contractors to be involved in implementation of the sub-project activities.

1.10 Organization of the Framework

The Framework is organized as follows:

Chapter 1:	Provides the introduction to the Framework;
Chapter 2:	Methodology
Chapter 3:	Baseline information
Chapter4:	Presents the legal framework within the distribution and transmission component KPLC projects will operate;
Chapter 5:	Presents a summary of the KPLC project description
Chapter 6:	Presents the environmental and social screening process for projects;
Chapter 7:	Presents the public consultation process carried out during the preparation of the ESMF and summarizes the outcomes;
Chapter 8:	Describes the potential environmental and social impacts and mitigation measures of the KPLC Project;
Chapter 9:	Provides the institutional setup for environmental and social monitoring and capacity building and training at KPLC to ensure efficient implementation of the ESMF.

2 METHODOLOGY AND CONSULTATION

Several methods were involved in the preparation of this ESMF to meet the requirements. An ESMF is meant to provide a screening process for the potential environmental and social impacts for the planned future project activities and recommend a platform for management plan for addressing the potential positive and negative impacts associated with the project. For the purpose of achieving these targets, the following approaches were used:

2.1 Detailed & In-depth Literature Review

This was done through a thorough review of the project appraisal documents focusing on project description-project development objective and key indicators, project components, project target areas, institutional and implementation arrangements, and monitoring and evaluation of outcomes. Some key baseline information on Kenya's recent macroeconomic developments especially in the energy sector development was reviewed from project documents. The review also covered Kenya's policy, legal, regulatory and administrative frameworks relevant to the proposed Last Mile connectivity distribution project. AfDB's Five Operational Safeguard Policies were reviewed to identify the likely policies to be triggered by subprojects.

Bearing in mind that Last Mile Connectivity distribution subproject sites were unknown at the time of the preparation of this ESMF, literature review further encompassed the overview of Kenya's physiographic and climatic issues, the state of the general environment and population and population dynamics just to inform Last Mile Connectivity Project.

Review on the existing baseline information and literature material was undertaken and helped in gaining a further and deeper understanding of the proposed project. A desk review of the Kenyan legal framework and policies was also conducted in order to the relevant legislations and policy documents that should be considered during project implementation. Among the documents that were reviewed in order to familiarize and further understand the project included:

Africa Development Bank Related Documents

- AfDB ESAP final Draft
- AfDB ISS Guidelines
- AfDB ISS Policy Statement and Operational Safeguards

Kenyan Documents

- Kenyan Constitution 2010
- Environmental Management and Coordination Act (1999)
- Water Act 2002
- Energy Act 2006
- Transport Act
- Land Acquisition Act
- Wayleave Act
- Public Health Act
- Wildlife Act 2006
- Forest Act 2005

2.2 Interactive Discussions with potential customers and the public

Starting from January, stakeholder engagement and consultation with regard to Last Mile connectivity was conducted on a preliminary basis by our field engineers in the forty seven counties during project site identification and mapping as part of a wider assessment where the views and thoughts of the sector players

were sought. However, in the preparation of the project, additional consultations were conducted in by SHE department during EIA process for ongoing nationwide substation upgrading, new substation construction and construction of New lines and uprating the existing once where discussion on last mile connectivity programme was discussed. Most of the issues and suggestions raise by the public revolve around connectivity. They propose the use of the stima loan model or any other method where they are made to get access to electricity and pay slowly over a period of time. Most the rural folk are relatively poor and are not able to pay upfront for the connection fees.

The stakeholder consultation was significant to the preparation of this ESMF and formed the basis for the determination of potential project impacts (at sector level) and viable mitigation measures.

Stakeholders Consultations

Consultations with key stakeholders were undertaken during the Environmental Assessment process for other substation upgrading projects in some counties to ensure that the implementation of the proposed Last Mile Connectivity Distribution Project , particularly with regard to environmental and social issues, takes on board views and concerns across different people and institutions including local and central government entities and key ministries at the County Level, were done mainly through interviews with key informants. Consultations were limited to stakeholders located in counties where the company was doing EIAs for new substations, Lines and upgrading of existing substation because of the following reasons:

- Although the Last Mile Connectivity project is intended to cover the whole country i.e. 47 counties, the sample counties were to present some generic environmental and social issues which cut across because the nature of work is the same hence the sample counties are therefore likely to provide a good representative sample
- The limited time to accomplish the ESMF preparation

2.3 Preparation of ESMF

Preparation of the ESMF included the following stages:

- Collation of baseline data on the environmental conditions of the country in general;
- Identification of positive and negative environmental and social impacts of the proposed projects at potential sector level;
- Identification of environmental and social mitigation measures;
- Preparation of screening procedures to be used while screening Last Mile connectivity project;
- Formulation of environmental and social monitoring plans.

3 KPLC'S LAST MILE CONNECTIVITY PROJECT DESCRIPTION

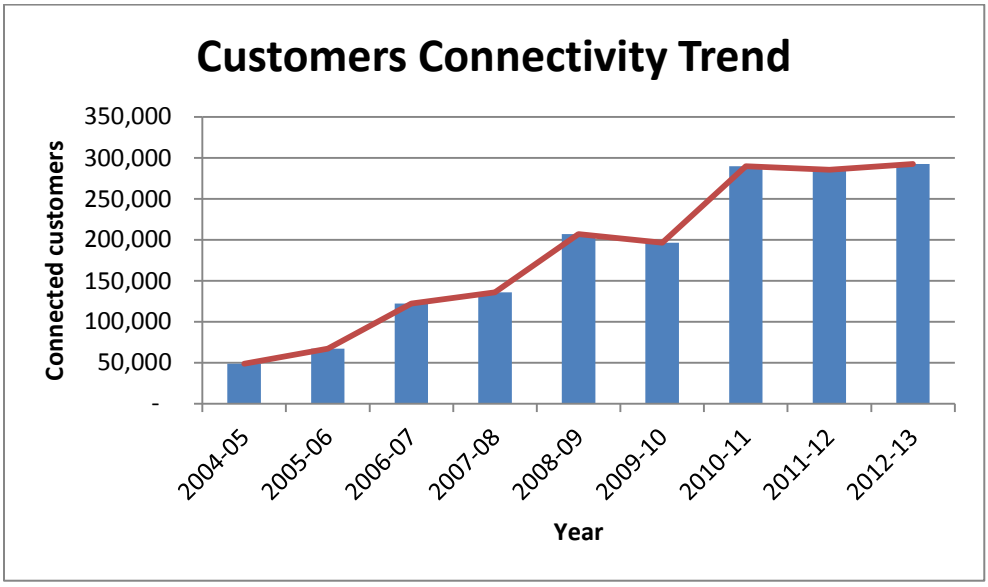
3.1 Introduction

Kenya Power supports the efforts of the Government of Kenya in the Electrification Schemes. Kenya Power projects normally results in significant amount of construction work for distribution and transmission lines, substation and access roads to substations but with minimal environmental impacts. All these projects shall be subjected to environmental screening so as to determine its impacts and propose various mitigation measures on the impacts to be identified and implemented in compliance with the donors' safeguard policies as well as relevant national environmental legislation.

3.2 Background

Over the last 10 years the country has seen a steady growth in electricity connections both in urban and rural areas. This has been driven by a combination of various factors chief among them being the incoming of a new political dispensation in 2002. The new government demanded that the company accelerate connectivity. This called for a totally new approach in the connectivity model within KPLC. In 2004, a new connection policy was developed to address this new challenge and also take cognisance of the more empowered customer and public. In it, among other things, the cost for connection to customers on low voltage was standardized for single phase and three phase to a minimum of KShs. 32,480 and KShs. 44,080 respectively (between 3 and 8KVA, including connection charges @ KShs. 1000/= per KVA, VAT inclusive, and within 600m of a distribution transformer). This saw an unprecedented increase in connections as shown by the huge jump between FY 2005-2006 and 2006-2007. The increase continued year to year.

Figure 1: Customers Connectivity Trend



(Source: KPLC Annual Reports & Financial Statements)

In order to accelerate the connectivity rate and achieve annual connections in the range of 1.3 million, it is proposed that a new model be adopted that will help overcome the current bottlenecks in the connectivity pipeline. This new model focuses on availing the service connection including the meter to the customer premises prior to engaging the customer to pay for the service. As such, activities such as wayleaves acquisitions together with attendant county and other authorities' permits and approvals, materials procurement/delivery logistics, construction, etc. shall be dealt with prior to the customer being requested to connect.

The county governments are gradually finding their ground and are expected to spur growth of businesses in their jurisdictions as they put more focus on infrastructure development. Coupled with the upcoming Vision 2030

flagship projects with the attendant ripple effect in their vicinity, the proposed strategy is bound to lead to accelerated economic growth and expansion.
Some of the benefits of this proposed model are:

- Accelerated access to electricity
- Improved standards of construction hence improved quality of supply;
- Provision of new supply in a shorter time;
- Opportunity for the company to develop long term network expansion plans.

3.3 Effect of the Standard Rate

The accelerated connectivity at the standardized rates has been achieved at a great cost to the company. Over the last five years during which time this initiative has been implemented, cost of all inputs has shot up by wide margins, as evidenced by the few items listed in the table below:

Table 1: Materials Cost Comparison

Materials	Unit	2007	2011	Increase
Wooden poles	KShs	8,382	12,150	44%
16mm2 Al cable	KShs	39	86	120%
Cut out	KShs	437	1,224	180%

Labour and transport costs have also risen over the same period

From the above, it is clear that KPLC has been subsidizing the input costs to a great extent. In all cases the additional costs above the standard (maximization) rates have been met by KPLC.

3.4 Proposed Model to Accelerate Connectivity

The Government has pledged to stimulate economic growth and accelerate job creation to improve the economic wellbeing of Kenyans. Among the many interventions to achieve this is expansion of the power distribution system to be within reach and thus enable more Kenyans connect to the grid at affordable cost and hence initiate economic activities at the micro-economic level. The current trend of network expansion driven by customer demand is approaching saturation as seen from the line graph in Figure 1. In the foreseeable future there is a likelihood of the annual connectivity stagnating at the 300,000-400,000 level. To jumpstart and accelerate connectivity, a new thinking is needed as happened in 2004.

To reduce the cost burden of increased connectivity on KPLC, as well as reduce the amount paid by the customer to connect to the grid, the strategy proposed is to extend the distribution network to as near the customer as possible using external or government funding. This can initially be achieved by extending the low voltage network on existing and other upcoming distribution transformers to reach households lying within transformer protection distance (maximization). This model would involve building low voltage lines both single phase and three phase (to a small extent) along rural access roads.

Thereafter the cost of connecting customers can be at the maximization rate based on the new average actual cost.
The company will still continue implementing the following existing connectivity expansion strategies:

a) Pre-investing in short medium voltage lines and distribution transformers to reach clusters of customers who may not be able to access the existing distribution transformers, but are close to existing MV lines;
b) The Umeme Pamoja initiative for groups of customers far from existing transformers and MV lines.
c) Clusters of 50 – Grouping potential customers in clusters of 50 households and providing reticulation for them, in order to drive down the individual contributions from each customer

3.5 Proposed Strategy

KPLC has a total of 35,000 distribution transformers spread across the country. The transformers were installed for various reasons, i.e., for new customers, reinforcement of existing transformers due to load growth,

reinforcement to reduce length of the low voltage lines hence improve transformer protected distances, etc. As such majority of the transformers will be having varied lengths of the low voltage network emanating from them, some of which will be passing in close proximity to ready and potential customers.

Data collected from KPLC regions indicates that the company has potential to connect approximately 472,002 households that are within 600 meters of the transformers through individual service lines.

Of these households, some will be within developed areas, majority of who will be reached by a service cable drop or a pole or two, whereas in the expansive zones in the peri-urban and rural areas, construction of a 600m low voltage line for a single customer will not be an exception. Based on an average of two spans (@ 50m) single phase LV line, 30m service cable drop (10% of the service drops assumed to be three phase), 40km return transport and implementation by labour and transport contractors, the projected cost of connecting all these households is approximately KShs. 41,260,352,805. The table below shows the distribution of the potential households and estimated cost of reaching them, per region. (The current and most economical practice at present is to construct almost all distribution lines using private labour and transport contractors. The calculation is thus based on using them to implement the project. The average cost of construction using labour and transport contractors is approximately 67%[1] of the estimated cost using internal KPLC teams).

Table 2: Total project cost per region (implementation by L&T contractors)

REGION	Estimated No. of Households within 600M of Transformer	Estimated Number of Customers	Low Voltage Line length, km
Nairobi North	44,178	110,265	4,418
Nairobi South	54,745	136,640	5,475
Nairobi West	50,333	125,628	5,033
West Kenya	115,979	289,476	11,598
North Rift	54,453	135,911	5,445
Central Rift	35,225	87,919	3,523
Coast Region	20,652	51,546	2,065
Mt. Kenya North	42,423	105,885	4,242
Mt. Kenya South	54,014	134,815	5,401
Total	**472,002**	**1,178,086**	**47,200**

Note [1]: Source: KPLC Database

3.6 Project Objectives

The Last Mile Connectivity project is aimed to support the Government's initiatives of ensuring increased electricity access to Kenyans, particularly among the low income groups. The existing distribution transformers shall be exploited to the maximum through extension of the low voltage network to reach households located in the vicinity of these transformers.

KPLC has a total of about 35,000 distribution transformers spread across the country. Within a 600 meter radius from these transformers, and the company has a potential to connect 472,002 households corresponding to approximately 1.2 million customers. The cost of connecting these households is estimated at about USD 685 Million (KShs 58.2 billion).

Since 2004, an extensive effort was made to facilitate the acceleration of customer connection throughout the country. At that time, for customers located within a 600-m radius of an existing transformer, the average cost (including VAT) for connection on low voltage (between 3 and 8 KVA) was standardized at KShs 32,480 for single phase and at KShs S 44,080 for three phases. However, this accelerated connectivity has been achieved at a great cost for KPLC. Since this initiative has been implemented, material costs have increased by wide margins.

Accordingly, the subsidies paid to KPLC rose from KShs 1.05 billion in 2007/2008 to KShs 7.5 billion in 2011/2012.

KPLC intends to explore the following strategies to support the Government's initiatives of ensuring increased connectivity and electricity access to Kenyans at an optimal cost:

i. Adopt a maximisation strategy which entails extending the low voltage network on existing and upcoming distribution transformers to reach households lying within transformer protection distances (600 meter).

ii. The company will continue to employ the pre-investment initiatives to reach clusters of customers who may not be able to access the existing distributions transformers, but are close to the existing medium voltage lines.

3.7 Project Components Description

In line with the Government's policy, the project aims at extending the low voltage system so that counties with low penetration rate benefit the most from the project. The proposed project is expected to benefit 200,000 customers, equivalent to approximately1, 000,000 people.

The main project component focuses on the expansion of the low voltage lines from the existing distribution transformers to customers as well as the installation of pre-paid energy meters.
The project consists of the following components:

- Construction of the low voltage network and installation of energy meters;
- Project supervision and management by a consultancy firm to assist KPLC during the project implementation;
- Financial audit of the project accounts carried out on an annual basis;
- Environmental and social costs of the project;

3.7.1 Low Voltage Distribution Power Line construction

There are three categories of distribution lines under the KPLC jurisdiction namely:

- Medium voltage lines – 66kV, 33kV and 11kV
- Low voltage lines – 415V and 240V

Most of the overhead power networks at 11kV, 33kV and 66kV are constructed on concrete or treated wooden poles. The poles are treated with creosote, which is a petrol-chemical product. The Last Mile Connectivity project will mainly covers extensions of 415 and 240 low voltage lines to household. The screening process and the proposed project ESMP shall provide for safe treatment and disposal for treated wooden poles and disposal of the metal bars that could be used in these projects.

3.7.2 Construction Materials

The proponent will source construction materials such as wooden poles from registered pole treatment and supply firms whose site have undergone satisfactory Environmental Impact Assessment/Audit and received NEMA approval. Since such firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction and treatment sites are considerably well mitigated. To reduce the negative impacts on availability and sustainability of the materials, the proponent will only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. Moreover, the proponent will ensure that wastage, damage or loss of materials at the construction site is kept minimal, as these would lead to additional demand for and extraction or purchase materials. In addition to the above measures, the proponent shall consider reuse of construction materials and use of recycled materials. This will lead to reduction in the amount of raw materials extracted from natural resources as well as reducing impacts at the extraction and treatment sites.

3.7.3 Way-leave Acquisition and Compensation for Low Voltage lines

As already noted the project will involve connection of power to the end user. Indeed most of the households are within developed areas, majority of who will be reached by a service cable drop or a pole or two, whereas in the expansive zones in the peri-urban and rural areas, construction of a 600m low voltage line for a single customer will not be an exception. The low voltage lines will mainly be constructed along the road reserve and the project will not involve any resettlement. The low voltage lines will require way leaves acquisition to facilitate line construction and protection of power line. Way leaves by definition is an easement or rights of way (ROW) which gives the right of use or restricts the use of land of another in a way that benefits other people other than the owner of the land. Other than KPLC, rights of way are also established for railways, roads, airways, pipelines.

While the project does not expect any resettlement, there is potential, never-the-less, of the need to compensate people whose assets, namely trees and crops may be damaged during project implementation. Way leaves is necessary for protection of power lines and it is not just a matter of facilitating line construction. The Energy Act 2007 provides that when a public electricity supplier intends to lay a power line on land owned by another person, the supplier must obtain consent (way leaves) beforehand.

The Way leave acquisition process entails the following main steps especially for the connection to customers.

- Survey, design and payment by the customer
- File is forwarded to way leaves officer who checks to see where the line will pass in order to identify the people to talk to
- Way leave officer talks to land owners or public utility representatives e.g roads authority on the need for a way leave consent
- The land owners sign the way leave consent allowing KPLC to lay line on their land
- Once consent is given the construction engineer/contractor proceeds with construction. Clearing of bushes and cutting of trees is done to pave way for the line
- Once construction is done, the construction engineer does a memo to the way leave officer to visit the site and assess the damage
- Damage assessment and recording is done by way leave officer in the presence of the owner and construction engineer or contractor who also sign the property damage report.
- Costing for damages is done by the way leave officer using property damages standard rates for the companies which are developed by the chief way leaves officer in liaison with government agencies such as ministry of agriculture and Kenya Forest service.
- The costed damages are forwarded to finance for processing the funds
- Once the funds are ready the way leave officer talks to the local administration i.e chief/assistant chief and arrange for a date when payments will be made. The officer then notifies all the concerned persons on the day and time of payment for damages which is done at the chiefs/assistant chiefs office
- Once payment is done the owner, wayleave officer, a representative from finance (accountant) and the chief signs the payment record sheet.

It is important to note that when granted, wayleaves does not mean ownership of land but only limited use to the land. This project may occasion damage to properties of third parties accidentally or necessitated by line construction, survey and maintenance.

The same procedure shall be followed in this project. The main emphasis is that the contractor/supervisor shall record all damages occasioned in the presence of the owner or his/her representative and forward to the way leave officer who shall arrange for payments.

Kenya Power has a Resettlement Policy Framework (RPF) and its purpose is to clarify resettlement principles, organizational arrangements and design criteria to be applied to KPLC projects that have potential for involuntary resettlement. A major objective of this RPF is to give guidelines on preparation of Resettlement Action Plans

3.7.4 Project Implementation, Supervision and management component

KPLC will be the Implementing Agency of the project. KPLC has the necessary technical and managerial ability to implement projects as demonstrated by the on-going projects financed by development partners. The involvement of the Supervision and Management consultant to be recruited through competitive bidding process will reinforce the capability of the Project Implement Team. The project is planned to be implemented in 18 months from contract commencement.

KPLC will designate a project implementation team (PIT) that will be responsible for the day-to-day implementation of the project. The PIT will, at minimum, comprise of: one (1) project Coordinator/Team Leader; four (4) Site supervision engineers; one (1) procurement expert; one (1) socio economist one (1) environmental expert; and one (1) accountant. The establishment of the PIT at KPLC has largely considered key qualifications and experience acceptable to the Bank because this will constitute one of the conditions for disbursement of the ADF loan.

3.7.5 Financial Management component

Kenya Power & Lighting Company (KPLC) has a projects division which has experts in all areas of project management including finance and accounting. This structures and systems are adequate for the project and if need be they can be enhanced. The Company has a lot of experience in implementing big utility projects and it is currently implementing various donor funded projects. Some of the donors include World Bank, French Development Agency (AFD) and the International Finance Corporation (IFC).

KPLC will prepare annual project financial statements in accordance with the International Financial Reporting Standards (IFRS) annually three months after closure of the financial year. KPLC will also produce and submit Project's Quarterly Progress Reports (QPRs) to the Bank within stipulated time frame of not later than 45 days after the end of each quarter.

The annual financial statements of the project will be audited by the Auditor General or a firm appointed by the Auditor General based on the bank's audit terms of reference. The current appointed auditor for KPLC is Deloitte & Touche. The annual Audit Report, complete with a Management Letter and responses, will be submitted to the Bank no later than six months after the end of the fiscal year.

The Bank's supervision missions will be conducted at least twice every year with the mission's objectives including that of ensuring strong financial management systems are maintained for the project throughout its life. Reviews will be carried out regularly to ensure that expenditures incurred by the project remain eligible for ADB Group funding.

3.7.6 Environmental and social Assessment component

Effectiveness in addressing environmental and social concerns requires a number of functions. These include:

- Ensuring that proper appraisal of environmental and social effects of new interventions takes place and proper measures are put in place to mitigate these effects. This is a KPLC function;
- Setting out the basis for compliance and enforcement of terms and conditions of approval of project plans. This should be an integral part of KPLC and other representatives from the government departments;
- Designing compliance strategies by the SHE Department of KPLC; and
- Monitoring compliance and management of environment and social issues.
- The Director of NEMA in charge of enforcement and compliance may conduct independent follow-up to verify compliance.

KPLC is expected to take an active role in the management of their environment and social concerns while other government departments that are more directly involved with the project will provide guidance to communities where these projects will be implemented to ensure compliance with policies from the Ministry of Environment and NEMA as well as the donors' safeguard policies. This will be facilitated through capacity building. The communities will be giving their views in regard to the proposed project and give suggestions on the project will

be implemented in a sustainable way taking into consideration of environmental and social issues of those communities.

The environmental and social screening process will be used at the planning stage of the projects to determine potential adverse environmental and social impacts, including the need for wayleave acquisition, and design of the distribution lines. KPLC PIT staff - with help of regional staff - will fill the environmental and social screening form. KPLC's Environmental Unit will analyze the forms and advise on the most suitable alternatives as necessary.

3.7.7 Monitoring and evaluation of Project Implementation

KPLC will maintain comprehensive and robust consultation, monitoring and evaluation systems. The PIT will ensure that the members in the Implementation Units are fully integrated into the management information processes of the project. The Monitoring and Evaluation System will track the performance indicators, scheduling and implementation data, and expenditure, as shall be agreed within the framework of the annual work plan and budget. The PIT will provide regular implementation reports.

4 CHAPTER THREE: BASELINE INFORMATION

This section describes the overall baseline condition of Kenya in terms of bio-physical environment, as well as the socio-economic and cultural. The proposed project will rolled out in the entire country within the 47 counties hence the baseline information presented below will for the entire country.

4.1 Location and Size

Kenya (***Figure 1***) is located in the eastern part of the African continent approximately between latitudes 4°21' N and 4° 28' S and between longitudes 34° and 42° E. Kenya is bordered by Uganda to the west, Ethiopia and South Sudan to the north, Tanzania to the south and Somalia and the Indian Ocean to the east. Kenya covers an area of approx. 587,000 km2, of which 11,000 km^2 consists of water bodies.

Kenya's landscape is grouped into geographical zones including; the Savannah Lands covering most of the arid and semi- arid areas, the Coastal Margin, the Rift Valley, the Highlands and the Lake Victoria Basin.

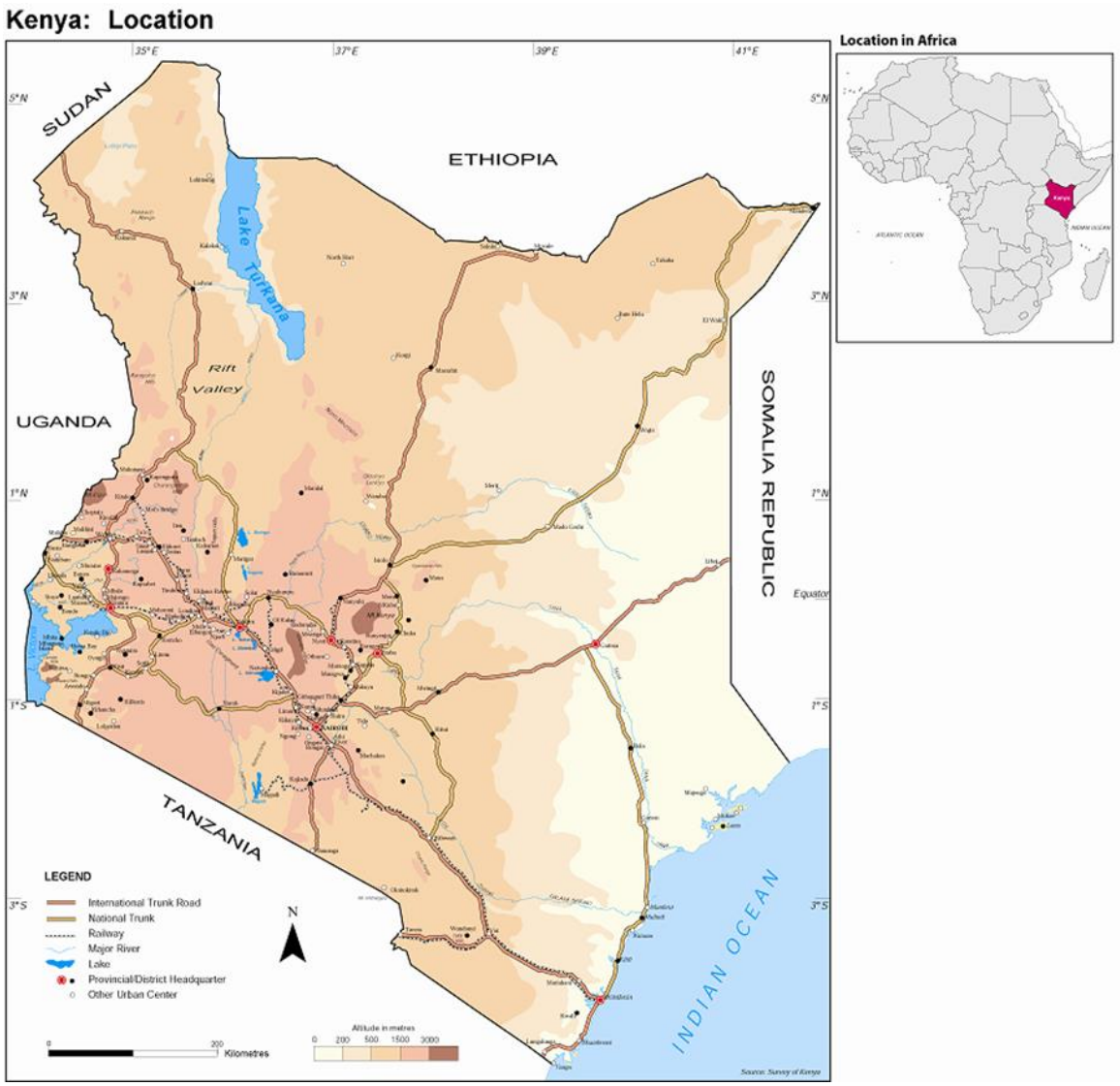


Figure 1: Map of Kenya

Kenya sits on the Equator in East Africa. It is bordered by the Indian Ocean to the east, Somalia and Ethiopia to the north, South Sudan to the Northwest, Tanzania to the South, and in the West, by Uganda. Kenya is Africa's tenth most populated country and ranks 22nd in terms of its size (Source: Survey of Kenya 2003)

Kenya lies along the equator in East Africa. Most of the country consists of high plateau areas and mountain ranges that rise up to 3,000 m and more. The plateau area is dissected by the Eastern Rift Valley, which is 40-50 km wide and up to 1,000 m lower than the flanking plateau.

The narrow coastal strip along the Indian Ocean is backed by a zone of thornbush-land. Some areas in central Kenya, at the flanks of the Rift Valley, and in western Kenya, close to Lake Victoria, are very densely populated.

The land stretches from the sea level (Indian Ocean) in the east through a diversity of landforms. From the coast, the altitude changes gradually through the coastal belt and plains (below 152metres above sea level), the dry intermediate low belt to what is known as the Kenya Highlands (over 900 metres above sea level). The country is split by the Great Rift Valley into the Western part, which slopes into Lake Victoria from the Mau ranges and Mount Elgon (4,300m) and the Eastern part dominated by Mt. Kenya and the Aberdare Ranges which rise to 5,200m and 4,000m respectively.

4.2 Physical Environment

4.2.1 Climate

Kenya enjoys a tropical climate. It is hot and humid at the coast, temperate inland and very dry in the north and northeast parts of the country. The average annual temperature for the coastal town of Mombasa (altitude 17 metres) is 30.30 Celsius maximum and 22.40 Celsius minimum, the capital city, Nairobi (altitude 1,661 metres) 25.20 Celsius maximum and 13.60 Celsius minimum, Eldoret (altitude 3,085) 23.60 Celsius maximum and 9.50 Celsius minimum, Lodwar (altitude) 506 metres) and the drier north plain lands 34.80 Celsius maximum and 23.70 Celsius minimum.

The long rains occur from April to June and short rains from October to December. The rainfall is sometimes heavy and when it does come it often falls in the afternoons and evenings. The hottest period is from February to March and coldest in July to August.

4.2.2 Topography and Drainage

The Republic of Kenya has an area of approximately 582,646 sq. km. comprising of 7.8% land and 2.2% water surface. Only 20% of the land area can be classified as medium to high potential agricultural land and the rest of the land is mainly arid or semiarid. Forests, woodlands and national reserves and game parks account for ten percent (10%) of the land area, i.e. 58,264 sq. km. 18.

Kenya's total land surface comprises of 13,396 km2 of water surface. This water surface comprise of a number of small lakes with fluctuating limits as well as part of Lake Victoria and most of Lake Turkana. Only 3,831 km2 of Lake Victoria is in Kenya while most of Lake Turkana lies in Kenya. Kenya's coastal line extends approximately 402 km along the Indian Ocean.

Topographically, the country may be divided into 4 distinct geographical and ecological regions or zones with different patterns of land use, namely; the coastal plain, the arid low plateau, the highlands, and the Lake Victoria basin. The rainfall patterns are extremely varied but generally follow those regions, with the Lake Victoria basin receiving the heaviest and most consistent rainfall.

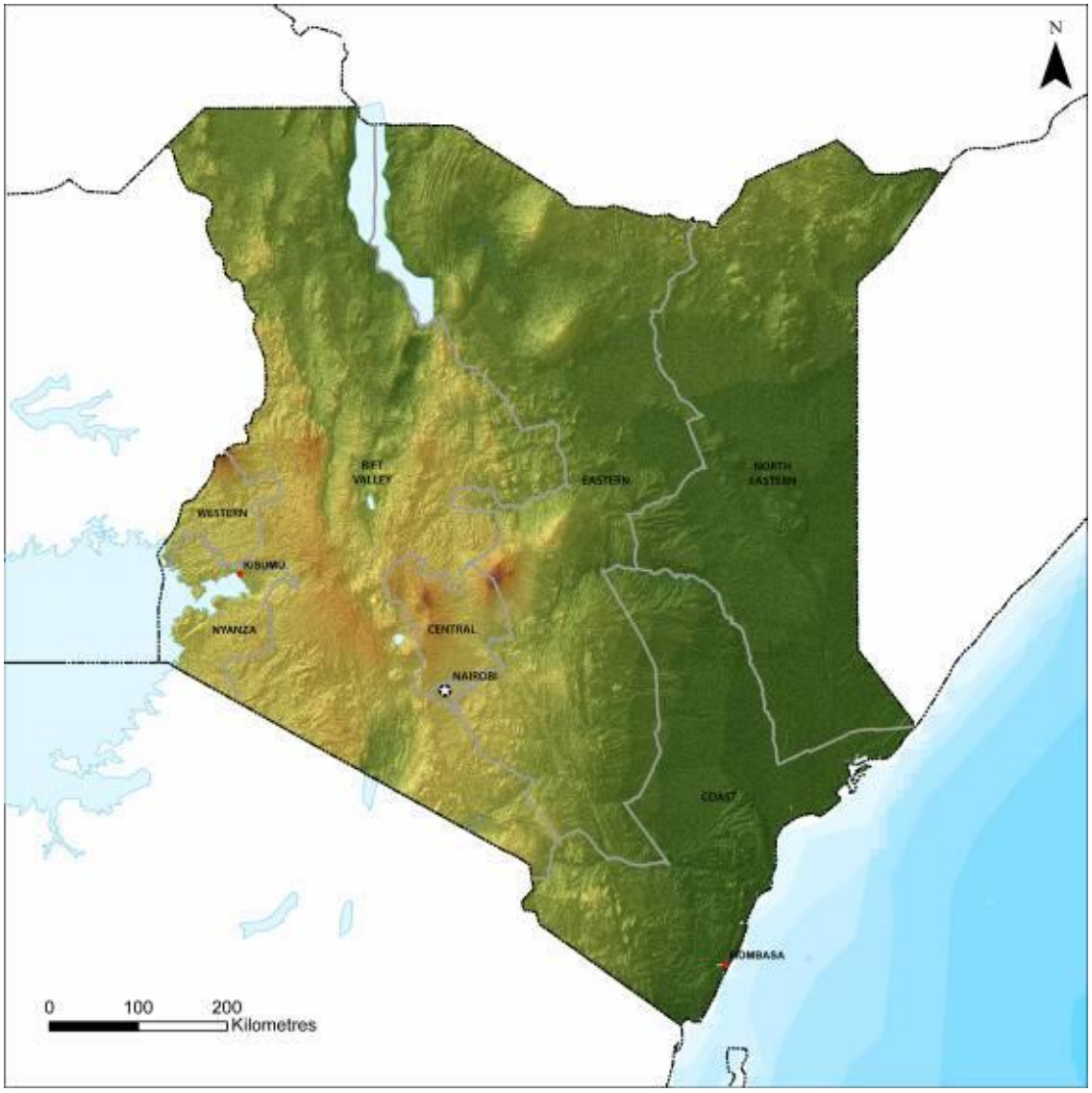


Figure 2: Relief Map of Kenya

Kenya's relief can be roughly divided into six major regions: the lowlands of the coastal belt and plains; the Buruma Waiir Low land belt; the Foreland Plateau; the Highlands (East and West);the Nyanza Low Plateau(part of the Lake Victoria Basin);and the Northern Plain lands(SurveyofKenya2003).

A small percentage of the water surface area is covered by surface drainage. This drainage is determined primarily by the Rift Valley, which roughly bisects the highland zone from North to South. Within the Rift Valley, drainage is into a chain of lakes, which have no surface outlet west of the Rift Valley rivers drain into Lake Victoria. To the East, rivers follow a southeasterly course into the Indian Ocean.

In some areas, topography and rainfall - runoff regime have created many semi-closed, poorly drained or overflow areas that retain a substantial amounts of runoff which originate on the unslope areas. On groundwater, the country is divided into three broad areas. These are volcanic rocks, precambrian metamorphic basement rocks and precambrian instrusive rocks and sedimentary rocks.

The volcanic rocks cover 26% of the country, more commonly in the western half of Kenya.
Groundwater sources occur in old land surfaces, which are weathered zones between successive lava flows that signify periods of quiescence. Fractures, faults, fissures and joints are also useful.

Water is mainly of bicarbonate type with low total dissolved solids. Local pockets of high fluoride are believed to be of volcanic and fumarolic origin.

The precambrian rocks cover an area which is approximately 17% of the country and are widely distributed in the central, western and north western parts of Kenya. Water in these areas occurs in deep horizons of faults, and fractures. Aquifers are generally unconfined and yields and water levels vary within rocks. The sedimentary rocks cover 55% of the country, predominantly in the eastern parts. These areas have loose and permeable sediments. The aquifers are shallow and unconfined and most of them are generally saline. The salinity results from accumulation of solute evaporite minerals within the sediments.

4.2.3 Hydrology

Kenya's four largest inland water bodies (Lake Victoria, Lake Turkana, Lake Naivasha, and Lake Baringo) account for about 1.9 per cent of the land area. The majority of Kenya's lakes, including both saline and freshwater, and closed and open basin systems, are located within the Great East African Rift Valley. Kenya's major permanent rivers originate in the highlands. The Nzoia, Yala, sondu Miriu, and Migori rivers drain into Lake Victoria. The Ewaso Ngiro River is found in the northeastern part of the country and the Tana and Athi rivers flow in the southeastern part. Therivers draining into Lake Victoria (covering over 8 per cent of Kenya's land area) provide about 65 per cent of Kenya's internal renewable surface water supply. The Athi River drainage area (11 per cent of Kenya's land area) provides 7 per cent, the lowest share among Kenya's major drainage areas (Survey of Kenya 2008 and MOWI.).

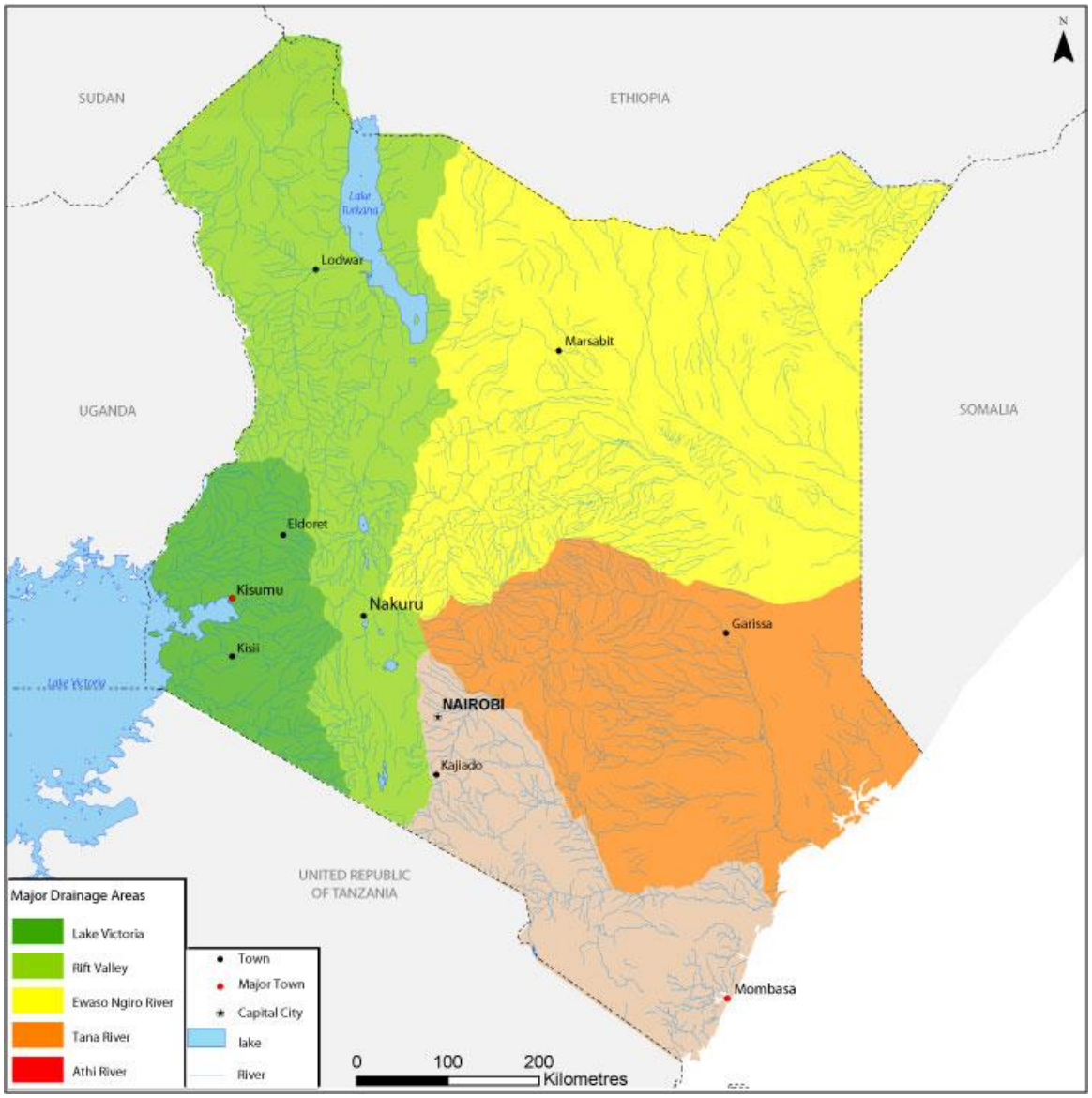


Figure 3: hydrological Map of Kenya

4.2.4 Soils and Geology

The geology of Kenya is characterized by Archean granite/greenstone terrain in western Kenya along Lake Victoria, the Neoproterozoic 'Pan-African' Mozambique Belt, which underlies the central part of the country and Mesozoic to Recent sediments underlying the eastern coastal areas.
The Eastern Rift Valley crosses Kenya from north to south and the volcanics associated with rift formation largely obliterate the generally north-south striking Neoproterozoic Mozambique Belt (Schlueter 1997). Rift Valley volcanogenic sediments and lacustrine and alluvial sediments cover large parts of the Eastern Rift.

About 59 per cent of Kenya's soils have moderate to high fertility, meaning they are theoretically suitable for growing crops. Fertility levels, however, depend on the amount of rainfall. Given the distribution and variability of rainfall in Kenya, only about 17 per cent of the land area has medium to high potential for crops, while the remaining 83 per cent is classified as arid and semiarid and so of low crop growing potential (Survey of Kenya 2003). Drylands, however, provide essential habitat for about half the country's livestock and 70 per cent of Kenya's wildlife (UNCCD 2002).

4.2.5 Land Use

Approximately seventy five per cent (75%) of the country's population lives within the medium to high potential (20% of land area) and the rest in the vast Arid and Semi-Arid Lands (ASALs). One consequence of this is that size and distribution of land varies quite widely as does population density which ranges from as low as 2 persons per sq. km. in the ASALs to a high of over 2000 in high potential areas.

3.5 Biological Environment-Ecosystems

Kenya's land is covered by different types of vegetation according to the climate, topography, andother io-physical factors. The major categories are grassland, forests, semi-deserts, and mountains. Human impacts on the land continue to alter the distribution, amount, and health of these ecosystems (Survey of Kenya 2003).

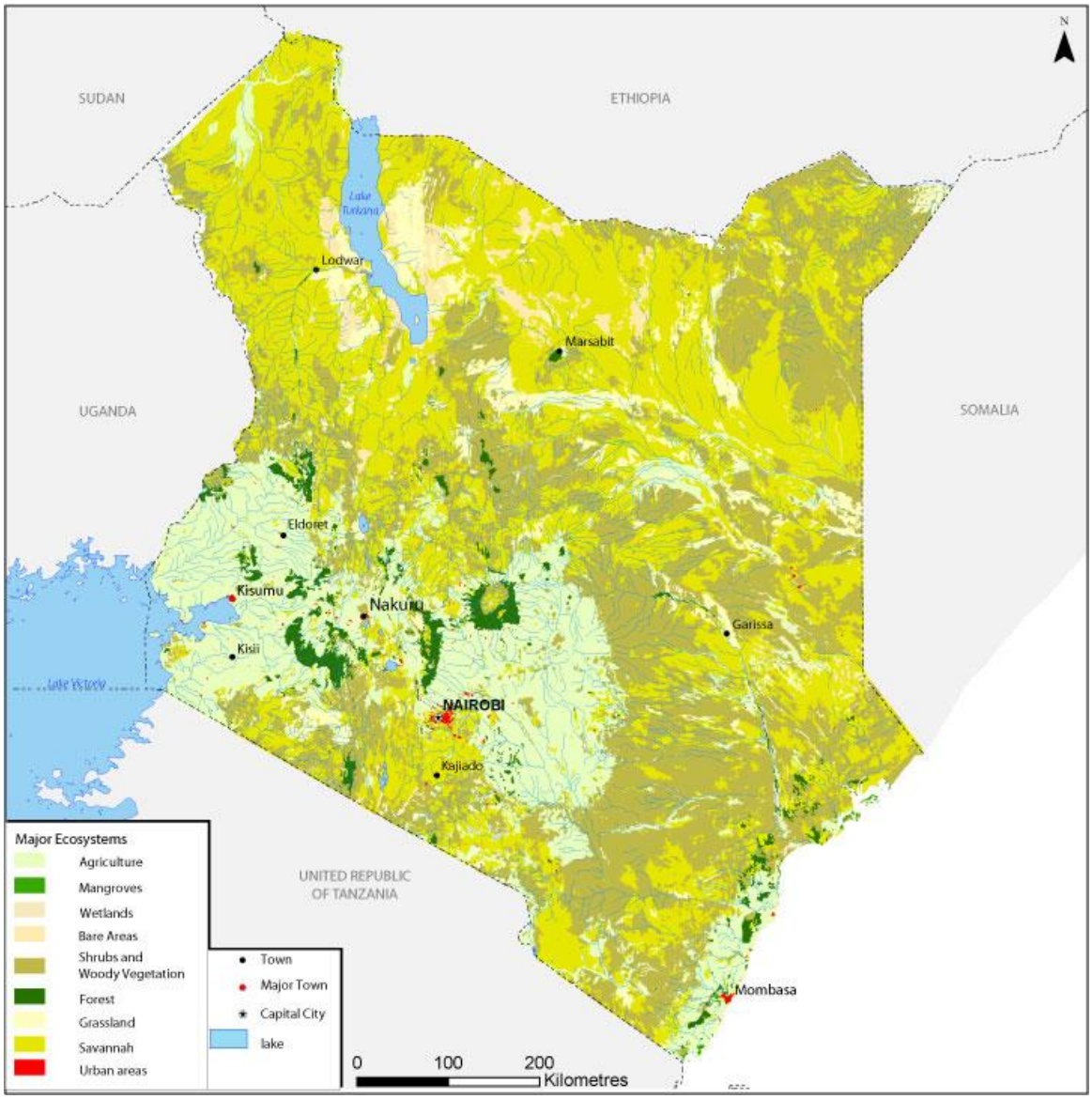


Figure 4: **Major ecosystems in Kenya**

4.2.6 Grasslands

Grasslands dominate Kenya's land cover and include what is known as 'savanna' vegetation. Permanent meadows and pastures occupy about 21.3 million ha. in Kenya, which represent 2.4 per cent of Africa's total meadows and pastures (FAO 2008).

4.2.7 Forests

Forests cover 2.9 per cent of Kenya's land area (KFMP 1995). The main forest types are moist highland forest, dry forest, tropical rain forest, coastal forest, and riverine and mangrove forests (Survey of Kenya 2003). Although they are not extensive land cover, Kenya's forests provide significant goods and services, including numerous non-timber forest products that provide local people with food, fibres, medicines, and shelter. The closed canopy forests are habitat for a disproportionately large percentage of the country's wildlife and other biodiversity. It is estimated that they harbor 40 per cent of large mammals, 30 per cent of birds and 35 per cent of the nation'sbutterflies. About half of Kenya's threatened mammals and birds are found in its forests (Survey of Kenya 2003).

4.2.8 Arid and semi-arid lands (ASALS)

Over 80 per cent of Kenya is arid or semi-arid lands (ASAL). These lands are home to over 10 million people. The ASAL has over 70 per cent of the livestock population and 90 per cent of the wild game, which attract tourism to

the area. The ASAL also contains much of Kenya's commercial mineral wealth (WRI et al. 2007 and MSDNKAL 2008).

4.2.9 Mountain vegetation

Kenya's five major mountainous regions (Mount Kenya, Mount Elgon, Aberdare Range, Mau Escarpment, and Cherangani Hills) are surrounded by foothills and high-elevation plateaus. Mountainous regions harbour unique types of vegetation due to the micro-climates that occur on their slopes. Different altitudes, aspects, and moisture availability create a large variety of ecosystems over relatively small areas.

4.2.10 Wetlands

Kenya's wetlands occur in both fresh and salt waters. They include coral reefs, marine inshore waters, mangroves, deltas, creeks, lake shores, rivers, marshes, ponds, impoundments, and mountain bogs. They are a source of water, provide numerous ecosystem services, and have a high diversity of characteristic biota or living organisms (Ramsar Convention 2001).

Kenya's wetlands cover about 14 000 km2 (2-3 per cent of the country's surface area) and are found along the major rivers. In addition, many seasonal and temporary wetlands occur all over the country, including rock pools and springs in the southern part of Nairobi, west of Ngong Hills, and at Limuru. Wetlands have also been created by damming water for hydroelectricity and water supplies, and some wetlands have been built to treat wastewater (Macharia 2004).

Wetlands are a source of social-cultural and economic potential providing people with food, medicinal products, firewood, and materials for building and handicrafts. Rapid population growth, agricultural operations, and encroachment of development pose a serious threat to wetlands. Expanding industries and urban centers discharge their waste water into them and the polluted waters are unhealthy for human and livestock use, destroy aquatic life, and restrict recreation opportunities (Ramsar Convention 2001).

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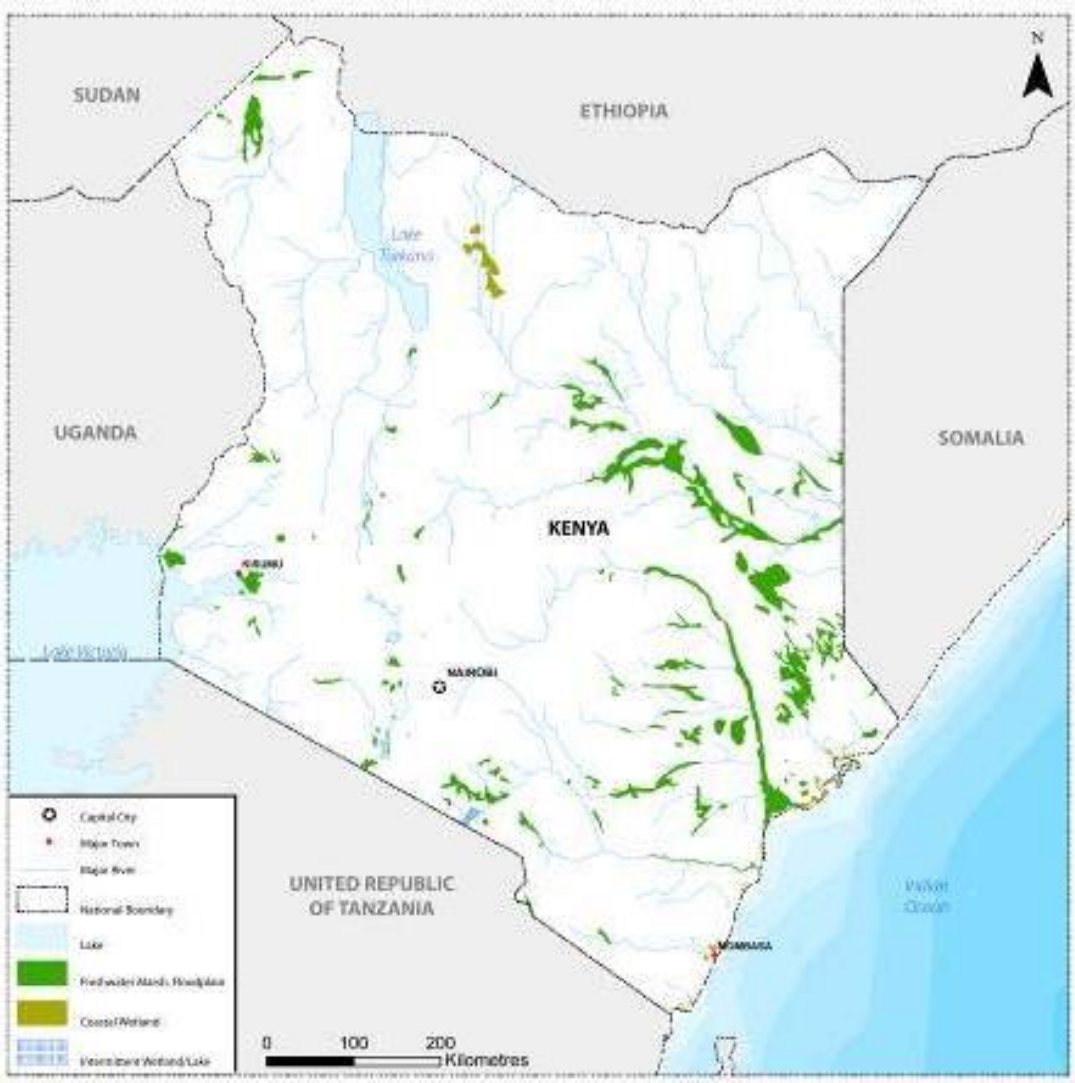

Figure 5: Kenya's Largest Wetlands

They include the shallow lakes Nakuru, Naivasha, Magadi, Kanyaboli, Jipe, Chala, Elmentaita, Baringo, Ol'Bolossat,
Amboseli and Kamnarok; the edges of Lake Victoria and Lorian, Saiwa, Yala, Shompole swamps; Lotigipi swamp (Lotagipi) and Kano plains; Kisii valley bottoms and Tana Delta; and coastal wetlands (Source: WWF 2005)

4.2.11 Marine and coastal areas

Kenya's marine and coastal environments include the Indian Ocean's territorial waters and the immediate areas that border the ocean. The Kenyan coast stretches 550 kilometers from the Somalian border in the north in a south-westerly direction to the border with Tanzania. The fringing coral reef (comprised of about 140 species of hard and soft corals) runs between 0.5.km and 2km off-shore with occasional gaps at the mouths of rivers and isolated areas facing creeks.

Beaches, cliffs, or mangrove forests dominate the shoreline in most areas. The coral-reef system, mangrove swamps, and hinterland provide unique natural landscapes and a wide range of biodiversity resources of special conservation concern.

4.2.12 Wildlife

Kenya's game parks and spectacular wildlife attract nearly two million tourists each year (UN Water 2006) and generate important domestic revenues. Wildlife conservation is thus a high priority. Formed in 1946, Nairobi National Park, just outside the city, was the country's first protected area. By 2008, about 75 237.9 km2 (WCPA 2007) of the nation's land area had been set aside as national parks and game reserves.

Wildlife is also protected by bans on game hunting, killing animals even when they attack, and the trade in ivory and skins. Nevertheless, poaching is a significant threat to many species including leopards, cheetahs, lions, elephants, and rhinoceroses. Efforts are being made to restore populations of the endangered African elephant and black rhino, and an aggressive campaign is being been waged against poachers. Moreover, increased pressure on marine resources has led the Kenyan government to establish a system of protected areas managed by the Kenya Wildlife Service (KWS) to conserve and manage the most important ecosystems along the coast. In total, Kenya has five Marine Protected Areas (MPA's).

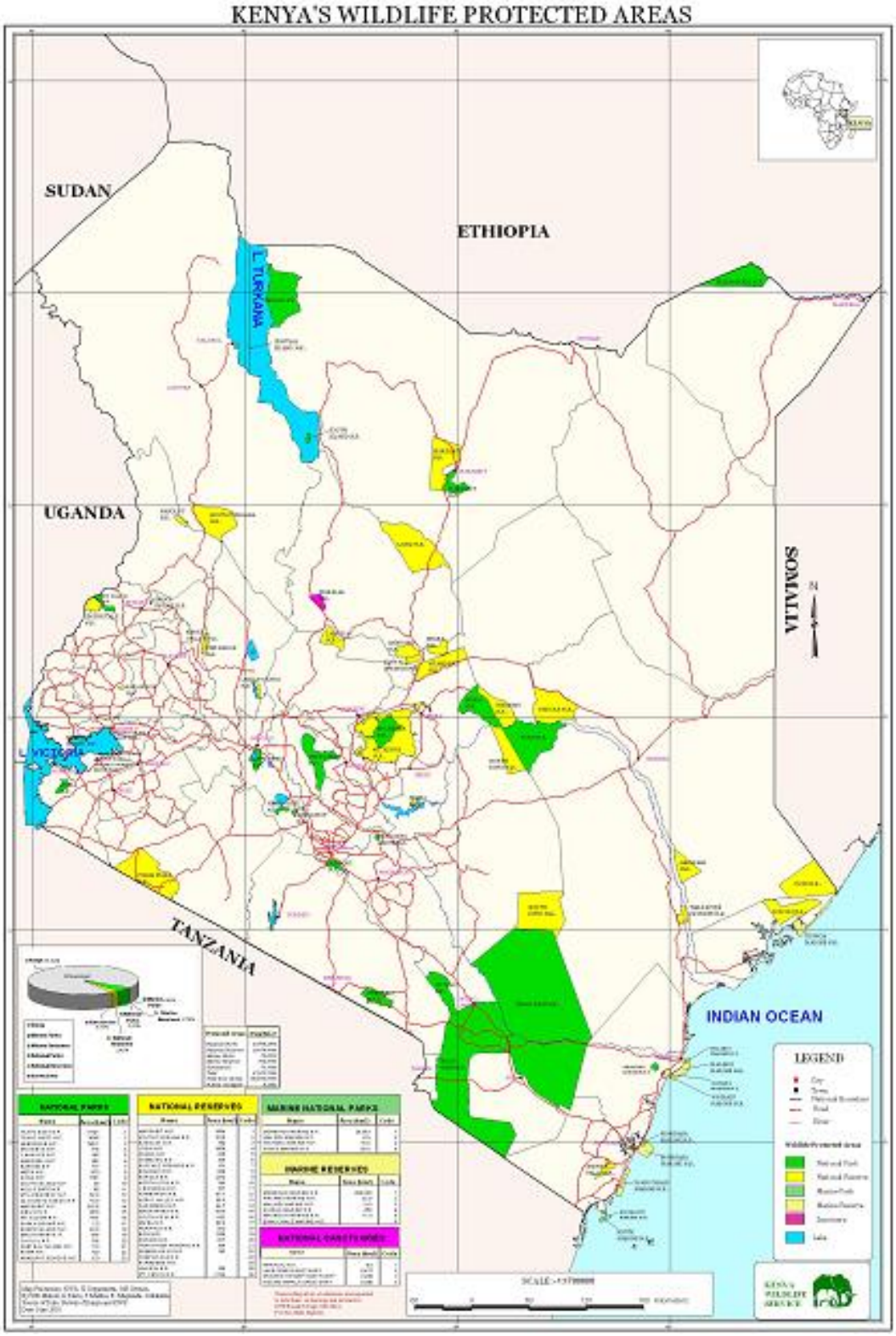

Figure 6: Protected Areas in Kenya

Examples of endangered species include the Sokoke scops owl (Otus ireneae); Taita blue-banded papilio (Papilio desmondi teita); the highly endangered Tana River mangabey (Cercocebus galeritus) and the Tana River red colobus (Piliocolobus rufomitratus); the green sea turtle (Chelonia mydas) and the critically endangered hawksbill turtle (Eretmochelys imbricata).

In addition to threats to species biodiversity, a number of types of ecosystems are disappearing or are in dangerous decline due to human activities. These include the slopes of Mount Kenya and coastal forests as well as the Horn of Africa Acacia Savannas, a major centre of endemism for dry land plants.

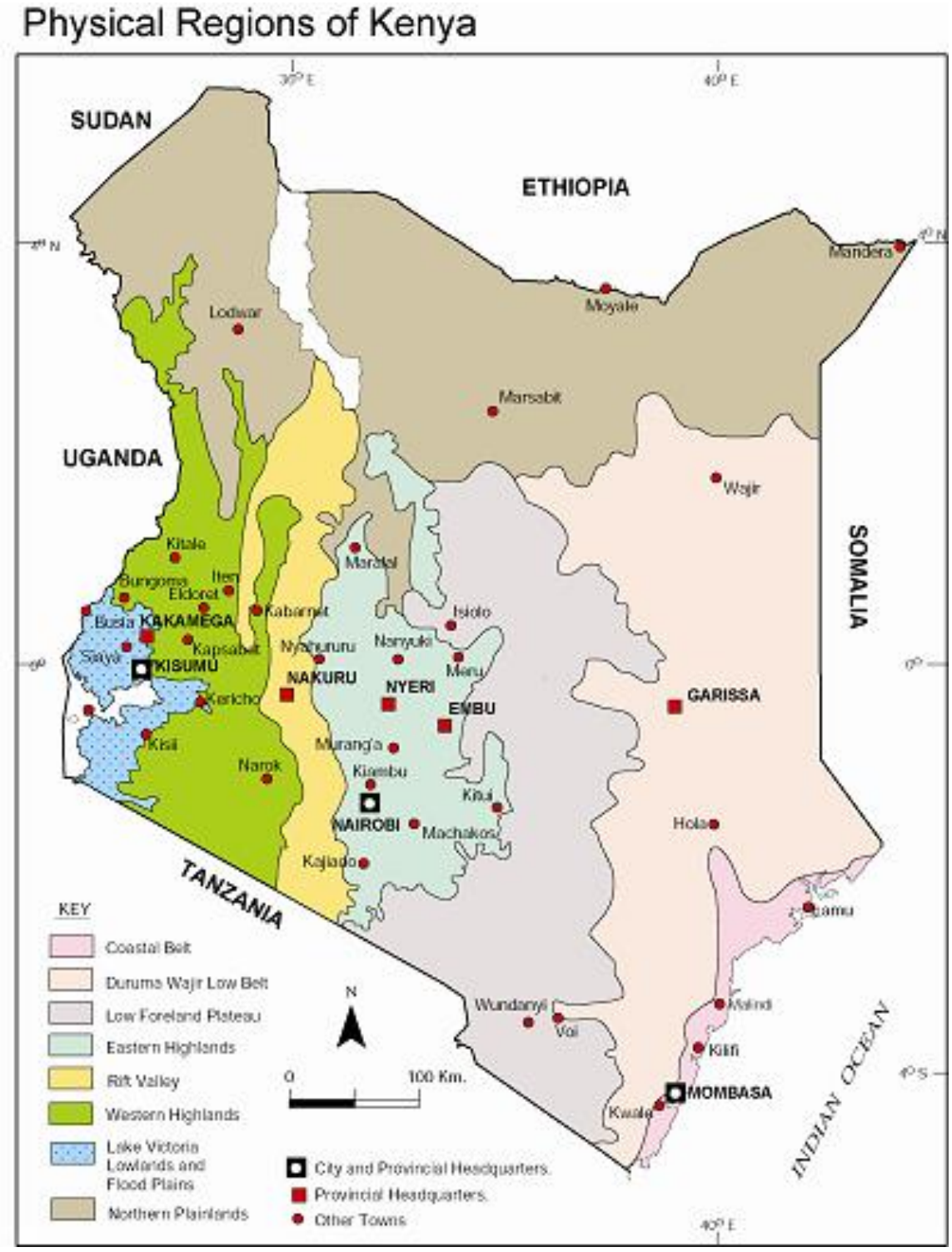

Figure 7: Physical Regions of Kenya

4.3 Socio-Economic Background

4.3.1 Population

Kenya's population increases by an estimated one million a year. The government revised population based on the 2009 census is 39.8 million, an increase of over 35 percent in the past decade. The population report shows the distribution of the population across the country, with Rift Valley Province being the most populous with 10.1 million people. Nairobi, the capital, has 3.1 million people, according to the report released by the Ministry of Planning and National Development. Demographic trends show that more people are moving to urban areas and the Bank estimates that half of Kenya's population will live in cities by 2050. Better macro-economic conditions in the past decade helped improve the welfare of Kenyans, but the poor remain vulnerability to drought and other crises induced by climate change. Rural and urban poverty remain a challenge. Recent analysis of the data from the 2005 to 2006 Kenya Integrated Household Budget Survey (KIHBS) indicates that national absolute poverty declined from 52.3 percent in 1997 to 46.1 percent in 2005 to 2006. While this decline in poverty compares well with other Sub Saharan African countries, it can still be considered high in comparison to neighboring countries such as Tanzania (about 36 percent) and Uganda (about 31 percent). In rural areas, overall poverty declined from 52.9 percent to 49.1 percent, while in urban areas, poverty declined from 49.2 percent in 1997 to 38.8 percent over the same period.

The Kenyan poverty profile also reveals strong regional disparities in the distribution of poverty.
According to the 2005 to 2006 survey, the lowest incidence of rural poverty was in Central province (30.3 percent), followed by Nyanza (47.9 percent), Rift Valley (49.7 percent), Eastern (51.1 percent), Western (53.2 percent), Coast (69.7 percent), and North Easter province (74.0 percent). Inequality in Kenya remains high. The distribution of income, measured by the Gini coefficient (a measure of inequality of income distribution—the higher the percentage the higher the level of inequality) was estimated at 39 percent in rural areas and 49 percent for urban areas (pre-crisis). Income disparities in the rural areas have gone down since 1997, while the disparities in the urban areas have increased slightly. The Commission on Revenue Allocation is using the development and poverty data to develop a model for more equitable distribution of public resources.

There has been additional progress with respect to other dimensions of social development over the past years. For example, net primary education enrolment was only 80 percent in 2003, but has since increased to about 90 percent in 2008 (with an equal enrolment ratio between boys and girls). In 2004, only about 60 percent of primary students completed their education compared with about 80 percent in 2008. The transition from primary to secondary and later to tertiary and university education has also improved in recent years due to increased public and private investment in the education sector.

4.3.2 Economic Growth & Setting

Kenya's economy recorded high growth rates of real Gross Domestic Product (GDP) averaging 6.6% per annum during the immediate post-independence years (1964-1973) and towards the end of that decade. Deceleration of this growth which started in late 1970s, continued until 2002 when the economy registered a record negative growth rate of 0.2%. During the years 1997-2002 economic growth declined steadily with GDP recording an average annual growth rate of only 0.9%, against a population growth rate of 2.9% per annum. The economy has been on a recovery path since 2003 when real GDP grew by only 0.5% to 6.1 % in 2007, giving rise to an annual growth rate of about 4.3% against a population growth rate of about 2.8% per annum.

Among the key factors contributing to the economic decline were poor infrastructure, particularly bad roads, inadequate energy supply, inadequate water supply, a weak institutional framework, weak performance of the major sectors of the economy namely; agricultural and manufacturing sectors, and poor macro-economic management. More recently, about 46.6 % of Kenya's population of 35.5 million people in 2005/061 was estimated to be living below the country's poverty line in both rural and urban areas.

Despite a number of economic challenges, Kenya will still experience a satisfactory growth rate of 4.3 percent in 2011. This will be higher than Kenya's long-term growth rate of 3.7 percent but still a full percentage point below the average projected for Sub-Sahara Africa. In the first half of 2011, the Kenyan economy grew by 4.5 percent, driven by a strong performance in the financial sector (8.2 percent), construction (8.1 percent), as well as hotels

and restaurants (6.4 percent). Moderate growth was recorded in the agricultural and industrial sectors. Overall growth for 2011 is expected to be balanced across all key sectors, with the services sector maintaining its position as the growth engine over the last decade

Agriculture has performed average despite the moderate drought. Agriculture production grew by 3.5 percent in the second first half of the year as rains normalized, especially in Kenya's "bread basket", the Rift Valley, and production held up again. The drought mostly affected Kenya's livestock production in Northern and Eastern regions. It is estimated that the drought shaved off 0.2 percentage points from GDP growth, mainly as a result of livestock mortality. Beyond these arid regions, low rainfall and high temperatures affected tea production. In addition, the crises in North Africa and Europe adversely affected the demand for Kenya's cash crops, mainly horticulture, coffee and tea.

Industrial sector growth remains driven by construction while manufacturing is lagging. The construction sub-sector recorded an impressive 8.1 percent growth in the first half compared to a 2.2 percent growth in the same period in 2010. Manufacturing grew at a modest 3.2 percent, compared to 5.5 percent in the same period last year. The drought impacted hydro power generation and the resulting high cost of energy has adversely affected the industrial sector. The share of hydro power in Kenya's energy supply declined from 57 percent in July 2010, to 43 percent in July 2011. This in turn increased dependence on back-up thermal power generation, which uses expensive imported fuel as its feedstock. Industries that depend on imported raw materials, saw their production costs increase significantly due to high import costs (oil and steel), along with the depreciation of the shilling.

The costs of imported machinery and equipment also increased substantially. The combined effect of these factors has negatively impacted the competitiveness of industry, resulting in a sluggish performance in 2011.

The services sector is holding up, fuelled by continued growth in ICT and a strong performance in tourism. Services grew by 4.3 percent in the first half of 2011, mainly driven by financial intermediation (8.2 percent); hotels and restaurants (6.4 percent), and transport and communication (5.2 percent). Tourist arrivals increased by 13.6 percent in the first half of 2011, compared to 2010 levels. Despite Europe's economic slowdown, 46 percent of arrivals were still from Europe, 25 percent from the rest of Africa, 12 percent from the Americas, and 10 percent from Asia. However, the emerging security concerns stemming from Kenya's incursion in Somalia will dampen tourist arrivals for the remainder of the year, though the high season is over.

The ICT revolution is reaching new milestones and is stimulating growth in other services. The mobile phone revolution has continued, with subscriptions peaking at 25.3 Million at the end of June 2011, which is more than the number of adults in Kenya. Since June 2010, subscriptions increased by more than 25 percent. In the same period, internet users increased by 60 percent, climbing to 12.5 Million.

This indicates that the data revolution is now also in full swing. A key factor in the growth of internet usage is the new affordable tools, including smart phones and social networking applications with both internet and mobile interface that are proving increasingly popular, especially among the urban youth. The sector has also generated additional innovations, including M-banking, linking mobile money with personal bank accounts, M-credit, and M-insurance, which are expanding the reach of financial services to previously unbanked segments of the population

4.4 The Physical Infrastructure Sector

The Physical Infrastructure Sector consists of Roads; Public Works; Transport; Energy; Local Government; Nairobi Metropolitan Development and Housing Sub-Sectors. In the new long term development blue print for the country "The Kenya Vision 2030", infrastructure development has been recognized as an enabler for sustained development of the economy and particularly for the six key sectors namely; Tourism, Business Process Outsourcing (BPO), Wholesale and Retail, Manufacturing, Financial Services and Agriculture and Livestock identified under the economic pillar.

The Kenya Vision 2030 recognizes the importance of development infrastructure as critical for socio-economic transformation. The Infrastructure Sector aspires for a country with modern metropolitan cities, municipalities and towns with infrastructural facilities that meet international standards to make Kenya a globally competitive and prosperous country. The strategies and measures to be pursued in the medium term include; supporting the development of infrastructure initiatives around flagship projects, strengthening the institutional framework for infrastructure development, raising the efficiency and quality of infrastructure as well as increasing the pace of infrastructure projects so that they are completed as envisaged, protecting the environment as a national asset and conserving it for the benefit of the future generations and the wider international community. Other measures include encouraging Private Sector participation in the provision of infrastructure services through the Public-Private-Partnerships (PPPs) framework. Below are the ongoing flagship physical infrastructure projects in the different sectors;

4.4.1 Public Works Sub-Sector

Sufficient investments in the Public Works sub-sector are required to facilitate provision of adequate building space for all stakeholders in Government. It is therefore necessary to develop innovative ways of resource mobilization and prudence utilization for optimal growth.

With rapid population and urbanization, proliferations of informal settlements increasingly continue to pose social and economic challenges for the housing sub sector. This can be mitigated by aggressive investment in housing infrastructural facilities and provision of appropriate incentives to foster private sector participation in housing development. Various legislative frameworks relevant to housing such as Building Laws; Housing Bill, Tenant and Landlord Bill need to be fast tracked for enactment to spur growth in the housing sector.

4.4.2 Metropolitan development sub sector

Metropolitan development sub sector has experienced inadequate funding although this has been rising gradually. However, as a result of the continuous capacity building in terms of personnel, facilities and equipment, the sub sector's actual expenditure has been increasing progressively. Its envisaged that the increase in resource allocation as well as the progressive capacity building will enable the sub - sector delivers its services through effective project implementation.

Successful implementation of projects in the roads' sub-sector will be realized if effective collaboration with key stakeholders is enhanced. It is notable that liquidity levels for road contractors have increased on account of reduction of withheld VAT from 16% to 8%. However the refund systems of input VAT continues to be too bureaucratic causing undue delays in the refund. The sub sector has endeavored to address the challenge of outstanding bills, through timely completion of ongoing projects and did not take to start any new projects to ensure that ongoing ones are adequately funded and are completed on time. Further, reduction of the percentage earmarked for maintenance of Class DE/Other roads to 10% and equal distribution of the same across all constituencies continues to impact negatively on road maintenance.

4.4.3 Energy sub-sector

The energy sub-sector is critical in ensuring sufficient and efficient power supply. However, it continues to experience inadequate power supply capacity resulting to over-reliance on hydropower. Some of the challenges experienced by the sub sector include inability of KPLC to connect all customers due to weak transmission and distribution network; high cost of power compared to other regional players; dependence on donor financing and their stringent conditionalities, and ever rising prices of fossil fuels prices.

Rural Electrification Programme: This programme will facilitate supply of power from the national grid to 460 trading centres and 110 secondary schools among other public facilities. In addition the Programme intends to spend Kshs. 180 million to provide solar electricity generators to 74 public institutions such as secondary schools, boarding primary schools, health centres and dispensaries. Some isolated mini diesel power stations will also be constructed to serve areas which are uneconomical to be supplied power from the national grid.

Geothermal Appraisal at Olkaria IV: Six (6) appraisal wells will be drilled to assess the commercial viability of producing 140 MW of electricity. In the medium the drilling campaign will be stepped up to other areas with geothermal resources to realize adequate steam to produce equivalent 600MWeCoal Exploration: Initial exploratory drilling at Mui Basin in Kitui and Mwingi Districts has indicated the existence of coal in this area. During the MTP period, appraisal drilling and assessment will be undertaken to determine the quantity and quality with a view to ascertaining the commercial viability of the coal deposits. Coal exploration will thereafter be extended to cover other areas such as Karoo in the Coast Province.

Wind Power Generation: Wind power generation by KenGen and IPPs is expected to supply a total of about 150 MW. Cogeneration: Power will also be produced in the process of producing sugar. The sugar factories in the country have the potential of producing about 120 MW using bagasse as the base.

4.4.4 Transport sub-sector

Transport sub-sector provides leadership in Transport policy development and therefore requires enhanced empowerment to facilitate effective co-ordination. With Kenya being strategically located with good access to sea and air connections to most parts of the world, there is pressure to ensure safety in all modes of transport. Piracy in Kenyan water is a concern and requires the concerted efforts and collaboration of the sub-sector and that of Defence by increasing the patrolling in the Kenyan waters along the Indian Ocean. As the road infrastructure is improved, there is need to ensure safety. To do this, road safety awareness campaigns, erection of studs in black spot and adoption of best tested and piloted systems will be enhanced. Effective sub-sector capacities are a pre-requisite in transforming challenges into opportunities through efficient
programme implementation.

Dredging and Deepening the Mombasa Port: The dredging of the port to deepen the channel to 16metres will enable larger post-Panama vessels to access the port and thereby remove the risk of the port slowly evolving into a feeder facility which larger vessels have no access. Dredging the port to 16 meters to accommodate panama vessels is underway. Under Port Container Terminal Expansion, Procurement of consultancy for civil works supervision is complete. Awarding of civil works contract is at an advanced stage.

Nairobi Metropolitan Region Rapid Bus Transit System: The Government has laid plans for the development of a rapid bus transport system starting with the following three transport corridors: Athi River Town to Kikuyu Town (approximately 38 km); Thika Town to the Central Business District (approximately 50 kms); and Jomo Kenyatta International Airport to the Central Business District (approximately 25 kms). The Nairobi Metropolitan region rapid bus transit is expected to be operational in four years' time. So far a feasibility study on Mass Rapid Transit System for Nairobi Metropolitan region is being undertaken together with development of commuter rail services in an effort to decongest Nairobi Metropolitan region.

Development of Light Rail for Nairobi and its Suburbs: The area expected to be served by the light rail stretches from Nairobi Railway Station, situated in the Central Business District, to Embakasi/Jomo Kenyatta International Airport, a distance of 15.6 kilometres, and borders the heavily populated industrial area, Makongeni, Makadara, Buru Buru, Doonholm and Pipeline, Jogoo Road, Outer Ring Road, Airport Roads, Mombasa Road, the Airport Siding and the Nairobi-Makandara. It is projected that the new light rail services will serve at least 150,000 daily passengers, which is 5 per cent of the future public transport demand in the Nairobi metropolitan area. To make this possible, a feasibility study for light Rail/Commuters trains to JKIA, CDB and uburbs (Athi River to City Centre, Kikuyu Town to city centre and Thika Town to the Central Business District) is in progress.

Development of a New Transport Corridor to Southern Sudan and Ethiopia: This corridor will link Lamu, Kenya's North Eastern province, Ethiopia and Southern Sudan: The project involves the development of a new transport corridor from the new port at Lamu through Garrisa, Isiolo, Maralal, Lodwar, and Lokichogio to branch at Isiolo to Ethiopia and Southern Sudan. This will ***Rehabilitation and Maintenance of Airstrips and Airport Expansion and Modernisation:*** This will involve rehabilitation and expansion of airstrips and airports serving tourist and commercial sites in the country.

5 DESCRIPTION OF THE ADMINISTRATIVE, POLICY AND REGULATORY FRAMEWORK

5.1 Introduction

There is a growing concern in Kenya and at global level that many forms of development activities cause damage to the environment. Development activities have the potential to damage the natural resources upon which the economies are based. Environmental Impact Assessment is a useful tool for protection of the environment from the negative effects of developmental activities. It is now accepted that development projects must be economically viable, socially acceptable and environmentally sound.

A detailed review of relevant institutional and legal as well as policy framework that bears significance or implication to this Last Mile Connectivity project is presented in this chapter of the ESMF report. The African Development Bank Safeguard Operational Policies applicable to the project as well as the international laws and conventions that bear relevance to the implementation of this project have also been highlighted in this chapter.

5.2 Environmental Problems in Kenya

There are many environmental problems and challenges in Kenya today. Among the cardinal environmental problems include: loss of biodiversity and habitat, land degradation, land use conflicts, human animal conflicts, water management and environmental pollution. This has been aggravated by lack of awareness and inadequate information amongst the public on the consequences of their interaction with the environment. KPLC is aware of the important role the environment plays and as such strives to carry its activities in an environmentally friendly way.

5.3 Administrative / Institutional Framework

At present there are over twenty (20) institutions and departments which deal with environmental issues in Kenya. Some of the key institutions include:

5.3.1 National Environment Management Authority (NEMA)

The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. However, NEMA's mandate is designated to the following committees:

5.4 Provincial and District Environment Committees

According to EMCA, 1999 No. 8, the Minister by notice in the gazette appoints Provincial and District Environment Committees of the Authority in respect of every province and district respectively. The Provincial and District Environment Committees are responsible for the proper management of the environment within the Province and District in respect of which they are appointed. They are also to perform such additional functions as are prescribed by the Act or as may, from time to time be assigned by the Minister by notice in the gazette. The decisions of these committees are legal and it is an offence not to implement them.

5.4.1 Public Complaints Committee

The Committee performs the following functions:

- Investigate any allegations or complaints against any person or against the authority in relation to the condition of the environment in Kenya and on its own motion, any suspected case of environmental degradation and to make a report of its findings together with its recommendations thereon to the Council.
- Prepare and submit to the Council periodic reports of its activities which shall form part of the annual report on the state of the environment under section 9 (3) and

- To perform such other functions and excise such powers as may be assigned to it by the Council.

5.4.2 National Environment Action Plan Committee

This Committee is responsible for the development of a 5-year Environment Action Plan among other things. The National Environment Action Plan shall:

- Contain an analysis of the Natural Resources of Kenya with an indication as to any pattern of change in their distribution and transmission quantity over time.
- Contain an analytical profile of the various uses and value of the natural resources incorporating considerations of intergenerational and intragenerational equity.
- Recommend appropriate legal and fiscal incentives that may be used to encourage the business community to incorporate environmental requirements into their planning and operational processes.
- Recommend methods for building national awareness through environmental education on the importance of sustainable use of the environment and natural resources for national development.
- Set out operational guidelines for the planning and management of the environment and natural resources.
- Identify actual or likely problems as may affect the natural resources and the broader environment context in which they exist.
- Identify and appraise trends in the development of urban and rural settlements, their impact on the environment, and strategies for the amelioration of their negative impacts.
- Propose guidelines for the integration of standards of environmental protection into development planning and management.
- Identify and recommend policy and legislative approaches for preventing, controlling or mitigating specific as well as general diverse impacts on the environment.
- Prioritise areas of environmental research and outline methods of using such research findings.
- Without prejudice to the foregoing, be reviewed and modified from time to time to incorporate emerging knowledge and realities and;
- Be binding on all persons and all government departments, agencies, States Corporation or other organ of government upon adoption by the national assembly.

5.4.3 Standards and Enforcement Review Committee

This is a technical Committee responsible for environmental standards formulation, methods of analysis, inspection, monitoring and technical advice on necessary mitigation measures.

5.4.4 National Environment Tribunal

This tribunal guides the handling of cases related to environmental offences in the Republic of Kenya.

5.4.5 National Environment Council (NEC)

EMCA 1999 No. 8 part iii section 4 outlines the establishment of the National Environment Council (NEC). NEC is responsible for policy formulation and directions for purposes of EMCA; set national goals and objectives and determines policies and priorities for the protection of the environment and promote co-operation among public departments, local authorities, private sector, non-governmental organisations and such other organisations engaged in environmental protection programmes.

5.5 The Legal, Regulatory and Policy Framework

5.5.1 The Constitution of Kenya, 2010: Constitutional provisions

Kenya now has a new Supreme law in form of the New Constitution which was promulgated on the 27th of August 2010 and which takes supremacy over all aspects of life and activity in the New Republic. The

Constitution is the supreme law of the Republic and binds all persons and all State organs at all levels of government. The Constitution of Kenya, 2010 provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectoral legislative documents are drawn.

In relation to the environment, article 42 of chapter four, *The Bill Of Rights*, confers to every person the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative measures, particularly those contemplated in Article 69, and to have obligations relating to the environment fulfilled under Article 70.

Chapter 5 of the document provides the main pillars on which the 77 environmental statutes are hinged.

Part 1 of the chapter dwells on land, outlining the principles informing land policy, land classification as well as land use and property. Of core importance is the definition of private land as land within the project area is largely privately owned, and would be acquired for irrigation purposes.

The second part of this chapter directs focus on the environment and natural resources. It provides a clear outline of the state's obligation with respect to the environment, thus;

"The state shall-

a) Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
b) Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;
c) Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
d) Encourage public participation in the management, protection and conservation of the environment;
e) Protect genetic resources and biological diversity;
f) Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
g) Eliminate processes and activities that are likely to endanger the environment; and
h) Utilise the environment and natural resources for the benefit of the people of Kenya."

There are further provisions on enforcement of environmental rights as well as establishment of legislation relating to the environment in accordance to the guidelines provided in this chapter.

In conformity with the Constitution of Kenya, 2010, every activity or project undertaken within the republic must be in tandem with the state's vision for the national environment as well as adherence to the right of every individual to a clean and healthy environment.

Section 69 (2) every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources

Every person has the right to a clean and healthy environment which includes the right –

a) To have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and
b) To have obligations relating to the environment fulfilled under Article 70

Section 69 (2) every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources

Section 70 provides for enforcement of environmental rights thus:

(1) If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.

(2) On application under clause (1), the court may make any order, or give any directions, it considers appropriate—
a) To prevent, stop or discontinue any act or omission that is harmful to the environment;
b) To compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or c) To provide compensation for any victim of a violation of the right to a clean and healthy environment.

(3) For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury.

Essentially, the new Constitution has embraced and provided further anchorage to the spirit and letter of EMCA 1999 whose requirements for environmental protection and management have largely informed Sections 69 through to 71 of this document. In Section 72 however, the new constitution allows for enactment of laws towards enforcement of any new provisions of the Supreme Law.

5.5.2 Vision 2030

The economic, social and political pillars of Kenya Vision 2030 are anchored on macroeconomic stability; continuity in governance reforms; enhanced equity and wealth creation opportunities for the poor; infrastructure; energy; science, technology and innovation (STI); land reform; human resources development; security as well as public sector reforms. The 2030 Vision aspires for a country firmly interconnected through a network of roads, Electricity railways, ports, airports, water and sanitation facilities, and telecommunications.

5.5.3 The Environment Management and Co-ordination Act, 1999

This is an Act of Parliament providing for the establishment of an appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto. This Act is divided into 13 Parts, covering main areas of environmental concern as follows: Preliminary (I); General principles (II); Administration (III); Environmental planning (IV); Protection and Conservation of the Environment (V), Environmental impact assessments (EIA), audits and monitoring (VI); Environmental audit and monitoring (VII); Environmental quality standards (VIII); Environmental Restoration orders, Environmental Easements (IX); Inspection, analysis and records (IX); Inspection Analysis and Records (X); International Treaties, Conventions and Agreements (XI) National Environment Tribunal (XII); Environmental Offences (XIII).

Part II of the Environment Management & Coordination Act, 1999 states that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. In order to partly ensure this is achieved, Part VI of the Act directs that any new programme, activity or operation should undergo environmental impact assessment and a report prepared for submission to the National Environmental Management Authority (NEMA), who in turn may issue a license as appropriate.

KPLC is committed to ensuring that all its activities are carried out in an environmentally friendly manner throughout the three major project phases of design, construction and operation of the proposed project.

The Act provides for the setting up of the various ESIA Regulations and Guidelines which are discussed below:

5.5.3.1 The Environmental (Impact Assessment and Audit) Regulations, 2003

This regulation provides guidelines for conducting Environmental Impact Assessments and Audits. It offers guidance on the fundamental aspects on which emphasis must be laid during field study and outlines the nature and structure of Environmental Impact Assessments and Audit reports. The legislation further explains the legal consequences of partial or non-compliance to the provisions of the Act.

Electrical infrastructure as an activity is listed on section 9 in the second schedule of EMCA as among projects that require full Environmental Impact Assessments before commencement. The project cannot start before the license is granted, upon conducting the EIA. For this reason, Kenya Power has to undertake ESIA studies for their projects.

5.5.3.2 The Environmental Management Coordination (Waste Management) Regulations): Legal Notice 121

The regulation provides that a waste generator shall use cleaner production methods, segregate waste generated and the waste transporter should be licensed. The notice further states no person shall engage in any activity likely to generate any hazardous waste without a valid Environmental Impact Assessment license issued by the National Environment Management Authority.

Hazardous waste will not be generated from this development. The project proponent will ensure that waste is segregated and a licensed waste transporter is contracted to disposed solid waste.

KPLC will manage all the construction waste as per the provision of this regulation.

5.5.3.3 The Environmental Management Coordination (Water Quality) Regulations): Legal Notice 120

This Legal Notice on Water Quality provides that anyone who discharges effluent into the environment or public sewer shall be required to apply for Effluent Discharge License. The license for discharge is Kshs 5,000 while annual license fee for discharge into the environment will be Kshs. 20,000 or Kshs 100,000 depending on the facility. Non-compliance with the regulations attracts a fine not exceeding Kshs 500,000 and the polluter pay principle may apply depending on the court ruling.

5.5.3.4 Environmental Management and Coordination (Noise and Excessive Vibration pollution) (Control) Regulations, 2009: Legal Notice 61

This regulation prohibits any person to cause unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. Part 11 section 6(1) provides that no person is shall cause noise from any source which exceeds any sound level as set out in the First Schedule of the regulations.

5.5.3.5 Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006

This legislation aims at enhancing preservation of biodiversity and safeguarding of endangered and rare plant and animal species within any human activity area.
Section 4 of the legislation expressly prohibits any activity which may have adverse effects on any ecosystem, lead to introduction of alien species in a given area or result in unsustainable utilization of available ecosystem resources.

5.5.3.6 Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations 2006

These regulations are described Legal Notice No. 131 of the Kenya Gazette Supplement no. 74, October 2006 and will apply to all internal combustion engine emission standards, emission inspections, the power of emission

inspectors, fuel catalysts, licensing to treat fuel, cost of clearing pollution and partnerships to control fossil fuel emissions. The fossil fuels considered are petrol, diesel, fuel oils and kerosene.

5.5.4 Public Health Act (Cap. 242)

Part IX, section 115, of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires that Local Authorities take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to be injurious or dangerous to human health. Such nuisance or conditions are defined under section 118 and include nuisances caused by accumulation of materials or refuse which in the opinion of the medical officer of health is likely to harbour rats or other vermin. The environmental management plan (EMP) advices the Proponent on safety and health aspects, potential impacts, personnel responsible for implementation and monitoring, frequency of monitoring, and estimated cost.

KPLC shall observe policy and regulatory requirements and implement measures to safeguard public health and safety.

5.5.5 County Government Acts, 2012

This Act makes provisions for county governments' powers, functions and responsibilities to deliver services and for connected purposes. Part VIII of the act on Citizen Participation (87) (b) emphasizes on the right of citizens to participate to any development projects prior to their implementation.

section 135 (1) states that the Cabinet Secretary may make regulations for the better carrying out of the purposes and provisions of this Act and such Regulations may be made in respect of all county governments and further units of decentralization generally or for any class of county governments and further units of decentralization comply to the set regulations and by laws.

This is the primary law governing the development of counties and thereby will be key during implementation of the Kenya Power projects. All organs established under this law should be consulted and approvals sought from the relevant authorities in relation to the relevant County Government where the project will be located.

5.5.6 Physical Planning Act, 1996

The Local Authorities are empowered under section 29 of the Act to reserve and maintain all land planned for open spaces, parks, urban forests and green belts. The same section, therefore allows for the prohibition or control of the use and development of land and buildings in the interest of proper and orderly development of an area.

Section 24 of the Physical Planning Act gives provision for the development of local physical development plan for guiding and coordinating development of infrastructure facilities and services within the area of authority of County, municipal and town council and for specific control of the use and development of land. The plan shows the manner in which the land in the area may be used.

Section 36 states that if in connection with development application a local authority is of the opinion that, the proposed activity will have injurious impact on the environment, the applicant shall be required to submit together with the application an Environmental Impact Assessment report. The environmental impact assessment report must be approved by the National Environmental Management Authority (NEMA) and followed by annual environmental audits as spelled out by EMCA 1999. Section 38 states that if the local authority finds out that the development activity is not complying to all laid down regulations, the local authority may serve an enforcement notice specifying the conditions of the development permissions alleged to have been contravened and compel the developer to restore the land to it's original conditions.

5.5.7 Urban Areas and Cities Act No. 13 of 2011

This is an act of Parliament to give effect to Article 184 of the Constitution; to provide for the, classification, governance and management of urban areas and cities; to provide for the criteria of establishing urban areas, to provide for the principle of governance and participation of residents and for connected purposes. This act will apply where Kenya Power projects will be located within urban areas and cities.

5.5.8 Land Act, 2012

This Act gives effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources, and for connected purposes.

Section 110(1) of the Act provides that land may be acquired compulsorily under this if the Commission certifies, in writing, that the land is required for public purposes or in the public interest as related to and necessary for fulfilment of the stated public purpose.

In such an acquisition, this Act, in section 111(1) provides that just compensation shall be paid promptly in full to all persons whose interests in the land have been determined.

The procedure for land acquisition is laid out in Part VIII of the Act.

5.5.9 The Land and Environment Court Act 2011

This is an Act of Parliament to give effect to Article 162(2)(b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. The principal objective of this Act is to enable the Court to facilitate the just, expeditious, proportionate and accessible resolution of disputes governed by this Act.

Section 13 (2) (b) of the Act outlines that in exercise of its jurisdiction under Article 162 (2) (b) of the Constitution, the Court shall have power to hear and determine disputes relating to environment and land, including disputes:

- Relating to environmental planning and protection, trade, climate issues, land use planning, title, tenure, boundaries, rates, rents, valuations, mining, minerals and other natural resources;
- Relating to compulsory acquisition of land;
- Relating to land administration and management;
- Relating to public, private and community land and contracts, chooses in action or other instruments granting any enforceable interests in land; and
- Any other dispute relating to environment and land.

5.5.10 Water Act, 2002

Part II, section 18, of the Water Act 2002 provides for national monitoring and information system on water resources. Following on this, sub-section 3 allows the Water Resources Management Authority (WRMA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may require to be kept by a facility operator and the information thereof furnished to the authority.

The Water Act Cap 372 vests the rights of all water to the state, and the power for the control of all body of water with the Minister, the powers is exercised through the Minister and the Director of water resources in consultation with the water catchments boards, it aims at provision of conservation of water and appointment and use of water resources. Part II Section 18 provides for national monitoring and information systems on water resources.

Following on this, Sub-section 3 allows the Water Resources Management Authority to demand from any person, specified information, documents, samples or materials on water resources. Under these rules, specific records may be required to be kept and the information thereof furnished to the authority on demand.

Section 76 states that no person shall discharge any trade effluent from any trade premises into sewers of a licensee without the consent of the licensee upon application indicating the nature and composition of the effluent, maximum quantity anticipated, flow rate of the effluent and any other information deemed necessary. The consent shall be issued on conditions including the payment rates for the discharge as may be provided under section 77 of the same Act.

5.5.11 Energy Act of 2006

The Energy Act of 2006 replaced the Electric Power Act of 1997 and The Petroleum Act, Cap 116. The Energy Act, amongst other issues, deals with all matters relating to all forms of energy including the generation, transmission, distribution and transmission , supply and use of electrical energy as well as the legal basis for establishing the systems associated with these purposes.

The Energy Act, 2006, also established the Energy Regulatory Commission (ERC) whose mandate is to regulate all functions and players in the Energy sector. One of the duties of the ERC is to ensure compliance with Environmental, Health and Safety Standards in the Energy Sector, as empowered by Section 98 of the Energy Act, 2006. In this respect, the following environmental issues will be considered before approval is granted:

1. The need to protect and manage the environment, and conserve natural resources;
2. The ability to operate in a manner designated to protect the health and safety of the project employees; the local and other potentially affected communities.

Licensing and authorization to generate and transmit electrical power must be supported by an Environmental Impact Assessment Report (EIA) approved by NEMA.

Part IV Section 80(1) provides that a person shall not conduct a business of importation, refining, exportation, whole sale, retail, storage or transportation of petroleum, except under and in accordance with the terms and conditions of a valid licence.

Part IV Section 90 (1) stipulates that a person intending to construct a pipeline, refinery, bulk storage facility or retail dispensing site shall before commencing such construction, apply in writing to the Energy Regulatory commission for a permit to do so. The application shall: specify the name and address of the proposed owner; be accompanied by three (3) copies of plans and specifications and be accompanied by an Environmental Impact Assessment (EIA) Report.

Part IV section 91(1) stipulates that the Energy Regulatory Commission shall, before issuing a permit under section 90, take into account all relevant factors including the relevant government policies and compliance with Environment Management and Coordination Act, 1999 and in particular EIA report as per Impact Assessment and Audit Regulations 2003, the Physical Planning Act, 1996 and the Local Government Act.

Part iv section 100 (1) provides that it is an offence if a person being the owner or operator of a refinery, pipeline, bulk liquefied Petroleum gas or natural gas facility, service station, filling station or storage depot, fails to institute appropriate environmental, health or safety control measures. The offence if convicted, he/she shall be liable to a fine not exceeding two million shillings or to a maximum term of imprisonment of two years, or to both.

5.5.12 Building Code 1968

Section 194 requires that where sewer exists, the occupants of the nearby premises shall apply to the local authority for a permit to connect to the sewer line and all the wastewater must be discharged into sewers.

5.5.13 Penal Code Act (Cap.63)

Section 191 of the penal code states that if any person or institution that voluntarily corrupts or foils water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighborhood or those passing along public way, commit an offence.

KPLC shall observe the guidelines as set out in the environmental management and monitoring plan laid out in this report as well as the recommendation provided for mitigation/minimization/avoidance of adverse impacts arising from the project activities.

5.5.14 Wildlife Conservation and Management Act, 2013

This Act provide for the protection, conservation, sustainable use and management of wildlife in Kenya and for connected purposes. The law has as one of its guiding principles the devolution of conservation and management of wildlife to landowners and managers in areas where wildlife occurs, through in particular the recognition of wildlife conservation as a form of land-use, better access to benefits from wildlife conservation, and adherence to the principles of sustainable utilization.

5.5.15 The Forestry Services Act, 2005

The Act led to the establishment of Kenya Forest Service which is charged with management of forests in consultation with the forest owners. The body enforces the conditions and regulations pertaining to logging, charcoal making and other forest utilization activities.

To ensure community participation in forest management, the service collaborates with other organizations and communities in the management and conservation of forests and for the utilization of the biodiversity.

Section 43 subsection 1 provides that if mining, quarrying or any other activity carried out in the forest, shall, where activity concerned is likely to result in forest cover depletion, the person responsible shall undertake compulsory re-vegetation immediately upon the completion of the activity.

5.5.16 Occupational Safety and Health Act, 2007

The Act provides for the safety, health and welfare of workers and all persons lawfully present at work place, as well as the establishment of the National Council for Occupational Safety and Health and for connected purposes.

Section 3(1) and (2) of the Act explains that it applies in all workplaces where any person is at work, either temporarily or permanently. It expounds on the purpose, which is to secure the safety, health and welfare of persons at work as well as protecting persons other than persons at work against risks resulting from, or connected to, activities at workplace.

Further, sections 43 and 44 of part V give regulations on registration of work places.

This shall be considered at the construction, implementation and decommissioning phases of the project.

5.5.17 The Traffic Act Chapter 295 Laws of Kenya

This Act consolidates the law relating to traffic on all public roads. The Act also prohibits encroachment on and damage to roads including land reserved for roads. KPLC will observe the provision of this Act.

5.6 Africa Development Bank Operational Safeguard Policies

The AfDB is concerned about the environmental and social impacts of its activities and requires environmental assessments for all projects it is to finance. Its safeguards policies, aimed at preventing and mitigating undue harm to people and their environment in the development process, also provide a platform for the participation of stakeholders in project design and implementation. The operational safeguard policies are:

- ***Operational Safeguard 1: Environmental and social assessment***. This overarching safeguard governs the process of determining a project's environmental and social category and the resulting environmental and social assessment requirements.

Summary
OS 1: Environmental and Social Assessment. This overarching safeguard governs the process of determining a project's environmental and social category and the resulting environmental and social assessment requirements: the scope of application; categorisation; use of a SESA and ESIA, where appropriate; Environmental and Social Management Plans; climate change vulnerability assessment; public consultation; community impacts; appraisal and treatment of vulnerable groups; and grievance procedures. It updates and consolidates the policy commitments set out in the Bank's policy on the environment.

- **Operational Safeguard 2: Involuntary resettlement: Land acquisition, population displacement and compensation**. This safeguard consolidates the policy commitments and requirements set out in the Bank's policy on involuntary resettlement, and incorporates a number of refinements designed to improve the operational effectiveness of those requirements.

Summary
OS 2: Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation. This safeguard consolidates the policy commitments and requirements set out in the Bank's policy on involuntary resettlement, and it incorporates refinements designed to improve the operational effectiveness of those requirements. In particular, it embraces comprehensive and forward-looking notions of livelihood and assets, accounting for their social, cultural, and economic dimensions. It also adopts a definition of community and common property that emphasizes the need to maintain social cohesion, community structures, and the social interlinkages that common property provides.

The safeguard retains the requirement to provide compensation at full replacement cost; reiterates the importance of a resettlement that improves standards of living, income-earning capacity, and overall means of livelihood; and emphasises the need to ensure that social considerations, such as gender, age, and stakes in the project outcome, do not disenfranchise particular project-affected people.

- **Operational Safeguard 3: Biodiversity and ecosystem services**. This safeguard aims to conserve biological diversity and promote the sustainable use of natural resources. It also translates the commitments in the Bank's policy on integrated water resources management into operational requirements.

Summary
OS 3: Biodiversity and Ecosystem Services. The overarching objective of this safeguard is to conserve biological diversity and promote the sustainable use of natural resources. It translates into OS requirements the Bank's commitments in its policy on integrated water resources management and the UN Convention on Biological Diversity. The safeguard reflects the importance of biodiversity on the African continent and the value of key ecosystems to the population, emphasizing the need to "respect, conserve and maintain [the] knowledge, innovations and practices of indigenous and local communities… [and] to protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements.

- ***Operational Safeguard 4: Pollution prevention and control, hazardous materials and resource efficiency***. This safeguard covers the range of key impacts of pollution, waste, and hazardous materials for

which there are agreed international conventions, as well as comprehensive industry-specific and regional standards, including greenhouse gas accounting, that other multilateral development banks follow.

Summary

OS 4: Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials and Resource Efficiency. This safeguard covers the range of impacts of pollution, waste, and hazardous materials for which there are agreed international conventions and comprehensive industry-specific standards that other multilateral development banks follow. It also introduces vulnerability analysis and monitoring of greenhouse gas emissions levels and provides a detailed analysis of the possible reduction or compensatory measures framework.

- **Operational Safeguard 5: Labour Conditions, Health and Safety**. This safeguard establishes the Bank's requirements for its borrowers or clients concerning workers' conditions, rights and protection from abuse or exploitation. It also ensures greater harmonisation with most other multilateral development banks.

Summary

OS 5: Labour Conditions, Health and Safety. This safeguard establishes the Bank's requirements for its borrowers or clients concerning workers' conditions, rights and protection from abuse or exploitation. It covers working conditions, workers' organizations, occupational health and safety, and avoidance of child or forced labour.

Only the Environmental and Social Assessment policy is expected to be triggered nearly in all Kenya Power projects. The other two policies that might be triggered include Biodiversity and ecosystem services, *Pollution prevention and control, hazardous materials and resource efficiency and* Labour Conditions, Health and Safety policies

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5.7 International Conventions and Treaties Ratified by Kenya

Kenya has ratified a number of international conventions pertinent to land administration, environmental protection and human rights. Some of these conventions are:

- Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention) 2001
- United Nations (UN) Convention on Biological Diversity 1994
- UN Framework Convention on Climate Change, 1992
- Kyoto Protocol to the United Nations Framework Convention on Climate Change
- Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (Basel Convention) 1989
- Montreal Protocol on Substances that Deplete the Ozone Layer
- Vienna Convention on the Ozone Layer 1985
- UN Convention on the Law of the Sea (UNCLOS), Montego Bay, 1982
- Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (Abidjan Convention) 1981
- Convention Concerning the Protection of the World Cultural and National Heritage (World Heritage Convention), Paris, 1975
- Convention on the Conservation of Migratory Species of Wildlife Animals, 1979
- Convention on the Prevention of Marine Pollution By Dumping of Wastes and Other Matter, 1972 (amended 1992)
- African Convention on Conservation of Nature and Natural Resources, 1968
- Convention on International Trade In Endangered Species of Wild Fauna And Flora

6 THE ENVIRONMENTAL AND SOCIAL SCREENING PROCESS FOR THE LAST MILE CONNECTIVITY DISTRIBUTION PROJECTS

6.1 The Environmental and Social Screening Process in Kenya

The Environmental Management Coordination Act of 1999 and the Environmental (Impact Assessment and Audit) Regulations (June 2003) prescribe the conduct for Environmental Impact Assessment for development projects. However, these instruments do not contain guidelines regarding the screening, identification, assessment and mitigation and monitoring of potential adverse, localized environmental and social impacts of small-scale investments, where the project details and specific project sites are not known at the time of appraisal of the parent project.

6.2 Environmental and Social Screening in the Framework

The Environmental and Social Screening Process outlined in the ESMF complements Kenya's EIA procedures for meeting the environmental and social management requirements. The Environmental and Social Screening Process also meets the requirements of the donors i.e. AfDB. It provides a mechanism for ensuring that potential adverse environmental and social impacts of future projects by KPLC are identified, assessed and mitigated and monitored as appropriate, through an environmental and social screening process (see ***Environmental and social screening form in (Annex 1).*** This will be undertaken by qualified KPLC staff at the national and regional levels.

6.3 Application of the Screening processes

The objectives of the screening process are to:

- Determine the potential adverse environmental and social impacts of the proposed project;
- Determine the appropriate environmental category as per OS 1 environmental assessment;
- Based on the assigned environmental category, determine the appropriate level of environmental work required (i.e. whether an EIA is required or not (environmental category 1); whether the application of simple mitigation measures will suffice (environmental category 2); or whether the project has negligible adverse environmental and social risks. (Environmental category 3).
- Determine appropriate mitigation measures for addressing adverse impacts using the Environmental and Social Checklist (annex 2); this checklist can be adjusted to reflect project-specific environmental management requirements;
- Determine the extent of potential solid and liquid waste generation, including hazardous wastes such as PCB and creosote, and appropriate mitigation measures;
- Determine potential adverse impacts on physical cultural resources, and provide guidance to be applied in the case of chance finds;
- Incorporate environmental mitigation measures as presented in the screening form and/or separate EA report into the proposed project design;
- Determine potential adverse social impacts due to land acquisition;
- Determine whether indigenous peoples are likely to be affected by the project;
- Indicate the need for a Resettlement Action Plan (RAP), which would be prepared in line with the KPLC Resettlement Policy Framework (RPF);
- Facilitate the review and approval of the screening results and separate ESMP reports (the screening form would be looking at planned construction and rehabilitation activities); and
- Provide environmental and social monitoring indicators to be followed during the construction, rehabilitation, operation and maintenance of the infrastructure service facilities and related project activities; and

The following criteria should be followed for project selection so as to comply with the environmental legislations:

- Proposed project construction/expansion will avoid or mitigate adverse impacts of the project construction / expansion projects on physical cultural resources, "physical cultural resources" are the movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance;

- Proposed project construction/expansion will not be located within conservation areas, protected areas, sanctuary, and forest areas as designated by Wildlife Conservation and Forest Departments;
- Proposed project will not be located within a wetland or on a reservation of surface water bodies.
- Potential environmental impacts associated with location will be minimized by selection of alternative sites;
- All stages of the project screening, design and implementation will be done in a participatory manner with public consultation with potential affected persons;
- Solid and liquid waste management facilities under the proposed project will not be sited adjacent to settlements; will not include treatment of hazardous waste. The PCB wastes will be disposed off by using of powerful reagents such as sodium. The reagent does not affect the basic oil itself, but breaks down the PCB, generating a residue which may be removed by physical separation. In the hands of expert contractors, such technologies can be carried out even whilst a transformer is in use and operating. The residue will be disposed off by incineration process. Waste oils can be recovered and recycled, either directly in the case of high oil content wastes, or after some form of separation and concentration from high aqueous content materials. While certain types of waste oils, lubricants in particular, can be subjected to regeneration processes which give products of comparable quality to the original material, a large volume of waste oil is used for its energy content, as a secondary or substitute fuel.
- The disposal of creosote treated wood, however, is subject to local regulation of disposing of the Insecticide, Fungicide, and Rodenticide. In case the local regulations will not apply then the international regulations shall apply on the three major wood preservations-- namely, creosote, pentachlorophenol, and inorganic arsenicals. Among other things, these rules require that wood which has been treated with creosote should not be burned in an outdoor fire or in stoves or fireplaces; rather, this wood should be buried in a non-hazardous waste landfill unless otherwise required by the law. This requirement was included to ensure that no toxic contaminants would be released as a result of the burning process.
- Proposed project with some significant environmental impacts will be undertaken but adequate mitigation measures will be put in place so as to minimize those impacts to the manageable size throughout the project period.
- There will be no involuntary land acquisition for proposed project as the distribution and transmission lines will be built along road reserves and plots for substations will be bought on willing buyer willing seller basis. So as to avoid involuntary resettlement and avoiding disputed areas. This will comply with donor safeguard policies.

The following procedure will be followed for the projects that are under the above criteria.

(a) The first step in environmental assessment will be preliminary screening. The KPLC PIT staff with assistance of regional staff will accomplish this task by completing the environmental and social screening form (annex 1) described in the ESMF.

(b) The completed environmental and social screening form (annex 1 of the ESMF) is attached to the recommendation and submitted to NEMA regional level for review and clearance purposes.

(c) Projects assessed to have some adverse environmental impacts and assigned the environmental category 1 will be required to go through a full EA.

(d) The environmental assessment will be undertaken in a participatory manner and the stakeholder consultations will be documented in the environmental assessment documents; in case a consultant will be used, KPLC Environment and Social Unit will prepare TOR and be involved in recruitment of EA consultants.

(e) The Environmental Guidelines for Contractors (annex 4) will be attached to the bidding documents to ensure environmentally and socially sound construction practices.

(f) For sites where Environmental assessments will be undertaken, NEMA approval will be sought before commencement of detailed design in order to ensure that good practices are included in the technical design.

(g) As regards the approval of environmental and social screening results, NEMA's regional offices will provide review and clearance prior to the commencement of works.

(h) KPLC Environment Unit will ensure that environmental concerns are addressed during planning, design, construction, and operations of the projects and appropriate mitigation measures are in place.

Proposed project selection, design, contracting, mitigation, monitoring and evaluation will be consistent with agreed process outlined in the ESMF and ESMP will be fully integrated into the Project Implementation Plan/Operations Manual and project cost tables.

The list of measures to mitigate potential adverse impacts as per screening results and/or separate EA reports, including terms and conditions and the sector specific ESMP, supplemented by any additional site specific measures will be attached as a part of the contract specifications. A clause in the Particular Conditions of Contract will refer to the Environmental and Social Management Plan for a proposed project. The Particular Conditions of Contract prepared by KPLC based on the environmental and social management plan will also stipulate that any non-compliance with the mitigation measures set out in the contract will attract the same remedies under the contract as any non-compliance with the contract provisions; such remedies would be instructions, notices, suspension of works, etc. The Instruction to Bidders will highlight the inclusion of the ESMP in the contract specifications and the contractor's obligation of compliance. The performance agreement will carry a clause to the effect that the recipient shall ensure the design; construction; operation and implementation of the proposed projects are carried out in accordance with the ESMF. In addition ***Environmental Guidelines for Contractors (Annex 3)*** will be implemented and monitored by the KPLC SHE staff.

6.4 The Screening Process

The extent of environmental work that might be required, prior to the commencement of construction and rehabilitation of the KPLC Projects will depend on the outcome of the screening process described below.

6.4.1 Step 1: Screening of project activities and sites

Prior to going to the field, a desk appraisal of the construction and rehabilitation plans, including sub stations (transformers), distribution and transmission lines designs, will be carried out by KPLC PIT and Environment unit staff or selected consultant. KPLC PIT with the help of regional staff will carry out the initial screening in the field, by completing the Environmental and Social Screening Form (Annex 1).

The screening form, when correctly completed, will facilitate the identification of potential environmental and social impacts, potential water and soil pollution, soil erosion, the need for safe disposal of creosote treated poles, PCB, need for way-leave acquisition, the determination of their significance, the assignment of the appropriate environmental category (consistent with OS1 Environmental and Social Assessment), the determination of appropriate environmental and social mitigation measures, and the need to conduct an Environmental Impact Assessment (EIA) and/or Resettlement Action Plans(RAPs) and/or IPPS.

To ensure that the screening form is completed correctly for the various project locations and activities, training should be provided to KPLC PIT staff, KPLC Environment unit staff and KPLC regional Staff as part of strengthening internal capacity.

6.4.2 Step 2: Assigning the Appropriate Environmental Categories

The environmental and social screening form, when completed, will provide information on the assignment of the appropriate environmental category to a particular project.

The KPLC PIT will be responsible for assigning the appropriate environmental category to the proposed KPLC Project with the requirements of OS 1 Environmental and Social Assessment and EMCA 1999.

Categorization follows the principle of using the appropriate type and level of environmental and social assessment for the type of operation. Working with Bank operations staff, the borrower proposes a category, providing sufficient supporting documentation and baseline data to allow the Bank's Compliance and Safeguards

function to review and validate the proposed category. The responsibility of appropriate categorisation is therefore shared by the Bank and its borrowers and should be based on reasonably accurate due diligence material.

- ***Category 1: Bank operations likely to cause significant environmental and social impacts.***

Category 1 projects are likely to induce significant and/or irreversible adverse environmental and/or social impacts, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. Some programme-based operations or other regional and sector programme loans that have significant adverse environmental or social risks and are deemed to be Category 1. In some cases, projects are included in Category 1 because of their potential cumulative impacts or the potential impacts of associated facilities. Any project requiring a Full Resettlement Action Plan (FRAP) under the provisions of the Bank's policy on involuntary resettlement is also deemed to be Category 1.

Category 1 programme-based operations or regional and sector loans require a SESA, and
Category 1 investment projects require an ESIA, both leading to the preparation of an ESMP. For a project requiring a FRAP, the ESIA includes, and—if there are no other issues requiring assessment— may be limited to, the social assessment needed to prepare the FRAP.

- ***Category 2: Bank operations likely to cause less adverse environmental and social impacts than Category 1***.

Category 2 projects are likely to have detrimental site-specific environmental and/or social impacts that are less adverse than those of Category 1 projects. Likely impacts are few in number, site-specific, largely reversible, and readily minimised by applying appropriate management and mitigation measures or incorporating internationally recognised design criteria and standards. A operation that involves resettlement activity for which an Abbreviated Resettlement Action Plan (ARAP) is required under the ESAPs is classified as Category 2. Most programme-based operations and regional or sector programme loans designed to finance a set of subprojects approved and implemented by the borrower or client are included in this category unless the nature, scale or sensitivity of the intended pipeline of subprojects involves either a high level of environmental and social risk or no such risk.

Category 2 projects require an appropriate level of environmental and social assessment (SESA for programme operations, investment plans, and some corporate loans, or ESIA for investment projects) tailored to the expected environmental and social risk so that the borrower can prepare and implement an adequate ESMP (for an investment project) or ESMF (for a programme operation), to manage the environmental and social risks of subprojects in compliance with the Bank's safeguards.

- ***Category 3: Bank operations with negligible adverse environmental and social risks***. Category 3 projects do not directly or indirectly affect the environment adversely and are unlikely to induce adverse social impacts. They do not require an environmental and social assessment. Beyond categorisation, no action is required. Nonetheless, to design a Category 3 project properly, it may be necessary to carry out gender analyses, institutional analyses, or other studies on specific, critical social considerations to anticipate and manage unintended impacts on the affected communities.

- ***Category 4: Bank operations involving lending to financial intermediaries***. Category 4 projects involve Bank lending to financial intermediaries that on-lend or invest in subprojects that may produce adverse environmental and social impacts. Financial intermediaries include banks, insurance, reinsurance and leasing companies, microfinance providers, private equity funds and investment funds that use the Bank's funds to lend or provide equity finance to their clients. Financial intermediaries also include private or public sector companies that receive corporate loans or loans for investment plans from the Bank that are used to finance a set of subprojects. Financial intermediary subprojects equivalent to Category 1 and Category 2 are subject to the relevant OS requirements, as if they were directly financed Category 1 or Category 2 projects. However, if a client will use a Bank corporate loan to finance high-risk investment projects known at the time of loan approval, the loan can be considered Category 1.

- Financial intermediary operations are further classified as FI-A, FI-B, and FI-C to reflect the potential environmental and social impacts and risks of the financial intermediary's existing or proposed portfolio of subprojects, based on the nature, type, scale and sector exposure. The main purpose of this sub-categorisation is to determine the scope and function of the financial intermediary's Environmental and Social Management System (ESMS) and the degree to which the client will be required to monitor and report on the environmental and social risks of its portfolio.

- *Subcategory FI-A:* the financial intermediary's portfolio is considered high risk, and it may include subprojects that have potential significant adverse environmental, climate change, or social impacts and that are equivalent to Category 1 projects.

- *Subcategory FI-B:* the financial intermediary's portfolio is deemed to be medium risk, and may include subprojects that have potential limited adverse environmental, climate change, or social impacts and that are equivalent to Category 2 projects.

- *Subcategory FI-C:* the financial intermediary's portfolio is considered low risk and includes subprojects that have minimal or no adverse environmental or social impacts and that are equivalent to Category 3 projects.

    - Each Category 4 financial intermediary is required to:
        - Have adequate corporate environmental and social governance policies, apply the Bank's OSs to its Category 1- and Category 2-equivalent subprojects, and comply with local environmental and social requirements;
        - Develop and maintain an ESMS in line with the Bank's OSs that is appropriate for the scale and nature of its operations—recognizing that the operations of financial intermediaries vary considerably and in some cases may pose minimal environmental and social risk (particularly those of reinsurance companies, which may only need to develop a corporate environmental and social policy);
        - Demonstrate that it has the management commitment, organizational capacity, resources and expertise to implement its ESMS for its subprojects; and
        - Develop and disclose a summary of the ESMS to the public on its website and make use of the Bank's Negative List (as defined in the ISS), which includes goods that are harmful to the environment, when soliciting a loan or a grant and before the loan can be approved.

The Bank carries out due diligence on the ESMS and the financial intermediary's organizational capacity before approving the transaction.

6.4.3 Step 3: Carrying Out Environmental and Social Impact Assessment

After reviewing the information provided in the environmental and social screening form, and having determined the appropriate environmental category, KPLC Environment Unit staff will determine whether (a) the application of simple mitigation measures outlined in the Environmental and Social Checklist will suffice (category 2); (b) a comprehensive Environmental Impact Assessment (EIA) will need to be carried out, using the national EIA guidelines (category 1); or (c) no additional environmental Assessment will be required (category 3).

In situations where the screening process identifies the need for land acquisition, impacts on assets, causes a loss of livelihood, and/or restricts access to natural resources, a CP shall be prepared consistent with the standards and guidelines set forth in the Resettlement Policy Framework (RPF), local legislations and donors safeguard policies. In situations where the screening process identifies peoples' presence in, or attachment to, project lands, an Indigenous Peoples Plan (IPP) will be prepared.

The EIA process will identify and assess the potential environmental and social impacts of the proposed construction activities, evaluate alternatives, as well as design and implement appropriate mitigation, management and monitoring measures. These measures will be captured in the Environmental and Social Management Plan (ESMP) which will be prepared as part of the EIA process for each project. ***Environmental***

and Social checklist (Annex 2) will be used for category 2 projects; and ***Generic EA TOR in Annex 5*** will guide EA study for category 1 projects in case they occur.

Preparation of the EIA, the ESMP and the RAP will be carried out in consultation with the relevant sector Ministries including potentially affected persons. The relevant government departments in close consultation with the Ministry of Environment, Water and Natural Resources and the Project Management Team will arrange for the (i) preparation of EIA terms of reference for projects; (ii) recruitment of a service provider to carry out the EIA; (iii) public consultations; and (iv) review and approval of the EIA through the national EIA approval process.

The Project Management Team, in close consultation with the relevant government departments, will arrange for the preparation of the ARAPs/ RAPS, following the provisions outlined in the Resettlement Policy Framework. Copies of the RAPs will be sent to the Bank for review and clearance prior to the commencement of civil works.

6.4.4 Step 4: Review and Approval of the Screening Activities

The results and recommendations presented in the environmental and social screening forms and the proposed mitigation measures presented in the environmental and social checklists will be reviewed by NEMA at the County level.

Where an EIA has been carried out, NEMA will review the reports to ensure that all environmental and social impacts have been identified and that effective mitigation measures have been proposed.

Where a RAP has been carried out, the National Treasury will review the action plans to ensure individuals have been properly identified, meaningfully consulted, participated in the planning, and appropriately compensated. Prior to implementing the compensation process, KPLC will ensure donor review and clearance of the RAP.

Based on the results of the above review process, and discussions with the relevant stakeholders and potentially affected persons, NEMA, in case of projects that don't require EIA or RAP, will make recommendations to the County Environmental Committee for approval/disapproval of the screening results and proposed mitigation measures. As regards to EIA reports, County environmental officer will recommend EIA reports to the NEMA for approval while RAPs will be approved by the Ministry of Lands, Housing and Urban Development.

6.4.5 Step 5: Public Consultations

Public consultation is a regulatory requirement by NEMA and donors' safeguards for new projects by which the public's input on matters affecting them is sought in regard to the project. Its main objectives will be improving the efficiency, transparency and public involvement in the proposed projects that will enhance the compliance of the environmental laws and policies in regard to the implementation of the projects. It will involve notification (to publicize the matter to be consulted on), consultation (a two-way flow of information and opinion exchange) as well as participation involving interest groups. Through public participation, environmental conservation will be enhanced.

6.4.6 Step 6: Environmental Monitoring

This describes the processes and activities that need to take place to characterize and monitor the quality of the environment in the project sites. This will be used towards the preparation of environmental screening, as well as in many circumstances in which the project activities carry a risk of harmful effects on the natural environment. All monitoring strategies and programmes for the projects shall have reasons and justifications which will be designed to establish the current status of an environment or to establish trends in environmental parameters where the projects shall be implemented. In all cases the results of monitoring will be reviewed, analysed statistically and published for the purpose of project implementation. The project design should have a monitoring programme which must have regard to the final use of the data before project monitoring starts. This environmental monitoring for the projects should be continues throughout the project life.

6.4.7 Step 7: Environmental Monitoring Indicators

These are the measurement, statistic or value that provides a proximate gauge or evidence of the effects of environmental management programs or of the state or condition of the environment that could result from the projects that could be implemented by KPLC. The environmental indicators that need to be monitored include; air quality, water quality, flora and fauna, human health, social and economic conditions.

7 PUBLIC CONSULTATION AND PARTICIPATION

As per the AfDB requirements the borrower or client is responsible for conducting and providing evidence of meaningful consultation (i.e., consultation that is free, prior and informed) with communities likely to be affected by environmental and social impacts, and with local stakeholders, and also for ensuring broad community support, especially for Category 1 projects and for projects affecting indigenous peoples. Kenya Power will undertake its consultation with reference to the updated IESIA Guidance Notes on consultation, participation and broad community support, which also provide guidance on affected communities' involvement in the process of project planning, implementation and monitoring. Consultation is based on stakeholder analysis and is preceded by disclosure of adequate project information and environmental and social information to ensure that participants are fully informed. This process will begin at an early stage during project preparation and continues as needed. It will be conducted in a timely manner in the context of key project preparation steps, in an appropriate language, and in an accessible place. The results of the consultation will be adequately being reflected in the project design and in the project documentation.

For Category 1 projects, the affected communities are given the opportunity to participate in key stages of project design and implementation. Therefore, stakeholders should be consulted to obtain their input into the preparation of the draft terms of reference of the environmental and social assessment, the draft SESA or ESIA report and summary, and the draft ESMP. For Category 2 projects, the affected communities and stakeholders are consulted about the draft environmental and social assessment report and the draft ESMP. Consultation should be conducted with the objective of ensuring that the project—especially a Category 1 project—has broad community support, and that affected people endorse the proposed mitigation and management measures. When the borrower or client has identified vulnerable communities that would potentially be affected by the project, the borrower/client engages in meaningful informed consultation and participation with the vulnerable communities, beginning as early as possible in the project cycle before the project is submitted for Board consideration and continuing throughout the project cycle. The borrower or client demonstrates that consulted individuals or groups can effectively represent the affected groups. In particular, this process of engagement:

- Involves representative bodies and civil society organisations, as well as members from the vulnerable communities themselves;
- Ensures inclusivity in a socially and culturally appropriate manner;
- Provides sufficient time for the vulnerable groups' decision-making processes;
- Facilitates the vulnerable groups' expression of their views, concerns and proposals in the language and manner of their choice, without external manipulation, interference, coercion, or intimidation; and
- Respects the culture, knowledge and practices of vulnerable communities.

7.1 Rationale for Consultation and Disclosure

According to Kenya's Guidelines for EIA and other donors relevant policies, public consultations are an integral component of the environmental and social screening process, EIA, Environmental Audit and RAP requirements, and the guidelines identify the following principal elements:

- Developers are required to conduct public consultation during the preparation of Project Briefs, EIAs, RAPs and IPP as well as implementation of the environmental and social screening process outlined in this ESMF.
- The Director of NEMA in charge of compliance and reinforcement may, conduct his or her own public consultation to verify the works of a developer.
- Formal EIA, RAP and ESMP documents are made available for public review and comments. Documents to which the public has access include Project Briefs, EIA terms of reference, draft and final EIA and RAP reports, and decisions of the appropriate authorities regarding project approval. The Director of NEMA in charge of compliance and enforcement and relevant government departments has developed practices and procedures for making these documents available to the public. It is very unusual that an EIA will need to

contain proprietary or market sensitive information (i.e. technological and financial) which a developer would prefer to remain confidential. Unless public knowledge of such information is crucial to project review.

- Certificates/Letters approving projects will be published by the developer and displayed for public inspection. Public consultations are critical in preparing an effective proposal for the construction and rehabilitation of the project activities. The first step is to hold public consultations with the local communities and all other interested and affected parties, during the screening process and in the course of preparing the ESMP

These consultations should identify key issues and determine how the concerns of all parties will be addressed in response to the terms of reference for the Lot specific ESMP which might be carried out for construction and rehabilitation proposals.

The public will be allowed to access information during screening, EIA preparation as well as final EIA reports before project appraisal and disclosure will also take place in the KPLC website and KPLC branch offices in a language which can be understood by the locals where the project will be implemented.

7.2 Instruments for Use during Consultations

The Kenya Guidelines for EIA and EA provides details concerning the public consultation methods in Kenya. Such methods include press conferences, information notices, brochures/fliers, interviews, questionnaires and polls, community meetings, advisory committees, and public hearings. The guidelines for public consultation include, among others, a requirement that major elements of the consultation program should be timed to coincide with significant planning and decision-making activities in the project cycle. In terms of Kenya's EIA process, and donors policy standards, public consultation should be undertaken during (i) the preparation of the EIA and RAP terms of reference; (ii) the carrying out of an EIA and RAP; (iii) government review of an EIA and RAP reports; and (iv) the preparation of environmental and social terms and conditions of approval. Consultations will be carried out by communities as part of the environmental and social screening process of projects, and the results will be communicated in an understandable language to potentially affected persons and beneficiaries.

Kenya Power is responsible for conducting and providing evidence of meaningful consultation (i.e., consultation that is free, prior and informed) with communities likely to be affected by environmental and social impacts, and with local stakeholders, and also for ensuring broad community support, especially for Category 1 projects and for projects affecting indigenous peoples.

Consultation will be undertaken with reference to the updated AfDB's IESIA Guidance Notes on consultation, participation and broad community support, which also provide guidance on affected communities' involvement in the process of project planning, implementation and monitoring. Consultation will mainly be based on stakeholder analysis and will be preceded by disclosure of adequate project information and environmental and social information to ensure that participants are fully informed. The consultation and public participation is a continuous process during project circle and it will begin at an early stage during project preparation and continues as needed. It will be conducted in a timely manner in the context of key project preparation steps, in an appropriate language, and in an accessible place. The results of the consultation are adequately reflected in the project design and in the project documentation.

For Category 1 projects, the affected communities are given the opportunity to participate in key stages of project design and implementation. Therefore, stakeholders should be consulted to obtain their input into the preparation of the draft terms of reference of the environmental and social assessment, the draft SESA or ESIA report and summary, and the draft ESMP. For Category 2 projects where the Last Mile Connectivity project has been categorized in, the affected communities and stakeholders will mainly be consulted about the draft environmental and social assessment report where applicable and the draft ESMP which is going to be developed using ESMF as a guide. Consultation will be conducted mainly with the objective of ensuring that the project has broad community support, and that affected people endorse the proposed mitigation and management measures.

8 ENVIRONMENTAL AND SOCIAL IMPACTS

8.1 Positive Environmental and Social Impacts

8.1.1 Project Beneficiaries

Preliminary data collected for the Last Mile project indicates that Kenya Power has a total of 34,899 distribution transformers across the country. Majority of the transformers have varied lengths of low voltage network emanating from them some of which pass close to ready and potential customers. The assessment done indicates further that the company has potential for connecting approximately 472,002 households that are within 600metres of the existing transformers. The estimated number of targeted customers (by metres installation) with the available funding from AfDB will be 193, 443. This translates into an estimated 851,149 people as direct beneficiaries accessing electricity at the current national household size of 4.4.

Electricity access will replace kerosene lamps which are expensive to operate. Kerosene is costly both for low income households that buy it, and for governments that subsidize it. In parts of Africa, for instance, kerosene costs make up 10-25% of household monthly budgets according to a report by Lighting Africa market trends report 2013. A study on Energy Kiosks for Lighting up Kenya presented in at Light Africa conference 2010 found that on average a family spends about 750 per month for lighting kerosene. Empirical data presented by Kenya National Bureau of Statistics found 2013 indicates that a family consuming about 50kw/h of electricity which is mainly domestic paid a bill of Kshs 586 in February 2012, Kshs 568 in January 2013 and 564 in February 2013 which gives an average bill of Ksh 572. Comparing these two costs of consumption electricity bills seem to be cheaper than using kerosene for lighting by about Kshs 128. Therefore the Last Mile Connectivity Project means greater savings on the part of the households.

8.1.2 Expected Impact on Poverty Alleviation

8.1.2.1 Employment and wealth creation

According to the Kenya Economic report of 2013 by Kenya Institute for Public Policy and Research Analysis (KIPPRA), the Kenyan economy has faced various shocks and challenges resulting in high cost of living and below-target growth rates. Consequently, the overall poverty levels increased from 48.8 per cent in 2007 to 50.8 per cent in 2008 before declining marginally to 49.8 per cent in 2012. The employment rate (proportion of employed persons to the working age population) is about 69.2%

The Last Mile Connectivity project will have a positive impact on both direct and indirect employment levels in the country although the bulk of them will be on temporary basis since the project has a timeframe. Based on an estimate of connecting a customer who is 600m away and requiring about 12 poles, it will take about 192 person hours. According to the preliminary estimate by the engineers each household will require an average of 1.8 poles which is basically 2 poles to be connected. Therefore, connecting each household will require 32 person-hours on average. Consequently connecting 128, 961 households will require 4, 126,752 person hours. These job opportunities will be will be made available to the locals thereby easing unemployment in the country. In addition this will translate into incomes at the household levels which will trigger other spending and demand in the local economy.

8.1.2.2 Local Material Supplies

Another positive impact of the project involves local material sourcing mainly sale of wooden poles for use in the project. An estimated 237, 359 wooden poles will be required for the project according to the preliminary engineer's estimates. Most of the poles about 80% are sourced locally while the rest come through importation. Transportation costs makes sourcing of poles locally more cost effective than importing. This project is not likely to be an exceptional in pole sourcing. Therefore, going by the estimate of 80% local sourcing, the local farmers will benefit by selling about 189, 887 poles. This translates into Kshs 664,605,200 using a farm-gate price of Kshs 3,500 per wooden pole for this kind of a project. The stated amount does not include labour and transport costs for the poles which will also be a benefit to the local people. Therefore the project will generate new income

revenues for the local population across the country. The new income revenues received will create demand for other goods and services causing a trickledown effect to the entire economy

8.1.2.3 Upscaling Electricity Access to the Poor

According to Kenya Power's annual report of 2012/2013, electricity access stood at 2,330,962 customers as at June 2013. This translates to about 27% of the total population accessing electricity. This is a small percentage owing to the fact that there exists many transformers within reach of the 600metre protection radius but the uptake has been low even with the existing connection rate of Kshs 34,480 for single phase. Needless to say, the uptake has been low due to the situation that the cost of connection has to be paid up front keeping in mind that about 46.6% of the Kenyan population is poor.

8.1.2.4 Connection payment model

From a social point of view, the Last Mile Connectivity Project should respond to the challenge of paying for connection charges upfront by utilizing a deferred mode of payment for the connection charges. A deferred model of payment has been used in the company before and is commonly referred to as Stima Loan. Stima Loan is a Kenya Power initiative in partnership with the French Development Agency (AFD) through the Government of Kenya. It aims at connecting low-income families that cannot afford the connection fees upfront by giving them loans. More than 49,000 Kenyans have benefitted (May, 2014) from the loan scheme with customers paying 20% upfront with the balance payment spread out over a period of 24 months. According to the Engineers preliminary estimates the average cost of connecting one household under the Last Mile connectivity project is $ 1,047 equivalent to about Kshs 91,089.

To allow more people and especially those in the low socio economic echelon (the poor) including the vulnerable groups (widows, widowers, orphans, persons with disabilities) to benefit, the government should consider allowing them to pay Kshs 35,000 on deferred mode while the government provides a subsidy on the difference. Kenya Power suggest that the government considers availing funds to utilize this kind of a model in the Last Mile Connectivity Project and probably extend the payment period to five years so that the payments to the individual customers loaded in the monthly bills is affordable.

In 2009/10, The Kenya Power & Lighting Company implemented a Demand Side Management program which involved retrofitting CFL bulbs in exchange with Incandescent light bulbs. The main objective of the project was to reduce system peak demand and mitigate load shedding due to poor hydrology then. The implementation of the project saw the peak demand reduced by about 50MW and increase in awareness on the use of CFLs to increase efficiency of use of energy. The supply side also resulted in a savings in energy purchase cost of Kshs 122.9 million. At the demand side fuel cost reduction savings/year was 7.2 billion. At individual level, a CFL uses 80% less electricity than an ordinary bulb. So, if a customer was using ordinary bulbs and they are replaced with energy saving ones, the bill for lighting (note that the customer will also be using the electricity for other things as well) will reduce by 80%.

Kenya Power has plans for a similar project. The project aims at replacing (approximately) 3,300,000 ICLs with high quality CFLs in Kenyan households free of charge across the country under the Green Light for Africa Small Scale Programme of Activities herein referred to as SSC-PoA. The PoA is currently under validation by an independent UN accredited body, Bureau Veritas. The CFLs will be rated 15,000hours lifetime with an average power rating of 14 watts and 22 Watts. The existing ICLs will be replaced with CFLs of similar light output. The distribution will mainly be to the low income households. The company through customer service should step up its campaigns of the importance of using the energy saving bulbs to the new beneficiaries of this project so that the bills will be affordable.

8.1.2.5 Social Inclusion

The national grid mainly serves the large urban areas and the relatively high population density rural areas. Large parts of the country, particularly in the northern part of the country, remain off-grid due to having only 7% of the country's total population. There are currently eight off grid counties in the country, namely Garissa, Lamu, Wajir, Mandera, Marsabit, Tana River, Turkana and Isiolo according to KPLC. The 14 existing Off-Grid power stations

are owned by the Government of Kenya under the Rural Electrification Programme and are managed by Kenya Power. With a total capacity of 17MW, the total energy generated by the off-grid diesel power plants is relatively low, and for the year 2012/13 amounted to just 0.4 % of the total electricity sales in the country.

The Last Mile Connectivity Project aims at scaling up access of electricity to all socio economic groups of the country. This is in line with the tenets of social inclusion which the World Bank defines as the process of improving the terms for individuals and groups to take part in society. Further, Social inclusion aims to empower poor and marginalized people to take advantage of burgeoning global opportunities. It ensures that people have a voice in decisions which affect their lives and that they enjoy equal access to markets, services and political, social and physical spaces.

According to the preliminary project design, the Last Mile Connectivity Project demonstrates this by making a 100% apportionment i.e connection to households in off grid station counties which is not the case in other counties. There is a deliberate effort to apply equity by ensuring counties with low penetration benefit the most. Consequently, the counties which hold low penetration and which also exhibit higher poverty levels will get 100% coverage. These are Garissa, Lamu, Mandera, Marsabit, Tana River, Isiolo, Turkana with only Wajir getting 75% coverage. The fact that the Last Mile Connectivity project will cover the off grid areas at a 100% despite their low sales in electricity is a demonstration that the project is keen on social inclusion.

8.1.2.6 HIV/AIDS

Kenya Power's HIV/AIDs policy underscores the fact that HIV/AIDS has no cure and the only way to stop its spread is through attitudinal and behavioral changes as well as management that can be secured effectively through education (awareness and information campaigns). One of the positive impacts of this project will be disseminating of HIV and AIDs information to communities and workers who otherwise would not have had the correct information on three levels:

a) Direct beneficiaries of the project i.e. those who will be connected will have the benefit of health education messages through use of radios and TV as using electricity to power these gadgets is more reliable. Benefits are higher because the beneficiaries will be able to access HIV/AIDs information that is reliable and which comes from time to time as they can use the T.V and radios at will. The beneficiaries will also benefit from expert's opinion on the pandemic such as listening to doctors and nutritionists regarding HIV/AIDs. including listening to doctors on the issues.

b) The other method of disseminating HIV/AIDs information during project implementation will be through the contractor. The contactors will be expected to disseminate information to the workers as part of their daily tool box talks. SHE department will liaise with NACC to get materials (if they are available at the time) on HIV/AIDS that can be distributed by the contractors during the tool box talk. This will reach more people as the project is being implemented country wide.

c) During the Environment Impact Assessment for other projects the Safety Health and Environment department disseminates HIV/AIDs to the public during public consultations meetings.

8.1.2.7 Health benefit of the project

According to the 2009 population census access to electricity stood at 23%, while 31% used lantern lamps and 39% was using tin lamps for lighting. This indicates that 70% of the population was using kerosene for lighting. Although access to electricity has improved a majority of Kenyans are still using kerosene for lighting. This poses health problems as reported by World Bank report 2008 on the Welfare of Rural Electrification. The report notes that kerosene lamps emit particles that cause air pollution; these are measured by the concentration of the smallest particles per cubic meter (PM10). Burning a liter of kerosene emits PM51 micrograms per hour, which is just above the World Health Organization 24-hour mean standard of PM10 of 50 micrograms per cubic meter. But these particles do not disperse, so burning a lamp for four hours can result in concentrations several times the World Health Organization standard. The health risks posed by this indoor air pollution mainly include acute lower respiratory infections, but also low birth weight, infant mortality, and pulmonary tuberculosis. Additionally,

available data suggest that insufficient illumination (low light) conditions can cause some degree of eye strain, and reading in these conditions over long periods of time may have the potential to increase the development of nearsightedness (myopia) in children and adults. The Last Mile project will result in many families replacing kerosene lamps for lighting with electricity there-by reducing disease burden at the family level and on the government.

8.1.2.8 Benefits to education

Access to electricity at the household level and schools will create opportunities for children to study. For example children from households with electricity have an advantage because they have more time for study and doing homework in the evening as opposed to children from households without electricity. This benefit will in the end translate to better results. Additionally children in households with electricity can also access T.V. which gives them an advantage of benefiting from education programs being aired through such communication channels. Appropriate lighting through electricity will provide school going children in homes an opportunity to study after household chores especially girls who have to assist their mothers in preparing dinner.

8.1.2.9 Improved standard of living

The implementation of this project will result in connecting about 851,149 beneficiaries to the national grid. Access to electricity will change the standard of living of the people as they can use domestic appliances like iron boxes, fridges, television sets, washing machines to mention but a few. Use of electricity for lighting implies that the people will not be exposed to smoke arising from use of kerosene lamps which predisposes people to respiratory diseases.

8.1.2.10 Increase in Revenues

The implementation of the project will boost income streams accrued from increased sales of electricity to KPLC in the long run. Though not in the short term, these revenues will go to system reinforcement to ensure reliable quality supply while some of it goes to the government as taxes which results in improvement in service provision by the government to its citizens.

8.1.2.11 Security

There will be enhanced security in the country arising from well-lit social, commercial and individual premises. With the implementation of the project, the level of security will increase across the country. This is as a result of more security lights which helps keep off opportunistic crimes and gender based violence.

8.1.2.12 Communications

Access to electricity will lead to improved communication for the beneficiaries. This will be enabled by the fact that charging of mobile phones will be easier and cheaper. Access also to mass media like radio and T.V will provide opportunity for the households to access a wide range of information which is useful for decision making. Some of information beneficiaries receive include: information on markets, farm inputs, crop management and local affairs, nutrition, diseases, investments and entertainment among others.

8.1.2.13 Gender Considerations

The vision of National Gender and Equality Commission is “A society that upholds gender equality, dignity and fairness for all”. The Commission is guided by a mission “To effectively and efficiently promote gender equality and freedom from discrimination of all persons in Kenya”. Kenya Powers Gender mainstreaming policy is in line with the NGEG Vision and Mission. The company’s gender vision is a world class power provider that is free from inequality and discrimination. The gender mission is promoting gender equality in powering people for better lives. The gender policy of Kenya Power is to mainstream gender within the company’s procedures, management and monitoring and evaluation processes for the equal benefit of men and women by 2015.

Electricity is a basic service especially for lighting but is still a luxury for many rural women and men. Access to modern electricity will go a long way towards alleviating the daily household burdens of women, giving them more time, improving their health and enhancing their livelihoods. The Last Mile Project will increase access to electricity across the whole country. Available literature on gender and energy suggests that providing electricity

to communities and homes and motive power for tasks considered women's work can promote gender equality, women's empowerment, and women's and girls'access to education, health care, and employment.

This project will not be an exceptional. Indeed, most gender benefits of the project will occur because women tend to spend more time at home, are responsible for household chores that can be carried out more productively with electricity, and because certain tasks are culturally defined as women's work. Majority of the beneficiaries will use the electricity mainly for lighting and powering low energy gadget such as TV, radio, phone charging, refrigeration and to some extent ironing and cooking. In general, lighting and TV are the first common uses of electricity, accounting for at least 80% of rural electricity consumption according to a working paper on Energy Gender and Development of the World Bank 2012. The first and strongest impacts of the project shall occur via lighting and TV. Electricity will definitely displace more expensive candles and kerosene lamps, thereby reducing indoor air pollution, fire, burn risk and providing higher quality light. Women and girls will benefit more from air pollution of kerosene lamps because they spend more time in the kitchen.

Lighting and television will improve access to information, the ability to study, and extend the effective working day. This is more so because children can have extended time of study. The women will also benefit more due to access of information especially on health and nutrition since they also spend more time at home. The project will also enhance security in the rural areas as most homes will be lit up, a benefit that is more appreciated by women.

8.2 Negative Environmental and Social Impacts

Despite the various socio economic and environmental benefits outlined, the project will also have some negative impacts. As regards the proposed KPLC Projects, potential adverse environmental and social impacts on the natural and human environment are likely to arise from inputs as well as project processes at the construction and operation and maintenance phases. The following are the negative impacts and suggested mitigation measures.

8.2.1.1 Impact on Natural Vegetation and Biodiversity

The project will involve short service lines within the 600m radius mainly along the road reserve. No tall growing trees will be allowed below the lines or along the way leave trace. Grass and short vegetation will be cleared to pave way for erection of poles.

8.2.1.2 Impacts on air quality from vehicle exhaust emissions

Exhaust emissions are likely to be generated by the construction vehicles and equipment. Motor vehicles that will be used to ferry construction materials would cause air quality impact by emitting pollutants through exhaust emissions.

8.2.1.3 Risk of sparks/fire from live conductors

Potential adverse impacts related to fire hazards can result from the project. The live conductors can cause short circuiting in case conductors touch one another due to strong winds, falling tree branches or trees. In case of big sparks falling on dry grass there can be a likelihood of fire.

8.2.1.4 Solid waste

Little if any solid waste will be generated which includes conductor cuttings and tree cuttings.

8.2.1.5 Electric shocks and electrocution of people

Electricity, though a good master and a bad servant, is a hazard and safety precautions must be adhered to and properly used. Within the households electric shocks are likely in case of poor handling of electricity such as using wet hands, poor wiring and overloading of sockets.

8.2.1.6 Occupation safety and health hazards

During construction many people will be engaged in activities such as pole and conductor wiring and working at heights. Workers can be exposed to occupational risks like falling from heights, being pressed by poles etc.

8.2.1.7 Public health risk

At project implementation many new workers will be involved and new interactions between people are likely to take place. These interactions are likely to pose risks to the social fabric of the society. Such risks include public health related issues such as (HIV/AIDS, communicable and sexually transmitted diseases (STDs).

8.2.1.8 Construction material sourcing-wooden poles

Majority of these service lines are constructed using wooden poles. This would impact on the environment because many poles will be used during construction.

8.2.1.9 Oil Leaks from transformers

Transformers can experience a leak arising from a fault, poor handling and vandalism. These leaks may result in potential contamination of surface and groundwater as well as soil.

8.2.1.10 Noise during construction

Noise pollution from the proposed development during construction noise will be generated from the construction machines and construction workers

8.2.1.11 Contamination from creosote-treated poles

Soil and water pollution due to unsafe disposal of creosote-treated poles my occur if proper care and management procedures are not put in place

8.3 Mitigation Measures

Mitigation measures involve avoiding of impact altogether, minimizing the impact, rectifying the impact and gradual elimination of impact over time. Mitigation measures are twofold: physical and socio-economic. Physical measures relate to issues of project siting, re-vegetation and preventive measures like bush clearing, erosion, sedimentation and pollution control and good construction / farming practices, waste management, and application of Environmental Guidelines for Contractors. Socio-economic measures will include education and awareness, hygiene and sanitation training, rules and regulations, institutional support (including skills training), and recruitment of qualified personnel.

The mitigation measures for the public health issues; explore options to accommodate crew off site and avoid camps and in absence of that, educate the crew about preserving vegetation, provide decent temporary sanitation facilities like toilets. Use local and regional labour as much as possible and provide HIV/AIDS awareness training to the workers and the community, provide guidelines on local culture, behaviour and social life to the workers and create walk ways and plant grass where necessary.

The mitigation measures for use of hazardous waste include; use off site treatment methods and only deliver poles ready for fixing, proper burning or disposal of any hazardous materials found on site, use protective gear during work, remove or bury all abandoned construction materials and rubbles and fill in and close all latrines and septic systems. The mitigation measures for use of heavy plant and equipment i.e. tippers for material delivery include; Minimize the use of heavy trucks, Provision of drainage channels to guide surface run offs and introduction of mulching to minimize effects on soil erosion and set protocols for vehicle maintenance on site and not dump any oil around the site.

A summary of typical environmental and social impacts and the corresponding typical mitigation measures for the types of activities likely to be undertaken by KPLC are as shown in Table 8.4 below.. The table are not intended to be exhaustive in content but rather to indicate in general the scope of ESIAs and ESMPs. It is entirely possible that additional impacts will be identified during impact assessment studies or audit preparation and will require additional mitigation measures. In the ESIAs and ESMPs, impacts shall be categorized according to project phase (planning, construction, operation, and decommissioning) and for all project types.

Table 3: ESMP Enhancement and Mitigation Program

No.	Potential negative impacts	Mitigation measures	Monitoring activities and surveillance	Responsibility for Monitoring	Performance Indicator	Timing	Estimated Cost (Ksh)
1.	**Electric shocks and electrocution of people.** Electricity, though a good master and a bad servant, is a hazard and safety precautions must be adhered to and properly used.	• Proper public education to the people on safe use of electricity • Proper wiring in the customers' premises by qualified technicians • Use of danger/hatari signs on the poles	Inspection	Supervising Engineer Contractor	• No of Public safety awareness sessions held • No of accidents recorded • No of deaths • Medical Records • Presence of Hazard communication signs • Availability of wiring certificate	operation	2,350,000
2.	**Occupation safety and health hazards.** During construction many people will be engaged in working. Such people are exposed to occupational risks like falling from heights, Accidents etc.	• The contractor must observe all the safety precautions to ensure workers work safely • Safety awareness creation to the workers • Use of personal protective equipment like gloves, helmet, climbing shoes, harnesses etc. • Staff Training and regular equipment service and testing • Only trained & certified workers to install, maintain or repair electrical equipment; • Use of signs, barriers and education/ public outreach to prevent public contact with potentially dangerous equipment; • Community policing to be encouraged to reduce vandalism of transformers and distribution cables • Follow safe work procedures • Maintain a fully stocked	Inspection	Safety Engineer; contractor ; Technical Engineer	• Workers in PPE • Records of safety awareness sessions held with workers • Fully stacked First Aid Kit • Competency records • Tool box talk records	Construction Operation & decommissioning	235,000

No.	Potential negative impacts	Mitigation measures	Monitoring activities and surveillance	Responsibility for Monitoring	Performance Indicator	Timing	Estimated Cost (Ksh)
		and accessible first aid kit • Observe OSHA 2007 regulations					
3.	**Public health risk** At project implementation many new workers will be involved and new interactions between people are likely to take place. These interactions are likely to pose risks to the social fabric of the society. Such risks include public health related issues such as (HIV/AIDS, communicable and sexually transmitted diseases (STDs).	• Public awareness of the public health issues identified. • Provision of condoms • Distribution of HIV & AIDS awareness materials in collaboration NACC	Inspection	Safety Engineer/ Project Engineer	• Availability of Condoms • No of public health awareness sessions with workers	Construction	150,000
4.	**Impact on Natural Vegetation** The project will involve short service lines within the 600m radius mainly along the road reserve. No tall growing trees will be allowed below the lines or along the way leave trace. Grass and short vegetation will be cleared to pave way for erection of poles.	• KPLC to plant trees as a way of compensation for the cleared ones • Clear limited areas only where the pole will be erected • Select alternative alignments to avoid sensitive natural features	Inspections	Environmentalist	• No of trees planted	Construction & operation	2,000,000
5.	**Construction material sourcing-wooden poles.** Majority of these service lines are constructed using wooden poles. This would impact on the environment as close to a million poles will be needed according to the preliminary estimates.	• Plant more trees to compensate for the poles used • Ensure accurate budgeting to ensure only necessary material is ordered • Proper storage to ensure minimal loss • Supply seedlings to farmers to increase forest cover	Inspection	Environmentalist/ project Engineer	• No concrete poles used • No of trees planted	Construction period	1,500,000

No.	Potential negative impacts	Mitigation measures	Monitoring activities and surveillance	Responsibility for Monitoring	Performance Indicator	Timing	Estimated Cost (Ksh)
6.	**Impacts on air quality from vehicle exhaust emissions** Exhaust emissions are likely to be generated by the vehicles used to ferry materials during construction. These exhaust emissions can impact on the quality of air.	• Drivers shall not leave vehicles idling so that exhaust emissions are lowered. • Maintain all machinery and equipment in good working order to ensure minimum emissions are produced.	Inspection	• Project engineer	• No vehicle idling onsite • Vehicle maintenance Records	Construction	Nil
7.	**Solid waste** Little if any solid waste will be generated which includes conductor and tree cuttings.	• All left over conductor cuttings to be disposed appropriately or be returned to the store for proper disposal • Proper budgeting of materials to reduce wastage • practice 3 Rs of waste management: reduce, reuse, recycle of materials • Properly Manage storage, transfer, and disposal of transformer oils according to industry standards	Inspection	Project Engineer	No waste on site Records of material return to store if any	Construction & Decommissioning	
8.	**Noise**	• Proper servicing of vehicles • Not necessary for power lines of such low voltage. However contractor should ensure minimal noise generation during construction and decommissioning phases • Maintain all work equipment at optimal operating condition • Monitor noise levels at sensitive receptors (residential areas, schools, hospitals) • Work through community liaison officers to agree on working hours and to respond promptly to complaints.	Inspection	Project Engineer / Safety Engineer	Vehicle maintenance Records	Construction & decommissioning	Nil

No.	Potential negative impacts	Mitigation measures	Monitoring activities and surveillance	Responsibility for Monitoring	Performance Indicator	Timing	Estimated Cost (Ksh)
9	**Risk of Fire from live conductors and Transformers-**Potential adverse impacts related to fire hazards remain a main feature of this project. The Transformers will have combustible products like the transformer oil and the risks associated with fire hazards form a significant adverse impact on the human health and environment	• No burning of vegetation along the distribution lines rights-of-way • Timely maintenance of the right of way • Time maintenance of transformers	Routine maintenance	Operation and Maintenance Engineer	Way leave and Transformer maintenance Records	Operation	1,000,000
10.	**Damage to crops and trees-**	Compensation for loss of crops and trees to the owners	Verification with owners of crops	Socio-economist	Records of payments made	Construction and operation	Nil
11.	**Oil Leaks** -The refilling and empting of the transformer oil can lead to accidental oil spills. There is a possibility of oil leaking from the transformers can lead to oil spills. This may lead to potential contamination of surface and groundwater as well as soil.	• Need to design appropriate protection devices against accidental discharge of transformer oil substances. • Frequent inspection and maintenance of the transformers should be done to minimize spilling. • All waste oils from maintenance of transformers and other associated equipment should be segregated and disposed properly by a reputable/registered waste handler in accordance with the waste disposal plan.				Operation and decommissioning	400,000

Table 4: Typical impacts and mitigation measures for new LV distribution lines and Wayleave acquisition

Project Activities / Environmental Aspects	Potential and Associated Impacts	Mitigation Measures
Acquisition of Right of Way (ROW)	Anxiety among potentially affected landowners and users	• Work through community liaison officers to keep public fully informed
	Dissatisfaction with compensation; disruption of livelihoods	• Prepare and implement compensation plan in accordance with the guiding principles and way leave regulations
	Loss of natural habitat	• Give preference in site selection to land already converted • Select alternative alignments to avoid protected areas and other sensitive natural features
	Loss of or damage to cultural resources	• Select alternative alignments to avoid physical cultural resources • Where avoidance is impossible, comply with AfDB OS2 and consult with national authorities and/or local leaders on best way to preserve or relocate cultural property. • Formulate and implement chance finds procedure
Clearance of RoW	Loss or fragmentation of or increased access to natural habitat, leading to reduction in biodiversity, possible impacts on rare or endangered species	• Give preference in site selection to land already converted • Minimize width of cleared area • Use labor-intensive mechanical clearing methods to maximize employment opportunities and avoid impacts of herbicides
	Accumulation of brush and debris	• Use appropriate disposal techniques; prohibit burning
Pole installation and Cable Stringing; Equipment Delivery and Installation	Soil / groundwater contamination from accidental fuel/engine oil spill refueling	• Store fuel and chemicals on an impermeable surface with a bund that will hold 110% of the capacity of fuel and chemicals stored. • Train personnel in safe fuel handling • Use drip pans to contain any spills during refueling activities
	Onsite noise and vibration and other hazards.	• Maintain all work equipment at optimal operating condition • Enforce use of PPE • Implementation of weekly Health and Safety (H&S) training • Daily tool box talks
	Disturbance by noise and vibration in surrounding communities	• Maintain all work equipment at optimal operating condition • Monitor noise levels at sensitive receptors (residential areas, schools, hospitals) • Work through community liaison officers to agree on working hours and to respond promptly to complaints. • Sensitize workers to reduce noise during working hours in sensitive areas
	Risk of accidents to life and property	• Set and enforce speed limits • Mandatory driver training • Use warning signs and, where necessary, personnel to direct traffic
	Damage to roads and other infrastructure caused by transit of	• Routine inspection, and prompt repair of any damage

Project Activities / Environmental Aspects	Potential and Associated Impacts	Mitigation Measures
	heavy trucks	
	Working at heights and in confined spaces.	• Adequate ladder should be provided • Provision of climbing shoes • Provide safety harness
Distribution line operation	Risk of electrocution, injury or property damage	• Prevent encroachment and enforce restrictions on activities in RoW • Post warning signs and properly install electrical poles with anti-climbs to prevent access to conductors by unauthorized personnel • Provide safety belts and include log-out/tag-out procedures • Create public and staff awareness on the electrical safety rules as set out in Kenya power safety book
	Pollution from Improper disposal of solid and liquid wastes	• Operators to practice 3 Rs of waste management: reduce, reuse, recycle • Dispose of wastes and scrapped equipment properly • Manage storage, transfer, and disposal of transformer oils according to industry standards
Distribution line maintenance	Damage to natural habitat	• Set and enforce restrictions on hunting by workers • Minimize width of cleared area • Use labor-intensive mechanical clearing methods to maximize employment opportunities and avoid impacts of herbicides
	Accumulation of brush and debris	• Use appropriate disposal techniques; prohibit burning
	Soil / groundwater contamination from accidental fuel/engine oil spill refueling	• Train personnel in safe fuel handling • Use drip pans to contain any spills during refueling activities
	Risk of accidents to life and property	• Set and enforce speed limits • Mandatory driver training • Use warning signs and, where necessary, personnel to direct traffic

8.4 Environmental and Social Management Plan (ESMP)

The purpose of the Environmental and Social Management Plan (ESMP) is to provide guidance during the implementation of the Proposed KPLC Projects regarding the institutional responsibilities and cost estimates for effective environmental and social management. Towards this end, the ESMP will:

- Ensure that proper appraisals on the effects of projects takes place and that proper measures are put in place to mitigate the effects;
- Set out the basis for compliance and enforcement of terms and conditions for approval;
- Design compliance strategies; and
- Monitor compliance and managing of the environment.

Thus, the provided ESMP (annex 6) (i) describes the potential adverse environmental and social impacts of future projects; (ii) outlines proposed mitigation measures to be adopted and indicate parties responsible for implementing mitigation measures; (iii) identifies parties that will carry out the monitoring of the implementation of the mitigation measures; (iv) outlines the time horizons for the various activities; and (v) detail the associated

costs and sources of funds. The ESMP will be included in the Project Implementation Manual and the cost estimates for implementing the ESMP will be included in project cost tables.

8.5 Monitoring Plan

Monitoring of the implementation of the ESMP will be done by KPLC Environment unit with assistance from regional safety officers/engineers. The ESMP will outline the institutional arrangements and cost estimates for environmental and social management during the implementation, operation and decommissioning of the KPLC Projects. The following are specific institutional responsibility for the projects:

- Play the role of facilitating the implementation of the projects
- To produce annual and periodical reports to the bank indicating the actions that have been undertaken towards the implementation of projects on the environmental status.
- To drawing up project objectives for monitoring purposes
- To form a committee that will oversee the exercise
- Develop the key indicators for monitoring purposes with the bank and ensure the monitoring capabilities.
- Carrying out Environmental awareness campaigns and collaborates with other stakeholders where these projects will be implemented.
- KPLC will be fully involved in the implementation of the project.

The capacity building needed for KPLC SHE department will be in terms of training which will involve regional safety engineers/officers and environmental unit staff in KPLC since they will be involved directly in implementing all KPLC projects and in carrying out environmental screening and monitoring. These trainings will ensure the SHE staffs have adequate manpower in all aspects of environment for sustainable development. Provision of necessary equipment for better execution of their duties and proper monitoring of these projects to ensure continuity and sustainability should be provided.

The following course shall be offered to the SHE staff who will oversee the environmental aspects of the proposed projects. They include;

- Environmental Management Systems and Impact Assessment& Implementation of the ESMF, Hazardous Waste Management and Pollution Control and
- Strategic Environmental and Social Assessment (SESA)
- Project Management and Monitoring and evaluation
- NEBOSH International Certificate in Occupational Safety & Health

KPLC SHE department needs manpower development to cope with its many tasks, which include the donor funded projects.

9 INSTITUTIONAL CAPACITY FOR ENVIRONMENTAL MANAGEMENT

9.1 Responsibilities for Environmental and Social Monitoring

Environmental and social monitoring will be carried out by the KPLC PIT in conjunction with the relevant government departments that have been given that responsibility by the Kenyan laws. Monitoring of environmental and social safeguards needs to be carried out during the construction and rehabilitation of the existing and new distribution and transmission lines and substations, as well as during their operation and maintenance.

The table below provides some of the key environmental and social monitoring indicators, to be adapted to the projects as necessary.

Table 5: Key environmental and social monitoring indicators

ISSUE	REMARKS
Reduction in soil erosion	
Increase in re-afforestation	
Drainages around infrastructures	
Wayleave acquisition	
Hectarage of land acquired	
Number of people affected	
Type and amount of assets to be affected for the community members and government by the project	
Number of persons expressing willingness to relocate	
Number of persons expressing unwillingness to relocate	
Livelihood status prior to project	
Livelihood status after project	
Has standard of living increased, decreased, or remained the same	
Number of women employed by civil works	
Number of employees receiving HIV/AIDS awareness training at work site	
Number of community members receiving HIV/AIDS awareness training during project implementation	
Number of people employed from project surrounding areas	
Construction Works of the proposed projects	
Hectarage of land clearance	
Project areas where infrastructure will be constructed	
Number of pit latrines for workers at camp site	
Number of water points for workers at camp site	
Number of environmental mitigation measures implemented and financed by projects	
Implementation status of safe disposal of	

ISSUE	REMARKS
creosote-treated poles	
Implementation status of the Environmental Guidelines for Contractors	
Number of staff and other personnel having completed environmental training	
Implementation status of safe disposal of PCB	
Number of complaints on inconveniences caused by the construction works (complaints against dust)	
Number of Accidents	
Number of cases contravening health and safety procedures	
Number of disposal sites for wastes from the construction sites and camp sites	
Number of Disposal sites that will be restored to original or better state in terms of environmental degradation.	

The SHE department ensures compliance with national and international environmental regulations and with the AfDB Operational Safeguards. The staff includes environmental and social specialists and Socio-economist. The SHE department has prepared a number of ESIAs, RAPs, and/or Environmental Audits as well monitoring of other projects for Kenya Power.

9.2 Monitoring, evaluation and reporting

Monitoring, evaluation and reporting on environmental issues will be part of project implementation processes and reporting systems. KPLC will keep records of all activities that will be undertaken under each project site, which will be compiled and used in enhancing environmental sustainability of the project sites. The KPLC PIT will be responsible for environmental and social monitoring at local levels. KPLC's Environmental Unit, Project engineers and Regional Safety Officers/engineers will distil environmental and social screening actions from the completed Environmental and Social Screening Forms (Annex 1). Compliance to environmental and social screening requirements will also be generated based on quarterly reports, annual reports, evaluation reports, feedback meetings and Implementation support missions. KPLC's Environment Unit will regularly report to the AfDB on the status of environmental and social management of projects in the project's Quarterly Reports.

9.3 Capacity Building and Environmental Trainings

Capacity building should be undertaken for the SHE department and Regional Safety Officers/Engineers to ensure that the ESMF is effectively operationalized. The KPLC PIT and regional staff involved in environmental matters have to be exposed to formal training in the management of environmental issues. The training program for various role players will include an orientation program on the ESMF to be done by SHE department which will include environmental assessment processes and participatory methodologies. Capacity building will help improve the effectiveness of stakeholders at various levels in the management of environmental and social impacts during planning, implementation and operation of proposed projects.

Capacity building will enhance the ESMF management capacity by allowing real application of the best practices such as the following:

- Screening of investments for potential environmental and social impacts, scoping assessments, planning mitigation options, public consultation to assess feasibility and acceptability options; steps 1-7 to implement the environmental and social screening process for projects;

- Environment: site selection to minimize environmental impacts and social disruption; restoration of drainage patterns including mitigation matters in contracts; management of impacts during construction; monitoring of effectiveness of measures;
- Monitoring and grievance redress: transparency and supervision responsibilities.

As regards the institutional capacity building, the KPLC PIT and regional staff as well as some staff of the SHE department in Nairobi are to be trained in different aspects of the implementation of the ESMF and the proposed Project, including interpretation and implementation of environmental impact management guidelines and the AfDB safeguard policies. Different groups involved in project implementation have different training needs in terms of raised awareness, sensitization to the issues, and detailed technical training. While some would require training on general awareness building and more specific training would be needed for others. The three major areas for anticipated trainings are:

- Awareness raising for participants who need to appreciate the significance or relevance of environmental issues;
- Sensitization to the issues for participants who need to be familiar enough with the issues that they can make informal and specific requests for technical support;
- Detailed technical training for participants who will need to analyze potentially adverse environmental impacts, to prescribe mitigation approaches and measures, and to prepare and supervise the implementation of environmental and social management plans. This training will address such matters as community participation methods; environmental assessment; using the ESMF; and project supervision and monitoring;
- The community members will be trained on better methods of environmental conservation and management.

The PIT will be attending various courses towards enhancing capacity building when they are identified. These courses include;

- Environmental conservation and management;
- Monitoring and evaluation;
- Waste management;
- Occupational Safety & Health;
- Project management;
- Climate change among others.

10 ANNEXES

10.1 Annex 1: Environmental and Social Screening Form

ENVIRONMENTAL AND SOCAL FORM.

Introduction

This form is a tool to standardise the environmental and social screening process of Last Mile Connectivity distribution projects / project areas in the Distribution Component.

The main objective of the screening process is to identify and highlight environmental and social issues that need to be taken into account in further decisions, planning, and design of a project. The aim is to support the sustainable implementation of the planned investments under the above project.

The screening must be carried out at an early stage of the sub-project (i.e., prefeasibility), in accordance with the requirement for donor financed projects. The proponent must complete each section of this form, as outlined below.

Proponent and Project Identification:

Name of Project: **Last Mile Connectivity Project**

Project Proponent (Company / Institution): **Kenya Power and Lighting and Company**

Contact person (Proponent):
Name: John Guda
Phone: 254 20 3201460
E-mail: jguda@kplc.co.ke

Responsible person and the name of the person completing this form:
Company:……..……..
Name:……..……..……..……
Phone:……
E-mail:……..……

Locality and date: Nairobi

Signature ……..…… (Proponent)

Signature…… (Responsible Consultant / Person)

The Screening Form

The questions regarding this form or the procedure may be sent to:

Kenya Power Lighting and Company
Wilfred Koech
Phone: 3202442/0722690119
E-mail: Wkoech@kplc.co.ke

GENERAL PROJECT DESCRIPTION AND SETTING		
	General Aspects/Questions	**Provision of answers to project aspects**
1.	Name and/or Title	
2.	Project Type	
3.	a) Expected start and end date (month/year) & b) project duration (in months) of the construction phase:	
4.	List the technology and machinery to be used in the construction and operation phases	
5.	List the materials to be used during the construction and operation phases (e.g., infrastructure, creosote treated poles, fuels and oils):	
6.	Expected number of workers during construction& operation:	
7.	Provide a map with the geographical location of the project;	
8.	Provide an appropriately-scaled map clearly showing: The project area with existing buildings, infrastructure, vegetation, and land use if Possible; The project area with any planned construction, plants, lines, or access roads if Possible	
9.	Is the project area or its immediate surroundings subject to pollution or environmental damage caused by other (existing) activities?	
10.	Is there any other infrastructure in or close to the project area?	
11.		
THE SOCIAL ASPECTS		
	Social issues around the project area	**Describe the potential issues/ impacts**
12.	Existing land uses on and around the (existing transformer)/project area	
13.	Land uses on or near the project area which will be negatively affected by project implementation?	
14.	Presence of residential/sensitive areas e.g. community facilities	
15.	Present owner(s)/users of the project area	
16.	Population density	

17.	Job opportunities (for the local people)	
18.	Effects of project on people's access to land or natural resources	
	Compensation to property damage	
19.	Effects of project on incomes, value of land and other economic activities?	
20.	Construction workers (number and how long they will spend in project area)	
21.	Exposure of community/public to diseases	
22.	Safety of workers (e.g. occupational health and safety issues)?	
23.	Public engagement (role of the project beneficiaries across all phases of the project)	
24.	Public risk to shocks and electrocution	
25.	Public awareness on use of the service (electricity)	
26.	Population density	
Conclusion from the screening process		

Environmental aspects

	Existing environment:	**Description –describe features and indicate sensitivity to disturbance**
Physical Features		
27.	Topography/terrain	
28.	Soil (type & quality)	
29.	Surface water (presence & quality)	
30.	Sediments/substance (Type and quality)	
31.	Ground water (local use & quality)	
32.	Air quality (any pollution issues)	
Biological features		
33.	Vegetation (trees, ground cover, aquatic vegetation)	

34.	Wetlands (e.g. bogs, fens and marshes)	
35.	Fish and fish habitant	
36.	Birds (water fowl, migratory birds and others)	
37.	Mammals	
38.	Special habitat areas (special designations or identifies sensitive zones)	
39.	Archaeological resources (recorded or potential for them to exist)	
40.	Special designations (parks, protected areas)	
41.	Traditional economic/cultural activities (trapping, fishing, collection of medicinal plants)	

Conclusion from the screening process

10.2 Annex 2: Environmental and Social Checklist Form

Please note that this checklist does not concern itself with screening which was done through annex 1

Potential Environmental & Social Impacts of Distribution component	**Proposed Mitigation Measures**
Creation of social conflict or inequity	Community participation & buy-in
Erosion of economic land value	Plan land use change Compensation, relocation
Damage to historical/cultural monuments or artefacts	Relocation of project affected people
Increased Deforestation	Afforestation
Nuisance – dust, smell or noise	Planning and sitting
Water and soil pollution	Control of water and soil pollution
Soil Erosion	Provide and use approved storm water drainage
Health hazards to workers and communities	Sensitize workers and community on safety and health measures
Increasing incidence of communicable diseases	Communication and awareness
Impacts of creosote-treated poles	Proper disposal of waste creosote treated poles
Impacts of PCB at sub-stations	Contractor, workers and community awareness
Impacts on aquatic flora and fauna	Minimize clearing of the natural habitat
Strain on vegetation cover	Minimize clearing of the natural habitat
Changes in migration patterns of humans and animals	Integrate with rural planning
Inundation of cultural or archaeological resources or artefacts	Consider alternative siting Remove resources;
Water logging of soil	Micro-engineering solutions
Loss of scenic value	Re-vegetate
Disruption of land tenure, ownership rights	Community participation & buy-in; implementation of RPF & RAP
Population migration to the area	Integrate with rural planning
Relocation of people	Community participation & buy-in; implementation of RPF
Indigenous Peoples	To be involved
Community participation & support, implementation of IPPF	Cooperation among all stakeholders
sub-project specific recommendations	
Sub-project	**Recommendations**
Substation (Transformers)	
Power Lines (distribution and transmission , medium voltage, low voltage, high voltage	
Wayleaves/Access roads	

10.3 Annex 3: Environmental Guidelines for Contractors

General Environmental Management Conditions

General

1. In addition to these general conditions, the Contractor shall comply with any specific Environmental Management Plan (EMP) for the works he is responsible for. The Contractor shall inform himself about such an EMP, and prepare his work strategy and plan to fully take into account relevant provisions of that EMP. If the Contractor fails to implement the approved EMP after written instruction by the Supervising Engineer to fulfill his obligation within the requested time, the Owner reserves the right to arrange through the SE for execution of the missing action by a third party on account of the Contractor.

2. Notwithstanding the Contractor's obligation under the above clause, the Contractor shall implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance Requirements specified in an EMP. In general these measures shall include but not be limited to:

   (a) Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.
   (b) Ensure that existing water flow regimes in rivers, streams and other natural or irrigation channels is maintained and/or re-established where they are disrupted due to works being carried out.
   (c) Upon discovery of ancient heritage, relics or anything that might or believed to be of archaeological or historical importance during the execution of works, immediately report such findings to the Supervising Engineer so that the appropriate authorities may be expeditiously contacted for fulfilment of the measures aimed at protecting such historical or archaeological resources.
   (d) Discourage construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities.
   (e) Implement soil erosion control measures in order to avoid surface run off and prevents siltation, etc.
   (f) Ensure that garbage, sanitation and drinking water facilities are provided in construction workers camps.
   (g) Ensure that, in as much as possible, local materials are used to avoid importation of foreign material and long distance transportation.
   (h) Ensure public safety, and meet traffic safety requirements for the operation of work to avoid accidents.

3. The Contractor shall adhere to the proposed activity implementation schedule and the monitoring plan /strategy to ensure effective feedback of monitoring information to project management so that Impact management can be implemented properly, and if necessary, adapt to changing and unforeseen conditions.

4. Besides the regular inspection of the sites by the Supervising Engineer for adherence to the Contract conditions and specifications, the Owner may appoint an Inspector to oversee the compliance with these environmental conditions and any proposed mitigation measures. State environmental Authorities may carry out similar inspection duties. In all cases, as directed by the Supervising Engineer, the Contractor shall comply with directives from such inspectors to implement measures. Required to ensure the adequacy rehabilitation measures carried out on the bio-physical environment and compensation for socio-economic disruption resulting from implementation of any works.

Work site/Campsite Waste Management

5. All vessels (drums, containers, bags, etc.) containing oil/fuel/surfacing materials and other hazardous Chemicals shall be bonded in order to contain spillage. All waste containers, litter and any other waste

generated during the construction shall be collected and disposed off at designated disposal sites in Line with applicable government waste management regulations.

6. Used oil from maintenance shall be collected and disposed of appropriately at designated sites or be re-used or sold for re-use locally.

7. Entry of runoff to the site shall be restricted by constructing diversion channels or holding structures Such as banks, drains, dams, etc. to reduce the potential of soil erosion and water pollution.

New extraction sites:

8. Vegetation clearing shall be restricted to the area required for safe operation of construction work. Vegetation clearing shall not be done more than two months in advance of operations.

9. Stockpile areas shall be located in areas where trees can act as buffers to prevent dust pollution.
   Perimeter drains shall be built around stockpile areas. Sediment and other pollutant traps shall be located at drainage exits from workings.

10. The Contractor shall deposit any excess material in accordance with the principles of these general conditions, and any applicable EMP, in areas approved by local authorities and/or the Supervising Engineer.

11. Areas for depositing hazardous materials such as contaminated liquid and solid materials shall be approved by the Supervising Engineer and appropriate local and/or national authorities before the commencement of work. Use of existing, approved sites shall be preferred over the establishment of new sites.

Soil Erosion Prevention

12. To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.

13. Always remove and retain topsoil for subsequent rehabilitation. Soils shall be stripped when they are wet as this can lead to soil compaction and loss of structure.

14. Re-vegetate stockpiles to protect the soil from erosion, discourage weeds and maintain an active population of beneficial soil microbes.

15. To the extent practicable, reinstate natural drainage patterns where they have been altered or impaired.

16. Identify potentially toxic overburden and screen with suitable material to prevent mobilization of toxins.

17. Ensure reshaped land is formed so as to be inherently stable, adequately drained and suitable for the desired long-term land use, and allow natural regeneration of vegetation.

18. Minimize the long-term visual impact by creating landforms that are compatible with the adjacent landscape.

19. Minimize erosion by wind and water both during and after the process of reinstatement.

20. Re-vegetate with plant species that will control erosion, provide vegetative diversity and, through succession, contribute to a resilient ecosystem. The choice of plant species for rehabilitation shall be done in consultation with local research institutions, forest department and the local people.

Water Resources Management

21. The Contractor shall at all costs avoid conflicting with water demands of local communities.

22. Abstraction of both surface and underground water shall only be done with the consultation of the local community and after obtaining a permit from the relevant Water Authority.

23. Abstraction of water from wetlands shall be avoided. Where necessary, authority has to be obtained from relevant authorities.

24. No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.

25. Wash water from washing out of equipment shall not be discharged into water courses or road drains.

26. Site spoils and temporary stockpiles shall be located away from the drainage system, and surface run off shall be directed away from stockpiles to prevent erosion.

Traffic Management

27. Location of access roads/detours shall be done in consultation with the local community especially in important or sensitive environments. Access roads shall not traverse wetland areas.

28. Upon the completion of civil works, all access roads shall be ripped and rehabilitated.

29. Access roads shall be sprinkled with water at least five times a day in settled areas, and three times in unsettled areas, to suppress dust emissions.

Disposal of Unusable Elements

30. Unusable materials and construction elements such as electromechanical equipment, cables, accessories and demolished structures will be disposed of in a manner approved by the Supervising Energy Expert (SE). The Contractor has to agree with the SE which elements are to be surrendered to the Client's premises, which will be recycled or reused, and which will be disposed of at approved landfill sites.

Health and Safety

31. In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks particularly of AIDS.

32. Adequate road signs to warn pedestrians and motorists of construction activities, diversions, etc. shall be provided at appropriate points.

33. Construction vehicles shall not exceed maximum speed limit of 40km per hour.

Repair of Private Property

34. Should the Contractor, deliberately or accidentally, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the owner a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.

35. In cases where compensation for inconveniences, damage of crops etc. are claimed by the owner, the Client has to be informed by the Contractor through the Supervising Engineer.

This compensation is in general settled under the responsibility of the Client before signing the Contract. In unforeseeable cases, the respective administrative entities of the Client will take care of compensation.

Contractor's Environment, Health and Safety Management Plan (EHS-MP &ESMP)

36. Within 6 weeks of signing the Contract, the Contractor shall prepare an EHS-MP to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works. The Contractor's EHS-MP will serve two main purposes:

    - For the Contractor, for internal purposes, to ensure that all measures are in place for adequate EHS management, and as an operational manual for his staff.

    - For the Client, supported where necessary by a Supervising Engineer, to ensure that the Contractor is fully prepared for the adequate management of the EHS aspects of the project, and as a basis for monitoring of the Contractor's EHS performance.

    37. The Contractor's EHS-MP shall provide at least: a description of procedures and methods for complying with these general environmental management conditions, and any specific conditions specified in an EMP; a description of specific mitigation measures that will be implemented in order to minimize adverse impacts; a description of all planned monitoring activities (e.g. sediment discharges from borrow areas) and the reporting thereof; and the internal organizational, management and reporting mechanisms put in place for such.

38. The Contractor's EHS-MP will be reviewed and approved by the Client before start of the works. This review should demonstrate if the Contractor's EHS-MP covers all of the identified impacts as spell out in the ESMF, and has defined appropriate measures to counteract any potential impacts.

EHS Reporting

39. The Contractor shall prepare bi-weekly progress reports to the Supervising Engineer on compliance with these general conditions, the project ESMP if any, and his own LOT specific EHS-MP. An example format for a Contractor EHS report is given below. It is expected that the Contractor's reports will include information on:

EHS management actions/measures taken, including approvals sought from local or national authorities;

- Problems encountered in relation to EHS aspects (incidents, including delays, cost consequences, etc. as a result thereof);
- Lack of compliance with contract requirements on the part of the Contractor;
- Changes of assumptions, conditions, measures, designs and actual works in relation to EHS aspects; and
- Observations, concerns raised and/or decisions taken with regard to EHS management during site meetings.

40. It is advisable that reporting of significant EHS incidents be done "as soon as practicable". Such incident reporting shall therefore be done individually. Also, it is advisable that the Contractor keeps his own records on health, safety and welfare of persons, and damage to property.

41. It is advisable to include such records, as well as copies of incident reports, as appendixes to the bi-weekly reports. Example formats for an incident notification and detailed report are given below.

Details of EHS performance will be reported to the Client through the Supervising Engineer reports to the Client.

Training of Contractor's Personnel

42. The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project EMP, and his own EHS-MP, and are able to fulfil

their expected roles and functions. Specific training should be provided to those employees that have particular responsibilities associated with the implementation of the EHS-MP.

General topics should be:

- EHS in general (working procedures);
- Emergency procedures; and social and cultural aspects (awareness rising on social issues).

Cost of Compliance

43. It is expected that compliance with these conditions is already part of standard good workmanship and state of art as generally required under this Contract. The item "Compliance with Environmental and Social Management Conditions" in the Bill of Quantities covers these costs. No other payments will be made to the Contractor for compliance with any request to avoid and/or mitigate an avoidable EHS impact.

Example Format: EHS Report

Contract: **Period of reporting:**

EHS management actions/measures:

Summarize EHS management actions/measures taken during period of reporting, including planning and management activities (e.g. risk and impact assessments), EHS training, specific design and work measures taken, etc.

EHS incidents:

Report on any problems encountered in relation to EHS aspects, including its consequences (delays, costs) and corrective measures taken. Include relevant incident reports.

EHS compliance:

Report on compliance with Contract EHS conditions, including any cases of non-compliance.

Changes:

Report on any changes of assumptions, conditions, measures, designs and actual works in relation to EHS aspects.

Concerns and observations:

Report on any observations, concerns raised and/or decisions taken with regard to EHS management during site meetings and visits.

Signature (Name, Title Date):
Contractor Representative

Example Format: EHS Incident Notification

Provide within 24 hrs to the Supervising Engineer

Originators Reference No: **Date of Incident:** **Time:**

Location of incident:

Name of Person(s) involved:

Employing Company:

Type of Incident:

Description of Incident:

Where, when, what, how, who, operation in progress at the time (only factual)

Immediate Action:

Immediate remedial action and actions taken to prevent reoccurrence or escalation
Signature (Name, Title, Date):

Contractor Representative
Example Format: Detailed EHS Incident Report

The Incident Notification should be follow-up by a Detailed EHS Incident Report
Containing the following information where applicable

1. Incident Summary

2. Specific Details

Date

Time

Place

Weather/Visibility

Road conditions

3. Persons Involved

Name/s

Age/s

Experience

Date joined Company

Last Medical Check

Current Medical Treatment

Evidence of Drugs/Alcohol

Last Safety Meeting attended

Infringements/Incidents record

4. Equipment Involved

5. Description of Incident

6. Findings of Investigation Team Interim/Final

Investigation Team Members

Persons Interviewed

Recommendations & Remedial Actions

Investigation Methodology

7. Signature (Name, Title, Date):

8. Attachments

Photographs

Witness Statements and Incident Notification Report

10.4 Annex 4: Generic EA Terms of Reference

I. Introduction and context

This section will be completed at the appropriate time, and will provide the necessary information with respect to the context and methodological approaches to be undertaken.

II. Objectives of the study

This section will (i) outline the objectives and particular activities of the planned activity; and (ii) indicate which activities are likely to have environmental and social impacts that will require appropriate mitigation. (Adapted to specific activities)

III. Terms of Reference

The consultant will perform the following tasks:

a) Carry out a description of the biophysical characteristics of the environment in which the planned activity will take place, and highlight the major constraints that need to be taken into account during construction as well as during operation of the facility;

b) Carry out a description of the socio-economic environment of the planned investment, and highlight the major constraints that need to be taken into account during construction as well as during operation of the facility;

c) Assess the potential environmental and social impacts due to construction or rehabilitation activities, and recommend mitigation measures as appropriate, including cost estimates;

d) Assess the potential environmental and social impacts due to the provision of water supply and sanitation facilities that might be needed for the planned facility and make appropriate recommendations;

e) Assess the need for liquid and solid waste collection, disposal and management in the facility, and make recommendations accordingly;

f) Discuss alternative project designs and make recommendations;

g) Assess alternative project designs and make recommendations;

h) Carry out a review of the respective national environmental policies, legislation, regulatory and administrative frameworks in conjunction with the donors' safeguard policies, indicate which of these policies is triggered by the planned activity, identify any gaps that might exist, and make recommendations as to how potential gaps should be bridged in the context of the planned activity;

i) Review the Conventions and Protocols to which the country is a signatory;

j) Assess the country's environmental assessment and management capacity, as well as the capacity to implement the proposed mitigation measures, and make appropriate recommendations, including potential capacity building and training needs, and their costs;

k) Prepare an Environmental and Social Management Plan (ESMP) for the planned activity. The ESMP should outline (a) potential environmental and social impacts resulting from the activity; (b) proposed mitigation measures; (c) institutional responsibilities for implementation of the mitigation measures; (d) monitoring indicators; (e) institutional responsibilities for monitoring the implementation of the mitigation measures; (f) cost estimates for these activities; and (g) time horizons for implementing the ESMP.

l) Public consultations: EIA results and proposed mitigating measures will then be shared with the potentially affected population, NGOs, local authorities and the private sector working in the area where the activity will take place. Minutes of this consultation will form an integral part of the report.

IV. Report Plan

- Cover page
- Table of Contents
- List of acronyms
- Executive summary (as necessary, in English and French)
- Introduction
- Description of the proposed activity
- Description of the environment of the area where the activity will take place
- Description of the policy, institutional and regulatory framework.
- Methods and techniques used during evaluation and impact analysis of the proposed activity.
- Description of potential alternatives to the proposed project design.
- Description of environmental and social impacts of the proposed activity.
- Discussion of consultations with relevant stakeholders, including potentially affected persons.
- Environmental Management Plan for the proposed activity.
- Monitoring indicators for the proposed activity.
- Recommendations
- References.
- List of individuals/ institutions contacted.
- Summary table of the Environmental Management Plan (EMP).

10.5 Annex 5: Environmental and Social Management Plan (ESMP)

Guidelines for the preparation of ESMP

The preparation of an ESMP should include the following key sections:

1. **Summary of Impacts:** Anticipated adverse environmental impacts should be identified and summarized as well as their relationship to social impacts and the appropriate mitigation measures.

2. **Description of Mitigation measures:** The mitigation measures proposed for the various impacts should be described in relation to the corresponding impacts while stating the conditions under which they are required. Adequate description of the consultations should be done and justified.

3. **Description of monitoring program:** A detailed monitoring program should be described in the ESMP, listing environmental performance indicators and their link with impacts and mitigation measures. The ESMP should also describe the parameters to be measured, methods to be used, sampling location and frequency of measurements, detection limits and a clear definition of thresholds that indicate the need for corrective measures. Monitoring and supervision schedules should be clearly stated and agreed with the Bank to ensure timely detection of needs for remedial action and also provide information on the level of compliance with ESMP in accordance with Bank safeguards. These arrangements must be clearly stated in the project implementation/operations manual to reinforce project supervision.

4. **Legal requirements and bidding/contract documents:** The ESMP should be incorporated in all legal documents to enforce compliance by all contractors participating in the project. The ESMP should be summarized and incorporated in the bidding and contract documents.

5. **Institutional arrangements:** The ESMP should clearly state who is responsible for monitoring, execution of remedial action and the reporting order and format to allow for a defined channel of information flow. It should also recommend institutional strengthening for relevant agencies and the funding authorities for the various activities.

6. **Capacity Development and Training:** To support timely and effective implementation of environmental project components and mitigation measures, the ESMP draws on the EA's assessment of the existence, role, and capability of environmental units on site or at the ministry level. If necessary, the ESMP recommends the establishment or expansion of such units, and the training of staff, to allow implementation of EA recommendations. Specifically, the ESMP provides a specific description of institutional arrangements i.e. who is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). To strengthen environmental management capability in the agencies responsible for implementation, most ESMPs cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

7. **Implementation Schedule:** The frequency, timing and duration of mitigation measures and monitoring should be stated in the implementation schedule. Links between mitigation measures and development of relevant institutions and legal requirements of the project should be stated.

8. **Reporting:** The order of information flow as it concerns monitoring reports should be clearly defined. The relevant officers to receive these reports should be those who have authorities to facilitate implementation of the results of the monitoring. These reports should also be communicated to the Bank via media to be agreed and specified in the ESMP. Adequate arrangements should be made by the Bank to facilitate the circulation of the ESMP through the selected means.

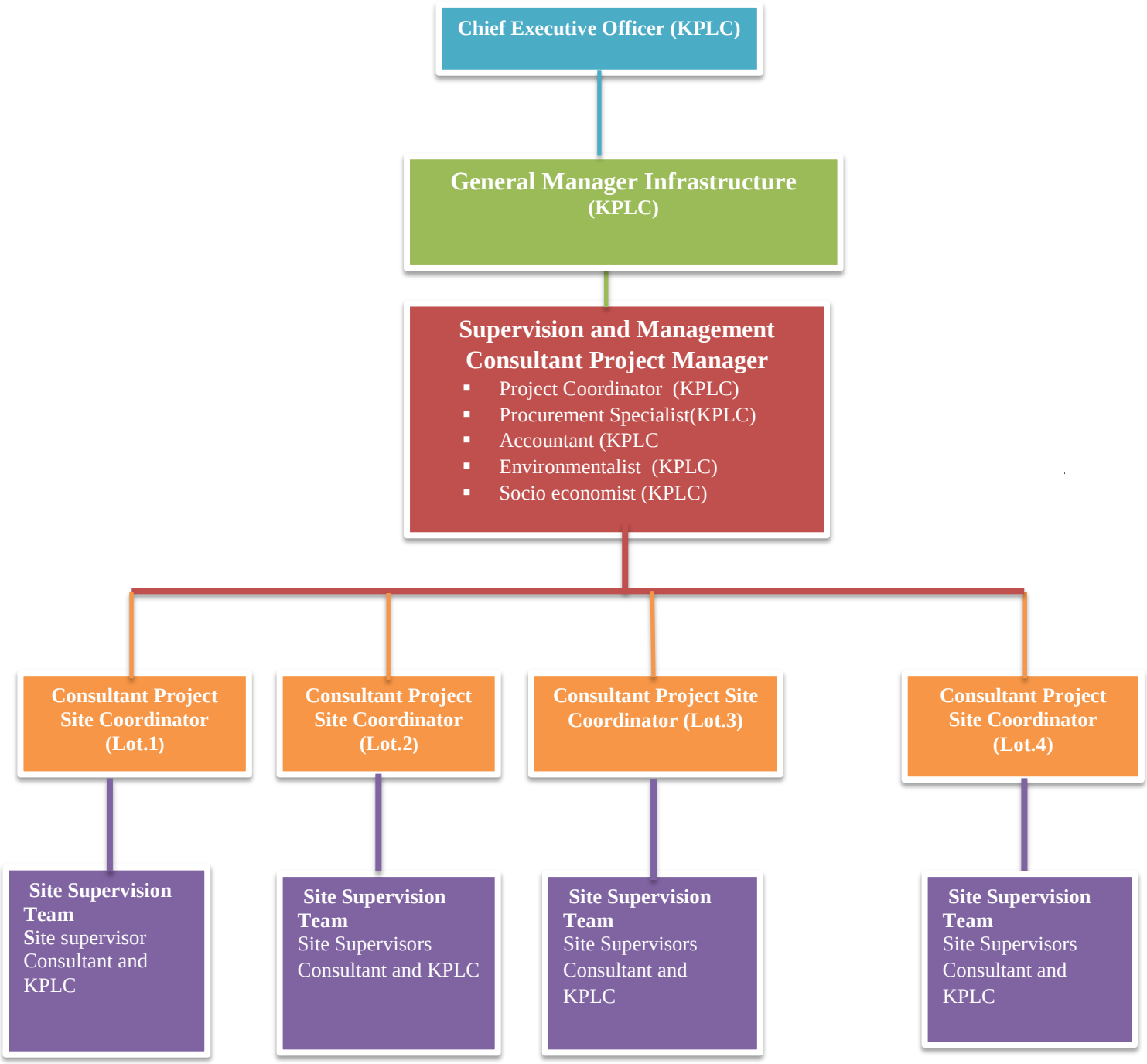
9. **Cost estimate:** The cost of carrying out monitoring and implementation of the mitigation measures at the various stages of the project should be integrated into the total cost of the project and factored into financial negotiations. These costs should include administrative, design and consultancy, operational and maintenance costs – resulting with meeting required standards and project design.

10.6 Sample of ESMP

Project Activities	Potential Environmental & Social Impacts	Proposed Mitigation Measures	Responsibility for implementing mitigation measures	Responsibility for Monitoring implementation of mitigation measures	Time Horizon	Cost Estimates (US$)
Construction of new substations; Construction of new access roads; Use of quarries and borrow pits Establishment of camp sites	Loss of vegetation, noise, dust, soil erosion, Construction waste, Generation of wastewater, Increase of water use; Loss of livelihoods; Spoil materials due to construction material excavation	Apply Environmental Guidelines for Contractors Implement RPF Implement EA and/or screening recommendations through contract requirements Use of separators Contractors.	Contractor KPLC-PIT	KPLC-PIT and Environment unit and Regional staff	Throughout construction period Prior to civil works	Incl. in Contract
Rehabilitation of existing substations (Transformers) and Lines	Interruption of services	Inform public of planned works and their potential environmental and social impacts	KPLC – PIT.	KPLC-PIT and Environment unit and Regional staff	Throughout construction period	None
	Loss of livelihoods and/or land for the projects	Implement RPF	KPLC – PIT.	KPLC-PIT and Environment unit and Regional staff	Throughout construction period of the sub project components	Incl. in Contract
	Increase of noise, dust, soil erosion, Construction waste, Generation of wastewater, Increase of water use Soil and water pollution due to PCB	Apply Environmenta l Guidelines for Contractors; Implement EA and/or screening recommendations through contract requirements Contamination sites should be covered with a barrier or coating to avoid contacts. Laboratory screening tests PCB waste management	Contractor KPLC-PIT Contractor and KPLC-PIT	KPLC-PIT and Environment unit and Regional staff	Throughout construction period	Incl. in Contract
Construction of new power lines	Loss of vegetation, noise, dust, soil erosion, Construction waste	Apply Environmental l Guidelines for Contractors	KPLC-PIT	KPLC-PIT and Environment unit and Regional staff	Throughout construction period	Incl. in Contract

Project Activities	Potential Environmental & Social Impacts	Proposed Mitigation Measures	Responsibility for implementing mitigation measures	Responsibility for Monitoring implementation of mitigation measures	Time Horizon	Cost Estimates (US$)
	Use and disposal of Creosote treated poles Loss of livelihoods					
Rehabilitation of existing power lines	Interruption of services	Inform public of planned works	KPLC-PIT	KPLC-PIT and Environment unit and Regional staff	Throughout Rehabilitation period	None
	Loss of livelihoods and/or land Use and disposal of creosote treated poles	Implement RPF Burning of this woods in high temperature incinerators Recycle and use of the poles Waste poles to be disposed in landfills	Contractor	KPLC-PIT and Environment unit and Regional staff	Before construction works	To be calculated when affected sites will be identified

10.7 Annex 7: Last Mile Connectivity Project Implementation Structure



10.8 Annex 8 Tentative number of Counties and Number of customers Involved in the project financing

No	County	Region / Sub Region	GROUP	Est House Holds (No.)	Est. Transformers Covered (No)	Est. Meters / Customers (No.)
1	ELGEYO MARAKWET	North Rift	LOT 1	2,275	79	3,412
2	NANDI	North Rift	LOT 1	3,030	109	4,546
3	UASIN GISHU	North Rift	LOT 1	2,156	91	3,234
4	TRANS NZOIA	North Rift	LOT 1	3,258	97	4,886
5	TURKANA	North Rift	LOT 1	1,013	40	1,520
6	WEST POKOT	North Rift	LOT 1	1,779	115	2,670
7 (a)	BARINGO	Central Rift	LOT 1	1,768	149	2,651
7 (b)	BARINGO	North Rift	LOT 1	1,092	54	1,638
8	NAKURU	Central Rift	LOT 1	4,943	305	7,415
9 (a)	KERICHO	West Kenya	LOT 1	1,994	77	2,990
9 (b)	KERICHO	Central Rift	LOT 1	842	45	1,263
10	BOMET	West Kenya	LOT 1	2,633	64	3,951
	Total LOT 1			**21,314**	**1,038**	**31,971**
11	BUSIA	West Kenya	LOT 2	2,460	79	3,690
12	KISUMU	West Kenya	LOT 2	4,367	197	6,551
13	SIAYA	West Kenya	LOT 2	3,797	181	5,694
14	VIHIGA	West Kenya	LOT 2	2,392	119	3,588
15	BUNGOMA	West Kenya	LOT 2	2,793	141	4,191
16(a)	KAKAMEGA	West Kenya	LOT 2	3,035	120	4,553
16(b)	KAKAMEGA	North Rift	LOT 2	1,090	46	1,635
17	HOMABAY	West Kenya	LOT 2	3,876	97	5,814
18	KISII	West Kenya	LOT 2	2,475	84	3,713
19	MIGORI	West Kenya	LOT 2	2,320	122	3,480
20	NYAMIRA	West Kenya	LOT 2	3,142	164	4,714
	Total LOT 2			**19,934**	**885**	**29,901**
21	EMBU	Mt Kenya North	LOT 3	2,218	78	3,327
22	KIRINYAGA	Mt Kenya North	LOT 3	1,728	34	2,592
23(a)	LAIKIPIA	Mt Kenya North	LOT 3	1,864	38	2,797
23(b)	LAIKIPIA	Central Rift	LOT 3	1,184	79	1,776
24	NYERI	Mt Kenya North	LOT 3	3,285	65	4,928
25	MURANG'A	Mt Kenya South	LOT 3	2,379	91	3,568
26	MERU	Mt Kenya North	LOT 3	3,248	95	4,872
27	THARAKA NITHI	Mt Kenya North	LOT 3	2,312	64	3,467
28	ISIOLO	Mt Kenya North	LOT 3	417	22	624
29	SAMBURU	Central Rift	LOT 3	882	42	1,323
30	GARISSA	Mt Kenya South	LOT 3	1,499	75	2,248
31	NYANDARUA	Central Rift	LOT 3	2,967	165	4,451
32(a)	KIAMBU	Nairobi North	LOT 3	4,001	132	6,002
32 (b)	KIAMBU	Nairobi West	LOT 3	2,614	72	3,920
32 (c)	KIAMBU	Mt Kenya South	LOT 3	2,500	107	3,750
	Total LOT 3			**21,014**	**682**	**31,521**
33	KITUI	Mt Kenya South	LOT 4	2,853	153	4,279
34	MACHAKOS	Nairobi South	LOT 4	4,168	146	6,252

No	County	Region / Sub Region	GROUP	Est House Holds (No.)	Est. Transformers Covered (No)	Est. Meters / Customers (No.)
35	MAKUENI	Nairobi South	LOT 4	3,282	211	4,924
36	KILIFI	Coast	LOT 4	3,309	75	4,962
37	KWALE	Coast	LOT 4	2,396	59	3,593
38	LAMU	Coast	LOT 4	309	12	464
39	MOMBASA	Coast	LOT 4	2,206	56	3,309
40	TAITA TAVETA	Coast	LOT 4	2,417	92	3,627
41	TANA RIVER	Coast	LOT 4	654	29	981
42	NAROK	Central Rift	LOT 4	3,012	193	4,518
43	KAJIADO	Nairobi West	LOT 4	3,457	166	5,186
44 (a)	NAIROBI	Nairobi North	LOT 4	2,962	100	4,444
44 (b)	NAIROBI	Nairobi South	LOT 4	2,480	23	3,721
44(c)	NAIROBI	Nairobi West	LOT 4	1,168	68	1,751
45	MANDERA	Nairobi South	LOT 4	884	28	1,326
46	MARSABIT	Nairobi South	LOT 4	801	58	1,201
47	WAJIR	Nairobi South	LOT 4	978	35	1,466
	Total LOT 4			**21,594**	**831**	**32,392**
	Grand Total			**128,961**	**5,236**	**193,443**