KENYA ELECTRICITY MODERNIZATION PROJECT (KEMP)

OFF GRID COMPONENT

ENVIRONMENTAL & SOCIAL MANAGEMENT FRAMEWORK

JANUARY 2015

The Environmental & Social Management Framework (ESMF) has been prepared by Environment & Social Unit, Safety, Health & Environment (SHE) Department, Kenya Power at the request of the Rural Electrification Authority. The ESMF has been prepared based on an overall Environmental & Social Assessment, which includes:

- The general baseline at project areas.
- Evaluation of potential Environmental & Social impacts of different project components and subcomponents, and
- Assessment of environmental practices in different ongoing and completed projects.

The ESMF provides the guidelines for the preparation of all mitigation plans (Environmental & Social Management Plans and Construction Management Plan) to respond to the anticipated project impacts, once the solar panels and/or wind turbines installation sites, extension of low voltage power line routes and specific household metering locations are definitively identified.

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ACRONYMS & ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
AFD	French Development Agency
AfDB	Africa Development Bank
AIDs	Acquired Immune Diseases
ASAL	Arid and Semi-Arid Land
BP	Bank Procedure
CBOs	Community Based Organizations
CCA	Cupper Chromium Arsenate
COK	Constitution of Kenya
CPS	Country Partnership Strategy
CSO	Civil Society Organizations
EAs	Environmental Assessments
EHS	Environmental, Health and Safety
EHS-MP	Environment Health & Safety Management Plan
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environment and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESSF	Environmental and Social Screening Form
ESU	Environment & Social Unit
FAO	Food & Agriculture Organization
FGDs	Focus Group Discussions
FPIC	Free, prior, and informed consultation
GDP	Gross Domestic Product
GOK	Government of Kenya
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HIV	Human Immunodeficiency Virus
ICT	Information Communication Technology
IESIA	Integrated Environmental and Social Impact Assessment
IFC	International Finance Corporation
IFRS	international Financial Reporting System
IP	Indigenous People
IPPF	Indigenous Peoples Planning Framework
ISTS	Integrated Safeguard Tracking System
KCAA	Kenya Civil Aviation Authority
KEMP	Kenya Electricity Modernization Project
KenGen	Kenya Electricity Generating Company
KFMP	Kenya Forest Management Plan
KP	Kenya Power
KPLC	Kenya Power& Lighting Company Ltd
KWS	Kenya Wildlife Service
KV	Kilo Volts
M&E	Monitoring and Evaluation
MOEP	Ministry of Energy and Petroleum
MPAs	Marine Protected Areas

MW	Mega Watts
NACC	National AIDS Control Council
NEMA	National Environment Management Authority
NEC	National Environment Council
NGO	Non-Governmental Organisations
OP	Operational Procedure
OS	Operational Safeguards
PBP	Project Based Programs
PCAIP	Public Consultation & Access Information Plan
PCB	polychlorinated biphenyl
PCR	Physical Cultural Resources
PIU	Project Implementation Unit
PIC	Public Information Centre
PIU	Project Implementation Unit
PPP	Public Private Partnership
PV	Photo Voltaic
PVS	Photo Voltaic System
QPRs	Quarterly Progress Reports
R&R	Rehabilitation & Resettlement
RAP	Resettlement Action Plan
REA	Rural Electrification Authority
RoW	Right of Way
RPF	Resettlement Policy Framework
SE	Supervision Engineer
SESA	Strategic Environmental & Social Assessment
SHE	Safety, Health & Environment
STDs	Sexually Transmitted Diseases
ToR	Terms of Reference
TV	Television
UN	United Nations
UNCLOS	UN Convention on the Law of the Sea
USD	USA Dollars
VAT	Value Added Tax
VMGF	Vulnerable & marginalize Group Framework
WB	World Bank
WRMA	Water Resources Management Authority

EXECUTIVE SUMMARY

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 to 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 urban areas. 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, it is necessary to develop a new mind set, as initially happened at the previous period of expansion in 2004.

Currently, only 35% of the households are connected to the national electricity grid. The Government plans to increase this to 70% by 2020 and 100 % by 2030 and has put in place strategies to accelerate access to modern energy services through public and private initiatives. The government, with support from development partners, has allocated substantial resources for development of energy infrastructure including exploitation of renewable energy resources. This effort provides opportunities for collaboration with the private sector in renewable energy development and national electrification.

Approximately two thirds of the population live in the Southern belt of Kenya, extending from east to west, and are mostly within reach of the national grid. The northern portions from the east to the west are sparsely populated. They will be expensive to interconnect to the national grid network. KPLC has therefore established a number of diesel-based mini-grids. More recently KPLC has begun to integrate wind and solar generation into these mini-grids.

The Kenya off-grid program to electrify remote centers has been in place sincethe early 1980s. Currently, there are 14 mini-grid power stations, which are managed by Kenya Power (KPLC) (12 stations) and Kenya Electricity Generating Company, (KenGen) (2 stations). The total installed capacity for these mini-grids is 19.16MW comprising of 18.1MW thermal, 0.55MW wind and 0.51MW solar. Among the stations managed by KPLC, one of the off-grid diesel stations, Moyale, is connected to the Ethiopian national grid. A second one, Mpeketoni, is expected to be connected to Kenya's national grid. The stations operated by KenGen (Garissa and Lamu) are comparatively large, and there are plans to extend the national grid to these areas.

The Kenya Electricity Modernization Project – to be financed by the World Bank Group through the International Development Association (IDA) - aims to support the Government's initiatives of ensuring increased electricity access to Kenyans, particularly among the low-income groups and those in off-grid areas.

This ESMF is for Sub-Component C2: Off-grid electrification. A separate ESMF has been prepared for sub component C1-Peri Urban Electrification.

Project Description

The Kenya Electricity Modernization Project – to be financed by the World Bank Group through the International Development Association (IDA) - aims to support the Government's initiatives of ensuring increased electricity access to Kenyans, particularly among low income groups in peri-urban and off-grid areas. The existing and new distribution transformers (pole-mounted) shall be optimized through extension of the low and medium voltage network to reach households located in the vicinity of these transformers.

The exact sub-project sites are not yet definitively identified. Once they are established Environmental Impact Assessments (EIAs) and or Environmental Management Plans (EMPs) will be prepared as required by NEMA and World Bank guidelines.

The Project Development Objective (PDO) to (a) increase access to electricity; (b) to improve reliability of electricity service and; (c) to restore KPLC's financial sustainability.

Description Project Sub-component C 2: Off-Grid Electrification.

This sub-component will be implemented by REA and will support the implementation of off-grid electrification solutions in areas whose connection to the national grid is financially not viable in the short and medium term. Electrification of those areas will be implemented through mini-grids supplied by hybrid generation systems, combining renewable resources (solar or wind) and thermal units running on diesel. This sub-component will use a PPP approach. The selection of project areas is based on the number of potential users and their demand, supported by an ongoing market sounding, a demand survey and pre-feasibility studies being carried out by REA. Typically, the schemes will be implemented in villages of 150-400 prospective users and approximate demand of 250-500kVA. The hybrid generation system will be implemented by an Independent Power Producer (IPP) with a Power Purchase Agreement (PPA) with KPLC. The construction of the distribution infrastructure will be implemented by REA.

Component D: Technical Assistance and Capacity Building

This component will finance consultancy services, feasibility studies for new investments, training actions and other activities.

Environmental and Social Requirements

In order to reduce, minimise and mitigate adverse impacts and undue harm of its development projects to the environment, all bank-financed projects are guided by environmental and social policies and procedures commonly referred to as safeguards instruments.

The KEMP Project may trigger the following environmental and social safeguard policies[1] of the World Bank. Safeguard OP 4.01, Environmental Assessment; OP 4.04, Natural Habitats; OP 4.11, Physical Cultural Resources; OP 4.10, Indigenous People, and OP 4.12, Involuntary Resettlement. The following safeguard policy instruments have been prepared and publicly disclosed for the different sub-components.

Safeguards Documents

KEMP Project Component	Policy Instrument
A1. Upgrade of the Supervisory Control and Data Acquisition/Energy Management System (SCADA/EMS). A2. Distribution system enhanced flexibility.	Environmental and Social Management Plan (ESMP)
C1. Peri-urban electrification	Environmental and Social Management Framework (ESMF) Resettlement Policy Framework (RPF)
C2: Off-grid electrification	Environmental and Social Management Framework (ESMF) Resettlement Policy Framework (RPF) Vulnerable and Marginalized Framework (VMGF)

Sub- component C2 Off grid electrification has triggered the following policies.

1. OP 4.01(Environmental Assessment),
2. OP 4.10 (Indigenous Peoples),
3. OP 4.12 (Involuntary Resettlement),
4. OP. 4.04 (Natural Habitats),
5. OP. 4.11 (Physical Cultural Resources).

Objective of ESMF for Component C2 Off-Grid Electrification

To address the adverse environmental impacts that may arise as a result of this project, specifically sub component C2 as described above, an Environmental and Social Management Framework has been recommended as fulfilment of the World Bank's requirement because the specific locations and scope of as well as potential environmental and social impacts are not known at this time for subprojects.

[1]The World Bank Safeguard Operational Policies (OPs) are OP4.01 – Environmental Assessment; OP4.04 – Natural Habitats; OP4.09 – Pest Management; OP4.10 Indigenous Peoples; OP4.11 – Physical Cultural Resources; OP4.12 – Involuntary Resettlement; OP4.36 – Forests; OP4.37 Safety of Dams; OP7.50 – Projects on International Waterways; and OP7.60 – Projects in Disputed Areas. See www.worldbank.org/safeguards for more information.

The purpose of this ESMF is to provide a procedure for environmental and social assessment of the above-mentioned Off-Grid Electrification Component of the KEMP project. This framework approach was selected because even though the general scope and footprint of the project is known, the precise sites of the investments are not yet definitively identified i.e. 6 general locations (geographic areas) have been proposed that will need to be confirmed and if confirmed the specific site selection for the physical infrastructure in these locations would afterwards be finalized. The ESMF will guide REA in determining the appropriate level of environmental and social assessment required for the sub-projects and in preparing the necessary environmental and social mitigation measures for these sub-projects, using a standardized ESMP, during the preconstruction, construction and operational phases.

This ESMF clarifies environmental and social impacts/enhancements, mitigation measures to be undertaken and the institutional responsibilities for (1) implementing the sub projects(2) mitigation measures (3) monitoring the mitigation measures (4) capacity building to ensure the aforementioned responsibilities will be carried out effectively.

This ESMF has been prepared in line with the relevant Bank safeguard policies on social and environmental management and has further taken into account Government of Kenya policies, legal and institutional framework related to environmental and social assessment. The process of preparing this ESMF entailed detailed desktop literature review coupled with consultation and engagement of appropriate stakeholders.

Methodology

Several methods were involved in the preparation of this ESMF to meet Government of Kenya requirements and World Bank Operational Policies for environmental safeguards.

- **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.

Policy, Legal and Institutional Issues

All investments under the KEMP must be consistent with the applicable laws, regulations, and notifications of the GoK that are relevant in the context of the proposed interventions/activities. The REA and the concerned line departments/agencies will ensure that the KEMP investments proposed and executed under KEMP are consistent with the regulatory and/or legal framework, whether national or county. Additionally, it is also to be ensured that activities are consistent with the World Bank's operational policies and guidelines. This section is not a legal opinion on the applicability ofthe law but serves as guidance in the application of the various laws and regulations to the current project context.

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 (EMCA) is the key instrument covering environmental management in all development sectors. 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/BP 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 as proposed in the standardized Environmental Management Plan, or (as determined by the screening process) may not require any environmental management, apart from the normal safety measures.

The following legal instruments among others were reviewed and they are some of the Government of Kenya's legislations that apply to this project as well as the World Bank safeguards policies.

- *Environmental Management and Coordination Act*
- *E-Waste Regulations for Kenya-Draft*
- *Constitution of Kenya*
- *Health Act*
- *Forest Act*
- *Occupational Health and Safety Act*
- *Wildlife Conservation Act*
- *Water Act*
- *Land Act*
- *World Bank safeguards policies (in particular OP 4.01- Environmental Assessment)*
- *Environmental Impact Assessment and Audit Regulations, 2003*
- *The Environmental Management Coordination (Waste Management) Regulations): Legal Notice 121*
- *Energy Act*

Environmental and Social Impacts

Beneficial Impacts

Component C2 (off-grid electrification) will finance green-field mini-grid investments in 6 locations to which the national grid will not be extended in the next decade or so.

Environmental and economic benefits of adding renewable energy to the national electrical grid can include: (i) Generating energy that produces no greenhouse gas emissions from fossil fuels and reduces air pollution typically generated by fossil fuels; (ii) Diversifying energy supply and reducing dependence on imported fuels; reduction in

the overall cost of energy produced; (iii) Reducing deforestation through lessening reliance on firewood: (iv) Creating economic development and jobs in manufacturing, installation, and more.

Other positive impacts of off-grid electrification include:

- *Employment and wealth creation*
- *Local Material Supplies*
- *Up Scaling Electricity Access to the Poor*
- *Social Inclusion*
- *HIV/AIDS education and awareness*
- *Health benefit of the project*
- *Benefits to education*
- *Improved standard of living*
- *Increase in Revenues*
- *Improved Security*
- *Improved Communications*
- *Gender Considerations*

Potential Adverse Impacts of Sub Component C2

- *Impact on natural vegetation and biodiversity(although extensive tree cutting will not be necessary. Any tree cutting will be kept to a minimum, and avoided wherever possible)*
- *Impacts on air quality from vehicle exhaust emissions*
- *Risk of sparks/fire from live conductors*
- *Solid waste*
- *Land Acquisition/displacement*
- *Electric shocks and electrocution of people*
- *Occupation safety and health hazards*
- *Public health risk*
- *Construction material sourcing-wooden poles*
- *Oil Leaks from transformers*
- *Noise during construction*
- *Contamination from CCA & creosote-treated poles*

Mitigation Measures for Environmental and Social Impacts

After environmental and social screening, mitigation measures will be identified for each adverse impact identified during the screening process–with a particular focus on the, disposal of obsolete batteries for photovoltaic systems, Occupational (and Public) Health and Safety issues, minimizing impacts on avifauna (particularly during nesting periods), minimization of vegetation loss along LV lines, and safe disposal of PCB andcreosote and CCA-treated poles. Any trees cut along the lines or at the generation sites will be replaced.

The exact sub-project sites are not yet definitively selected. Once they are confirmed Environmental Impact Assessments (EIAs) and or Environmental Management Plans (EMPs) will be prepared as required by NEMA and World Bank guidelines. The contractor will implement the mitigation measures and REA-PIU, NEMA and the Bank will undertake monitoring.Given the relatively remote location of the sub-projects, it is particularly important to ensure that project site selection avoids insofar as possible areas

of high biodiversity value, and if unavoidable, to ensure that all necessary measures are taken to minimize disturbance to local flora, fauna, and avifauna. The sub-project ESIAs will provide project-specific baseline data on the physical, biological, and socio-economic conditions of the specific project sites and will delineate project-specific impacts, and mitigation measures.

Thus, the sub-project ESIAs (detailed in the Terms of Reference in Annex 6) will : (i) describe the potential adverse environmental and social impacts of future projects; (ii) outline proposed mitigation measures to be adopted and indicate parties responsible for implementing mitigation measures; (iii) identify parties that will carry out the monitoring of the implementation of the mitigation measures; (iv) outline the time horizons for the various activities; and (v) detail the associated costs and sources of funds.

Capacity Building and Training

REA will be responsible for implementing component C2. REA has an environmental specialist in its PIU.REA's capacity to implement Component C2 will be strengthened through deployment of existing specialized REA staff to the existing PIU of the IDA financed KEEP. These will include an additional social specialist.Training in World Bank safeguard policies will be provided to these specialists.

Public Consultations

Public Consultations were held on 6th and 12th January 2015 during disclosure of the draft ESMF to the Public and relevant stakeholders. The Forums were attended by participants and stakeholders across the country representing different institutions, government agencies, NGOs, indigenous people organizations, the private sector, the Office of the President, contractors, county governments, and investors and other players in the energy sector, among others. A comprehensive list of the participants is included in the minutes of the Stakeholder Forum consultations appended to this report.

The two forums began with an introduction and description of the KEMP Project, and an explanation of the reporting and management requirements with regard to social and environmental issues. This was followed by specific presentations on the environmental and social safeguard documents under the Project, including an explanation of the grievance redress mechanism. It was emphasised that more consultations will be held with communities that are proposed as targeted beneficiaries, during the sub-project selection process.

As per World Bank 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 projects affecting indigenous peoples. The consultations were done with reference to the updated Integrated Environmental and Social Impact Assessment (IESIA) stipulated guidelines and procedures of KPLC 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. The deliberations of the consultations in detail are found in the Chapter on Public Consultations and minutes for the stakeholder forum appended at the end of this report.

Project Implementation

The Ministry of Energy and Petroleum (MoEP) will be responsible for overall coordination and oversight of the project, including (i) definition of areas to be electrified based on technical and policy development priorities; (ii) consolidating information from implementing agencies; (iii) monitoring the implementation of project; and (iv) evaluating the project. The MoEP will hire, on a competitive basis, a Project Coordinator to consolidate the information prepared by the implementing agencies and will report to the Principal Secretary, MoEP

The Rural Electrification Authority an agency of government under the MOEP will implement Component C2 of the project. Its mandate under the draft Energy bill is to be expanded to include promotion and development of renewable energy resources (excluding large scale). The REA will be supported by a Technical Advisory Service (Consultant) for implementation of component C2 of the project.

Project Implementation Unit (PIU) in REA

REA will strengthen its capacity to implement Component C2 through deployment of existing specialized REA staff to the existing PIU of the IDA financed KEEP. These will include the following additional staff a legal specialist, procurement specialist, environment specialist& social specialist and a renewable energy engineer. The unit will be supported by a Transaction Adviser (consultant firm) that will provide all the specialized expertise in the areas of structured finance, design of competitive processes for selection of private entities in public private partnership arrangements, contract negotiations with private parties, project supervision, etc.

Monitoring and Evaluation

A Monitoring & Evaluation (M&E) system is planned and will be established for the project, and safeguard compliance will be integral part of the project M&E. Both an internal and periodic external monitoring is proposed to ensure ESMF implementation. Internal monitoring will be carried out by the proposed site Management Office regularly and periodically by REA PIU, focusing on outcomes, outputs and implementation progress for each KEMP proposed sites and components. The proposed site management office will submit to central PIU office and World Bank regular bimonthly (once in two months) reports during implementation. Similarly, independent consultant or agency using quantitative and qualitative methods and review of information and site visit will carry out periodic external monitoring. The ESMF evaluation will be mid-term and end term and both have to be third party evaluation.

ESMF Implementation Budget

The ESMF implementation budget refers to all costs that will be incurred to implement the requirements or recommendations of the ESMF. The ESMF requirements ensure that Project implementation integrates environmental and social issues for the sustainability of the project as well as the sub-projects. Among other things the ESMF recommends the following key issues, namely; training, capacity building, screening, reviewing and monitoring mechanisms. The total cost for training and implementation of the ESMF is estimated at approximately USD **75,000.**Actual costs will be determined during the implementation phase, when the specific number of people required for training will be identified and the level of technical assistance required**.**

2 INTRODUCTION

2.1 Background and Context

The energy sector plays a critical role in the socio-economic development of a country. Kenya is committed to universal access to modern forms of energy by year 2030, as articulated in the national economic development blueprint, the Vision 2030 (the Vision). The goal of the Vision is to make Kenya a middle-income country enjoying a high quality of life by the year 2030.[2] The objectives of the Vision have been adopted as GoK's national development objectives. Under this Vision, Kenya expects to achieve an economic growth rate of 10 % and above.

Energy is identified as a critical enabler of this vision. Currently, only 35% of the households have electricity access from the national grid or mini-grids. The electrification rate is planned to be increased to 70 % by 2020 and 100 % by 2030. To attain these goals, policy and regulatory frameworks have been articulated for the energy sector through energy policy (Sessional Paper No.4 of 2004) and the Energy Act of 2006. A draft Energy Bill 2013 and a draft Energy Policy are under consideration.

Currently, the energy policy and the Act are being reviewed to align them with the Vision, the new Constitution of Kenya (2010) and global trends. The energy policy under review aims to set out the national policies and strategies for the energy sector that are aligned to the new Constitution and in tandem with the Vision.

The government has strategies to accelerate access to modern energy services through public and private initiatives. The government, with support from development partners, has allocated substantial resources for development of energy infrastructure including exploitation of renewable energy resources. This effort provides opportunities for collaboration with private sector in renewable energy development and national electrification.

During the last decade, Kenya has emerged as one of the growing number of success stories in Africa. Kenya has the largest economy in East Africa. Gross Domestic Product (GDP) is projected to grow 4.7 percent a year in 2014 and 2015. Kenya's poverty level is estimated to have declined from 47 percent in 2005, to between 34 to 42 percent in 2013. The population in Kenya doubled over the last 25 years and by 2040, Kenya – with a predicted 75 million people; and a strong emerging middle class – is expected to become the 21st largest economy in the world. Kenya's economy is more diversified than most countries in Sub-Saharan Africa. About 55 percent of Kenya's GDP comes from services, transport, finance, tourism, information and communications technology (ICT) and trade – sectors that critically depend upon reliable power supply. With relatively low levels of debt, a stable exchange rate, and declining inflation, Kenya is able to run higher fiscal deficits to maintain its public investment program, especially in infrastructure.

[2]See http://www.vision2030.go.ke/

***Vision 2030,* Kenya's long-term development strategy, expanded infrastructure access as a key element in achieving higher levels of economic growth.** *Vision 2030* targets an average annual economic growth rate of 10 percent between 2013 and 2030. This significantly higher economic growth will require modern, efficient infrastructure facilities to expand the productive sectors of the economy and improve access to markets. The upgrade of the infrastructure platform calls for rehabilitating the road network, upgrading the railways, improving urban public transport, and expanding access to electricity and safe water. In an effort to improve equity of opportunity, the overall program gives a special emphasis to expanding the access of the rural and urban poor to basic services such as electricity, water, and sanitation.

Kenya's dynamic private sector faces serious infrastructure constraints. Electricity supply and transport need to be improved if Kenya is to maximize its potential for private sector-led growth. Kenya's vibrant private sector is a major source of economic growth, driven by expanding services in telecommunications and transport. Kenya benefits from its geographical location that is favourable to trade, with the port of Mombasa serving as the most important gateway for imports to the East African Community (EAC) countries, South Sudan and eastern DRC. Considering that affordable and reliable electricity supply is an essential underpinning of Kenya's competitiveness, investment in the T&D infrastructure, along with efficiency in operations and maintenance, remain critical for the country.

Higher levels of electricity service reliability and quality are necessary for stronger economic growth and increased competitiveness. Currently, poor quality and reliability of service imposes high costs on business (including the capital cost of self-generation and loss of production). Enterprises experience frequent electricity service interruption and many have self-power generation on their premises in order to meet their electricity needs. Approximately 35 percent of the population has access to electricity. Accelerating the pace of electrification in line with the government's target of 70 percent electrification by 2017 can contribute to eliminating extreme poverty and achieving shared prosperity.

The Kenya Electricity Modernization Project – to be financed by the World Bank Group through the International Development Association (IDA) - aims to support the Government's initiatives of ensuring increased electricity access to Kenyans, particularly among the low-income groups and those in Off-Grid areas.

2.2 Objectives and Rationale for the ESMF

The objective of this ESMF is to ensure that the implementation of the Kenya Electricity Modernization Program Off Grid component, for which the exact locations of the sub-project sites are not definitively identified at this stage (MoEP has proposed a number of locations), 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 and environmental management procedure 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 Environmental and Social Management Framework 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.

The ESMF seeks to:

- Ensure that all projects are screened for potential adverse environmental and social impacts and that appropriate mitigation and monitoring measures, including cost estimates, are identified and implemented by qualified personnel at the local and national levels;
- Support and empower REA 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.
- Establish clear procedures and methodologies for screening, reviewing and managing environmental and social safeguards for the components to be financed under the KEMP.
- Consolidate and facilitate understanding of all essential policies and regulations of the GoK as well as the World Bank's environmental and social safeguards regime that are applicable to the Project
- Provide practical guidance on the implementation of the environmental and social management measures.
- Specify norms and procedures for the conservation and restoration of historic and archeological objects for dealing with chance finds during works.
- Specify institutional arrangements, including appropriate roles and responsibilities for managing, reporting and monitoring environmental and social concerns of the KEMP component investments.
- Provide a framework for consultation and information disclosure.
- Determine the other institutional requirements, including those related to training and capacity building, needed to successfully implement the provisions of the ESMF.

The application and implementation of the ESMF therefore, will:

- Support the integration of environmental aspects into the decision making process at all stages related to planning, design, execution, operation and maintenance of KEMP investments, by identifying, avoiding and/or minimizing adverse environmental impacts early-on in the project cycle.
- Minimize environmental degradation to the extent possible resulting from either directly KEMP component activities or through indirect, induced and cumulative effects of project activities.
- Enhance the positive/sustainable environmental and social outcomes through improved/appropriate planning, design and implementation of sub-activities of the project components.

- Consider the level of environmental and social risk of each type of KEMP component activates in allocating time and resources to be dedicated for stakeholder consultation.
- Build the capacity of REA to take-up and coordinate responsibilities related to the application and implementation of the ESMF, including the preparation of the KEMP Component specific Environmental Assessment and Management Plans (if required).
- Provide guidelines and procedures for further consultations during project implementation, in particular in defining and designing KEMP component specific works.
- Provide a systematic guidance to address potential risks and to enhance quality, targeting, and benefits to the surrounding communities.
- Ensure that those stakeholders, irrespective of whether they benefit from or are adversely affected by the project interventions, are well informed and are able participate in the decision-making process.
- Support compliance with applicable legal/regulatory requirements of GoK as well as with the requirements set forth in the relevant Bank policies.
- Protect human health.
- Minimize adverse impacts on cultural property.

2.3 Project Description

2.3.1 Objectives of the Project

The proposed project development objectives (PDOs) of KEMP are: (a) to increase access to electricity; (b) to improve reliability of electricity service; and (c) to restore KPLC's financial sustainability.

2.3.2 Project Components:

Component A- Improvement in Service Delivery and Reliability
The objective of this sub-component is to enhance flexibility in operations and allow a more efficient management of the distribution network.
Sub- Component A-2-Distribution system enhanced flexibility.
Sub-component A-3-Enhance maintenance practices to improve the quality in electricity supply.

Component B: Revenue Protection Program
The main objective of the RPP is to permanently protect KPLC's revenues from sales to the segment of large and medium customers, ensuring that all users in that "high value" segment are systematically billed according to their accurately metered full consumption.

Component C: Electrification Program
This component will support the government's objective of 70 percent household connectivity by 2017 by providing financing for the connection of new households in a

more cost-effective manner. Payment of a connection fee will not be a pre-requisite for households to be connected. However, households may be required to contribute to the national electrification program in return for a connection as it is government policy. The amount of this contribution will however be based on household affordability so that no household remains unconnected due to inability to pay the contribution (during appraisal, the specific principles will be assessed and agreed with KPLC and the regulator).
Sub-component C1-Peri-urban electrification.
Sub-component C2–Off-Grid electrification

This sub-component will be implemented by REA and will support the implementation of off-grid electrification solutions in areas whose connection to the national grid is financially not viable in the short and medium term. Electrification of those areas will be implemented through mini-grids supplied preferably by hybrid generation systems, combining renewable resources (solar or wind) and thermal units running on diesel. This sub-component will use a PPP approach. The selection of project areas is based on the number of potential users and their demand, supported by an ongoing market sounding, a demand survey and pre-feasibility studies being carried out by REA. Typically, the schemes will be implemented in villages of 150-400 prospective users and approximate demand of 250-500kVA. The hybrid generation system will be implemented by an Independent Power Producer (IPP) with a Purchase Power Agreement (PPA) with KPLC. The construction of the distribution infrastructure will be implemented by REA.

Component D: Technical Assistance and Capacity Building
This component will finance consultancy services, feasibility studies for new investments, training actions and other activities to support, among others:

(i) *Preparation of the National Electrification Strategy (NES).*

(ii) *Detailed national technical specifications and standardization.*

(iii) *Regulations for enforcing quality on electricity service delivery.*

(iv) *Project preparation support and feasibility studies for new investment projects as required.*

2.3.3 Project Beneficiaries

Component C2 (off-grid electrification) will finance green-field mini-grid investments in six locations that will not be electrified by the national grid in the short and medium term. Electrification of these locations will be through mini-grids, combining renewable resources (solar or wind) and thermal units. This sub-component will pilot Public-Private-Partnership (PPP) arrangements.

An Independent Power Producer (IPP) with a Purchase Power Agreement (PPA) with KPLC will implement the hybrid generation system. The IPP will invest in the fuel-based generation component and SREP and IDA funding will finance the supply and installation of the renewable generation facilities and the mini-grid distribution network. The construction of the distribution infrastructure will be implemented by REA and new

users will become KPLC's customers. To ensure sustainability of provision of electricity services to users connected to the mini-grid, a contract between KPLC and a local company providing operation (network and commercial) and maintenance services will be signed. The selection of project areas will be based on the number of potential users and their demand.

2.4 Project Institutional and Implementation Arrangements

The Ministry of Energy and Petroleum will be responsible for overall coordination and oversight of the project, including (i) definition of areas to be electrified based on technical and policy development priorities; (ii) consolidating information from implementing agencies; (iii) monitoring the implementation of project; and (iv) evaluating the project. The MoEP will hire, on a competitive basis, a Project Coordinator to consolidate the information prepared by the implementing agencies and will report to the Principal Secretary, MoEP.

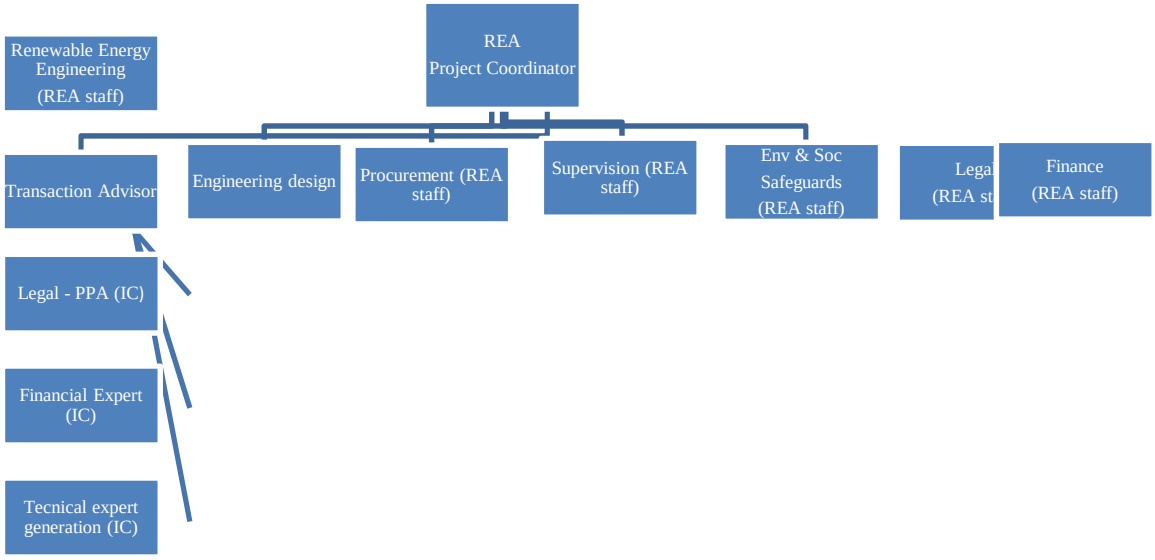
2.4.1 Rural Electrification Authority

An agency of government under the MoEP will implement Component C2 of the project. Its mandate under the daft Energy bill is to be expanded to include promotion and development of renewable energy resources (excluding large scale). The REA will be supported by a Technical Advisory Service (Consultant) for implementation of component C2 of the project. REA will prepare the needed safeguards instrument, in this case the EIA/EMP, in accordance to the ESMF. REA will screen proposed sub projects to determine their viability and feasibility. Once a sub project is proposed for funding, REA will prepare a TORs for the EIA/EMP consultant.

Project Implementation Unit (PIU) in REA

REA will strengthen its capacity to implement Component C2 through deployment of existing specialized REA staff to the existing PIU of the IDA financed KEEP. These will include the following additional staff (a legal specialist, procurement specialist, environment & social specialist and renewable energy engineer). The unit will be supported by a transaction adviser (consultant firm) that will provide all the specialized expertise in the areas of structured finance, design of competitive processes for selection of private entities in public private partnership arrangements, contract negotiations with private parties, project supervision, etc.

Figure 1 REA Project Implementation for Off-Grid Component of KEMP



2.5 Way-leave Acquisition and Compensation for Low Voltage lines

As already noted the project will involve connection of power to end users i.e. to low-income households Off-Grid areas. The low voltage lines to connect the households will be mainly constructed along the road reserve and these 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.
While the project does not expect any resettlement, there may be need, nevertheless, 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 consult 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 if any exists, will be undertaken with, minimal disturbance wherever possible to pave way for the line. The wayleaves officer will pay the tree owners as stipulated by the law and RPF prepared for the project as per OP 4.12 and records will be kept.
- Once construction is done, the construction engineer does a memo to the way leave officer to visit the site and assess the impact, if any damage to property has taken place.
- In such a case, 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 cost of 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, wayleave 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.

3 METHODOLOGY AND CONSULTATION

3.1 Detailed & In-depth Literature Review

A thorough review of the project appraisal documents was undertaken, 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 KEMP project. The World Bank Operational Safeguard Policies were reviewed to identify the likely policies to be triggered by subprojects.

Bearing in mind that KEMP subproject sites were unknown at the time of the preparation of this ESMF, the literature review further encompassed the overview of Kenya's physiographic and climatic issues, the state of the general environment and population and population dynamics throughout the country. 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 Kenya's legal framework and policies related to electronic wastes 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 familiarise and further understand the project included:

World Bank Related Documents

- *Aide Memoires*
- *World Bank Safeguards Policies*
- *Project Concept Note*
- *Project Appraisal Document*
- *World Bank Group Environmental, Health, and Safety Guidelines (known as the "EHS Guidelines"). http://www.ifc.org/ifcext/sustainability.nsf/Content/EHSGuidelines*
- *IFC Performance Standards*

Kenya's Legislative Documents

- *Environmental Management and Coordination Act*
- *E-Waste Management Regulations for Kenya -Draft*
- *Constitution of Government of Kenya*
- *Energy Act*
- *Energy Regulatory Authority Act*
- *Environmental Impact Assessment and Audit Regulations, 2003*
- *The Environmental Management Coordination (Waste Management) Regulations): Legal Notice 121*
- *Land Act*
- *Wayleave Act*
- *Public Health Act*
- *Wildlife Act 2006*
- *Forest Act 2005*
- *Water Act*

3.2 Public Consultation and Discussions

Public consultation and discussions were done on 6th and 12th January 2015.The Forums were attended by participants and stakeholders across the country representing different institutions, government agencies, NGOs, indigenous people's organizations , the private sector, the Office of the President, contractors, county governments, and investors and other players in the energy sector, among others. A comprehensive list of the participants is included in the minutes of the Stakeholder Forum consultations appended to this report.

The Forums began with an introduction and description of the KEMP Project, and an explanation of the reporting and management requirements with regard to social and environmental issues. This was followed by specific presentations on the environmental and social safeguard documents under the project, including an explanation of the grievance redress mechanism. It was emphasised that more consultations will be held with communities that are proposed as targeted beneficiaries, during the sub-project selection process.

3.3 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;*
- *Identification of environmental and social mitigation measures;*
- *Formulation of environmental and social monitoring plans.*

4 BASELINE DATA

This section describes the overall baseline condition of Kenya in terms of biophysical environment, as well as the socio-economic.

4.1 Location and Size

Kenya (***Figure 1***) is located in the eastern part of the African continent approximately between latitudes $4^0$21' N and 4^o 28' S and between longitudes 34^o and 42^o 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 strip, the Rift Valley, the Highlands and the Lake Victoria Basin.

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 22^{nd} in terms of its size (Source: Survey of Kenya 2003)

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 thorn bush-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.

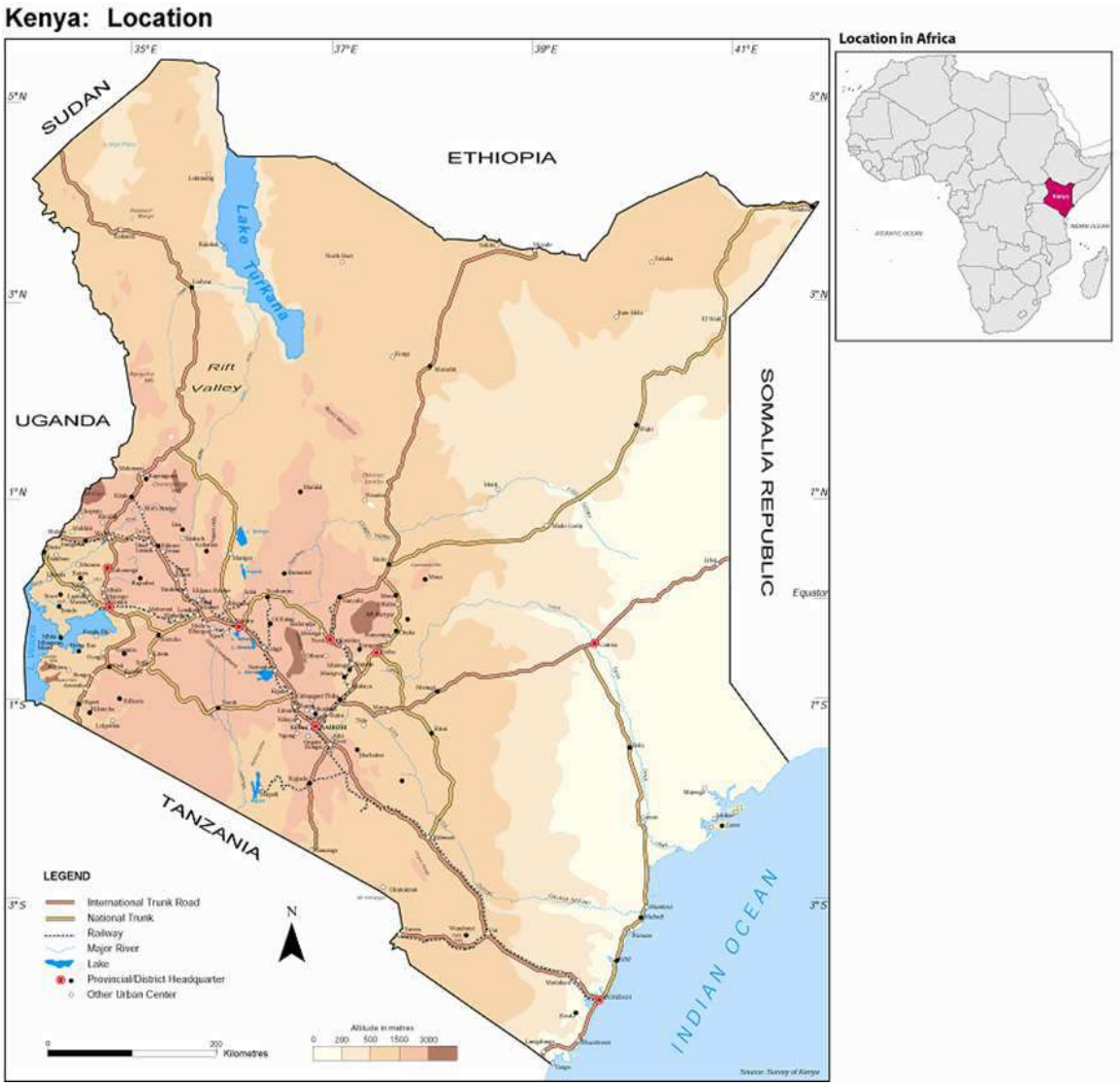


Figure 2: Map of Kenya

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.

4.3 Topography and Drainage

The Republic of Kenya has an area of approximately 582,646 sq. km. comprising of 97.8% 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.

Kenya's total land surface comprises of 13,396 km^2 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 km^2 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.

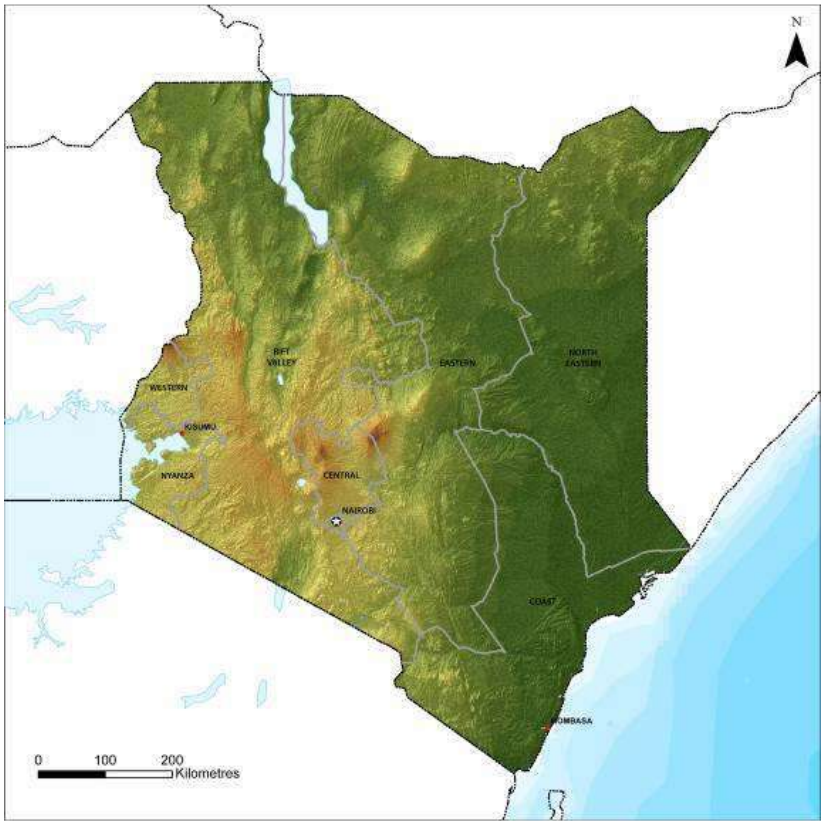


Figure 3: Topography and Drainage of Kenya

Kenya's relief can be roughly divided into six major regions: the lowlands of the coastal belt and plains; the Buruma Wajir 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(Survey of Kenya2003).

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 sloped areas. On groundwater, the country is divided into three broad areas. These are volcanic rocks, Precambrian metamorphic basement rocks and Precambrian intrusive rocks and sedimentary rocks. The volcanic rocks cover 26% of the country, more commonly in the western half of Kenya. 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. 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.

4.3.1 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. The rivers draining into Lake Victoria (covering over 8 per cent of Kenya's land area) provide about65 per cent of Kenya's internal renewable surface water supply. The Athi River drainage area (11per 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).

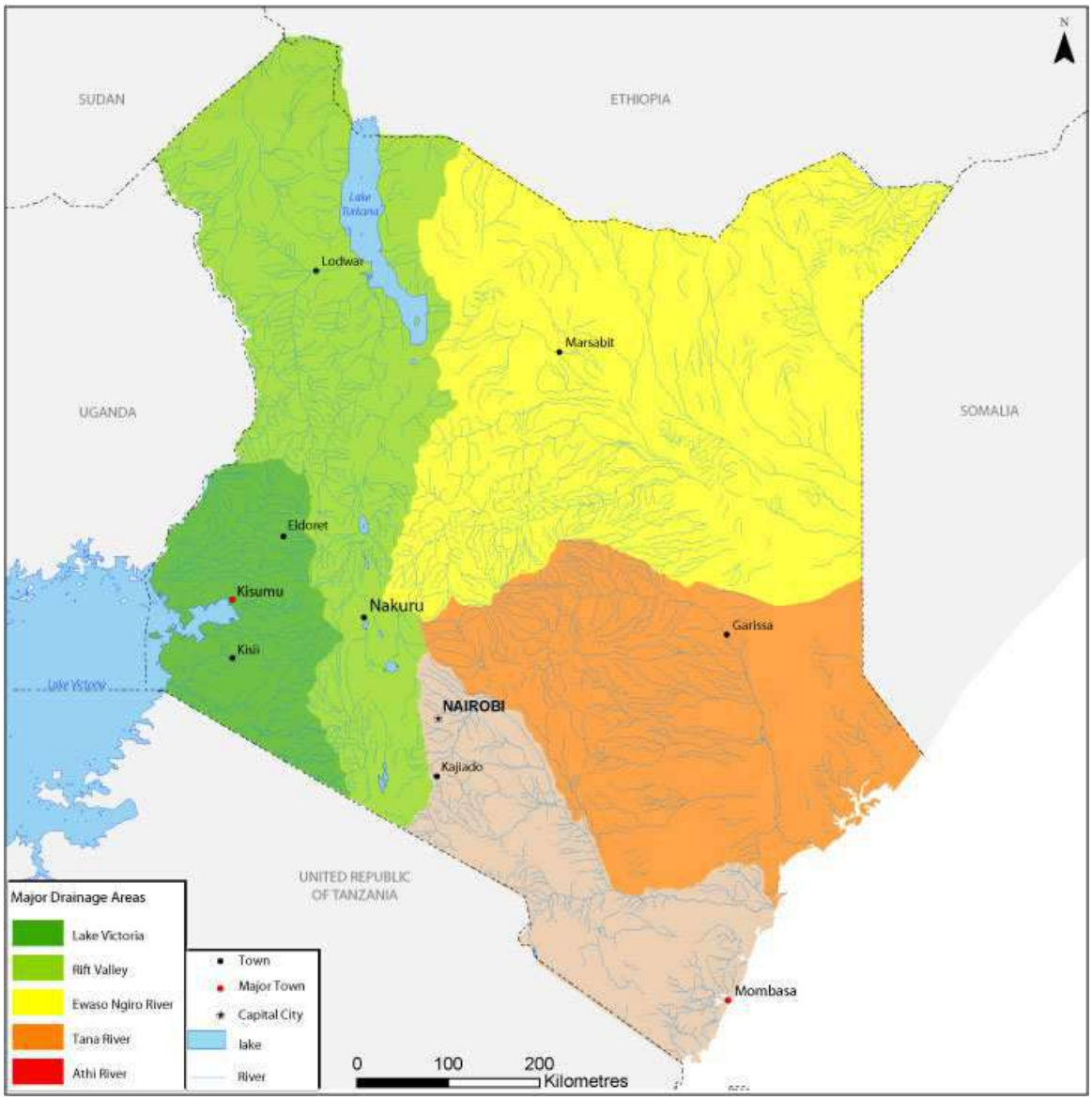


Figure 4: hydrological Map of Kenya

4.3.2 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 semi-arid and so of low crop growing potential (Survey of Kenya 2003). Dry lands, however, provide essential habitat for about half the country's livestock and 70 per cent of Kenya's wildlife (UNCCD 2002).

4.4 Biological Environment

Kenya's land is covered by different types of vegetation according to the climate, topography, and other 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).

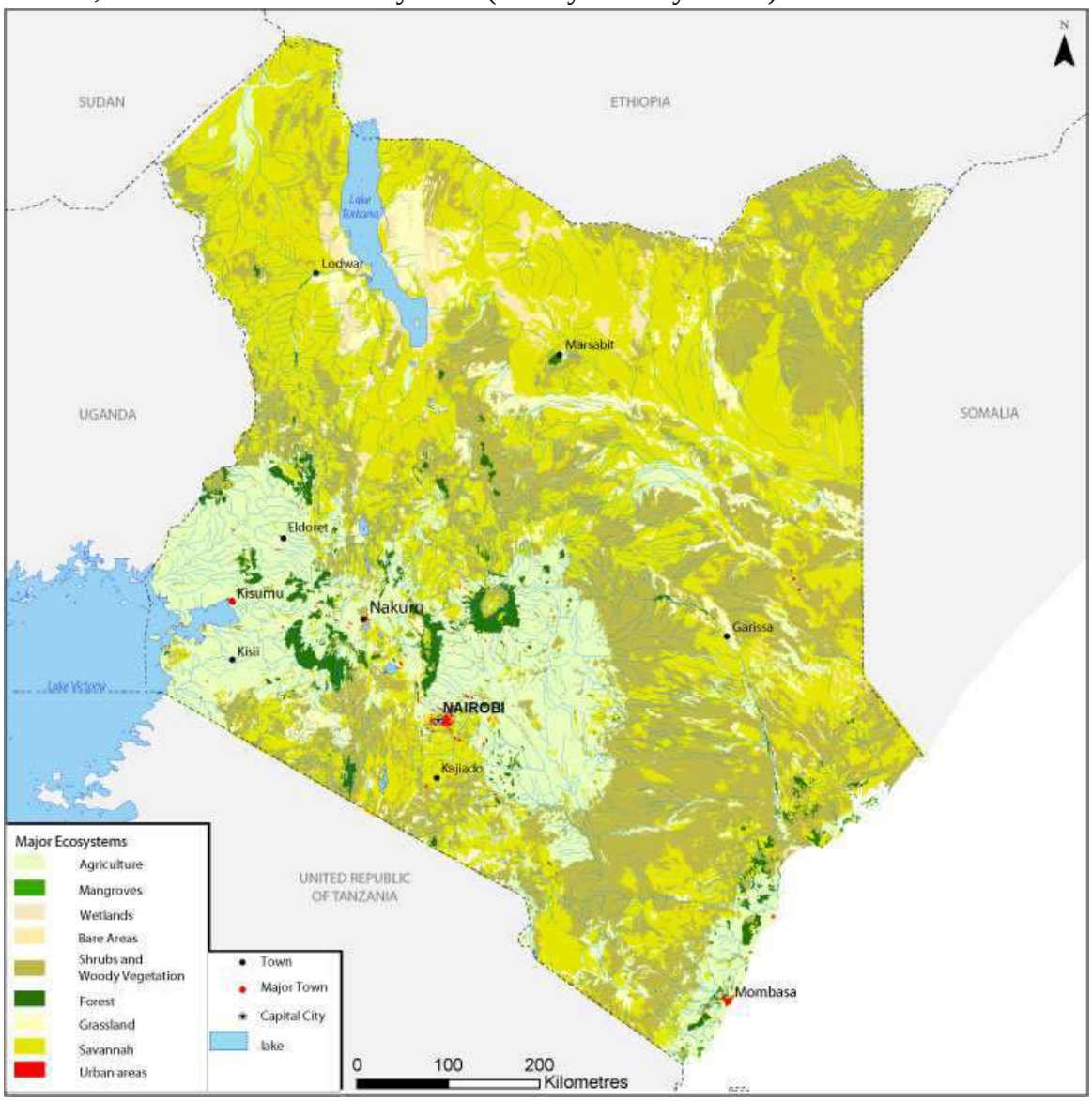


Figure 5: Major Ecosystems in Kenya

4.4.1 Forests and Woodlands

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, fibers, 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's butterflies. About half of Kenya's threatened mammals and birds are found in its forests (Survey of Kenya 2003).

4.4.2 Freshwaters and Wetlands

Kenya's wetlands occur in both fresh and salt waters. They include coral reefs, mangroves, deltas, creeks, lakeshores, 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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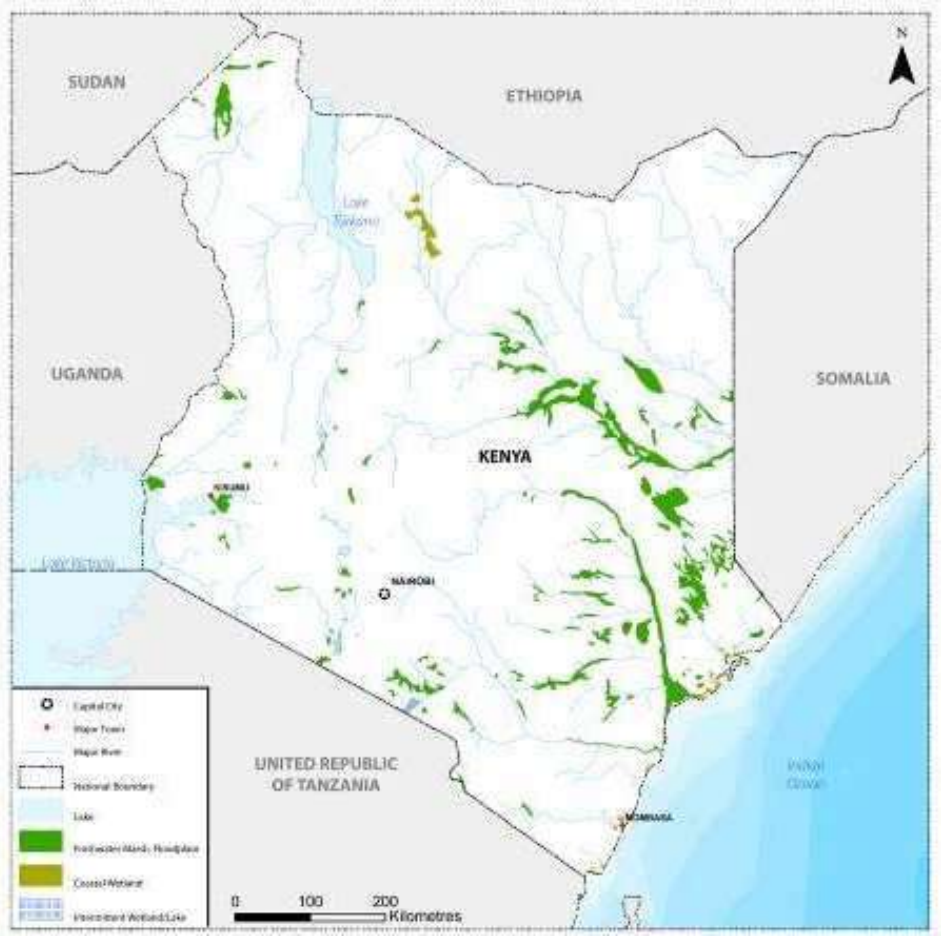

Figure 6: Kenya's Largest Wetlands

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).

4.4.3 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.kmand 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.

4.4.4 Wildlife

Kenya's game parks and spectacular wildlife attract nearly two million tourists each year (UNWater2006)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).

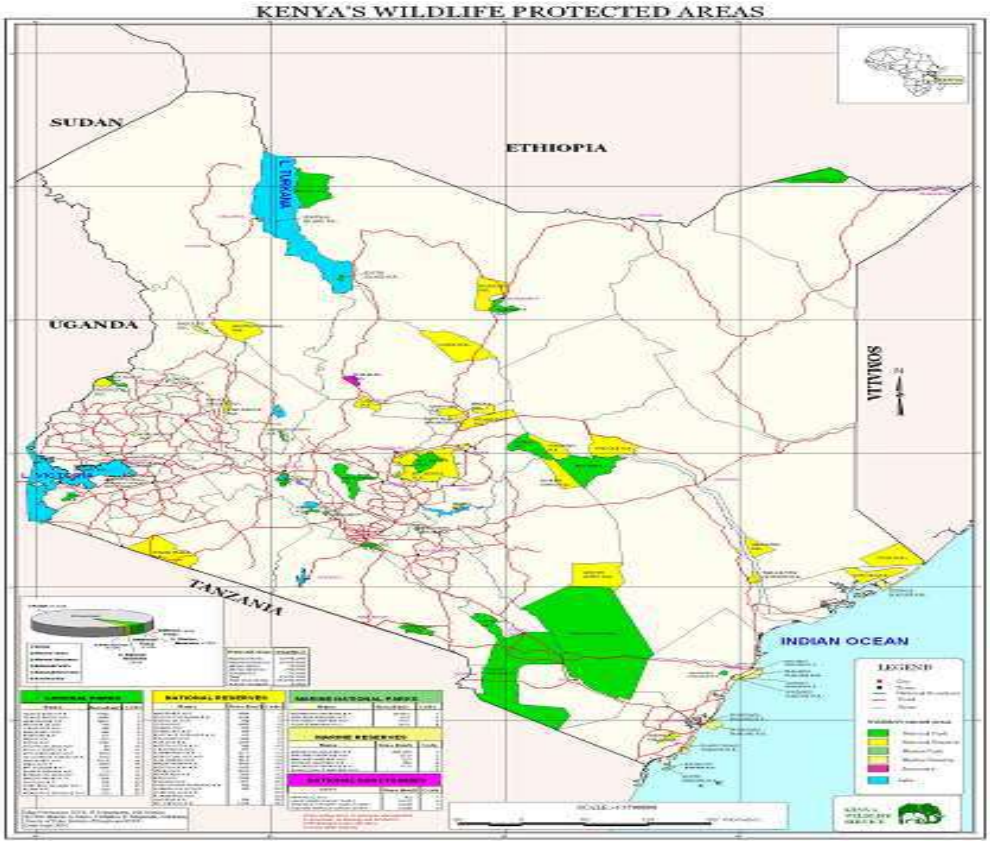

Figure 7: Protected Areas in Kenya

Examples of endangered species include theSokokescops owl (*Otusireneae);* Taita blue-banded papilio *(Papiliodesmonditeita);* the highly endangeredTana River*mangabey (Cercocebusgaleritus)* and the Tana River red colobus *(Piliocolobusrufomitratus);* the green sea turtle *(Cheloniamydas)* and the critically *endangered hawksbill turtle (Eretmochelysimbricata).*

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.

4.5 Socio-Economic Background

4.5.1 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.

4.5.2 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 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.

5 DESCRIPTION OF THE ADMINISTRATIVE, POLICY AND REGULATORY FRAMEWORK

5.1 The Legal, Regulatory and Policy Framework

5.1.1 Constitution of Kenya

Kenya 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-*

- *Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;*
- *Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;*
- *Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;*
- *Encourage public participation in the management, protection and conservation of the environment;*
- *Protect genetic resources and biological diversity;*
- *Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;*
- *Eliminate processes and activities that are likely to endanger the environment; and*
- *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 Article69; 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.

5.1.2 Environmental Management and Coordination Act, 1999

The Environmental Management and Coordination Act of 1999 (EMCA) is an act of Parliament that provides for the establishment of an appropriate legal and institutional framework for the management of the environment. The act allows the cabinet secretary in

charge of environment to gazette standards, regulations and guidelines for the proper management, conservation and protection of the environment.

EMCA, 1999 has a general definition of hazardous waste in the Fifth Schedule which describes E-wastes as having five distinct characteristics i.e. explosivity, flammability, oxidizivity, toxicity and corrositivity. The E-waste contains compounds of metals classified as hazardous wastes by virtue of its constituents. Section 5 of the E-waste Management Guidelines requires the E-waste generator to minimize E-waste and eliminate E-waste altogether as well as identifying and eliminating potential negative impacts of the product, enabling the recovery and reuse of the product, reclamation and recycling and incorporating environmental concerns in the design and disposal of a product. Sections 17-23 require the generators of hazardous waste to conduct an EIA and labelled clearly the "hazardous waste". The Designated National Authority uses Basel Convention guidelines and NEMA over sees the entire transport of such materials.

The EMCA has introduced what is in effect is a parallel system for managing hazardous chemicals and hazardous waste. Section 91 provides the characteristics of hazard. The Act provides that hazardous waste and substances and chemicals shall not be imported into Kenya or exported from Kenya or transported through Kenya without a valid permit issued by the authority (NEMA). Where the E-wastes are being exported from Kenya the written consent of the receiving country must also be obtained. This is a requirement under the Basel Convention on the trans boundary movement of hazardous waste, it is a 1989 convention and it imposes a system, which is known as prior informed consent requirement.

The requirement is a requirement that the importing country must give its prior consent before the import is undertaken. The catch is that the consent must be informed and for the consent to be informed the exporting country must disclose the nature of the substance being exported. (Kenya has not ratified the Basel Convention) only 10 African Countries ratified this convention this is because African countries took the view that they will never get informed consent from the developed world and what they give will not be free consent, and even if informed consent is given, it will be too technical they will not understand it. Africans went ahead and signed the Bamako convention, which says that hazardous material cannot be imported into African but they say it can be moved as between the African countries.

Under Section 93 the Act prohibits the discharge of hazardous substances or chemicals into any waters or other segments of the environment. A person who is responsible for the discharge shall pay the cost of removing the substance or chemicals including the cost incurred by the government in restoring the environment which has been damaged.

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

5.1.3 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.

5.1.4 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. The Environmental Management and Co-ordination (Waste Management) Regulations 2006, is the government's legal instrument that deals with waste management in Kenya. Although there is no direct provision for E-waste, the E-waste Management Regulations 2006 apply to electronic waste by virtue of their composition, which includes several of the substances listed as hazardous waste.

5.1.5 The Environmental Management Coordination (Controlled Management) Regulations): Legal Notice 121

The Environment Management and Coordination (Controlled Substances) Regulations 2007, deals with management and control of substances that deplete the Ozone. However, the regulations provide a list of hazardous substances but do not detail how they should be handled in relation to E-waste management.

5.1.6 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.

5.1.7 The Environmental Management Coordination (Noise and Excessive Vibration Pollution Control Waste Regulations): 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.

5.1.8 The Environmental Management Coordination (Convention 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.

5.1.9 The Environmental Management 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.

5.1.10 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.

5.1.11 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.

5.1.12 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 its original conditions.

5.1.13 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.

5.1.14 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:

- The need to protect and manage the environment, and conserve natural resources;
- 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.
- An Environmental Impact Assessment Report (EIA) approved by NEMA must support licensing and authorization to generate and transmit electrical power.

Part IV Section 80(1) provides that a person shall not conduct a business of importation, refining, exportation, wholesale, 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.

5.1.15 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.

5.1.16 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 neighbourhood 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.

5.1.17 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.

5.1.18 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.

5.1.19 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.

Health

The premise must be kept clean; a premise must not be overcrowded. The circulation of fresh air must secure adequate ventilation of workrooms. There must be sufficient and suitable lighting in every part of the premise in which persons are working or passing. There should also be sufficient and suitable sanitary conveniences separate for each sex, must be provided subject to conformity with any standards prescribed by rules. Food and drinks should not be partaken in dangerous places or work-rooms. Provision of suitable protective clothing and appliances including where necessary, suitable gloves, footwear, goggles, gas masks, and head covering, and maintained for the use of workers in any process involving exposure to wet or to any injurious or offensive substances.

Safety

Fencing of premises and dangerous parts of other machinery is mandatory. Training and supervision of inexperienced workers, protection of eyes with goggles or effective screens must be provided in certain specified processes. Floors, passages, gangways, stairs, and ladders must be soundly constructed and properly maintained and handrails must be provided for stairs. Special precaution against gassing is laid down for work in confined spaces where persons are liable to overcome by dangerous fumes. Air receivers and fittings must be of sound construction and properly maintained. Adequate and suitable means for extinguishing fire must be provided in addition to adequate means of escape in case of fire must be provided.

Welfare

An adequate supply of both quantity and quality of wholesome drinking water must be provided. Maintenance of suitable washing facilities, accommodation for clothing not worn during working hours must be provided. Sitting facilities for all female workers whose work is done while standing should be provided to enable them take advantage of any opportunity for resting. Every premise shall be provided with readily accessible means for extinguishing fire and persons trained in the correct use of such means shall be present during all working periods.

Regular individual examination or surveys of health conditions of industrial medicine and hygiene must be performed and the cost will be met by the employer. This will ensure that the examination can take place without any loss of earning for the employees and if possible within normal working hours. The (OSH) Act provides for development and maintenance of an effective program of collection, compilation and analysis of occupational safety. This will ensure that health statistics, which shall cover injuries and illness including disabling during working hours, are adhered. *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.*

5.1.20 Work Injury and Benefits Act, (WIBA) 2007

This Act provides for compensation to employees for work related injuries and disease contracted in the course of their employment and for connected purposes. Key sections of the Act include the obligations of employers; right to compensation; reporting of

accidents; compensation; occupational diseases; medical aid etc. *In case of any accidents or incidents during the project cycle, this Act will guide the course of action to be taken*.

5.1.21 The Traffic Act Cap 403 0f 2009

This Act consolidates the law relating to traffic on all public roads. Key sections include registration and licensing of vehicles; driving licenses; driving and other offences relating to the use of vehicles on roads; regulation of traffic; accidents; offences by drivers other than motor vehicles and other road users. Many types of equipment and fuel shall be transported through the roads to the proposed site. Their registration and licensing will be required to follow the stipulated road regulations. The Act also prohibits encroachment on and damage to roads including land reserved for roads. KPLC will observe the provisions of the Act.

5.1.22 The Civil Aviation Act No. 21 of 2013

The provisions of this Act or any regulations made there under shall, except where expressly or by implication excluded, apply to—

(a) All aircraft whilst in or over any part of Kenya;

(b) All Kenya aircraft and the crew and other persons on board wherever they may be; and

(c) All aerodromes and service providers within aerodromes.

The provisions of this Act shall not, except where expressly included or if the Cabinet Secretary so directs by order published in the Gazette, apply to state aircraft or to any class or classes of state aircraft. All aircraft shall be subject to the requirements of this Act in respect of rules of the air. The proposed Substation upgrade is not going to penetrate the atmosphere beyond 15 meters and is not proximal to any airstrip and this act will not be triggered.

5.1.23 Electronic Waste Management Regulations-Draft

Kenya has prepared guidelines for E-waste management and in 2013 further completed the development of draft E-waste regulations, which are yet to come into force. Further, the environmental Management and Coordination (Waste Management Regulations) regulations 2006, may apply to electronic waste where they can be classified as hazardous waste. In 2013, Kenya completed the development of E-waste regulations, which are still considered draft pending official gazetted before enactment into law. Key highlights of the regulations include among others:

Registration of Producers

The draft regulations require producers intending to introduce new or used electrical and electronic equipment into Kenya apply for registration from NEMA and further states that already existing producers operating in Kenya must register with the Authority within sixty (60) days of the coming into force of this regulation as per sub-regulation (2);

Producers Register Database

The regulations require that NEMA maintain an Electrical and Electronic Equipment producer'sregisterasspecifiedinschedule3whichshallbeopenedtothepublicforinspection.

Annual compliance certificate of Producers
According to the draft regulations, every producer shall obtain an annual compliance certificate upon-

a) Declaring the previous year's weight of electrical and electronic equipment introduced in the market by product type;
b) Production of an evidence note with a licensed treatment facility;
c) Production of a valid contractual agreement with a licensed treatment facility;

Producer Responsibility
The regulations in regard to producer responsibility require that producer declare to the Authority previous year's electrical and electronic equipment products introduced into the market; and provide to NEMA subsequent year's projected imports of any electrical and electronic equipment products.

Further the regulations demand that every producer provide information to recyclers on how to dismantle their product at the end of life and the location of any hazardous substances or items within the product; and that every producer shall, within their relevant product category, support the financing of collection and treatment for problematic fractions by the licensed treatment facility to ensure effective take back and treatment of E-waste.

The draft regulations in terms of electrical and electronic equipment Registry state that a registry shall be established with the aim of keeping a register on the following; tonnage and categories of E-waste collected and processed by licensed treatment facilities; thetotaltonnageandcategoriesofelectricalandelectronicequipmentplacedonthe market by all producers; and status of compliance based on percentage of obligations fulfilled.

Responsibilities of Recyclers
The regulations impose responsibilities to recyclers including the requirement to receive and dismantle E-waste electrical and electronic equipment into hazardous and non-hazardous components in an environmentally sound manner and ensuring that the components, which cannot be recycled locally, are exported as specified in this regulation.

Responsibilities of Generators
The generator shall ensure E-waste is segregated from other forms of waste and is taken to licensed refurbishers' collection centres or recyclers.

Importation of Electrical and Electronic Equipment
The regulations require that electrical and electronic equipment imported into the country shall bear a label indicating the year and country of manufacture and restricts the importation of electrical and electronic equipment containing Cathode Ray Tubes into the country except for essential services such as medical equipment.

Prohibitions

The regulations have several prohibitions, which include prohibition against disposal of E-waste through burning; in non-designated waste receptacles or by burial or at a dumpsite. The regulations further prohibit treatment of Cathode Ray Tubes in an unsound environmental manner; cause leaching of precious metals with acids and other hazardous waste from printed wire boards or Printed Circuit Board in an uncontrolled manner; carryout open burning of electrical and electronic equipment/E-waste at the recycling facilities; or abandon E-waste anywhere other than in the collection centres and/or in the licensed recycling facilities.

Penalties

Any person who contravenes this regulation commits an offence and liable on conviction to a fine not exceeding one hundred thousand shillings or to imprisonment for a term not exceeding six months or to both.

5.2 Institutional Framework

5.2.1 Ministry of Environment, Water and Natural Resources

The Ministry of Environment, Water and Natural Resources (MEWNR) is responsible for the environment at policy level. One of its key functions is the full implementation of the EnvironmentalManagementCoordinationAct(EMCA)1999whichdefineshazardouswaste,pollutantsandpollution.Toachievethisobjective,theMinistry'sroleistocreateanenablingenvironmentthroughpolicy,legalandregulatoryreformsforenvironmentalandnaturalresourcesmanagement.

The mandate of the ministry is to monitor, protect, conserve and manage the environment and natural resources through sustainable exploitation for socio-economic development aimed at eradication of poverty, improving living standards and ensuring that a clean environment is sustained now and in the future. The ministry comprises of various divisions at the headquarters and the following parastatals and departments including the National Environment Management Authority.

Roles and Functions in relation to E-waste

1. The ministry has a core function and role of policy formulation, analysis and review in matters related to environment and natural resources. In E-waste, this is the principal responsibility responsible for formulating E-waste policies and was involved in the drafting of the existing draft E-waste regulations and guidelines for Kenya.

2. The ministry has the mandate to ensure sustainable management and conservation of environment and this implies that the ministry has a critical role in ensuring that E-waste is addressed sustainable to ensure conservation of the environment.

3. The ministry has the mandate to promote, monitor and coordinate environmental activities and enforce compliance of environmental regulations and guidelines. In respect to E-waste thus, this ministry has the significant role ensuring the same in

relation to E-waste related activities as well as enforcing compliance to the E-waste regulations and guidelines.

5.2.2 National Environment Management Authority-NEMA

The National Environment Management Authority (NEMA) is the principal instrument of Government in the implementation of all policies relating to the environment. In the NEMA strategic plan 2010-12, key objectives include universal compliance and enforcement of environmental regulations, developing guidelines and standards and the prosecution of offenders failing to meet the provisions of the EMCA1999. The lead agencies that are also pertinent to E-waste management include the Ministry of Information and Communication, Communications Commission of Kenya (CCK), Kenya Bureau of Standards (KEBS), Kenya Revenue Authority (KRA), Ministry of Education.

NEMA is established under the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, as the principal instrument of government in the implementation of all policies relating to the environment.

Roles and Functions in relation to E-waste

1. Coordinating the various environmental management activities being undertaken by the lead agencies including those related to E-waste management

2. Promote the integration of environmental considerations into development policies, plans, programmes and projects, with a view to ensuring the proper management and rational utilization of environmental resources, on sustainable yield basis, for the improvement of the quality of human life in Kenya. In the context of E-waste, NEMA has the role of ensuring that policies, plans and programs that entail increased uptake of electronics e.g. ICT policies, consider the environmental implication of electronics specifically as a waste after end of life.

3. Carry out surveys, which will assist in the proper management and conservation of the environment. In the context of E-waste, NEMA plays a role of conducting surveys on E-waste including quantities, impacts, challenges, management efforts etc. with a view of assisting in proper management and conservation of the environment

4. Advise Government on legislative and other measures for the management of the environment or the implementation of relevant international conventions, treaties and agreements. NEMA's role in regard to E-waste and this function is related to the international conventions touching on E-waste namely: Basel and Bamako.

5. Advise the Government on regional and international conventions, treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements.

6. Undertake and coordinate research, investigation and surveys, collect, collate and disseminate information on the findings of such research, investigations or surveys. In the context of E-waste, NEMA has the responsibility of spearheading

and coordinating all research, investigations and surveys related to E-waste including dissemination of the findings.

7. Identify projects and programmes for which environmental audit or environmental monitoring must be conducted under this Act.

8. Undertake, in cooperation with relevant lead agencies, programmes intended to enhance environmental education and public awareness, about the need for sound environmental management, as well as for enlisting public support and encouraging the effort made by other entities in that regard.

9. Publish and disseminate manual codes or guidelines relating to environmental management and prevention or abatement of environmental degradation. In the context of E-waste, NEMA has the role of publishing and disseminating the existing E-waste guidelines.

10. Render advice and technical support, where possible, to entities engaged in natural resources management and environmental protection, so as to enable them to carry out their responsibilities satisfactorily.

11. Prepare and issue an annual report on the State of Environment in Kenya and in this regard, may direct any lead agency to prepare and submit to it a report on the state of the sector of the environment under the administration of that lead agency.

5.3 E-Waste Challenges in Kenya

The Kenyan government has rolled out an e-government programme to promote use of information and communication technology (ICT) in all sectors. The resultant waste from their usage has over the years accumulated, and now poses a threat to the environment. Kenya lacks an up to date national inventory of E-waste quantities and this presents a general challenge in terms of tackling the management of the same. The determination of and availability of E-waste quantities is a significant step in the overall management of E-waste including investing in E-waste as a sector.

5.4 Sources of E-wastes in Kenya

The principal e-waste generated by off-grid electrification would be batteries used to power solar installations.

5.5 Types of E-wastes in Kenya

According to a study conducted by UNEP in 2009, it was estimated that the current E-waste generated annually in Kenya was 11,400 tonnes from refrigerators, 2,800 tonnes from TVs, 2,500 tonnes from personal computers, 500 tonnes from printers and 150 tonnes from mobile phones (UNEP & UNU, 2009). This is old data and it is envisaged that the quantities of E-wastes has increased since this time therefore making a case for and justification to conduct a new inventory.

A mass flow study carried out in 2007 by Kenya ICT Action Network showed that: 1,513 tons of electronics entered the Kenya market. The consumer in addition to receiving 1,489.4 tons from the formal market, also received 151.3 tons from the second hand market. Other sources also indicate that Kenya has reached a mobile penetration rate of more than 63% and an internet penetration of more than 18.6%. The number of internet users in (2007) was estimated at 10.2 million.

The number of ICT companies along the sector increased to more than 4000 companies. Moreover, many shops and kiosks also resell ICT related services; especially services and products relating to the mobile phone. ICT is being extensively used in the education, health, industrial, trade and communication sectors. Private sector has been installing heavy computing equipment and data centres, mainly mobile operators, banks, and Manufacturing sector companies. From statistics, the consumers are likely to:

- Dispose of 1,210.4 tons in the second-hand market;
- Dispose of 18.6 tons to collectors or to be refurbished;
- Dispose of 18.6 tons directly to recyclers.

According to National Environment Management Authority, each year the country generates 3,000 tons of electronic waste. This number raises doubts on the accuracy of and prediction or estimation of E-waste due to the fact that if 3,000 tons are generated annually, it follows that an almost similar amount of E-waste should be disposed. This anomaly points to the critical need to undertake an accurate inventory of E-waste to date in Kenya and further design methodologies for estimating or ascertaining E-wastes generated and disposed on an annual basis.

6 DESCRIPTION OF WORLD BANK ENVIRONMENTAL & SOCIAL SAFEGUARDS POLICIES AND TRIGGERS

KEMP is classified as environmental Category B according to the Bank's OP 4.01. The projects are expected to have significant positive environmental and social impacts, with relatively minor and localized negative impacts. The ESMF has been developed to ensure environmental and social due diligence for subprojects. **Table 3** below summarises the World Bank's Safeguards Policies.

Table 3: Summary of World Bank's Safeguards Policies

Policy	Objective	Trigger for the Policy
OP/BP 4.01 Environmental Assessment	The objective of this policy is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is triggered if a project is likely to have potential (adverse) environmental risks and impacts on its area of influence. OP 4.01 covers impacts on the natural environment (air, water and land); human health and safety; physical cultural resources; and transboundary and global environment concerns.	Depending on the project, and nature of impacts a range of instruments can be used: EIA, environmental audit, hazard or risk assessment and environmental management plan (EMP).When a project is likely to have sectoral or regional impacts, sectoral or regional EA is required. The Borrower is responsible for carrying out the ESIA.
OP/BP 4.04 Natural Habitats	This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal, and marine ecosystems. They include areas lightly modified by human activities, but retaining their ecological functions and most native species. This bank policy prohibits financing for developments that would significantly convert or degrade critical natural habitats, and preference is on siting projects on already converted land.	This policy is triggered by any project (including any sub-project under a sector investment or financial intermediary) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).
OP/BP 4.36 Forests	The objective of this policy is to assist borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development and protect the vital local and global environmental services and values of forests. Where forest restoration and plantation development are necessary to meet these objectives, the Bank assists borrowers with forest restoration activities that maintain or enhance biodiversity and ecosystem	This policy is triggered whenever any Bank-financed investment project (i) has the potential to have impacts on the health and quality of forests or the rights and welfare of people and their level of dependence upon or interaction with forests; or (ii) aims to bring about changes in the management, protection or

Policy	Objective	Trigger for the Policy
	functionality. The Bank assists borrowers with the establishment of environmentally appropriate, socially beneficial and economically viable forest plantations to help meet growing demands for forest goods and services.	utilization of natural forests or plantations.
OP 4.09 Pest Management	The objective of this policy is to (i) promote the use of biological or environmental control and reduce reliance on synthetic chemical pesticides; and (ii) strengthen the capacity of the country's regulatory framework and institutions to promote and support safe, effective and environmentally sound pest management. More specifically, the policy aims to (a) Ascertain that pest management activities in Bank-financed operations are based on integrated approaches and seek to reduce reliance on synthetic chemical pesticides (Integrated Pest Management (IPM) in agricultural projects and Integrated Vector Management (IVM) in public health projects. (b) Ensure that health and environmental hazards associated with pest management, especially the use of pesticides are minimized and can be properly managed by the user. (c) As necessary, support policy reform and institutional capacity development to (i) enhance implementation of IPM-based pest management and (ii) regulate and monitor the distribution and use of pesticides. Pesticides in WHO Classes IA and IB may not be procured for Bank supported projects.	The policy is triggered if: (i) procurement of pesticides or pesticide application equipment is envisaged (either directly through the project, or indirectly through on-lending, co-financing, or government counterpart funding); (ii) the project may affect pest management in a way that harm could be done, even though the project is not envisaged to procure pesticides. This includes projects that may (i) lead to substantially increased pesticide use and subsequent increase in health and environmental risk; (ii) maintain or expand present pest management practices that are unsustainable, not based on an IPM approach, and/or pose significant health or environmental risks.
OP/BP 4.11 Physical Cultural Resources	The objective of this policy is to assist countries to avoid or mitigate adverse impacts of development projects on physical cultural resources. For purposes of this policy, "physical cultural resources" are defined as 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. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or underwater. The cultural interest may be at the local, provincial or national level, or within the international community.	This policy applies to all projects requiring a Category A or B Environmental Assessment under OP 4.01, project located in, or in the vicinity of, recognized cultural heritage sites, and projects designed to support the management or conservation of physical cultural resources.
OP/BP 4.10 Indigenous Peoples	The objective of this policy is to (i) ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; (ii) ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and (iii) ensure that indigenous peoples receive culturally appropriate and gender and inter-generationally inclusive social and economic benefits. The policy requires free, prior and informed consultation with indigenous peoples.	The policy is triggered when the project affects the indigenous peoples (with characteristics described in OP 4.10 para 4) in the project area.
OP/BP 4.12 Involuntary Resettlement	The objective of this policy is to (i) avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; (ii) assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them; (iii) encourage community participation in planning and implementing	This policy covers not only physical relocation, but any loss of land or other assets resulting in: (i) relocation or loss of shelter; (ii) loss of assets or access to assets; (iii) loss of income sources or means of livelihood, whether or not the

Policy	Objective	Trigger for the Policy
	resettlement; and (iv) provide assistance to affected people regardless of the legality of land tenure.	affected people must move to another location. This policy also applies to the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.
OP/BP 4.37 Safety of Dams	The objectives of this policy are as follows: For new dams, to ensure that experienced and competent professionals design and supervise construction; the borrower adopts and implements dam safety measures for the dam and associated works. For existing dams, to ensure that any dam that can influence the performance of the project is identified, a dam safety assessment is carried out, and necessary additional dam safety measures and remedial work are implemented.	This policy is triggered when the Bank finances: (i) a project involving construction of a large dam (15 m or higher) or a high hazard dam; and (ii) a project which is dependent on an existing dam. For small dams, generic dam safety measures designed by qualified engineers are usually adequate. Dams with ≥15m in height review by an independent dam safety panel is required.
OP 7.50 Projects in International Waters	The objective of this policy is to ensure that Bank-financed projects affecting international waterways would not affect: (i) relations between the Bank and its borrowers and between states (whether members of the Bank or not); and (ii) the efficient utilization and protection of international waterways. The policy applies to the following types of projects: (a) Hydroelectric, irrigation, flood control, navigation, drainage, water and sewerage, industrial and similar projects that involve the use or potential pollution of international waterways; and (b) Detailed design and engineering studies of projects under (a) above, include those carried out by the Bank as executing agency or in any other capacity.	This policy is triggered if (a) any river, canal, lake or similar body of water that forms a boundary between, or any river or body of surface water that flows through two or more states, whether Bank members or not; (b) any tributary or other body of surface water that is a component of any waterway described under (a); and (c) any bay, gulf strait, or channel bounded by two or more states, or if within one state recognized as a necessary channel of communication between the open sea and other states, and any river flowing into such waters.
OP 7.60 Projects in Disputed Areas	The objective of this policy is to ensure that projects in disputed areas are dealt with at the earliest possible stage: (a) so as not to affect relations between the Bank and its member countries; (b) so as not to affect relations between the borrower and neighboring countries; and (c) so as not to prejudice the position of either the Bank or the countries concerned.	This policy is triggered if the proposed project will be in a "disputed area". Questions to be answered include: Is the borrower involved in any disputes over an area with any of its neighbors. Is the project situated in a disputed area? Could any component financed or likely to be financed as part of the project be situated in a disputed area?
The WB Group Environment, Health and Safety Guidelines.	The General EHS Guidelines contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors. The guidelines include;- **Environment** • Air Emissions and Ambient Air Quality • Energy Conservation • Wastewater and Ambient Water Quality • Water Conservation	These guidelines will be followed during the preparation of mitigation measures. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and

Policy	Objective	Trigger for the Policy
	• Hazardous Materials Management • Waste Management • Noise • Contaminated Land **Occupational Health and Safety Guidelines** **Community Health and Safety** **Construction and Decommissioning**	detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

6.1 World Bank's Safeguards Triggered by KEMP

Component **C2** of KEMP triggers OPs 4.01 (Environmental Assessment) and 4.12 (Involuntary Resettlement) 4.04 (Natural Habitats), 4.11 (Physical Cultural Resources), and 4.12 (Indigenous Peoples). The safeguards instruments prepared for any sub projects will address the requirements of any applicable policies.

Table 4: Safeguard polices to be triggered under KEMP C2 Sub Component Off-Grid Electrification

Safeguard Policies Triggered by the Project	Reasons For Triggers
Environmental Assessment (OP/BP 4.01)	Sub projects are likely to have potential significant adverse environmental impacts. The objective of OP 4.01 is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate environmental screening, analysis of actions and mitigation of their likely environmental impacts and monitoring. Therefore, OP 4.01 has been triggered, and in line with this operational policy, the environmental and social screening process for the distribution component of the Kenya Electricity Expansion Project (KPLC) funded sub-projects has been prepared
Natural Habitats (OP/BP 4.04)	Sub projects may be located in or close to areas with natural unique flora and fauna though the component is unlikely to have significant negative impacts on natural habitat works will nevertheless be implemented in rural and remote areas of the country that may be home to diverse flora, fauna, and avifauna.
Involuntary Resettlement (OP/BP 4.12)	Sub projects may involve land take for construction purposes including, wind turbines, solar panels, mini grids etc.
Indigenous Peoples (OP/BP 4.10)	Sub projects may be located in areas with vulnerable and marginalised groups/people
Physical Cultural Resources (OP/BP 4.11)	Given that the works will take place in areas of archaeological importance, OP 4.11 has been triggered as a precaution. Therefore, the ESMF includes guidance in the event chance finds are made (see Annex 1, 3).

6.1.1 Environmental Assessment (OP4.01)

This policy requires Environmental Assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision-making. The EA is a process whose breadth, depth, and type of analysis will depend on the nature, scale, and potential environmental impact of the proposed projects under KEMP.

The adverse environmental and social impacts under KEMP will come from sub projects under component C2, which include among others construction of wind turbines, solar panels, mini grids etc. However, since the exact location of most of these investments have not be identified, the World Bank safeguard policy calls for the GoK to prepare an Environmental and Social Management Framework (ESMF) in accordance with its' procedures.

OP4.01 is triggered because KEMP will finance sub projects under sub component C2 that are likely to have adverse environmental and social impacts. This ESMF establishes a mechanism to determine and assess future potential environmental and social impacts during implementation of project activities, and sets out mitigation, monitoring and institutional measures to be taken during operations of these activities, to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

In regard to disclosure of the ESMF report, World Bank requires that the report be disclosed as a separate document as a condition for Bank appraisal. This report will be disclosed to the general public to meet this requirement as well as the Info shop of the World Bank and the date of disclosure will precede the date for appraisal of the program.

The extent and type of environmental and social assessment required by the World Bank is a function of the project's environmental impact and hence, its environmental screening category. The World Bank undertakes environmental and social screening of each proposed subproject to determine the appropriate extent and type of environmental and social assessment. The World Bank classifies projects into one of three categories (A, B and C), depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

Due to the limited scope and largely benign environmental impact of the off-grid electrification component, it is classified as a Category B.

Table 5. World Bank EA Screening Categories

Category "A"	An EIA is always required for projects that are in this category. Impacts are expected to be 'adverse, sensitive, irreversible and diverse with attributes such as pollutant discharges large enough to cause degradation of air, water, or soil; large-scale physical disturbance of the site or surroundings; extraction, consumption or conversion of substantial amounts of forests and other natural resources; measurable modification of hydrological cycles; use of hazardous materials in more than incidental quantities; and involuntary displacement of people and other significant social disturbances.
Category B	When the subproject's adverse environmental impacts on human populations or environmentally important areas (including wetlands, forests, grasslands, and other natural habitats) are less adverse than those of Category A subprojects. Impacts are site – specific; few, if any, of the impacts are irreversible; and in most cases, mitigation measures can be designed more readily than for Category A subprojects. The scope of environmental assessment for a Category B subproject may vary from sub-project to sub-project, but it is narrower than that of a Category A sub-project. It examines the subproject's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.
Category C	If the subproject is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental assessment action is required for a Category C sub-project.

6.2 Alignment of WB and GOK Polices relevant to this ESMF

Both the World Bank safeguards policies and GoK laws are generally aligned in principle and objective:

- *Both require screening of sub project investments in order to determine if further environmental analysis (ESIAs) is needed.*
- *Both require ESIA before project design and implementation (which also includes an assessment of social impacts).*
- *Both require public disclosure of ESIA reports.*
- *EMCA recognizes other sectoral laws while WB has safeguards for specific interests.*
- *The Bank requires that stakeholder consultations be undertaken during planning, implementation and operation phases of the project, which is equivalent to the EMCA requirements.*
- *Additionally, statutory annual environmental audits are required by EMCA.*
- *The national provisions for the management of resettlement related issues are not as fully developed and therefore not at par with the World Bank safeguard policy requirements. Thus, it is expected that the WB OP 4.12 will be mostly applied under the KEMP and a separate document to guide the process, i.e. a Resettlement Policy Framework (RPF) and Vulnerable and Marginalized Groups Framework (VMGF) document will be prepared as a standalone report to support the social management and acceptability of the projects.*

In Kenya, it is a mandatory requirement under EMCA 1999 for all proposed development projects to be preceded by an ESIA study. However, prior to developing an ESIA, a project proponent is required to prepare a project report to aid NEMA in making a determination whether a full scale ESIA is necessary or not. Thus, under the laws of Kenya, environmental assessment is fully mainstreamed in all development process and starts with a screening process, which is consistent with World Bank safeguard policies on EA that calls for mandatory screening as well to determine the rating category.

Project reports will be prepared for all the sub project investments under the KEMP to determine if they require a full scale ESIA. Further, in order to fully insure against triggers to WB safeguard policies, individual investments will be screened against each policy as part of the EA process.

6.3 Requirements for Public Disclosure

This ESMF will be disclosed in country through posting on the websites of Ministry of Energy and Petroleum and the Rural Electrification Authority as well as in the Bank's info shop.

7 DETERMINATION OF POTENTIAL ENVIRONMENT AND SOCIAL IMPACTS

The KEMP project is classified category B for environment due to limited adverse environmental impacts which are site specific, largely reversible and can be readily addressed through mitigation measures. The KEMP Off-Grid sites are likely to be located in a sensitive ecosystem, since most areas in off-grid areas are generally sensitive with historical and cultural significance. The land to be used for the Solar, Wind and diesel generation mini-grid development will be acquired from individuals or county government by REA or GoK (the sites for the generation facilities will be small – not more than half an acre). Typically the generator is housed in a shipping type container along with spare parts.

The location of the project site coupled with the clean nature of solar and wind power generation ensures that the KEMP Off-Grid component will not cause major significant adverse environmental and social impacts during construction and operation. The main project impacts are associated with the solar panels, batteries and wind turbines, clearing of shrub vegetation, and construction waste management and influx of people. Moreover, most of the associated impacts are limited to the construction phase and are temporary in nature. Except for the visual quality and potential of bird strikes, operational phase KEMP impact has a limited environmental footprint.

Harnessing power from the wind is one of the cleanest and most sustainable ways to generate electricity, as it produces no toxic pollution or global warming emissions. Wind is also abundant, inexhaustible, and affordable, which makes it a viable and large-scale alternative to fossil fuels.

Solar power facilities reduce the environmental impacts of combustion used in fossil fuel power generation, such as impacts from greenhouse gases and other air pollution emissions. Unlike fossil fuel power generating facilities, solar facilities have very low air emissions of air pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds, and the greenhouse gas carbon dioxide during operations.

In addition to these benefits of solar and wind power development, construction and operation of solar and wind facilities creates both direct and indirect employment and additional income in the regions where the development occurs. However, there are also some adverse impacts associated with solar and wind power facilities that must be considered in the process of granting authorizations and the process of developing environmental guidance for such facilities.

Potential adverse impacts to various resources associated with the construction, operation, and decommissioning of solar and wind power plants are briefly outlined below. These solar and wind energy environmental considerations include land disturbance/land use impacts; potential impacts to ecologically important areas; impacts to vegetation, wildlife, wildlife habitat, and sensitive species; visual intrusion, cultural,

paleontological, and socioeconomic, impacts, ; and the need to adequately dispose of obsolete batteries from photovoltaic installations.

7.1 Potential Impacts

7.1.1 Positive Environmental Impacts

Generally the KEMP project and specifically the off-grid component will have positive impact on the environment in in the short, medium and long term, for the following reasons;

Proactive Environmental Protection and Ecosystem Conservation

Due to rural electrification the demand for fuel wood and charcoal as the main source of energy will drastically reduce. Therefore this will have a cumulative positive impact on conservation of forest ecosystems and their service as a natural habitat .It offers opportunities for development and exploitation of renewable sources of energy, limiting $C0_2$ and local pollutants.

Improved Services Delivery

Access to energy services for the public facilities in health, education and agriculture leading to quality service delivery

Poverty Reduction

Poverty is wide spread mostly in the off –grid rural areas and this project will greatly benefit the rural poor to better their lives and diversify their sources of income through improved business opportunities and farming technologies.

Access to Modern Energy Services

Currently, only 35% of the households have electricity access from the national grid or mini-grids. The electrification rate is planned to be increased to 70 % by 2020 and 100 % by 2030. The population not connected is using wood as a source of energy contributing to further environmental degradation.

These low rates are a major constraint to higher rural non-farm incomes and an improved quality of life that can be gained not just from improved household lighting and communications, but also from improved service delivery in rural health, education and water facilities.

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. A study on Energy Kiosks for Lighting up Kenya presented at Light Africa conference 2010 found that on average a family spends about 750 Kshs per month for lighting kerosene. Data presented by Kenya National Bureau of Statistics found that in 2013 a family consuming about 50 kWh of electricity, which is mainly for domestic use, paid a bill of Kshs 586 in February 2012, Kshs 568 in January 2013 and Kshs564 in February 2013, which gives an average bill of Kshs 572. Comparing these two costs of consumption electricity bills seem to be cheaper than using kerosene for lighting by about

Kshs 128. Therefore the Kenya Electricity Modernization Project means greater savings on the part of the households.

Employment and Wealth Creation

The Kenya Electricity Modernization project will provide some employment during construction in 6 locations in a few regions.

Social Inclusion

The national grid mainly serves the large urban areas and the relatively high population density rural areas. By providing electricity to the 6 rural locations, social inclusion of these communities will be enhanced (through improved communications and information access).

HIV/AIDS Education and Awareness

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 two 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 toolbox talks. REAwill 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 toolbox talk. This will reach more people as the project is being implemented countrywide.

Health Benefits

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 eyestrain, 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 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.

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.

Improved Standard of Living

The implementation of this project will result in connecting about 400 beneficiaries to electricity in off Grid areas. 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.

Security

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

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.

Gender Considerations

In most Kenyan cultures the responsibility of sourcing and providing the household energy is left to the women. Therefore, on the demand side, especially in rural areas, there is need to relieve women from the burden of searching for energy, especially fire wood and to sensitize them on the environmental concerns involved.

The government's national energy policy states;
To promote gender equality within the energy sub-sectors both on the demand and supply.

- To facilitate education and training for women in all energy aspects.
- To promote awareness on gender issues concerning men and women's social roles in the energy sector, including training on appropriate technologies.
- To promote awareness and advocacy on gender issues in the energy sector.

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.

7.2 Adverse Environmental Impacts

Despite the various socio economic and environmental benefits outlined, the project will also have some negative impacts.As regards the proposed sub-component (off-grid electrification), 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, operation and maintenance phases. The following are the potential negative impacts and mitigation measures.

Potential Adverse Social Impacts from the off-grid component:

The environmental and social screening form and checklist are specifically designed to ensure that adverse social impacts from off-grid activities are identified and captured in the planning stages and effectively mitigated. Both environmental and social mitigation measures would be verifiable monitored during the various stages of the program cycle.

Impact on Natural Vegetation and Biodiversity

The project will involve installations of small power generation schemes (e.g. solar, wind) and short low voltage lines. 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 these schemes and poles. Obsolete batteries will also impact on natural vegetation and Biodiversity if not properly disposed of. There is also a possibility of impact of wind turbines on wildlife, most notably on birds and bats due to collision with rotating propellers of the turbines.

The clearing of land for the hybrid generation facilities may affect native vegetation and wildlife, including loss of habitat; interference with rainfall and drainage; or direct

contact causing injury or death. The impacts are exacerbated when the species affected are classified as sensitive, rare, or threatened and endangered. Given the small size and isolated location of these sub-projects eligible for off-grid electrification, cutting of trees will be minimal. The potential sites are located in areas of very low population density, thereby allowing more options for site selection, further reducing the need to cut trees.

Impacts on Air Quality

Exhaust emissions are likely to be generated by the construction vehicles and equipment as well as diesel generators. Motor vehicles that will be used to ferry construction materials would cause air quality impact by emitting pollutants through exhaust emissions.Air quality can also be impacted by emissions associated with other stages of the wind turbines and solar life cycle, including manufacturing, materials transportation, installation, maintenance, and decommissioning and dismantlement. Most estimates of life-cycle emissions for photovoltaic systems are between 0.07 and 0.18 pounds of carbon dioxide equivalent per kilowatt-hour.

Risk of Sparks/Fire from 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. This can be as a result of Off-Grid conditions, which are mainly dry and windy.

Solid/Electronic Waste

Little if any solid waste will be generated which includes conductor cuttings, obsolete batteries, scrap metals and tree cuttings. For the civil works at control rooms and for the electrification of households, key factors are to ensure that appropriate safety guidelines are adopted, and that obsolete equipment and construction waste is disposed of in an environmentally sustainable manner.

Electric Shocks and Electrocution

Electricity 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.

Occupation Safety and Health Hazards

During construction people will be engaged in activities such as pole and conductor wiring, plant assembling and working at heights. Workers can be exposed to occupational risks like falling from heights, being pressed by poles. Workers also face risks associated with inhaling silicon dust emanating from chemicals used to clean semi-conductors in PV solar cells.

At project implementation 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).

HIV/AIDS affects both education coverage and quality. It dampens the demand for education as affected households have fewer resources to spend on education either because of reduced income due to morbidity of income earners or diversion of scarce resources for health care. Children in these households are often taken out of school to care for ill parents or have to work to make up for lost household income, and an increasing number are becoming orphans. At the same time, the epidemic affects the supply of educational services at all levels through increased mortality, morbidity and absenteeism among teachers and education personnel.

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.

Noise

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

Contamination from CCA & Creosote-Treated Poles

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

Soil erosion

Soil erosions resulting from the excavation of the PV panels' and wind turbines foundations and civil works associated with PV panels' accessories and auxiliary facilities.Construction of solar facilities on large areas of land requires clearing and grading, and results in soil compaction, potential alteration of drainage channels, and increased runoff and erosion. Engineering methods can be used to mitigate these impacts.

Visual Intrusion Impacts

Even though the hybrid generation facilities will be small,their geometric and sometimes highly reflective surfaces may have visual impacts. However, being visible is not necessarily the same as being intrusive. Aesthetic issues are by their nature highly subjective. Proper siting decisions can help to avoid aesthetic impacts to the landscape.

Cultural and Social Impacts

Cultural and paleontological artifacts and cultural landscapes may be disturbed by the hybrid generation facilities. Additionally, socioeconomic impacts (both positive and negative) may be associated with the facilities. For example, they will provide employment opportunities, but an influx of workers could disrupt public services. These impacts may be disproportionately experienced by minority or low-income populations, thus resulting in environmental justice issues.

Hazardous Materials Impacts

Photovoltaic panels may contain hazardous materials, and although they are sealed under normal operating conditions, there is the potential for environmental contamination if they were damaged or improperly disposed upon decommissioning. Proper planning and good maintenance practices can be used to minimize impacts from hazardous materials.

Wildlife and Habitat

The impact of wind turbines on wildlife, most notably on birds and bats, has been widely documented and studied. A recent research in USA found evidence of bird and bat deaths from collisions with wind turbines and due to changes in air pressure caused by the spinning turbines, as well as from habitat disruption. It was though concluded that these impacts are relatively low and do not pose a threat to species populations.

Research into wildlife behavior and advances in wind turbine technology have helped to reduce bird and bat deaths. For example, wildlife biologists have found that bats are most active when wind speeds are low. Using this information, the Bats and Wind Energy experts concluded that keeping wind turbines motionless during times of low wind speeds could reduce bat deaths by more than half without significantly affecting power production. Other wildlife impacts can be mitigated through better siting of wind turbines as well as appropriate wind farm siting and best management practices. Bird collision will be avoided by reducing height of turbines and avoiding migration routes of important bird species or in Important Bird Areas.

Life-Cycle Global Warming Emissions

While there are no global warming emissions associated with operating wind turbines, there are emissions associated with other stages of a wind turbine's life-cycle, including materials production, materials transportation, on-site construction and assembly, operation and maintenance, and decommissioning and dismantlement.

Estimates of total global warming emissions depend on a number of factors, including wind speed, percent of time the wind is blowing, and the material composition of the wind turbine. Most estimates of wind turbine life-cycle global warming emissions are between 0.02 and 0.04 pounds of carbon dioxide equivalent per kilowatt-hour. To put this into context, estimates of life-cycle global warming emissions for natural gas generated electricity are between 0.6 and 2 pounds of carbon dioxide equivalent per kilowatt-hour and estimates for coal-generated electricity are 1.4 and 3.6 pounds of carbon dioxide equivalent per kilowatt-hour.

Waste management problem of non-biodegradable equipment

Most of the components of electronic devices are not biodegradable and hence provides a challenge in terms of disposal. Non-biodegradable equipment often remain in the environment for years and end up becoming a menace, eye sore as well as a landscape and visual intrusion problem.

Toxicity and radioactive nature of E-waste to the human, water, soil and animals

Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully. While some naturally occurring substances are harmless in nature, their use in the manufacture of electronic equipment often results in compounds, which are hazardous (e.g. chromium becomes chromium VI). Lead, mercury, cadmium, and polybrominated flame retardants are found in electronic equipment and are all persistent, bio-accumulative toxins (PBTs). They can create environmental and health risks when computers are manufactured, incinerated, land filled or melted during recycling. PBTs, in particular are a dangerous class of chemicals that linger in the environment and accumulate in living tissues because they increase in concentration as they move up the food chain, PBTs can reach dangerous levels in living organisms, even when released in minute quantities. PBTs are harmful to human health and the environment and have been associated with cancer, nerve damage and reproductive disorders. The following list gives a selection of the mostly found toxic substances in E-waste.

Table 6. Toxic Substances in E-waste

Substance	Occurrence in E-waste
Halogenated compounds	
PCB (polychlorinated biphenyls)	Condensers, Transformers
TBBA (tetrabromo-bisphenol-A) PBB (polybrominated biphenyls) PBDE (polybrominateddiphenyl ethers)	Fire retardants for plastics (thermoplastic components, cable insulation) TBBA is presently the most widely used flame retardant in printed
Chlorofluorocarbon (CFC)	Cooling unit, Insulation foam
PVC (polyvinyl chloride)	Cable insulation
Heavy metals and other metals:	
Arsenic	Small quantities in the form of gallium arsenide within light emitting diodes
Barium	Getters in CRT
Beryllium	Power supply boxes which contain silicon controlled rectifiers and x-ray lenses
Cadmium	Rechargeable NiCd-batteries, fluorescent layer (CRT screens), printer inks and toners, photocopying-machines (printer drums)
Chromium VI	Data tapes, floppy-disks
Lead	CRT screens, batteries, printed wiring boards
Lithium	Li-batteries
Mercury	Fluorescent lamps that provide backlighting in LCDs, in some alkaline batteries and mercury wetted switches
Nickel	Rechargeable NiCd-batteries or NiMH-batteries, electron gun in CRT
Rare Earth elements (Yttrium, Europium)	Fluorescent layer (CRT-screen)
Selenium	Older photocopying-machines (photo drums)
Zinc sulphide	Interior of CRT screens, mixed with rare earth metals

7.3 Adverse Social Impacts

E-waste affects people's health

Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully. While some

naturally occurring substances are harmless in nature, their use in the manufacture of electronic equipment often results in compounds, which are hazardous (e.g. chromium becomes chromium VI).

Land Disturbance/Land Use Impacts

Solar energy facilities may require relatively large areas for solar radiation collection when used to generate electricity and this may interfere with existing land uses, such as grazing, community uses, and minerals production if present in such area. Solar facilities could impact the use of nearby specially designated areas such as wilderness areas, areas of critical environmental concern, or special recreation management areas. Proper siting decisions can help to avoid land disturbance and land use impacts. The land use impact of wind power facilities varies substantially depending on the site: wind turbines placed in flat areas typically use more land than those located in hilly areas. However, wind turbines do not occupy all of this land; they must be spaced approximately 5 to 10 rotor diameters apart (a rotor diameter is the diameter of the wind turbine blades). Thus, the turbines themselves and the surrounding infrastructure (including roads and transmission lines) occupy a small portion of the total area of a wind facility. Employing best practices in planning and siting can help minimize potential land use impacts of offshore and land-based wind projects.

Public Health and Community

Sound and visual impact are the two main public health and community concerns associated with operating wind turbines. Most of the sound generated by wind turbines is aerodynamic, caused by the movement of turbine blades through the air. There is also mechanical sound generated by the turbine itself. Overall sound levels depend on turbine design and wind speed.

Some people living close to wind facilities are likely to complain about sound and vibration issues, but it has been found that these issues do not adversely impact public health. However, it is important for wind turbine developers to take these community concerns seriously by following “good neighbor” best practices for siting turbines and initiating open dialogue with affected community members.

Additionally, technological advances, such as minimizing blade surface imperfections and using sound-absorbent materials can reduce wind turbine noise.

The Kenya Civil Aviation Authority (KCAA) requires that large wind turbines, like all structures over 200 feet high, have white or red lights for aviation safety. However as long as there are no gaps in lighting greater than a half-mile, it is not necessary to light each tower in a multi-turbine wind project. Daytime lighting is unnecessary as long as the turbines are painted white. When it comes to aesthetics, wind turbines can elicit strong reactions. To some people, they are graceful sculptures; to others, they are eyesores that compromise the natural landscape. Whether a community is willing to accept an altered skyline in return for cleaner power should be decided in an open public participation, consultation and dialogue.

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
Electric shocks and electrocution of people.	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
Impact to Sensitive and Ecologically Important Areas	Identify environmentally sensitive or ecologically fragile areas (if any); If the proposed construction is located close to these areas, take necessary measures to avoid/ minimize disturbance The exact position of the solar PV array layout, wind turbines should be determined by the environmental specialist, and from specifications and design to avoid all sensitive areas in the positioning of the facility.	Inspection	Environmentalist/ project Engineer/ contractor	No solar panels installed in sensitive ecosystem	Pre-construction and construction

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
Design and Work Plan Impacts	No use of gravel or sand from the onsite or surrounding areas. Consider possible alternatives for construction materials (aggregates) from the certified suppliers. The use of concrete for stabilization is to be avoided as far as possible. Choice of the location that gives the best economy in terms of excavation and fill in order to avoid or minimize soil erosion during excavation works for the construction of the stand-alone PVS structures In case of usage of free standing structure, a proper structural design that is environmental friendly and requires less maintenance is suggested. Driven piers and screws are recommended in order to minimize the environmental impact of the facility.	Inspection	Environmentalist/ project Engineer/ contractor	No solar panels installed in sensitive ecosystem	Pre-construction and construction

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
Impacts to Aesthetics	Avoid the sites, which have a tourism value. During site selection and site detailing, consider ways to minimize visual intrusion and improving aesthetic qualities (including landscaping and plantation to compensate visual and aesthetic impacts).	Inspection	Environmentalist/ project Engineer/ contractor	No. of trees to camouflage the PVs and wind turbines No PVs and wind turbines in tourist attraction sites	Pre-construction and construction
Impact on Existing Land Use	Avoid land acquisition, locate projects on GoK land; compensate for land acquired using the RFP	Inspection	Environmentalist/ project Engineer/ contractor	-	Pre-construction and construction
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;	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

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
	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 Solar Panels, transformers and distribution cables Follow safe work procedures Maintain a fully stocked and accessible first aid kit Observe OSHA 2007 regulations Install lights and cautionary signs in hazardous areas Ensure the operation staff get o/m advice and training from the post commissioning services experts contracted Ensure operational manual and professional training manual at all time in the facility Ensure sufficient funding available to carry out periodic maintenance and repairs of the PV installations				

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
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/Distribution 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
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	REA to plant trees as a way of compensation for the cleared ones Clear limited areas only where the panels foundations will be erected Select alternative site locations to avoid sensitive natural features	Inspections	Environmentalist	• No of trees planted	Construction & operation

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
cleared to pave way for erection of panel foundations and wind turbines					
Construction Material Sourcing 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
Impacts on Air Quality 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
Solid waste Little if any solid waste will be generated which includes conductor,	All left over conductor cuttings to be disposed appropriately or be returned to the store for proper disposal Proper budgeting of materials to	Inspection	Project Engineer	No waste on site Records of material return to store if any	Construction & Decommissioning

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
obsolete batteries and tree cuttings.	reduce wastage Practice 3 Rs of waste management: reduce, reuse, recycle of materials Manage storage, transfer, and disposal of transformer oils, acid and other hazardous materials according to industry standards Put up mobile collection units/storage for obsolete batteries which should be properly equipped and shall be protected from solar radiation, humidity and temperature				
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, hospital's) Work through community liaison	Inspection	Project Engineer / Safety Engineer	Vehicle maintenance Records	Construction & decommissioning

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
	officers to agree on working hours and to respond promptly to complaints. Technological advances, such as minimizing blade surface imperfections and using sound-absorbent materials can reduce wind turbine noise				
Risk of Fire -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
Damage to Biodiversity	Better siting of wind turbines to avoid bird migratory routes or Important Bird Areas		Environmental specialist	Records of payments made	Construction and operation
Loss of Physical Cultural Resources	Physical Cultural Resources may be triggered as a precaution, although the sub-projects are not expected to traverse areas of cultural or historical importance. Chance finds procedures will be included in contracts and in the	Close monitoring of the contractor	Environmental specialist	Records of any chance finding and report to the NMK	Construction

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
	environmental documents. Avoid the sites, which have a cultural or heritage value. The KPLC proposed candidate sites have avoided sites of cultural heritage.				
Oil and other hazardous material Leaks -The operation, refilling and empting of the transformer oil can lead to accidental oil spills. There is a possibility of leaking of acid, lead and other hazardous materials from the obsolete batteries. 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. The enclosure for obsolete batteries shall be capable of holding any run-off or spillage--the floor must be cemented, so as to prevent oil contamination by a potential spill acid or lead, and must have a containment system				Operation and decommissioning

Potential Negative Impacts	Mitigation Measures	Monitoring	Responsibility for Monitoring	Performance Indicators	Timing
	for possible leaks of hazardous substances.				
Soil Erosion Impacts(clearing an grading during construction activities would disturb on sites oils and increase the potential for erosion)	Minimize work areas; Keep vegetation clearing at the necessary minimum Keep vehicles on defined tracks (internal road tracks to be determined before the construction commences) Encourage re-vegetation as soon as the construction activities finish, or plan to immediately rehabilitate the disturbed sites after use. Implementation of a storm water management plan developed as part of the permitting process would minimize impacts.	Close monitoring of the contractor	Environmental specialist	No soil erosions No sedimentations of rivers/ wells	Construction

7.4 Way-leave Acquisition and Compensation for Low Voltage lines

As already noted the project will involve connection of power to end users i.e. to low-income households Off-Grid areas. The low voltage lines to connect the households will be mainly constructed along the road reserve and the 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.

While the project does not expect any resettlement, there may be need, nevertheless, 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 consult 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 REA to lay line on their land
- Once consent is given the construction engineer/contractor proceeds with construction. Clearing of bushes and cutting of trees if any exists, will be undertaken with, minimal disturbance wherever possible to pave way for the line. The wayleaves officer will pay the tree owners as stipulated by the law and RPF prepared for the project as per OP 4.12 and records will be kept.
- Once construction is done, the construction engineer does a memo to the way leave officer to visit the site and assess the impact, if any damage to property has taken place.
- In such a case, 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 cost of 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, wayleave 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.

7.5 Monitoring Roles and Responsibilities

The goal of monitoring is to measure the success rate of the project, determine whether interventions have resulted in dealing with negative impacts, whether further interventions are needed or monitoring is to be extended in some areas.

7.5.1 REA/PIU -Environmental and Social Specialists

The REA/PIU will have an environmental specialist and a social safeguard specialist who will provide oversight, screening of sub projects, and preparation of ToRs for ESIAs, facilitation, coordination, review of ESIAs, monitoring and evaluation of all the sub projects. The PIU will prepare quarterly monitoring reports of all active investments under implementation and these will be submitted to the World Bank.

7.5.2 Bank's Monitoring Support

The Bank will provide second line of monitoring compliance and commitments made in the Management Plans through supervision. The Bank will further undertake monitoring during its scheduled project supervision missions. Specifically, for each year that the agreement is in effect, MoEP will be required to submit all the monitoring reports to the Bank as part of its reporting and the Bank supervision missions will review these reports and provide feedback.

7.5.3 National Environment Management Authority (NEMA)

The EMCA places the responsibility of environmental protection on NEMA as the coordinating agency. NEMA is charged with the overall role of providing oversight in regard to monitoring for all project activities that have potential impacts on the environment in Kenya. NEMA will undertake periodic monitoring of the investment projects by making regular site inspection visits to determine compliance with the investment projects ESIAs approved and will further rely on the submitted annual audit reports submitted for each investment project annually as required by EMCA as a way of monitoring. NEMA will provide approvals and ESIA licence to all the investments based on the ESIA reports submitted, without NEMA's approval implementation of the investment project will not move forward. All monitoring reports as well as annual environmental audit repost will be submitted to NEMA as specified by the environmental assessment and audit regulations.

7.6 E-Waste Mitigation Measure and Management/Disposal Plan

This ESMF contains potential mitigation measures through which the adverse impacts associated with E-Waste emanating from this project can be managed. The mitigation measures or guidelines have been designed in order to avoid, minimize and reduce negative environmental and social impacts at the project level. The mitigation measures are presented in the following tables in a descriptive format.

7.6.1 Procurement of Electronic Equipment from Credible Manufacturers

The project will as a mitigation measure ensures that all electronic devices are procured from manufacturers that are credible and that all equipment will have a clear date of manufacture and warranty. This will avoid procurement of refurbished or used second hand electronic devises with a shorter shelf life a common problem that leads to generation of E-waste as a result of obsoleteness.

7.6.2 Recycling

All the E-wastes generated will be taken to Nairobi where there is a facility that recycles E-waste at no cost. The East African Compliant Recycling Company is operating Kenya's first E-waste recycling facility, operating to international health, safety and environmental

standards and establishing a local, sustainable IT E-waste recycling industry.

The East Africa Compliant Recycling was designed as a scalable model for E-waste recycling. It was established in Mombasa in October 2011 as a pilot project with funding from HP. The EACR is the first facility of its kind in East Africa to test a practical approach to E-waste recycling. The objectives behind its establishment were to:

- Analyse and measure volumes of E-waste returned
- Establish the process to safely separate the products into parts
- Identify facilities and markets to process all the resulting dismantled materials

Since beginning official operations, the EACR remains the only recycling facility in Kenya to accept, dismantle and separate all E-waste components and not just the valuable resources. Plastics, glass, batteries - everything - are all disposed in accordance with the highest international criteria while generating local income and employment opportunities. Until now, the facility receives end-of-life IT from business and public sector customers, as well as from the informal sector for recycling.EACR facility offers its workers advice on handling E-waste containing hazardous materials such as lead and cadmium.

Table 8. E-Waste Management/Disposal Plan

Issue: Procurement and provision of Electronic Devices e.g. Solar panels and batteries				
Impact	**Mitigation**	**Monitoring**	**Responsibility**	**Budget (USD)**
Air Pollution through improper disposal which leads to release of toxic, hazardous and carcinogenic gaseous	Procure Electronic devices from credible manufactures to avoid purchasing second hand, refurbished or obsolete devices with a short shelf life or already categorised as E-Waste Recycle all E-waste; Transport all E-wastes to the East African Compliant Recycling Company in Nairobi. Conduct awareness and sensitization targeting the users of the electronic devices to ensure that they engage in best practise for E-waste management.	Warranty for Electronic Devices purchased Credibility of manufacturers supplying the electronic devices Availability of E-waste receptacles in each school Number of awareness and training conducted for users of electronic devices on E-waste Certificate of disposal of E-wastes given by the East African Compliant Recycling Company attesting that E-waste from the program have been successfully disposed	MOEP/KPLC, and NEMA	5,000 USD for transport and purchase of recycling bins. The East African Compliant Recycling Company offers free recycling services.
Human Health Impacts due to poor disposal.	Procure Electronic devices from credible manufactures to avoid	Warranty for Electronic Devices purchased	MOEP/KPLC, and NEMA	5,000 USD for transport and purchase of recycling bins. The

Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully.	purchasing second hand, refurbished or obsolete devices with a short shelf life or already categorised as E-Waste Recycle all E-waste; Transport all E-wastes to the East African Compliant Recycling Company in Nairobi. Conduct awareness and sensitization targeting the users of the electronic devices to ensure that they engage in best practise for E-waste management.	Credibility of manufacturers supplying the electronic devices Availability of E-waste receptacles in each school Certificate of disposal of E-wastes given by the East African Compliant Recycling Company attesting that E-waste from the program have been successfully disposed		East African Compliant Recycling Company offers free recycling services.
Pollution of land resources including landfills Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully.	Procure Electronic devices from credible manufactures to avoid purchasing second hand, refurbished or obsolete devices with a short shelf life or already categorised as E-Waste Recycle all E-waste; Transport all E-wastes to the East African Compliant Recycling Company in Nairobi.	Warranty for Electronic Devices purchased Credibility of manufacturers supplying the electronic devices Certificate of disposal of E-wastes given by the East African Compliant Recycling Company attesting that E-waste from the program have been successfully disposed	MOEP and NEMA	5,000 USD for transport and purchase of recycling bins. The East African Compliant Recycling Company offers free recycling services.
Pollutionof water bodies Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully.	Procure Electronic devices from credible manufactures to avoid purchasing second hand, refurbished or obsolete devices with a short shelf life or already categorised as E-Waste Recycle all E-waste; Transport all E-wastes to the East African Compliant Recycling	Warranty for Electronic Devices purchased Credibility of manufacturers supplying the electronic devices Certificate of disposal	MOEP and NEMA	5,000 USD for transport and purchase of recycling bins. The East African Compliant Recycling Company offers free recycling services.

	Company in Nairobi. Conduct awareness and sensitization targeting the users of the electronic devices to ensure that they engage in best practise for E-waste management.	of E-wastes given by the East African Compliant Recycling Company attesting that E-waste from the program have been successfully disposed		

8 MITIGATION MEASURES

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. In the off-grid electrification sub-projects, it is particularly important to ensure that project site selection avoids insofar as possible areas of high biodiversity value, and if unavoidable, to ensure that all necessary measures are taken to minimize disturbance to local flora, fauna, and avifauna. 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 public health issues include: 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 REA are as shown in Table 8. The table are not intended to be exhaustive in content but rather to indicate in general the scope of ESIAs and ESMPs. Given that sites for the sub-projects are not yet definitively identified, and may be located in areas of high biodiversity value, it may be possible that additional impacts will be identified during impact assessment studies or audit preparation and will require additional mitigation measures and close collaboration with Kenya Wildlife Service. In the ESIAs and ESMPs, impacts shall be categorized according to project phase (planning, construction, operation, and decommissioning) and for all project types.

Table 8: ESMP and Mitigation Program

Potential negative impacts	Mitigation measures	Monitoring activities and surveillance	Responsibility for Monitoring	Performance Indicator	Timing
Impact to Sensitive and Ecologically Important Areas	Identify environmentally sensitive or ecologically fragile areas (if any); If the proposed construction is located close to these areas, take necessary measures to avoid/ minimize disturbance The exact position of the solar PV array layout, wind turbines should be determined by the environmental specialist, and from specifications and design to avoid all sensitive areas in the positioning of the facility.	Inspection	Environmentalist/ project Engineer/ contractor	No solar panels installed in sensitive ecosystem	Pre-construction and construction
Impact on Natural Vegetation The project will involve short service lines from the generation sources to local consumers. No tall growing trees will be allowed below the lines . Grass and short vegetation will be cleared to pave way for erection of poles.	• Clear limited areas only where the pole will be erected • Select alternative alignments to avoid sensitive natural features • Although , given the low population density, it should be possible to minimize tree cutting, REA will replant trees in case any need to be cut	Inspections	Environmentalist	• No of trees planted	Construction & operation
Impacts to Aesthetics	Avoid the sites, which have a tourism value. During site selection and site detailing, consider ways to minimize visual intrusion and improving aesthetic qualities (including landscaping and plantation to compensate visual and aesthetic impacts).	Inspection	Environmentalist/ project Engineer/ contractor	No. of trees to camouflage the PVs and wind turbines No PVs and wind turbines in tourist attraction sites	Pre-construction and construction
Electric shocks and electrocution of people. 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	operation

Potential negative impacts	Mitigation measures	Monitoring activities and surveillance	Responsibility for Monitoring	Performance Indicator	Timing
				• Presence of Hazard communication signs • Availability of wiring certificate	
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 and accessible first aid kit • Observe OSHA 2007 regulations	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
Public health risk At project implementation many new workers will	• Public awareness of the public health issues identified. • Provision of condoms	Inspection	Safety Engineer/ Project Engineer	• Availability of Condoms • No of	Construction

Potential negative impacts	Mitigation measures	Monitoring activities and surveillance	Responsibility for Monitoring	Performance Indicator	Timing
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, particularly in remote areas. Such risks include public health related issues such as (HIV/AIDS, communicable and sexually transmitted diseases (STDs).	• Distribution of HIV & AIDS awareness materials in collaboration NACC			public health awareness sessions with workers	
Solid waste Little if any solid waste will be generated which includes conductor, obsolete batteries 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 Manage storage, transfer, and disposal of transformer oils, acid and other hazardous materials according to industry standards Put up mobile collection units/storage for obsolete batteries which should be properly equipped and shall be protected from solar radiation, humidity and temperature	Inspection	Project Engineer	No waste on site Records of material return to store if any	Construction & Decommissioning
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

Potential negative impacts	Mitigation measures	Monitoring activities and surveillance	Responsibility for Monitoring	Performance Indicator	Timing
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, hospital's) Work through community liaison officers to agree on working hours and to respond promptly to complaints. Technological advances, such as minimizing blade surface imperfections and using sound-absorbent materials can reduce wind turbine noise	Inspection	Project Engineer / Safety Engineer	Vehicle maintenance Records	Construction & decommissioning
Risk of Fire -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
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
Loss of physical cultural resources	Physical Cultural Resources may be triggered as a precaution, although the sub-projects are not expected to traverse areas of cultural or historical importance. Chance find procedures will be included in contracts and in the environmental documents.	Close monitoring of the contractor	Environmental specialist	Records of any chance finding and report to the NMK	Construction
Oil Leaks -The refilling and empting of the transformer oil can lead to accidental oil spills.	• Need to design appropriate protection devices against accidental discharge of				Operation and decommissioning

Potential negative impacts	Mitigation measures	Monitoring activities and surveillance	Responsibility for Monitoring	Performance Indicator	Timing
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.	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.				

Environmental and Social Impact Assessment (ESIA) for Sub-Projects

The purpose of the Environmental and Social Impact Assessment (ESIA) is to provide guidance during the implementation of proposed sub-projects regarding the institutional responsibilities and cost estimates for effective environmental and social management. The sub-project ESIAs will provide project-specific baseline data on the physical, biological, and socio-economic conditions of the specific project sites and will delineate project-specific impacts, and mitigation measures.

Thus, the sub-project ESIAs (detailed in the Terms of Reference in Annex 6) will : (i) describe the potential adverse environmental and social impacts of future projects; (ii) outline proposed mitigation measures to be adopted and indicate parties responsible for implementing mitigation measures; (iii) identify parties that will carry out the monitoring of the implementation of the mitigation measures; (iv) outline the time horizons for the various activities; and (v) detail the associated costs and sources of funds.

Monitoring

Monitoring of the implementation of the sub-project ESIAs will be undertaken by REA/PIU with assistance from regional safety officers/engineers. The ESIA will outline the institutional arrangements and cost estimates for environmental and social management during the implementation, operation and decommissioning of the sub-project. The following are specific institutional responsibilities for the projects:

- Facilitate the implementation of the projects
- To produce annual and periodical reports to the World Bank indicating the actions that have been undertaken towards the implementation of projects with regard to environmental safeguard compliance.
- Develop the key indicators for monitoring purposes with the bank and ensure the monitoring capabilities.
- Carry out Environmental awareness campaigns and collaborates with other stakeholders where these projects will be implemented.

9 PROJECT REVIEW, COORDINATION AND IMPLEMENTATION ARRANGEMENTS

9.1 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.

9.2 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 World Bank. It provides a mechanism for ensuring that potential adverse environmental and social impacts of projects 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 NEMA registered EIA/EA experts with REA staff.

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 OP/BP 4.01 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 A); whether the application of simple mitigation measures will suffice (environmental category B) as is the case for the KEMP project; or whether the project hasnegligible adverse environmental and social risks. (Environmental category C).
- 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;
- 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.

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 are servation 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 of 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 residues will be disposed of 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 and obsolete batteries, however, are subject to local regulation of disposing of the Insecticide, Fungicide, Rodenticide and other hazardous materials. 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.
- Obsolete batteries are hazardous waste because of their corrosive properties and toxicity, resulting from the sulphuric acid and lead contained in them. It is suggested that the company responsible for the operation and maintenance phase of Photovoltaic Systems (PVS) be given the responsibility to collect obsolete batteries. This company must train its staff in the collection and transportation of used acid-lead batteries.
- 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.

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

- The first step in environmental assessment will be preliminary screening. The REA/PIU staff with assistance of regional staff will accomplish this task by completing the environmental and social screening form (annex 1) described in the ESMF.
- 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.
- Projects assessed to have some adverse environmental impacts and assigned the environmental category 1 will be required to go through a full EA.
- 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, REA PIU will prepare TOR and be involved in recruitment of EA consultants. Although currently REA has adequate capacity to carryout screening.
- The Environmental Guidelines for Contractors (annex 3) will be attached to the bidding documents to ensure environmentally and socially sound construction practices.
- 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.
- 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.
- REA PIU will ensure that environmental concerns areaddressed 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 REA 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 REA staff.

9.3 The Screening Process

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

9.3.1 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), and distribution lines designs, will be carried out by REA/PIU and Environment unit staff or selected consultant. REA/PIU 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 OP/BP 4.01 Environmental and Social Assessment),the determination of appropriate environmental and social mitigation measures, and the need to conduct an EIA and/or RAPs and/or VMPP.

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

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 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.

9.3.2 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 REA/PIU and validated 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, REA 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, REA will ensure Bank 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 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.

9.3.3 Step 5: Public Consultations

Public consultation is a regulatory requirement by NEMA and the World Bank 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.

Completion of this screening form will facilitate the identification of potential environmental and social impacts, determination of their significance, assignment of the appropriate environmental category, proposal of appropriate environmental mitigation measures, or recommend the execution of an Environmental and Social Impact Assessment (ESIA), if necessary.

Development of project reports follows systematic process as follows;

- *Review of TORs with the implementing partners for adequacy*
- *Familiarization with project design*
- *Familiarization with projects area of influence*
- *Identification of the relevant statutes and WB safeguard policies*
- *Determination/ Identification of all stakeholders to project*
- *On-the-ground investigations of the bio-physical baseline*
- *Consultations with stakeholders*
- *Impact prediction and interpretation*
- *Identification of mitigation measures*
- *Development of an environmental management plan complete with budget and identification of responsibilities*
- *Finalization of project report*

9.3.4 NEMA Screening Process-Statutory content of Project Reports:

Regulation 7(1) of Legal Notice 101 stipulates content of Project Reports to include the following;-

- *The nature of the project;*
- *The location of the project including the physical area that may be affected by the project's activities;*
- *The activities that shall be undertaken during the project construction, operation, and decommissioning phases;*
- *The design of the project;*
- *The materials to be used, products, by-products, including waste to be generated by the project and the methods of disposal;*

- *The potential environmental impacts of the project and the mitigation measures to be taken during and after implementation;*
- *An action plan for the prevention and management of possible accidents during the project cycle;*
- *A plan to ensure the health and safety of the workers and neighbouring communities;*
- *The economic and socio-cultural impacts to the local community and the nation in general;*
- *The project budget;*
- *Any other information that the Authority may require.*

Once a project report is submitted to NEMA, a decision is made by NEMA and in the event that NEMA, based on the project report submitted makes a decision that an ESIA report must be prepared, the REA will be required to identify independent NEMA registered expert(s) to prepare an ESIA report in accordance with the EMCA.

Project Reports are normally prepared as a means of informing NEMA of the proposed development such that after review of the report, NEMA advises on the need or other wisefor a full ESIA. The ESIA regulations allow for approval of proposed projects at the Project Report Stage and have been effectively used by NEMA to grant Environmental Licenses to small projects without requiring a full ESIA.

Table 10: The NEMA Process for Approving Investment Project Reports

Steps	Action	Actor	Time requirement
One	Submission of PR to NEMA. NEMA receives PR, issues a receipt and acknowledgement.	KEMP/PIU and Implementing partners	To be undertaken by KEMP/PIU and Implementing partners environmental and social specialists with input from the Safeguards Advisor
Two	NEMA mails PR to Lead Agencies	NEMA	7 days assuming all requirements are fulfilled
Three	Lead agencies review PR and issue comments	Lead Agencies	21 days (minimum) after receipt of PR from NEMA.
Four	Review of PR by NEMA	NEMA	30 days after receipt of PR.
Five	Communication of findings from NEMA review	NEMA	45 days after receipt of PR.

Typical outcomes of review of Project Reports from NEMA are likely to be as shown in **Table 10** below. These are as follows:

Project investment is approved. Where NEMA and lead agencies ascertain that a project report has disclosed adequate mitigation for identified impacts, the project is approved by NEMA upon which, conditions attached to grant of an Environmental License are issued. Once these are fulfilled, an Environmental License is also issued subject to conditions which will be specific to the sub project in question. Among these is the requirement that the scheme design should not be altered without approval by NEMA. As well, an audit report is required of each project after the first year of completion.

Project Report discloses potential for major irreversible adverse impacts.In this case, NEMA may not approve the project.

Table 11: Possible Outcomes of NEMA Review of Project Reports

Outcome	Recommendation	Important precautions
Project found to have no significant Social and Environmental Impacts or Project report discloses sufficient mitigation measures	An Environmental License will be issued by NEMA	Project report must disclose adequate mitigation measures and show proof of comprehensive consultations within the area of influence.
Significant adverse social and environmental impacts found or Project Report fails to disclose adequate mitigation measures.	A full cycle EIA will be required by NEMA	As above
A proponent is dissatisfied with the outcome of the NEMA review.	An Appeal is provided for	

In the eventuality that a Project cannot be approved by NEMA on the basis of a Project Report, the proponent will be advised to undertake full cycle ESIA leading to development of a fully-fledged Environmental and Social Impact Assessment Study Report. **Figure 2** below outlines the ESIA process and review to be followed in an event that a determination for a full scale ESIA is arrived at by NEMA.

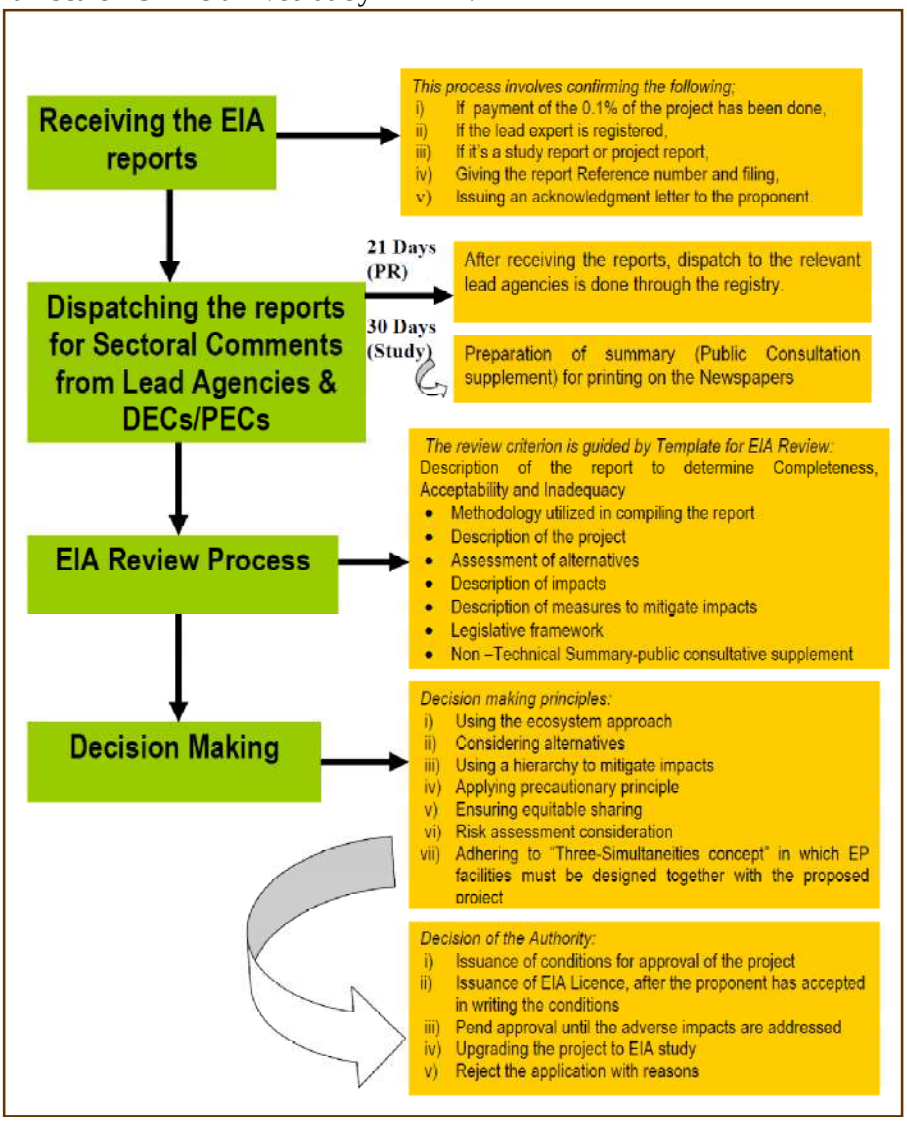

Figure 2: EIA process

9.3.5 Scoping Report

Firstly, on advice from NEMA, the proponent will prepare a Scoping Report specifying the project's area of influence, the thematic scope and depth of assessments required, the composition of the required ESIA team, and the probable budget required to prepare the ESIA Study.

9.3.6 ESIA Study

Upon review and approval of the Scoping Report, NEMA will advise that an ESIA Study be undertaken. The ESIA Study will entail a systematic investigation of all impact areas as identified in the scoping report, taking care to document the current baseline environment, resource exploitation patterns and ecological pressure points.

The REA/PIU will prepare the Terms of Reference for the ESIA and follow procurement rules for the recruitment of consultants for the ESIA.

Also, the impact mitigation measures provided in this ESMF may provide some basis for the design of the ToR. To facilitate the formulation of the ToR, a template has been prepared and provided in the **Annex** of this report. In the case of existing operations, the outline for Environmental and Social Management Plans (ESMPs) is also given.

The ESIA will identify and evaluate potential environmental impacts for the proposed investments, evaluate alternatives, and design mitigation measures. The preparation of the ESIA will be done in consultation with stakeholders, including people who may be affected. It is mandatory for the ESIA study to undertake public consultation with all stakeholders in the project's area of influence. The public consultations should identify key issues and determine how the concerns of all parties will be addressed in the ESIA. When an ESIA is necessary, the administrative process enacted by the NEMA will be followed and executed. The ESIA Team should note and understand all stakeholder interests so as to cater for them in the ESMP. All information will be written into a Draft ESIA Report prepared in the same format as the project Report and submitted to NEMA for review. Upon review of this report, it will be subjected to public review.

9.3.7 Social Impact Assessment Process

The breadth, depth, and type of analysis required for the social assessment will be proportional to the nature and scale of the proposed sub project's potential and effects on the affected persons.

The social assessment will be conducted by socio-economic experts and will ensure that through primary and secondary literature search critical information including (i) ethnic composition and demographic characteristics; (ii) land use; (iii) water use; (iv) non-agricultural activities such as livestock/itinerant pastoralism, fishing and other income generating activities; (v) socio-cultural issues regarding decision making within communities; (vi) gender division of labor and rights/responsibilities; (vii) use of land, land and resource tenure, access to and control over resources, resource rights including those related to water; (viii) access to different services and inclusion in the producer organizations based on gender; and (ix) baseline health situation with a focus on water borne and sexually transmitted diseases (STDs) among others are collected and documented

9.3.8 Public Review of the ESIA Report

EMCA provides for public consultation and review of all EIA reports prepared and dictates that all ESIA documents be disclosed at certain points for the public to provide comment. Copies of ESIA are placed at vantage points including the NEMA Library and NEMA website, NEMA Regional Offices and the sector Ministry responsible for a particular undertaking. NEMA serves a 21-day public notice in the national and local newspapers about the ESIA publication and its availability for public comments. When the public review period elapses, the comments and issues raised by the public are consolidated and addressed and the report re-submitted as final.

9.3.9 ESIA Review Process

The Implementing Agency will submit the draft ESIA to NEMA. The report will be reviewed by a cross-sectoral National Environmental and Social Impact Assessment Technical Review Committee (ESIA/TAC) made up of representatives of various Ministries, Departments and Agencies. The review committee is expected to:

- *Assist the Agency in screening/reviewing all Environmental Assessment Applications and Reports (Environmental Impact Statements, Annual Environmental Reports, Environmental Management Plans and other related reports)*
- *Make recommendations to the Director General of the NEMA for final decision-making*
- *Provide technical advice on conduct of assessments and related studies on undertakings and the reports submitted on them;*
- *Make recommendations on the adequacy of the assessment and any observed gap;*
- *Advice on the seriousness of such gaps and the risks or otherwise to decisions required to be made recommend whether the undertakings as proposed must be accepted and under what conditions, or not to be accepted and the reasons, as well provide guidance on how any outstanding issue/areas may be satisfactorily addressed.*

The review committees are mandated to co-opt relevant officials as and when necessary. In certain instances the support of international ESIA institutions such as the Netherlands ESIA Commission are solicited in review of some major or controversial projects where there is limited national expertise.

9.3.10 Environmental Permitting Decision

In cases where the draft ESIA is found acceptable, the implementing agencies of the specific REA/PIU will be notified to finalized the reports and submit 10 hard copies and an electronic copy. Following submission to NEMA, the implementing agency shall be issued an Environmental License.

9.3.11 Annual Environmental Audit

An independently commissioned environmental and social audit will be carried out on an annual basis. The audit team will report to NEMA, REA/PIU, who will lead the implementation of any corrective measures that are required. An audit is necessary to ensure (i) that the ESMF process is being implemented appropriately, and (ii) that mitigation measures are being identified and implemented. The audit will be able to identify any amendments in the ESMF approach that are required to improve its effectiveness.

The annual audit also provides a strong incentive for the MWI to ensure that the ESMF will be implemented, and the individual ESMPs will be developed and implemented.

9.4 Overall Project Compliance and Reporting

The ESMF will be implemented by the KEMP executing agencies. The implementing agency will collaborate with the safeguards specialist within the PIU and the World Bank to ensure effective execution. **Table 11**provides a summary of the stages and institutional responsibilities for the screening, preparation, assessment, approval and implementation of the sub project activities.

Table 12: Screening Responsibilities

No.	Stage	Institutional responsibility	Implementation responsibility
1.	Screening of Environmental and Social Infrastructure Project to assist in project formulation using checklist	REA /PIU	REA /PIU
	Statutory Environmental Registration of KEMP Component C2	REA PIU	REA/PIU
2.	Determination of appropriate environmental assessment level/ category	REA/PIU	REAREA/PIU
2.1	Selection validation	World Bank	/PIU
3.	Implementation of environmental assessment	REAPIU	REAPIU
	If ESIA is necessary		
3.1	Preparation of Terms of Reference	REA/PIU	REA/PIU
3.2	Validation of ESIA/ESMP TOR	NEMA/ World Bank	REA /PIU Safeguard Specialists
3.3	Selection of Consultant	MALF /MOF/ Procurement Office	EO/ Procurement Officer/ PIU Safeguard Specialist
3.4	Realization of the EIA, Public Consultation Integration of environmental and social management plan issues in the tendering and project implementation	Implementing agency/Procurement Office/Consultancy firm/Contractor	REA/PIU
4.	Review and Approval	NEMA/ World Bank/ REA/PIU	
4.1	ESIA Approval	NEMA/ World Bank	
4.2	Simple ESIA/ESMP Approval (Category B and C)	REA/PIU	REA/PIU
5.	Public Consultation and disclosure	REA/PIU / NEMA	REA/PIU
6.	Surveillance and monitoring	Implementing agency/NEMA/ World Bank/ REA/PIU	KEMP/PIU
7.	Development of monitoring indicators	REA/PIU	REA/PIU

10. CAPACITY BUILDING, TRAINING AND TECHNICAL ASSISTANCE

10.1 Responsibilities for Environmental and Social Monitoring

Environmental and social monitoring will be carried out by the REA/PIU 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 13: 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 PIU 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 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.	

REA ensures compliance with national and international environmental regulations and with the World Bank Operational Safeguards. The staff will include; environmental and social specialists and Socio-economist. The environmental unit of REA has prepared a number of ESIAs, RAPs, and/or Environmental Audits as well monitoring of other projects for REA

10.1.1 Monitoring, Evaluation and Reporting

Monitoring, evaluation and reporting on environmental issues will be part of project implementation processes and reporting systems. REA 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 REA/PIU will be responsible for environmental and social monitoring at local levels. REA'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). 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. REA/PIU will regularly report to the World Bankon the status of environmental and social management of projects in the project's Quarterly Reports.

10.1.2 Capacity Building and Environmental Training

The REA/ PIU involved in environmental matters will have formal training in the management of environmental issues. The training program 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 REA PIU and regional staff as well as some staff 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 World Bank 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 analyse 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 PIU will be attending various courses towards enhancing capacity building when they are identified. These courses include;

- Environmental conservation and management;
- SEA trainings
- ESMF implementation and monitoring trainings
- Monitoring and evaluation;
- Waste management;
- Occupational safety & health;
- Project management;
- Climate change among others.
- Environmental quality assessment and monitoring
- Ecological assessment trainings especially on fauna and flora

11. PUBLIC CONSULTATION AND PARTICIPATION

Participatory Stakeholder Forums were held on 6th and 12thJanuary, 2015 to disclose and consult with stakeholders on the environmental safeguards documents for the KEMP project. Given that at this stage, the exact sub-project sites are not yet definitely identified, (a number of locations have been proposed by MoEP) consultations were held on this draft Environmental and Social Management Framework. Once off-grid sub-project locations have been identified and confirmed for inclusion under KEMP, Environmental Impact Assessments (EIAs) and/ or Environmental Management Plans (EMPs) will be prepared as required by NEMA and World Bank guidelines and further public and stakeholder consultations with targeted beneficiaries will be conducted at that time.

The location of KEMP off-grid sub-projects will be identified by the PIUand sub-project designs will be carried out through consultation with the community and the targeted beneficiaries. After location selection of a sub-project community level environmental screening will be an integral part of the sub-project planning. The community meetings will be held to discuss the sub-projects, identify the community priorities and identify the scope of work.

Thus Consultation will be a continuous process by which opinion from public will be sought on matters affecting them. Public consultation is generally a continuous process aimed at engaging the stakeholder efforts throughout the planning, design, construction, and operation a project. The objectives of consultation and access to information will be to generate public awareness by providing information about a sub-project to all stakeholders, particularly the sub-projects affected persons (PAPs) in a timely manner, and to provide opportunity to the stakeholders to voice their opinions and concerns on different aspects of the project. The opinions and suggestions of the stakeholders would assist in taking appropriate decisions for effective environmental management of the sub-projects. It would help facilitate and streamline decision making whilst fostering an atmosphere of understanding among individuals, groups and organizations, who could affect or be affected by the sub-projects. As a part of Environmental Screening and EIA, an effective public consultation and access to information plan (PCAIP) will needs to be developed. The specific objectives of Public Consultation are:

• To keep stakeholders informed about the sub-projects at different stages of implementation,
• To address the environmental and social concerns/ impacts, and device mitigation measures taking into account the opinion/ suggestions of the stakeholders,
• To generate and document broad community support for the sub-projects,
• To improve communications among interested parties, and
• To establish formal complaint submittal / resolution mechanisms.
• To discuss the KEMP project and document its issues, concerns and mitigation measures.

11.1 Instruments for Use during Consultations

A critical element of the in KEMP project will be planning the implementation of a comprehensive participatory consultation program that will be associated with the selection of participation techniques to meet desired objectives. Considering the importance of effective participation and consultation in a wide spread project area along with the time and resource constraints in the KEMP project, the following participation techniques will be followed:

• Information dissemination and information sharing techniques will be used to inform advice stakeholders in a timely manner of proposed the stakeholders regarding the actions being undertaken in a KEMP project sites. Tools and techniques used will include: through personal communication to make them aware about the project as well as to incorporate users input at different stages of the project.
• A questionnaire/survey to gather quantitative and qualitative feedback information about the KEMP sub-projects. Individual schemes through questionnaires survey.
• Focused Group Discussion (FGDs) should be conducted covering different components of the KEMP project to increase local awareness about the forthcoming project as well as to incorporate their views, needs, priorities considering different positive and negative impact of the project.
• Key Informant surveys will be carried out among the more well-informed and long term members of the project area (including knowledgeable and elderly people) of the project area to incorporate their views and suggestions based on from their long experiences and knowledge and knowledge of the project area.
• Hot Spot Consultation will be conducted in problematic locations of the KEMP schemes with participation of knowledgeable and affected people, prominent members of the community local elite, public representatives, officials and NGO representatives people to ensure to mitigate adverse impact considering their views suggestions from their practical experiences as per local needs and concerns are taken into account.
• Participatory workshops will be organized with the participation of different types of representative stakeholders.

The focus group discussions (FGDs) will have representations from the cross-sections of the stake-holders of various professions and categories like agriculture, fishery, students, teachers, business persons, poorer section of the community, housewives, women groups, vulnerable groups, NGOs/CBOs, LGED, local government, development organizations, development partners. The Environmental and Social Specialist will monitor and contact the stakeholders as and when necessary. The experts will conduct the FGD in consultation and coordination with the designated stakeholders, PIT and project Engineers.

11.2 Summary of the outcome of Public and Stakeholder consultations held on 6th and 12th January 2015

In addition to questions on environmental issues, green (renewable) energy, social, resettlement, and gender issues, Kenya Power PLC addressed concerns raised about reliability and security of power [concerns were raised about the burned out transformers], financial accessibility for low-income consumers, how peri-urban areas are classified for inclusion [the most significant classification is based on population density], criteria for determining connectivity [what is the maximum distribution distance from household allowed to secure for connection],and accessibility to power data/mapping.

Comprehensive discussions and deliberations on the outcome of the Stakeholder Forum (Including Kenya Power's detailed responses to concerns raised) can be found in the minutes appended to this report as Annex 7.

Since consultations for all components of the KEMP Project were held concurrently, some of the questions relate more to the off-grid electrification component of the KEMP Project. Some of the key issues picked salient issues highlighted by attendees included:

Kenya Forestry Service (KFS) requested that consultations be conducted to be done early on in design of the route alignment to minimize any cutting of trees, and that they it be given an opportunity to provide forest resource assessment to minimize conflicts on land use. (However, the nature and scope of the KEMP project will not necessitate any large-scale tree cutting).

Kenya Civil Aviation Authority (KCAA) requested that they be to be consulted in advance to work with Kenya Power and Kenya power to work with it to ensure aerodromes, airports, and heliports are safeguarded from power lines and associated facilities.

Participants from the Office of the Presidents (Chiefs) requested that Kenya Power works in partnership with them and that they be involved in the criteria for selection of the Peri- urban areas that will benefit from the project.

Kenya Power responded to queries from would work with County governments and the Ministry for Interior Security to assure them that Kenya Power is working to address the issue of transformer vandalism and illegal connections that were costing the company and the national economy big revenue losses.

In response to concerns raised, Kenya Power reiterated that power line way leaves must, should be respected and Kenya Power will to work with County governments to stop Temporary Occupation Licences that were a safety risk to the public and the electric power infrastructure system.

Many participants from the Counties requested for assistance Kenya Power and the Ministry of Energy to provide assistance in plotting and carrying out studies on Wind and Solar capacity and to make available of energy data in the public domain.

The participants from the devolved government agencies also requested Kenya Power to consider their County integrated plans when implementing KEMP and other electricity access plans.

Action Aid international was concerned about the quality of compensation and resettlement. (This question will be addressed in the RPF for the off-grid component).
Kenya Association of Manufacturer's (KAM) asked whether there was any focus on industries to enable them be sited on rural and off grid areas. It was noted that REA and KETRACO were aware of this issues, and would be engaged in projects to ensure access to electricity in rural and off-grid areas.

Some of the Contractors present (Que Energy Limited) advised Kenya Power to look into new systems and technologies for dual systems mainly solar and thermal. They also noted that emphasis was on communities and wondered what Kenya Power was doing to cover private contractors.

WinPower Ltd Company was concerned on the criteria to be used in selection of contractors in the off grid areas, and the tendering process was explained to them.

The devolved government's reported that they were already generating their own power generating stations in partnerships with Private investors and were concerned whether they could also feed into the existing grid.

Most participants were concerned about on the perceived high connection costs and tariffs and wanted to know whether KEMP was a continuation of GPOBA. It was noted that KEMP was the next level up of GPOBA and Peri-urban areas were more organized with better infrastructure.

A specific consultation forum with representatives of Vulnerable and Marginalized Groups (VMGs) was conducted on 12th January 2015 in Stima Plaza. The forum was attended by 16 people with 6 of the participants from VMGs from different counties (Narok, Kwale, Nakuru and Kajiado. Four safeguards instruments prepared for the KEMP were presented during this forum. These were: (a) Resettlement Policy for KEMP; (b) Vulnerable and Marginalized Group Framework (VMGF) for KEMP; (c) Environmental and Social Management Framework (ESMF) for Peri Urban Component and the (d) Environmental and Social Management Framework for the Off Grid Component. The representatives of the VMGS were appreciative of the initiative to involve them during the preparatory stage of KEMP project. They were in particular impressed by the policy documents and the manner in which these addressed their issues of concern. They were overall supportive of the project goal and objectives and proposed interventions. Participants were very resourceful in discussing and highlighting issues of concern in each of the instruments. The main issues raised included:

a) What mechanisms were in place to increase affordability of connections by VMGs;
b) Need to pay particular attention to gender/women;
c) Ascertaining free, prior and informed consultations
d) Treatment of VMGs that do not have title deeds
e) Clear feedback mechanisms
f) Compensation for sensitive sites
g) More clarity on principles of compensation for losses;
h)Clarification on role and responsibilities of government and bank in screening/triggering policy O.P 4.10 and undertaking the social assessment process;
i) The need to build on local /cultural mechanisms for GRM.

However, they cautioned that from their past experiences reality has tended to depart from the paper work and urged that all efforts be made to ensure implementation will be as per the instruments presented.

The Bank and KPLC (on behalf of REA) clarified that the project was guided by principles embodied in the safeguard documents presented and the various Bank operational policies triggered. KPLC (on behalf of REA) welcomed the comments/suggestions and promised to take them into considerations.

A full summary of consultations, including a list of attendees, is detailed in Annex 7.

12. GRIEVANCE REDRESS MECHANISM

Grievance mechanisms provide a formal avenue for affected groups or stakeholders to engage with the project implementers or owners on issues of concern or unaddressed impacts. Grievances are any complaints or suggestions about the way a project is being implemented. They may take the form of specific complaints for damages/injury, concerns about routine project activities, or perceived incidents or impacts. Identifying and responding to grievances supports the development of positive relationships between projects and affected groups/communities, and other stakeholders.

The World Bank/IFC standards outline requirements for grievance mechanisms for some projects. Grievance mechanisms should receive and facilitate resolution of the affected institutional or communities' concerns and grievances. The World Bank/IFC states the concerns should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities, at no cost and without retribution.

Mechanisms should be appropriate to the scale of impacts and risks presented by a project. Grievances can be an indication of growing stakeholder concerns (real and perceived) and can escalate if not identified and resolved. The management of grievances is therefore a vital component of stakeholder management and an important aspect of risk management for a project. Projects may have a range of potential adverse impacts to people and the environment in general, identifying grievances and ensuring timely resolution is therefore very necessary. As such the ESMF has developed a grievance management process to serve as a guide during project implementation.

Table 14: Grievance Management

Process	Description	Time Frame	Other Information
Identification of grievance	Face to face; phone; letter, e-mail; recorded during public/community interaction; others	1 Day	Email address; hotline number
Grievance assessed and logged	Significance assessed and grievance recorded or logged (i.e. in a log book)	3-6 Days	Significance criteria: Level 1 –one off event; Level 2 – complaint is widespread or repeated; Level 3- any complaint (one off or repeated) that indicates breach of law or policy or this ESMF/RPF provisions
Grievance is acknowledged	Acknowledgement of grievance through appropriate medium	8-15 Days	
Development of response	Grievance assigned to appropriate party for resolution Response development with input from management/ relevant stakeholders	4-8 Days	
Response signed off	Redress action approved at appropriate	8-15 Days	
Implementation and communication of response	Redress action implemented and update of progress on resolution communicated to complainant	5-9 Days	

REA will use this Grievance Redress Mechanism in case of any incidence or complaint from the public or affected persons and the details of the GRM will be captured in the RPF prepared for this Off-Grid component.

13. ESMF IMPLEMENTATION BUDGET

The ESMF implementation budget refers to all costs that will be incurred to implement the requirements or recommendations of the ESMF. The ESMF requirements ensure that implementation of the projects integrates environmental and social issues for the sustainability of the project as well as the sub-projects. Among other things the ESMF recommends the following key issues, namely; training, capacity building, screening, reviewing and monitoring mechanisms. These issues are clearly described here under; the staff- who will be involved in the implementation of the project should be trained to enhance their skills on environmental and social issues. Building the capacity of staff in REA's PIU will enable them to screen, review and monitor environmental issues in the sub-projects to ensure compliance with requirements of the national policies and Acts as well as World Bank safeguard policies.

Furthermore, screening and reviewing processes would also involve some cost implications. Every sub-project would be screened and reviewed by the implementing unit while involving Environmental Experts.

Monitoring plan: there will be monitoring during the implementation of the sub-projects in order to measure the effectiveness of the mitigation measures. The monitoring and reporting procedures will ensure early detection of conditions that necessitate particular mitigation measures and will furnish information on the progress and results of mitigation. The monitoring component will involve some cost implications. Based on previous experience from related projects, the estimated costs for monitoring would be

Table 15: Estimated level of costs for ESMF implementation

ESMF proposed actions)	Concerned institutions	Level of cost (USD)
Training and capacity Building	Procurement, infrastructure and Network Management	5,000
Screening and reviewing	Project Implementation Team/Unit	10,000
Monitoring activities	PIU, NEMA	50,000
Total Costs		**75,000**

The cost implications for implementing this ESMF are reflected in table 14 above. The estimates reflect the level of cost but the actual costs will be determined during the implementation phase, when the specific number of people required for training will be identified and the level of technical assistance required.

14. CONCLUSION AND RECOMMENDATIONS

This Environmental and Social Management Framework (ESMF) has been prepared to establish the mechanism to determine and assess future potential adverse environmental and social impacts of sub-projects that are to be identified and cleared under the Off-Grid electrification component of the Kenya Electricity Modernization Project.

This ESMF is meant to ensure that the implementation of the KEMP, of which the specific sub-project sites are unknown at this stage, will be carried out in an environmentally and socially sustainable manner. The ESMF provides 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 the preparation of site-specific Environmental Impact Assessments (EIA) where applicable, in accordance with the EMCA, 1999 as well as World Bank safeguard policies particularly Environmental Assessment (OP/BP 4.01).

Consequently, specific information on the number of sub-projects, site location of sub projects, land requirements, geo-physical land features, nature, type and use of equipment etc. are not available at this stage. Therefore, exact details and the intensity of social and environmental impacts and their effective mitigation cannot be determined.

However, the framework among other things mentions the World Bank Operational Safeguards that are likely to be triggered by the proposed power connectivity project, identifies potential environmental concerns/impacts, environmental and social management plan, institutional responsibilities, capacity building, training needs, and technical assistance required.

In view of all these the ESMF therefore recommends the following;

- **Capacity Building**; The ESMF recognizes existing gaps and weaknesses for implementing ESMF under this project and realizes the importance of strengthening the capacity of key implementing departments and PIU. However, currently, most Departments and units/sections are lacking the necessary capacity to able to comply with requirements of national policies and Acts as well as World Bank safeguard policies. This will provide a conducive and enabling environment to address environmental and social issues in the company across all counties under this project and implementation of ESMF.

- **Training needs**; Staff who will be appointed to the Project Implementation Team (PIU), Implementing units and other sections which will be responsible for coordinating activities across the company for managing sub-projects for the purpose of maintaining a formative monitoring system throughout the project to assess the quality of implementation, use of funds, and impacts should have the necessary skills in Environmental and Social Management. Therefore they should undertake training in environmental management. Training topics may include an overview of environmental issues within the power sector, introduction to EIA processes and methods, impact analysis, EIA review, the role of the public and stakeholders, EIA experience in Kenya, and case studies. Other training needs are explained in chapter 10.

- The implementation of KEMP sub-projects should strongly integrate environmental and social issues in relation to the sub-project as outlined in this ESMF. Furthermore the implementation of the KEMP project as well as its subprojects must comply with the Kenyan Policies and Laws as well as World Bank Polices.

- **Adherence to ESMF requirements**; The ESMF requires this project to ensure that procedures are followed in relation to environmental and social screening, review and approval prior to implementation of sub- projects to be financed under the KEMP. Furthermore, appropriate roles and responsibilities, for managing and monitoring environmental and social concerns related to sub-projects should also be followed.

15. REFERENCE

1. Basiye Karen Khayanje (2008), Extended Producer Responsibility for the Management of Waste from Mobile Phones, IIIEE, Lund University, theses.
2. Building Code 1968
3. County Government Acts, 2012
4. Energy Act of 2006
5. Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006
6. Environmental Management and Coordination (Fossil Fuel Emission Control) Regulations 2006
7. Environmental Management and Coordination (Noise and Excessive Vibration pollution) (Control) Regulations, 2009: Legal Notice 61
8. Government of Kenya Agriculture Act
9. Government of Kenya Antiquities and Monuments Act, Cap 215 of 1983
10. Government of Kenya Employment Act, 2007
11. Government of Kenya Fiscal Management Act (CAP 5) of 2009
12. Government of Kenya Maritime Authority Act 2006
13. Government of Kenya Public Procurement and Disposal Act
14. Government of Kenya Roads Board Act
15. Government of Kenya State of Environment 2010
16. Government of Kenya Wayleave Act
17. IFC Performance Standards
18. ILO (2012), The global impact of e-waste: addressing the challenge/Karin Lundgren; International Labour Office, Programme on Safety and Health at Work and the Environment (Safe Work), Sectoral Activities Department (SECTOR). Geneva.
19. Kenya power Safety Rules Handbook 2014
20. Kenya Vision 2030:A Globally competitive and prosperous Kenya 2007
21. Land Act, 2012
22. Occupational Safety and Health Act, 2007
23. Penal Code Act (Cap.63)
24. Physical Planning Act, 1996
25. Public Health Act (Cap. 242)
26. The Civil Aviation Act No. 21 of 2013
27. The Constitution of Kenya, 2010: Constitutional provisions
28. The Environment Management and Co-ordination Act, 1999
29. The Environmental (Impact Assessment and Audit) Regulations, 2003
30. The Environmental Management Coordination (Waste Management) Regulations): Legal Notice 121
31. The Environmental Management Coordination (Water Quality) Regulations): Legal Notice 120
32. The Forestry Services Act, 2005
33. The Land and Environment Court Act 2011
34. The Traffic Act Cap 403 0f 2009
35. United Nations Environment Programme &United Nations University, (2009), Sustainable Innovation And Technology Transfer Industrial Sector Studies Recycling from E-Waste To Resources.
36. Urban Areas and Cities Act No. 13 of 2011
37. Waema, Wanjira, Finaly, Schuluepand Mureithi (2008), E-waste assessment in Kenya, Baseline Assessment Report for Kenya, proceedings of the 19th Waste

Management Conference of the IWMSA (Wastecon 2008).
38. Water Act, 2002
39. Wildlife Conservation and Management Act, 2013
40. Work Injury and Benefits Act, (WIBA) 2007
41. World Bank Aide Memoire for GPE Project
42. World Bank Environmental Assessment OP.4.01
43. World Bank GPE Project Appraisal Document (PAD),
44. World Bank Project documentation for KEMP
45. World Bank Safeguards Policies World Bank Group Environmental, Health, and Safety Guidelines (known as the "EHS Guidelines").http://www.ifc.org/ifcext/sustainability.nsf/Content/EHSGuidelines

15.1 Annex 1: Environmental and Social Screening Form

GENERAL PROJECT DESCRIPTION AND SETTING		
	General Aspects/Questions	**Provision of answers to project aspects**
	Name and/or Title	
	Project Type	
	Expected start and end date (month/year) & project duration (in months) of the construction phase:	
	List the technology and machinery to be used in the construction and operation phases	
	List the materials to be used during the construction and operation phases (e.g., infrastructure, creosote treated poles, fuels and oils):	
	Expected number of workers during construction & operation:	
	Provide a map with the geographical location of the project;	
	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	
	Is the project area or its immediate surroundings subject to pollution or environmental damage caused by other (existing) activities?	
	Is there any other infrastructure in or close to the project area?	
THE SOCIAL ASPECTS		
	Social issues around the project area	**Describe the potential issues/impacts**
	Existing land uses on and around the (existing transformer)/project area	
	Land uses on or near the project area which will be negatively affected by project implementation?	
	Presence of residential/sensitive areas e.g. community facilities	
	Present owner(s)/users of the project area	
	Population density	
	Job opportunities (for the local people)	
	Effects of project on people's access to land or natural resources	
	Compensation to property damage	
	Effects of project on incomes, value of land and other economic activities?	
	Construction workers (number and how long they will spend in project area)	
	Exposure of community/public to diseases	
	Safety of workers (e.g. occupational health and safety issues)?	

	Public engagement (role of the project beneficiaries across all phases of the project)	
	Public risk to shocks and electrocution	
	Public awareness on use of the service (electricity)	
	Population density	
Conclusion from the screening process		
ENVIRONMENTAL ASPECTS		
	Existing environment:	**Description –describe features and indicate sensitivity to disturbance**
Physical Features		
	Topography/terrain	
	Soil (type & quality)	
	Surface water (presence & quality)	
	Sediments/substance (Type and quality)	
	Ground water (local use & quality)	
	Air quality (any pollution issues)	
Biological features		
	Vegetation (trees, ground cover, aquatic vegetation)	
	Wetlands (e.g. bogs, fens and marshes)	
	Fish and fish habitant	
	Birds (water fowl, migratory birds and others)	
	Mammals	
	Special habitat areas (special designations or identifies sensitive zones)	
	Archaeological resources (recorded or potential for them to exist)	
	Special designations (parks, protected areas)	
	Traditional economic/cultural activities (trapping, fishing, collection of medicinal plants)	
Conclusion from the screening process		

15.2 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	

15.3 Annex 3: Environmental Guidelines for Contractors

General Environmental Management Conditions
General
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 fulfil 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.

- 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:

- 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.

- 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.

- 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.

- 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.
- Implement soil erosion control measures in order to avoid surface run off and prevents siltation, etc.

- Ensure that garbage, sanitation and drinking water facilities are provided in construction workers camps.

- Ensure that, in as much as possible, local materials are used to avoid importation of foreign material and long distance transportation.

- Ensure public safety, and meet traffic safety requirements for the operation of work to avoid accidents.

- 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.

- 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

- 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 of at designated disposal sites in Line with applicable government waste management regulations.

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

- 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:

- 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.

- 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.

- 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.

- 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

- To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.
- 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.
- Re-vegetate stockpiles to protect the soil from erosion, discourage weed sand maintain an active population of beneficial soil microbes.
- To the extent practicable, reinstate natural drainage patterns where they have been altered or impaired.
- Identify potentially toxic overburden and screen with suitable material to prevent mobilization of toxins.
- 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.
- Minimize the long-term visual impact by creating landforms that are compatible with the adjacent landscape.
- Minimize erosion by wind and water both during and after the process of reinstatement.
- 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

- The Contractor shall at all costs avoid conflicting with water demands of local communities.
- 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.
- Abstraction of water from wetlands shall be avoided. Where necessary, authority has to be obtained from relevant authorities.
- No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.
- Wash water from washing out of equipment shall not be discharged into water courses or road drains.
- 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

- 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.

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

- 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

Unusable materials and construction elements such as electro-mechanical 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

- 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.

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

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

Repair of Private Property

- 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.

- 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)

- 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.

- 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.

- 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

- 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 toEHS management during site meetings.
- 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.

- 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

- 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

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.

15.4 Annex 4: Disposal of Obsolete Batteries

Batteries are electrical storage devices –mechanisms that produce chemical reactions of oxide - reduction (REDOX), to transform chemical energy into electricity, and releasing it when connected to an external circuit. Batteries serve important roles in solar energy systems. They are used as back-up resources in grid-connected systems while they are the main component in stand-alone systems.

A battery is formed by a box or container of polypropylene or rubber material, containing lead metal sheets separated from the metallic lead grids by sleeves of polyethylene or polyvinyl chloride. The reaction between plates is produced by the electrolyte formed by sulfuric acid and water.

When a battery reaches the end of its useful life it becomes hazardous waste because it can pose a risk to health, or contaminate water and soil and affect flora and fauna, and the environment in general, if obsolete batteries are not adequately disposed of.

Obsolete batteries are hazardous waste because of their corrosive properties and toxicity, resulting from the sulfuric acid and lead contained in them.

It is suggested that the company responsible for the operation and maintenance phase of Photovoltaic Systems (PVS) be given the responsibility to collect obsolete batteries. This company must train its staff in the collection and transportation of used acid-lead batteries.

OBSOLETE BATTERY MANAGEMENT PLAN
To avoid negative impacts to the environment, a Management Plan for the disposal of obsolete batteries should be implemented, which consists of the following steps:

Battery collection
The staff of the distribution company that is responsible for the maintenance of photovoltaic systems, should also be responsible for determining when the battery has completed its useful life (approximately the fourth year of use) in order to collect it. Mobile collection units must be appropriately equipped, i.e., they must be transported in dry conditions and must be sealed to prevent leakage of acid.

Temporary storage of batteries

- The distributor should have a room for temporary storage of batteries, which must have the following characteristics:
- The enclosure shall be protected from solar radiation, humidity and temperature.
- The enclosure shall be capable of holding any runoff or spillage-- the floor must be cemented, so as to prevent soil contamination by a potential spill acid or lead, and must have a containment system for possible leaks of hazardous substances.
- The ceiling must be in good condition to prevent rainwater falling on the batteries. The batteries must be stacked horizontally to prevent leakage of acid and placed on pallets of wood or plastic to prevent leakage.
- This enclosure should be away from heat sources.
- The enclosure must have fire extinguishers based on carbon dioxide or dry chemical.
- In case of acid spills, the storage area must have containers at the bottom containing the spilled acid. This acid must be neutralized with sodium bicarbonate.

- To reduce risks, personnel should wear work clothes and personal protective equipment, including masks, gloves and rubber aprons.
- The entrance of batteries to storage area and exit to the recycler should be registered to keep better control.
- In cases of acid spills, water should not be thrown on an electrolyte spill to avoid an exothermic reaction. To this effect it is important clean the affected area with a cloth soaked in a solution of sodium bicarbonate in order to neutralize the acid that may remain.

As evidence of the delivery of obsolete batteries to the company performing the recycling, there must be a record of the date and number of batteries delivered to the responsible recycling company.

15.5 Annex 5: 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 orescalation

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

15.6 Annex 6: Sample Terms of Reference (Tor) For an Environmental & Social Impact Assessment for Sub Projects

1. Objectives of the ToR

This section should state the scope of the ESIA in relation to the screening category, and identify the geothermal project the ESIA will apply to. It should prescribe the process and its timing of project preparation, design, and implementation stages in order to adequately address Bank safeguards issues. Further, it should identify constrains (adequacy of existing baseline data and need for additional data) and provide and exact development schedule.

2. Background Information

The ToR should provide pertinent background for preparing the ESIA. This would include a brief description of:

- Statement of the project objectives,
- Implementing agency/sponsor and their requirements for conducting an ESIA,
- Project components, especially those that will finance subprojects;
- Anticipated types of subprojects/components, and what types will not be financed by the project;
- Ares of influence to be assessed (description plus good map)
- Summary of environmental/social setting
- Applicable Bank safeguards policies, and consequent Project preparation requirements, as specified in the approved ISDS.

The ToR should also include a brief history of the project, including alternatives considered, its current status and timetable, and the identities of any associated projects. Also include a description of other project preparation activities underway (e.g., legal analysis, institutional analysis, economic analysis, social assessment, baseline study) since the consultant preparing the ESIA will need to coordinate with other teams to ensure an effective and efficient information exchange.

3. EA Requirements/Regulations

This paragraph should identify any regulations and guidelines, which will govern the conduct of the assessment or specify the content of its report. They may include any or all of the following:

- National laws and/or regulations on environmental assessments;
- Regional, provincial or communal environmental assessment regulations;
- Environmental assessment regulations of any other financing organizations involved in the project.
- Relevant international environmental agreements/conventions to which the country is party
- World Bank Operational Policies 4.01 "Environmental Assessment," 4.04 “Natural Habitats”, 4.11 “Cultural Property”, 4.12 “Involuntary Resettlement”, 4.10 “Indigenous People” and other pertinent operational policies and Guidelines.

4. Study Area and Likely Major Impacts

Specify the area involved and the boundaries of the study area for the assessment (e.g., water catchment). Where appropriate specify the right-of-way (ROW)-width and alignment for pipelines. Similarly, specify locations for transmission substations, pumps.

Identify adjacent or remote areas which should be considered with respect to impacts of particular aspects of the project.

5. Scope of Work

In some cases, the tasks to be carried out by a consultant will be known with sufficient certainty to be specified completely in the terms of reference. In other cases, information deficiencies need to be alleviated or specialized field studies or modelling activities performed to assess impacts, and the

consultant will be asked to define particular tasks in more detail for contracting agency review and approval.

Task 1. Description of the Proposed Project. Provide a brief description of the relevant parts of the project, using maps (at appropriate scale) and including the following information: location of all project related development sites and ROW's, including offsite investments; general layout; flow diagrams/drawings of facilities/operation design basis, size, capacity, flow-through of unit operations, including pollution control technology; pre-construction activities; construction activities; schedule; staffing and support; facilities and services; commissioning, operation and maintenance activities; required offsite investments; and life expectancy for major components. [Note: there may be particular types of information appropriate in the description of the project category you are concerned with. Please specify them here.]

Include the need for any resettlement plan or indigenous people development plan.

Provide maps at appropriate scales to illustrate the general setting of project-related development sites and ROW's, as well as surrounding areas likely to be impacted. These maps should include topographic contours, as available, as well as locations of major surface waters, roads, railways, town centers, parks and reserves, and political boundaries. Also provide, as available, maps to illustrate land use, including industrial, residential, commercial and institutional development, agriculture, etc.

Task 2. Description of the Environment (baseline condition). Assemble, evaluate and present baseline data on the relevant physical, biological, and socio-economic characteristics of the development area and area of influence. Include information on any changes anticipated before the project commences. [Annotate or modify the lists below to show the critical information for this project category, or that which is irrelevant to it. You should particularly avoid compiling irrelevant data.]

a.) Physical environment: geology (e.g., stratigraphy and seismic history of development areas, integrity of geological layers protecting portable groundwater supplies); topography (e.g., drainage patterns around construction areas); soils (e.g., agricultural value); climate and meteorology; ambient air quality; existing sources of air emissions; surface and ground- water hydrology (e.g., soil erosion and sedimentation potential, flood hazard potential); water resources (e.g., adequacy of water supply) coastal and oceanic parameters; existing water pollution discharges, and receiving water quality (e.g., ability to assimilate effluent discharges and maintain water quality standards for desired uses).

b.) Biological environment: flora (e.g., types and diversity); fauna (e.g., resident and migratory); rare or endangered species within or in areas adjacent to project related development sites or ROW's; sensitive habitats, including parks or preserves, significant natural sites, etc.; species of commercial importance; and species with potential to become nuisances, vectors or dangerous.

c.) Socio-cultural environment (include both present and projected where appropriate): population; land use (e.g., year-round and seasonal); planned development activities; community structure; employment; distribution of income, goods and services; recreation; public health; cultural properties (e.g., archeological and historically significant sites); indigenous peoples and traditional tribal land; and customs, aspirations and attitudes.

Task 3. Legislative and Regulatory Considerations. Describe the pertinent regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc., at international, national, regional and local levels (The TOR should specify those that are known and require the consultant to investigate for others.) If trans boundary impacts are likely, relevant international conventions should be described.

Task 4. Determination of the Potential Impacts of the Proposed Project. Predict and assess all significant impacts that the project is likely to generate, in quantitative terms as far as possible. Assess the impacts from changes brought about by the project on baseline environmental conditions as described under Task 2.

In this analysis, distinguish between significant positive and negative impacts, direct, indirect, and cumulative impacts, and immediate and long-term impacts. Identify impacts that may occur due to accidental events. Identify impacts, which are unavoidable or irreversible. Wherever possible, describe impacts quantitatively, in terms of environmental costs and benefits. Assign economic values when feasible. Impact analyses for sub projects should be divided between construction impacts and operational impacts.

Characterize the extent and quality of available data, explaining significant information deficiencies and any uncertainties associated with predictions of impact. If possible, give the TOR for studies to obtain the missing information. [Identify the types of special studies likely to be needed for this project category.] For information not be obtainable until after execution, provide TOR for studies to monitor operations over a given time period and to modify designs and/or operational parameters based upon updated impact analysis.

Task 5. Analysis of Alternatives to the Proposed Project. Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives, which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Compare alternatives in terms of potential environmental impacts; capital and operating costs; suit- ability under local conditions; and institutional, training, and monitoring requirements. When describing the impacts, indicate which are irreversible or unavoidable and which can be mitigated. To the extent possible, quantify the costs and benefits of each alternative, incorporating the estimated costs of any associated mitigating measures.

Include the alternative of not constructing the project to demonstrate environmental conditions without it. Alternatives should include the following: the “no action” alternative (as mentioned above); alternative means of meeting the energy requirements; the alternative of upgrading existing facilities; alternative routes and sites; alternative design; and alternative methods of construction, including costs and reliability.

Task 6. Development of an Environmental Management Plan (EMP). Recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Include measures to address emergency response requirements for accidental events.

Estimate the impacts and costs of those measures, and of the institutional and training requirements to implement them. Consider compensation to affected parties for impacts, which cannot be mitigated. Prepare a management plan including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures. Provide environmental protection clauses for application by contractors and consultants.

The ToR should state that the concerned and affected parties should agree mitigating measures before they are submitted as recommendations in the EMP

Task 7. Identification of Institutional Needs to Implement Environmental Assessment Recommendations. Review the authority and capability of institutions at local, provincial/regional, and national levels and recommend steps to strengthen or expand them so that the management and monitoring plans in the environmental assessment can be implemented. The recommendations may extend to new laws and regulations, new agencies or agency functions, inter-sectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support.

Task 8. Development of a Monitoring Plan. Prepare a detailed plan to monitor the implementation of mitigating measures and the impacts of the project during construction and operation. Include in the plan an estimate of capital and operating costs and a description of other inputs (such as training and institutional strengthening) needed to implement the plan.

Depending upon local conditions and predicted impacts upon communities/individuals, there may be a need for a Resettlement Action Plan.

Task 9. Assist in Inter-Agency Coordination and Public/NGO Participation. Assist in coordinating the environmental assessment with other government agencies, in obtaining the views of local NGO's and affected groups, and in keeping records of meetings and other activities, communications, and comments and their disposition. (The Terms of Reference [TOR] should specify the types of activities; e.g. interagency scoping session environmental briefings for project staff and interagency committees, support to environmental advisory panels, public forum.). Review the authority and capability of institutions at local, provincial/regional, and national levels and recommend steps to strengthen or expand them so that the management or monitoring plans in the environmental assessment are likely to be implemented. The recommendations may extend to new laws and regulations, new agencies or agency functions, inter-sectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support.

Relevant material will be provided to affected groups in a timely manner prior to consultation and in a form and language that is understandable and accessible to the groups being consulted. The consultant should maintain a record of the public consultation and the record should indicate: means other than consultations (e.g., surveys) used to seek the views of affected stakeholders; the date and location of the consultation meetings, a list of the attendees and their affiliation and contract address: and summary minutes.

6. Report.

The environmental assessment report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. Detailed or un-interpreted data are not appropriate in the main text and should be presented in appendices or a separate volume. Unpublished documents used in the assessment may not be readily available and should also be assembled in an appendix. Organize the environmental assessment report according to the outline below. *(This is the format suggested in OP4.01; the ToR may specify a different one to satisfy national agency requirements as long as the topics required in the Bank's OP are covered)*

- Executive Summary
- Policy, Legal and Administrative Framework
- Description of the Proposed Project
- Baseline Data (Description of the Environment)
- Significant Environmental Impacts
- Analysis of Alternatives
- Environmental Management Plan
- Environmental Management and Training
- Environmental Monitoring Plan
- Inter-Agency Coordination and Public/NGO Participation
- Appendices: List of Environmental Assessment Preparers References Record of Interagency/Forum/Consultation Meetings (This is the format suggested in OD 4.01; the TOR may specify a different one to satisfy national agency requirements as long as the topics required in the Bank's directive are covered.)

7. Consulting Team

Environmental assessment requires interdisciplinary analysis. The general skills required of an environmental assessment team are: environmental management planning, ecology, hydrology/hydrogeology, and water quality analysis.

(Identify in this paragraph, which specializations ought to be included on the team for the particular project category.) Note: The team will be required to work closely with specialists undertaking the social analysis and to define arrangements for the final report, especially if the EA and social analysis are to be combined in one report.

8. Services, Facilities and Materials to be provided by the Client

The ToR should specify what services, facilities and materials will be provided to the Consultant by the World Bank and the Borrower, for example:

- The Project ISDS and draft PAD;
- Relevant background documentation and studies;
- Example ESMFs that demonstrate best practice, especially from the region or country;
- Making all necessary arrangements for facilitating the work of the Consultant and to provide access to government authorities, other Project stakeholders, and Project sites.

9. Schedule and Deliverables

Specify dates for the consultancy deliverables (e.g. detailed work plan within 2 weeks, interim report within 7 weeks, and final draft report within 10 weeks of contract signature), and the overall duration of the consultancy (e.g. 15 weeks from contract signature).

10. Technical Proposal Contents

The ToR should require a technical proposal that at least:

- Demonstrates that the Consultant understands the overall scope and nature of the ESIA preparation work, and what will be required to respond satisfactorily to each component of the ToR;
- Demonstrates that the Consultant and his proposed team have relevant and appropriate experience to carry out all components of the ToR. Detailed curriculum vitae for each team member must be included;
- Describes the overall methodology for carrying out each component of the ToR, including desk and field studies, and data collection and analysis methods; and
- Provides an initial plan of work, outputs, and staff assignments with levels of effort by task.

11. Budget and Payments

The ToR should indicate if there is a budget ceiling for the consultancy. The ToR should specify the payment schedule (e.g. 10% on contract signature, 10% on delivery of detailed work plan, 40% on delivery of interim report, 30% on delivery of final draft ESIA, and 10% on delivery of final ESIA).

1. Other Information

Include here lists of data sources, project background reports and studies, relevant publications, and other items to which the consultant's attention should be directed.

15.7 Annex 7: Minutes of KEMP Stakeholder Consultation forum held on 6th January, 2015 at Safari Park Hotel, Nairobi.

MINUTES OF KEMP STAKEHOLDER CONSULTION FORUM ORGANISED BY KENYA POWER
DATE: 6/01/2015
VENUE: THE SAFARI PARK HOTEL, NAIROBI,
TIME: 9:00 AM – 1:30 PM

Agenda:
Disclosure and consultation on Kenya Electricity Modernization Project (KEMP) safeguard documents.

MIN 01/01/2015 – Preliminaries

Samuel Abaya of Kenya Power called the meeting to attention; he welcomed guests and thanked them for coming.

The meeting was opened by a word of Prayer from Mercy Towett of Kenya Power.

Samuel Abaya then invited John Guda, the Manager - Safety Health & Environment, KPLC. John Guda officially welcomed guests on behalf of the Ministry of Energy & Petroleum and Kenya Power. He informed participants that the main purpose of this stakeholder forum was to deliberate concerning electrification programsand disclose safeguard documents to be applied in **Kenya Electricity Modernization Project** (KEMP). Kenya Power plans to connect over 1 million new customers in the FY 2014/2015 and to facilitate in achieving the government's target of moving the current electricity access rate of 30-32 percent to 70 percent by 2017 through various projects some of which may have environmental and/or social challenges. These potential environmental and social impacts would be the subject of this particular meeting.

John Guda then introduced the Kenya Power team, representatives from the Ministry of Energy& Petroleum, Rural Electrification Authority, Energy Regulatory Commission and the World Bank personnel present.

MIN 02/1/2015 – Welcoming Speech

Eng. Michael Adhiambo, the Manager – Projects at Kenya Power, delivered the welcoming speech on behalf of Eng. Stanley Mutwiri, General Manager - Infrastructure Development at Kenya Power.

Eng. Adhiambo welcomed guests to the meeting and thanked them for availing themselves. He informed participants that the Kenya Electricity Modernization Project (KEMP) which would be the subject of this meeting was part of a range of other projects funded by the World Bank. Such projects form part of the Kenya Energy Expansion Project (KEEP). The main purpose of this workshop was therefore to bring all stakeholders on board as KEMP would be undertaken all over the country.

KEMP is aimed at improving access to electricity as currently household access is 30-32 percent and Kenya Power would like to increase this to over 70 percent by 2017. He noted

that as electricity access increases there would therefore be need to improve the system. Therefore he informed participants that KEMP consist of 4 major components:

- Component A - Improvement in Service Delivery and Reliability
- Component B - Revenue Protection Program
- Component C - Electrification Program. This was aimed at increased electricity access to unreached areas, through the Off – Grid Component and Peri- Urban Component. The Off - Grid component would cover sparsely populated areas not covered by main national grid and would be implemented through mini grid areas. The Peri-Urban Component would target areas of lower income groups in towns and cities.
- Component D - Technical Assistance and Capacity Building

Therefore, Eng. Adhiambo noted that all those that will be affected by the projects need to be made aware of impacts to environment and social issues hence the purpose of the meeting. In addition, he informed participants thatsuch public consultations are a key requirement for the National Environment and Management Authority (NEMA). This meeting would also enable people to raise any issues they may have concerning KEMP.

MIN 03/01/2015 Forum Objectives and Frameworks Overview: John Guda

Participants were informed that the main objectives of KEMP were:

1. To increase access to electricity
2. To improve reliability of electricity service
3. To restore KPLC'S financial sustainability

The KEMP components were as follows:

- A – Improvement in Service Delivery and Reliability
- B –Revenue Protection Program
- C – Electrification Program - Peri-Urban electrification and Off-grid electrification
- D – Technical Assistance and Capacity Building

John Guda informed participants that this meeting was concerned with the third component that is the **electrification program**. Thus Kenya Power had prepared various safeguard documents with regards to the electrification component. These documents included *Environmental Social Management Frameworks* (ESMF) for Off-Grid and Peri-Urban Components, the *Resettlement Policy Framework* (RPF) and the *Vulnerable & Marginalised Groups Framework* (VMGF) for the Off-Grid Component. It is these safeguards that would be disclosed during this meeting and inputs from participants collected concerning these.

MIN 04/01/2015 – Presentations on ESMFs – Peri Urban and Off Grid Components

Wilfred Koech of Kenya Power took the participants through two presentations to disclose the Environmental Social Management Frameworks for the Peri-Urban Component and the Off-Grid Component respectively. He informed the participants that the exact sub-project sites were not known yet. When they are identified Environmental Impact Assessments (EIAs) and/or Environmental Management Frameworks (EMPs) will be prepared as needed in accordance with National Environment Management Authority (NEMA) and World Bank guidelines.

The presentations included the background information of Peri-Urban and Off-Grid Components respectively and their objectives; the purpose of the ESMF; the methodology

used in preparing the two ESMFs; policy and regulatory frameworks; World Bank Operational Safeguard Policies that would be triggered by each component respectively; public consultation; the potential beneficial and adverse impacts of each of the components respectively and subsequent mitigation measures.

The Environmental and Social Management Frameworks (ESMFs) would ensure that the KEMP would be implemented in a socially and environmentally sustainable manner. The ESMFs will support capturing of environmental and social issues in decision making.

MIN 05/01/2015 – Presentations on RPF and VMGF – Off Grid Component

Njeru of Kenya Power took the participants through two presentations namely; the Resettlement Policy Framework (RPF) and the Vulnerable Marginalised Groups Framework (VMGF) for the Off Grid component. These two safeguards were necessary to ensure that KEMP takes care of the social impacts of the project.

The RPF is concerned with social impacts that require resettlement. The RPF is a form of commitment by Kenya Power indicating how it shall handle resettlement in the event it is found necessary. The framework set out principles of how resettlement will be done. However it was noted that Kenya Power was not anticipating major movements of people, however the RPF would cater for resettlement if it were to occur, keeping in line with World Banks Operational Policy 4.12 on Involuntary Resettlement.

The presentation on the RPF included its purpose and objectives; methodology used in preparing the RPF, potential impacts and mitigation measures; compensation; public participation and consultation; RPF monitoring during implementation and the grievance redress mechanisms.

The VMGF would ensure that if vulnerable or marginalised groups would be present in any of the Off- Grid project sites that they are given special attention as such groups are unable to voice and claim their rights as compared to the rest of society. Therefore in case indigenous People are found where the projects will be implemented the World Bank Operational Policy 4.10 on Indigenous People would be triggered.

The VMGF was prepared in anticipation of Vulnerable& Marginalised Groups (VMGs), however it was noted that exact locations of the project were not yet conclusive. Therefore it was not yet known if VMGs are present on any of the Off-Grid Sites. Once locations were known screening would be done to identify the VMGF. If they are present a specific Vulnerable Marginalised Group Plan (VMGP) would be prepared specific for that group.

Further consultations would therefore take place as the Off-Grid Component of KEMP progresses, such consultations are important as they would enable identification together with VMGs the impacts of the project and culturally sensitive mitigation measures. It was also noted that the aim was to enhance project benefits to VMGs and avoid or mitigate any adverse impacts on them. The presentation on the VMGF included the purpose of the VMGF, methodology used to prepare the document, social assessment of VMGs, the potential beneficial and adverse impacts of the project, public participation and consultation Vulnerable and Marginalised Groups Plan, the grievance redress mechanisms, monitoring and reporting arrangements and disclosure arrangements.

MIN 06/01/2015 – Plenary Session

Comment/Question	Response / Remarks from Kenya Power
Okoth Obado – Governor Migori County Main challenge in Migori is inadequate power supply and power outages. Therefore I am pleased to be part of this forum and I hope it will aid in generating solutions to address these issues in Migori.	Concerning distribution transformers one the greatest challenges is vandalism. It is not that the transformers have become worse. Technology has modernised. It is vandalism, taking components of the transformers and accessories that degrade the life of the transformers. It is a challenge not only for Kenya Power but for the whole country. If there are opportunities to work together maybe through initiatives such as community policing then this issue can be addressed. Initially power to the whole Nyanza area was fed through a substation in Kericho (Chemosit Substation). But to address shortages in Nyanza region another transmission line was extended from Kericho to Kisumu. But this is still not adequate for Migori, Kuria and Homa Bay. Therefore there is another substation being done in Migori County behind Sony Sugar factory gate in order to address issue of power outages being experienced in Migori. Out of that substation there will be lines to supply Gogo, Homa Bay, a special line to Migori town another line going to Kuria, Isebania and Ogembo. Transmission towers are also being erected in that area under KEEP (implemented by KPLC/KETRACO) In addition for other areas Kenya Power is aware that Homa Bay has the same problems. To address this there is a KETRACO line from Sondu Miriu substation to Homa Bay. A third alternate line will be constructed. The line is to run from Olkaria though Narok to join current Line from Kericho to Kisii. The Governor was welcomed to visit the Substation site behind Sony Sugar factory.

Comment/Question	Response / Remarks from Kenya Power
Concerning Power Reliability (one of the objectives on KEMP) – what is happening with the current transformers that are burning out so easily?	
To increase accessibility high tariffs are charged. Are there cheaper ways to connect people to electricity?	Connection charges - One of the challenges to accessibility is charges. The Governor challenged Kenya Power to come up with new and innovative ways. This project will explore such new and innovative ways. There are also a number of projects Kenya Power is running that can have people being connected without necessary paying fully initial charges, and instead can pay through instalments. Clarification on tariffs: New connections – There are many avenues through which customers can be connected. Customers (within 600 metres from transformers) that can be connected for KES. 35,000. ERC is conducting studies on tariffs and will advices Kenya Power in due course. There are also various financing arrangements such as *Stima Loan*, which is available through Kenya Power, Equity Bank, Jamii Bora. This can be paid via instalments. The Global Partnership on Output Based Aid (GPOBA) Project funded by World Bank to electrify slums is very affordable. The KES 1000 cost can be paid in instalments after connection. Participants were urged to notify Kenya Power of any slums in their areas and Kenya Power will arrange a study and see how to provide a solution to electrify these areas. If there is a line passing through a community it is possible to connect people around that area so participants were urged to mobilize people to be connected. At Kenya Power, marketing officers are also actively engaged all over the country meeting potential customers. Communities can organise themselves in groups and follow up connections. More information could be found on the Kenya Power website or by visiting any Kenya Power office and asking for a marketing officer who will assist concerning connectivity.

Comment/Question	Response / Remarks from Kenya Power
Off grid systems – along the lake there are strong winds and sunshine, can I be assisted to have a study done in my area on harnessing wind and solar energy?	It was agreed that wind power is a potential avenue because of strong winds along lake shore, and that potential can be explored. Wind and solar options will be explored especially in areas such as the islands on Lake Victoria that are off grid.
In my county I host a small sub-station Gogo, it generates about 1-2MW but it has potential to generate up to 50MW. Can we confirm if potential to increase power is there?	Gogo Substation – old substation currently generates just about 1.5 MW, it was agreed that there is potential to produce more energy. Nevertheless it may not be economical to develop a full substation at this point but the lines mentioned should be able to stabilize the power in Migori and adjoining areas. Concrete answers concerning increased generation could not be given because that was under KenGen's mandate.
Ruben Sinange – Minister Energy & Environment, Nyamira County Nyamira suffers the same situation as Migori: What does Peri- Urban mean in very small towns? What is classified as peri-urban and how are you going to select Peri-Urban areas in smaller towns? Will they be left out and focus be only on big cities?	The definition of Peri-Urban does not discriminate whether the towns are major or smaller towns. It is if there is sufficient density to get many people on the grid, which qualifies an area for this Peri-Urban electrification. It was agreed that it is difficult to distinguish between Peri-Urban and Rural areas but Kenya Power will use existing County development plans to help with this.
Concerning Off grid electrification already some of us have been in contact with investors and have made some preparations. How can we coordinate with you on this? Kenya Power has mentioned it will be a public private partnership, How can we move forward on this?	It was noted that some counties have taken it upon themselves to establish some Off-Grid sites. So there is need to coordinate with these efforts to avoid duplication. It was agreed that there is need to share what plans Kenya Power and the Counties have. Kenya Power is also aware that a number of counties have taken initiative to establish public-private partnerships to supplement public funding. Whatever generation stations the counties have established through such public-private partnerships ideally should be able to feed into main grid.
Is Peri–Urban electrification different from the	The difference is that Peri-Urban is the next level up from GPOBA, it is not as a result of

Comment/Question	Response / Remarks from Kenya Power
Global Partnership on Output Based Aid (GPOBA) Project or is it an extension? How will connection charges be different with Peri-Urban?	haphazard development. Peri-Urban areas are more organised better planned with infrastructure. Facilities can be run in a more organised and structured manner.
Rural areas want to be connected but population is not in high density, and the connection charges are too high. How can we help them? Is there any Funding?	There are other ongoing projects that are intended to improve supply. They are being funded by other donors such as the African Development Bank and other donors in addition to initiatives taken by KPLC under Boresha Stima Projects. If there is a line passing through a community it is possible to connect people around that area so participants were urged to mobilize people to be connected. However at Kenya Power, marketing officers are actively engaged all over the country meeting and sourcing potential customers. Communities can organise themselves in groups and follow up connections. More information can be found on the Kenya Power website by visiting any Kenya Power office and asking for a marketing officer who will assist concerning connectivity.
I would like to appreciate Kenya Power work specifically Boresha which has reached Homa-Bay. Will KEMP be a continuation of Boresha since it is aimed at improving reliability?	No. As noted earlier it is an electrification program with Peri-Urban and Off-Grid components. Boresha Stima Projects were being done was to upgrade the existing infrastructure.
Anne Kariuki – Kenya Association of Manufactures (KAM) You mentioned households in the presentations. Is there any focus on industries to enable them to move to Peri-Urban and off grid areas?	Concerning industries Kenya Power is also putting up new substations to boost supply in Peri-Urban areas to encourage investors and this has been funded under a separate cover. KETRACO is also doing a number of upgrades. In total there are 70 new substations that are being implemented.

Comment/Question	Response / Remarks from Kenya Power
When you say increasing connectivity what exactly does it entail? For example is it 100 metres to the nearest transformer or pole?	Distribution distance to connect households is 600m from the transformer. The rate is currently KES 35,000. This is being reviewed and could become lower. The Last Mile Connectivity Project will enable those within 600 Metres to be connected immediately and money can be recovered over time. As part of improving electricity access; Peri-Urban component funded by World Bank goes beyond Last Mile Connectivity.
Eunice Karoki – Minister of Environment, Kiambu County For the Peri-Urban component will you consult counties and our development plans since we have already planned and identified Peri-Urban areas and industries?	New Kenya Power County Managers were being established. So each of the Counties can provide information on their plans so we can streamline with ours and improve coordination
Data – it is challenging as we cannot access data on power from Kenya Power, this hampers development plans.	Kenya power does not work in a vacuum, the company works hand in hand with development partners. Kenya Power is interested in knowing what the County's plans are in order to enable collaboration. County Managers will work closely with Counties to know their plans. Kenya Power is generous with sharing data. Most Kenya Power maps at the moment are in hard copy hence the challenge in accessing them could come from there. This will become easier once the company concludes on a GIS project that will digitize data. The company is willing to share technical data. The data that might be sensitive; is that which infringes on rights of a third party.
Will land acquisition be compulsory?	No

Comment/Question	Response / Remarks from Kenya Power
Ondieki Evans - Minister Environment and Energy Nairobi County During presentation on ESMF I did not see a proper framework on how hazardous waste will be handled.	The ESMF for the Off-Grid component contains a section on electronic waste, this on Chapter 7, pages 88 - 91. Concerning the ESMF for the Peri-Urban component not much electronic waste is expected for this component. However in the event of any this has been taken care of in the ESMF for the Peri-Urban Component under Chapter 7, from page 69.
Resettlement Frameworks – I did not see a lot of input on gender. In the case of compensation it is the men who will want to pick the money and the women left out	Gender considerations will be taken especially during consultations in identifying impacts to allow all parties affected including women understand the compensations and voice their concerns. Issues of payment that involves family property disputes will be handled as they arise. The county administrators from the county and national government will be engaged in dealing with such disputes.
Input on other marginalized groups – widows, orphans, single mothers etc. not seen in the VMGF. How they will be protected?	Within Vulnerable and marginalized groups there could be certain groups who are also vulnerable such as; the aged, orphaned children, female headed households, disabled and persons living with HIV/AIDs. During preparation of actual VMGP these groups will be accorded special attention to ensure they do not miss out on the benefits of the project and that they are not negatively impacted by the project.
Vulnerable groups in urban areas – there are truly marginalised groups in slums; need to capture uniqueness of urban areas in terms of marginalized groups.	The KEMP project component of electrifying Peri-Urban areas does not envisage any resettlement because only low voltage lines will be put in place. Therefore, no adverse impacts will occur in urban areas to disadvantage vulnerable groups further
Energy from renewable resources – why should electricity from a free resource be so expensive? You need to explain to the public why this is.	Kenya Power is getting raw energy, harnessing and distributing it involves costs. This is from initial capital outlay and also systems and infrastructure that are put in place to distribute energy and make it consumable. In addition to maintenance of infrastructure That is why the renewable energy comes at a cost. Biggest component that has been escalating costs is the thermal component. But diversification is being carried out include forms renewable energy and this should help reduce costs.
Suggestion - can World Bank extend this concept such that issue revolves around empowering all	Comments noted

Comment/Question	Response / Remarks from Kenya Power
people? (not just in terms of those falling under definitions of Peri-Urban, VMGs. Green energy – we need an to move towards implementation	
Daniel Theuri – Que Energy Ltd There are technologies on solar thermal that can be used. There are new technologies where opportunities for dual systems that Kenya Power should look into.	Comments well taken and will be considered
1st Presentation - environmental compliance, who is responsible for enforcing this?	Environment and Social Unit in partnership with implementing departments within Kenya Power, in other incidences REA will be involved especially in the off-grid areas in liaison with NEMA.
2nd presentation - emphasis on community; what about the investor? Need to come up with mechanism to cover other stakeholders like investors.	Tenders will be floated and competitive bidding will be done to select contractors based on set evaluation criteria.
World Bank policy on International Waterways – Does this cover trans boundary rivers?	World Bank Operational Policy on international waterways will not be triggered in KEMP
Information sharing and Data - come up with a protocol for formal sharing of information. Establishing a Liaison person at Ministry of Energy is a suggestion	Data is available following studies done by the Government in partnership with UNEP, NASA and such data is available from the ministry of Energy
Gibwa Kajubi– World Bank To plenary - what did people think of the social frameworks, the RPF and VMG? What is the feeling of the participants on this	Comments well taken.

Comment/Question	Response / Remarks from Kenya Power
Simiyu Mabuya– DCG (Contractor) As a contractor in off grid and hybrid generations – what will be the expectation from the contractor?	Tenders will be floated and competitive bidding will be done to select contractors based on set evaluation criteria.
Concerning Information 2 years ago Ministry of Energy and Petroleum commissioned a feasibility study on renewable energy. So are we going by the same study?	Yes in addition to other studies done in collaboration with UNEP and NASA, in some specific incidences further site specific studies will be conducted.
On marginalized groups what about the youth and accessing contracts from these projects?	Marginalized groups (youth) and KPLC contracts: due to type of financing for this type of project there are specific guidelines that ensure competitive bidding and open process. Contractors covering all groups such as youth women are welcome so long as skills exist amongst them. In maintenance and as the systems continue to run contractors will participate actively, and in the supply of spare parts. In the main works there are strict guidelines which will be specified in the tender documents.
Magdelene Kariuki – Manager, Action Aid International Quality of compensation and resettlement – will quality of resource being compensated be retained?	Quality of compensation is well explained in the RPF document pages 32, 33 and chapter 8 on valuation and compensation.
Community land – is there an audit process that will be put in place to mitigate disfranchisement of women and address gender?	Community property is handled differently. The parties concerned are called for a meeting so that there is consensus. If it is land that is held in trust discussions are held first with the trustees and then the members. Deliberate effort will be put to ensure women participate including holding consultative meetings with women only so assess to assess specific impacts and appropriate mitigations

Comment/Question	Response / Remarks from Kenya Power
Peter Kihoria – Ministry of Argiculture, Livestock and Fisheries, Kajiado County I work a lot with pastoralist groups in Kajiado concerning social inclusion amongst vulnerable marginalized groups. In pastoral communities you have to coerce women to give their opinions, the usually will not give their comments. Men will not be concerned about water and firewood. When the land is compensated for land women are able to continue to using it. However when its financial compensation women lose out on livelihood as the men take the money.	Consultations will be done on how to loop the women in and have appropriate mitigations. In case of issues involving payments of family property national government (the administration) will be engaged i.e. chiefs to advice. In communities where women are shy to speak in meetings, they will be consulted differently so that mitigation measures will be sensitive to their needs.
What is the plan for capacity building for women to utilize electricity for their development and enhance their livelihoods that is, reap benefits of projects?	Women will be sensitized on various ways they can use electricity for economic benefits.
Dr. Pacifica Ogola – Kengen The KEMP project is more of a national project and there is a lot of diversity in social and environmental issues. There isn't a one size fits all, so need to recognize diversity. You need to take lessons learnt from previous projects as well.	Comments well taken and issues will be addressed as and when necessary. The ESMF, VMGF and RPF are guidelines and commitments from the proponent that environmental and social issues will be handled. This is because exact locations of the projects are not yet identified. Once site identification is done the specific Environmental Impact Assessment, vulnerable and Marginalized Groups Plans and Resettlement Action plans will be prepared as required.

Comment/Question	Response / Remarks from Kenya Power
Caution on social impacts – resettlement was downplayed; presentation mentioned that there would be not mass movements, so what does actually mass mean? It is not just about the numbers. When you go to a place where land adjudication has not been done then other challenges will present. Also need to consider impacts if developing on a world heritage sites. In addition consider the long term sustainability of the Off-Grid component	
Asman Owiti - Chief Kasarani Kindly what is KPLC doing on the mitigation issue barring people on encroaching on way leaves since the same is issued by County Governments through issuance of TOL (Temporary Occupation Licence) to people? How will this conflict be resolved between KPLC and County Governments?	KPLC will work with the County Governments to ensure Way Leaves are respected and encroachment is not allowed.
Bernard Osawa –WinPower Ltd What is the criterion for selection of PPP partners/ Investors for Off- Grid sites?	Competitive bidding based on set evaluation criteria after tenders are floated. Process will be public and transparent.
What ESMF, RPP and VMGF standards will apply in this case?	The investors should observe the guidelines provided in the safeguard documents
John N Ikinya- Chief, Kirigiti Location-Kiambu Sub County Early last year, there was plan to construct a substation at Thathi-Ini village within my location to address constant power outages, considering	There were challenges in getting a site for the sub-station and this has caused delays.

Comment/Question	Response / Remarks from Kenya Power
the growing and ever increasing population in Kiambu town. However the land turned out to be registered under private individual though an okay had been given by County Government. Now, what option is there to implement the same project in this area? Probably can you consider purchasing a private land for the same purpose?	
Criterion for selection of Peri-Urban centers to be included in the project. This should be reflected in the methodology for ESMF.	Peri-Urban areas will be determined based on population density
The selection/ Sampling criterion should ensure geographical equity	KEMP is a nationwide project
Engineer Philemon Kachila - County Chief officer, Infrastructure, Taita Taveta County Taita taveta has enormous potential for off-grid installations such as: i) Large tracks of government controlled ranches that have potential for both solar and wind farms. ii) Enormous sisal estates and factories that have potential for biomass/biomass installations. iii) Rivers flowing from the highlands to the lowlands which have high altitude ranges. These have potential for micro HEP The market for power is readily available from hotels spread in the Tsavo East and West National	Comments well taken and will be considered

Comment/Question	Response / Remarks from Kenya Power
Parks and planned livestock abattoirs. On behalf of the county executive we would like to partner with KP/WB to carry out feasibility studies to map out the exact potential (resources) with a bid to invite investors. We would like to partner with KP/WB in selection of projects within the county. Kindly let us know whether we can be considered as partners in this KEMP.	
Kenya Forest Service The purpose of the ESMF is to ensure full integration of environmental and social concerns in the KEMP planning process: At what stage will Kenya power integrate environmental and social concerns during project implementation? (route alignment survey and project design vis-à-vis environmental and social integration)	Environmental and Social considerations are being integrated as early as possible from the planning phase, through implementation to decommissioning phases.
The purpose of the RPF and VMGF is to ensure public participation and full compensation to the affected farmers through consensus. The services of Kenya Forest Service can be outsourced at gazette rates for forest resource assessment in order to minimize conflicts with land owners and avoid litigation in law courts which are expensive and time consuming (Use of experts and professional bodies can help alienate challenges and compensation and resettlement plans)	Comments well taken and will be considered

Comment/Question	Response / Remarks from Kenya Power
Peter Munyao – Kenya Civil Aviation Authority (KCAA) Kenya power to continue working with Kenya Civil Aviation Authority in order to ensure aerodromes, airports, airstrips and heliports are safeguarded from power lines and associated facilities. Currently there is massive development of energy in which KCAA is participating in: -power lines -wind turbines -solar panel areas (new) among other infrastructures challenging aviation. It is important to note they are current and planned infrastructure	Comments well taken and will be considered
S. C Muraguri – Chief Mukuru- Kaiyaba What programs do you have for the slums of Nairobi? Do you know cartels (power men) are selling electricity at KES 500 per cubicle per month? Do you know Mukuru Kaiyaba with 19,621 cubicles gives KES 9,810,500 to cartels? Why can't Kenya power use chiefs, DCs and DOs	GPOBA projects are under implementation to ensure that consumers pay for what they use and minimize on revenue loss and safety challenges in the slum areas.

Comment/Question	Response / Remarks from Kenya Power
(National Government) togive power metres to cubicle owners directly than through cartels?	

LIST OF PARTICIPANTS – KEMP STAKEHOLDERS CONSULTATION FORUM ORGANISED BY KENYA POWER
DATE: 06.01.2015
VENUE: SAFARI PARK HOTEL

NO.	NAME	ORGANIZATION	TITLE	COUNTY
1.	Mwende Njiraini	Communications Authority of Kenya - Headquarters		Nairobi
2.	Bernard O. Mboda	Kenya Wildlife Service - Headquarters		Nairobi
3.	Mohamed Siyaid Adan	Afrimark S. Ltd.		Nairobi
4.	Alice Njoki Kago	Office of the President	Chief – Kilimabogo Location	Kiambu
5.	Daniel Theuri	Que Energy Ltd.		Nairobi

NO.	NAME	ORGANIZATION	TITLE	COUNTY
6.	Robert N. Kamau	NgongJua Kali		Kajiado
7.	Moses Mpesha	Office of the President	Chief - Oloolua	Kajiado
8.	Peninah Karomo	Rural Electrification Authority Headquarters		Nairobi
9.	Mayabi Baxton	Office of the President		
10.	Agnes Wachira	Energy Regulatory Commission Headquarters		
11.	Magdalene Kariuki	Action Aid Kenya	High Value Fundraising Manager	Nairobi
12.	Gibwa Kajubi	World Bank	Senior Social Devel. Specialist	Nairobi
13.	Peter Otieno			Homa Bay
14.	Benedict Omondi	Kenya Forest Service Headquarters		
15.	Nassur Mohamed	Ministry of Interior		
16.	Sarah W. Waigwe	Office of the President	Chief Kalimoni	Kiambu
17.	Muchui Muiruri	Office of the President	Chief Komo	Kiambu
18.	Silas Miriti	Office of the President	Chief Savannah	Nairobi
19.	Pharesh Ratego	County Government	Minister of Environment	Homa Bay
20.	Stephen Mwigai	Nairobi Metrological Department		Nairobi
21.	Ouma Naukal	Office of the President	Chief Sovir	
22.	Lambert K. Nyaagweso			Bungoma
23.	Eliud Munene	Kenya National Highways Authority Headquarters		Nairobi
24.	Hillary C. Chumo	Office of the President	Senior Chief	
25.	Dr. Micah Makworo	Jomo Kenyatta University of Agriculture & Technology		
26.	Sylvester Wanyulu	Office of the President	Assistant Chief Kihingo	Kiambu
27.	Henry Gichungi	SMA Sunbelt		Nairobi
28.	Christine Dembah	Office of the President	Chief	Nairobi
29.	Abdiwahad Ahmed	Office of the President	Chief	Nairobi
30.	George Kibugi	Office of the President	Chief	Nairobi
31.	Elspeth Njeri	Office of the President	Chief	Nairobi
32.	David Omendo	Office of the President	Chief	Nairobi
33.	Anne Kariuki	Kenya Association of Manufacturers Headquarters		Nairobi
34.	Nahashon K Opiyo	Office of the president	Chief	Nairobi

NO.	NAME	ORGANIZATION	TITLE	COUNTY
35.	HanspRaeber	WinPower Limited		Nairobi
36.	Simiyu P Mabaya	D.C.G		Nairobi
37.	Vincent K Abuga	Office of the President	Chief	Nairobi
38.	Solomon Muraguri	Office of the President	Chief	Nairobi
39.	James Gitau	Office of the President	Chief	Nairobi
40.	Patrick Adila	Office of the President	Chief	Nairobi
41.	Patrick W. Njoroge	Office of the President	Chief	Kiambu
42.	Nancy W Kiboro	Office of the President	Chief	Kiambu
43.	Peter M Njuguna	Office of the President	Chief	Kiambu
44.	Eng. Kennedy Makudioh	Ministry of Agriculture Livestock & Fisheries - SDA		
45.	Peter Kihoria	Ministry of Agriculture Livestock and Fisheries	District Agriculture officer	Kajiado
46.	Charles C. Gacibu	Office of the President	Chief-juja	Kiambu
47.	Barrack Goho	County Government		Kisii
48.	Malik Issa	Rural Electrification Authority Headquarters		Nairobi
49.	Mbirro Jack	Office of the President	Chief	Nairobi
50.	Charles Maina	Salwan Energy Limited		Nairobi
51.	Hesbon Kayesi	Office of the President	chief	Kiambu
52.	Fredrick Egondi	Office of the President	chief	Nairobi
53.	Judith Kimeu	Rural Electrification Authority Headquarters		Nairobi
54.	John N Ikinya	Office of the president	chief	Kiambu
55.	Michael Mwangi	Office of the president	chief	Kiambu
56.	Mungai Kihara	Ministry of Energy & Petroleum Headquarters		Nairobi
57.	Dr. Patricia Ogola	Kenya Electricity Generating Company		Nairobi
58.	Jonathan Kirorio	Office of the president	Chief - Ngong Subcounty	Kajiado
59.	Amar Devgun	Win Power Ltd		Nairobi
60.	George Kato	Kenya National Highways Authority		Nairobi
61.	Christopher Gathuma	Office of the President	Chief	Nairobi
62.	Eng. Benson Mwakire	Min. of Energy and petroleum		Nairobi
63.	Josphine Mwegi	ACC Municipality		
64.	George Kimemia	Office of the President	Chief	Kajiado
65.	Paul Kapaito	Office of the President	Chief	Kajiado

NO.	NAME	ORGANIZATION	TITLE	COUNTY
66.	J N Kariuki	Office of the President	Chief	Kajiado
67.	Mahmoud Dida	Office of the President	Chief	Kajiado
68.	Chritine Makiimei	Office of the President	Chief	Kiambu
69.	Peter M Kamau	Office of the President	Chief	Kiambu
70.	Salome K Muthomi	NGAO		
71.	Asman Owiti	Office of the President	Chief	Nairobi
72.	Humphrey Kamau	Office of the President	Chief	Nairobi
73.	Richard Mavisi	MEST		
74.	George Ogago	Office of the President	Ass. Chief	Nairobi
75.	Henry K Naman	Office of the President	Chief	Nairobi
76.	Alphona Vata	Office of the President	Personal Assistant	Nairobi
77.	Rose M Kibocha	Office of the President	Chief	Nairobi
78.	Reuben Sinange	County Government	Minister of Energy and Environment	Nyamira
79.	Boniface Muduku	County Government		Kiambu
80.	Bernard Osawa	Wind for Prosperity		Nairobi
81.	Mwai Gicheru	NGAO		
82.	F N Mworoa	Office of the President		
83.	S M Kamau	Office of the President		
84.	D I Waiguru	Office of the President		
85.	Benadecca Irungu	Office of the President		
86.	Francis Ndukui	Office of the President	Chief	Kiambu
87.	Eunice Kaloki	County Government		Kiambu
88.	Obado Okoth	County Government	Governor	Migori
89.	Peter s Kyale	Office of the President		
90.	Anfrew Atandi	Office of the President		
91.	Elizabeth Omondi	Office of the President		
92.	Millicent A Okoko	Office of the President		
93.	Martin Kinoti	Gem-cm Construction Ltd		Nairobi
94.	Richard Juma	Office of the President		
95.	Evans Ondieki	County Government	Minister Energy and	Nairobi

NO.	NAME	ORGANIZATION	TITLE	COUNTY
			Environment	
96.	Charles Kombe	County Government		
97.	Moses Ngamia	Office of the President		
98.	Richard K Soy	Office of the President		
99.	Angeline Oduor	Office of the President		
100.	John K Mang`uri	Office of the President		
101.	Philemon Kachila	County Government	Chief of Staff	Taita Taveta
102.	Joel Kavingio	Office of the President		
103.	Jorum Midiwo	Office of the President		
104.	Philip Ndegwa	Office of the President		
105.	Joseph N Wangai	Office of the President		
106.	Peter M Munyao	Kenya Civil Aviation Authority (KCCA)		Nairobi
107.	Peter Ngugi	Office of the President		
108.	Joseph Kinuthia	Office of the President		
109.	Josiah Mwangi	Kenya Urban Roads Authority		Nairobi
110.	Laurencia Njagi	World Bank	Senior Energy Specialist	Nairobi
111.	Mmbetsa O. Beja	Office of the President		
112.	David Sarun	Office of the President	Chief Starehe	Nairobi
113.	Kyran O'Sullivan	World Bank	Head Energy Specialist	Nairobi

KEMP STAKEHOLDERS FORUM IN PICTURES

KEMP Consultative meeting in progress

John Guda- Manager SHE – KPLC, addressing the consultative forum

ENG. Michael Adhiambo (KPLC) responding to questions

 Migori Governor, Okoth Obado making his contribution	 Minister of Energy, Water & Environment – Homa Bay county making his contribution
 A participant asking a question	

PARTICIPANTS LIST

Kenya Power

LIST OF PARTICIPANTS AT THE STAKEHOLDER CONSULTATION MEETING HELD ON 6TH JANUARY 2015 AT SAFARI PARK HOTEL

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Kenya Power

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MINUTES OF THE MEETING WITH REPRESENTATIVES OF VMGS.
MINUTES OF KEMP STAKEHOLDER CONSULTATION MEETING
DATE: 12TH JANUARY 2015
VENUE: STIMA PLAZA

The Vulnerable Marginalised Groups representatives were overall supportive of the project goals and objectives and the proposed interventions. Main issues raised included (a) What mechanisms were in place for affordability of connections by VMGs; (b) Need to pay attention to gender/women; (c) More clarity on the principles of compensation for losses; (d) clarification of role and responsibilities of government and the bank in screening/triggering the policy OP 4.10 and undertaking Social Assessment process and (e) need to build on local/cultural mechanisms for GRM.

The Bank and KPLC (on behalf of REA) clarified that the project was guided by the principlesembodied in the safeguard documents presented and the various Bank Operational Policies triggered. KPLC on behalf of REA welcomed comments/suggestions and will take them into consideration. Specific responses are as in the minutes below:

MIN 01/01/2015 – Preliminaries

John Guda, Manager – Safety Health and Environment - Kenya Power, welcomed participants to the meeting on behalf of the Ministry of Energy and Petroleum and Kenya Power, and REA.

The meeting was opened by word of prayer from Mercy Towett of Kenya Power.
KPLC shared that the Kenyan Government planned to increase electricity to increase electricity access from approximately 30% to 70% by 2017. Therefore to increase electricity access some initiatives have been undertaken by Kenya Power with financing from various donors such as the World Bank. The Kenya Electricity Modernization Project was such an initiative. Therefore it was necessary to create awareness to key stakeholders on this. To do this Kenya Power had organized a Stakeholder Consultation Forum on the 6th of January 2015. However key stakeholders were not well represented resulting in the organization of the day's meeting.He then invited the participants to introduce themselves.

Participants were informed that KEMP would comprise of four components:

a) Delivery Enhancement – working with existing substations to enhance quality and reliability
b) Revenue protection
c) Electrification Programme – would entail Peri- Urban and Off- Grid Components
d) Building capacity

This particular meeting would concern Component C, this component would be financed by the World Bank. One of the World Bank requirements was the preparation of certain documents, thus Kenya Power and/or REA had prepared four documents that were to be disclosed. These documents were the Environmental Social Management Framework (ESMF) for the Peri – Urban Component, Environmental Social Management Framework (ESMF) for the Off Grid Component, the Resettlement Policy Framework (RPF) for the Off

Grid Component and the Vulnerable Marginalized Groups Framework (VMGF) for Off-grid Component. The meeting was to disclose these documents to the participants. Therefore presentations on the safeguard documents would be shared and views and inputs from the participants were highly welcome. All presentations would be shared via email.

MIN 02/1/2015 – Presentation on Environmental Social Management Framework – KEMP Peri-Urban Component

Simon Mwangangi took the participants through the Environmental Social Management Framework for the Peri - Urban Component of KEMP. He informed participants that this presentation was the same one that was shared during the stakeholders meeting that took place of the 6th of January 2015. In addition he informed the participants that the actual sites for the project were not yet established and when known site specific Environmental Social Impact Assessments would be undertaken as and when necessary.

The presentation included a background on the KEMP project and its objectives; the Peri-Urban component; the purpose of the ESMF; scope of the Peri-Urban component, World Bank Safeguard instruments that might be triggered; potential positive and negative impacts of the project; mitigation measures; stakeholder involvement and public consultations and avenues for grievance redress.

MIN 03/02/2015 – Presentation on Environmental Social Management Framework – KEMP Off-Grid Component

Simon Mwangangi took the participants through the Environmental SMF for the off grid components. He informed the participants that 'Off-Grid' would entail those areas that had not been penetrated by the national grid. As feasibility studies had shown these areas could not be cost effectively served by the national grid. Currently those sites had not yet been conclusively identified. He informed the participants that major environmental impacts were not anticipated as the Off-Grid component would entail green energy.

The presentation included a background on the Off-Grid component; the purpose and objectives of the ESMF; World Bank Operational Safeguard Policies that might be triggered; potential environmental and social impacts; mitigation measures; public consultation and participation and the grievance redress mechanism.

Major social and environmental impacts for both components were not expected, as the Peri-Urban component would entail extension of existing lines. As for the Off-grid it would depend on number of households and densities of those specific areas, thus site locations had not been identified.

MIN 04/02/2015 – Presentation on KEMP Resettlement Policy Framework (RPF) – Off-Grid Component

Samuel Abaya of Kenya Power took the participants though the Resettlement Policy Framework, the participants were informed that resettlement was not expected as land acquisition would be done on a willing seller willing buyer basis. However this framework had been prepared in the event any resettlement was to occur. Site specific Resettlement Action Plans (RAPs) would be prepared as and when necessary. The framework was in line with the World Bank Operational Policy 4.12.

The presentation included the purpose of the RPF, objectives of the RPF, methodology for RPF preparation; potential impacts; eligibility for compensation; valuation methods for compensation; resettlement action plans (RAP); stakeholder consultation and participation; RPF implementation; RPF implementation and monitoring; implementation budget and the grievance redress mechanism

The participants were informed that the specific budget had not been established as all the sites had not been identified.

MIN 04/02/2015 – Presentation on KEMP Vulnerable Marginalized Groups Framework (VMGF)

Roseline Njeru of Kenya Power made a presentation on the Vulnerable Marginalized Groups Framework (VMGF). She informed the participants that the VMGF was a requirement of the World Bank and it would ensure that the rights of such groups are protected. It was emphasized that the main idea was to enhance project benefits to Vulnerable Marginalized Groups (VMGs) and avoid potential adverse impacts and increased marginalization.
The framework was prepared because the specific project sites had not yet been conclusively identified. Hence the framework would act as a guideline for REA in the event that such communities were found when project sites had been identified. Specific Vulnerable Marginalized Groups Plan (VMGP) would be prepared as and when necessary. The VMGF was in line with the World Bank's Operation Policy 4.10 on Indigenous People, the policy stated indigenous people however in this framework the term VMG was used in reference to the same.

The presentation included the purpose of the VMGF, screening of VMGF, Social assessment of the vulnerable &marginalized groups; policy and legal framework; methodology and consultation in preparation of VMGF; potential positive and negative impacts of KEMP on VMGs; free, prior and informed consultations; vulnerable and marginalized groups plan (VMGP); strategy for participation and consultation with VMGs; grievance redress mechanism; monitoring and reporting arrangements and disclosure arrangements for VMGPs was discussed.

The main issues raised included
a) What mechanisms were in place to improve affordability by VMGs?
b) The need to pay particular attention to gender/women
c) More clarity on the principle for compensation for losses;
d) Clarification on role and responsibilities of Government and Bank in screening / triggering the OP 4.10 policy and undertaking the social assessment process;
e) The need to build on local/cultural mechanisms for GRM
The bank and KPLC (on behalf of REA) clarified that the project was guided by the principles in the safeguard documents presented and the various bank operational policies triggered. KPLC work on the comments/suggestions and promised to take them into consideration. The specific responses are in detailed in the minutes below:

MIN 05/01/2015 – Plenary Session

The following issues emerged from the plenary discussions

No.	Comments / Issues Raised	Response
1.	**Affordability** Some of the participants wondered how the project would ensure access to marginalized given that the costs in the past have been prohibitive and beyond reach of the VMGs	Kenya Power had put in place mechanisms to enhance access for the lower income groups including: Stima Loan – where payments can be made through installments after connection The move towards renewable energy would see costs reduce and enable more connections even for the lower income groups.
2.	**Gender and youth** Participants suggested that special attention be given to women and youth during consultations. The challenge of how connection would be done in semi-permanent structures was raised.	The process would ensure inclusive consultations during the meeting. Representatives of women and youth would be part of the team overseeing the implementation of the project. Connections to semi-permanent houses (grass thatched) could be done.
3.	**Ascertaining Free, prior and informed consultations / participation** Participants raised the concern of how the project implementing agency would conduct free, prior and informed consultations had been done, and which institutional framework would be used to ensure this. It was suggested that the IPOs were now moving towards consent rather than consultations. The representatives of VMGs suggested that VMG participation should go beyond engaging them as casual labourers on sites, to tapping on their expertise and enhancing livelihoods.	There would be use of broad based consultations involving community leaders, Indigenous Peoples Organizations (IPOs), women, youth and the VMGs and triangulation of information collected. It was acknowledged that the World Bank Safeguard Policies were under review however the present policy on consultation would apply to the project until the review process was completed Giving people power would expand their opportunities towards improving their livelihoods.
4.	**Treatment of VMGs that do not have title deeds** Participants raised the issue of those VMGs that do not have title deeds, therefore how would they access electricity through this project as connection was attached to title deed, and in addition how they would be compensated for land.	If land is to be acquired it will be guided by willing buyer willing seller basis and compensation funds would be place into escrow until land disputes are clarified.

		For those VMGs living in the periphery of the forest, connection consent would have to be secured from Kenya Forest Service, before household connections could be done. Kenya Power will use certified valuers and the principles of the RPF require compensation at current market value.
	The participants raised the issue of land acquisition through 'the willing buyer willing seller' which may still compromise rights of VMGs.	
5.	**Clear feedback mechanisms** Participants suggested that there was need for clear mechanisms for feedback in the entire process.	The entire process would involve inclusive consultations where input by stakeholders would progressively inform the project.
6.	**Compensation for sensitive cultural sites** The challenge of compensating for sensitive socio-cultural sites and artefacts such as sacred places, graves etc.	The project did not foresee resettlement however if it occurred, every attempt would be made to avoid such sites. They would be dealt with in accordance with the World Bank's Operational Policy 4.11. Consultation with community elders could also be done in such cases.
	The participants raised the issue of how adverse impacts such as loss of livelihoods would be compensated	The RPF clearly stipulates how various losses would be compensated such as land, structures, business, crops trees etc.
7.	**Clarification on the roles and responsibilities of the borrower and the Bank in screening and triggering OP 4.10 and undertaking Social assessment** The issue of conflict of interest arising from the borrower undertaking social assessment was raised.	The initial screening is undertaken by the World Bank to determine whether to trigger OP 4.10 and the borrower carries on the social assessment guided by Terms of Reference (TOR) as per OP 4.10.
8.	**The need to build on local / cultural mechanisms for Grievance Redress Mechanism** Emphasis was placed on the need to explore local/cultural mechanisms for grievance redress before resorting to the courts.	The entire process would involve free, prior, informed consultation and participation of all stakeholders.

MIN 06/01/2015 – Wrap Up and Way Forward

John Guda, Manager Safety Health and Environment – Kenya Power – reiterated that Kenya Power was doing its level best to increase electricity access across the country. He thanked the participants for their attendance and inputs; he also informed them that their inputs would be incorporated. Further consultations would follow as the project is developed and urged them to be part and parcel of the project in their respective regions.

VMGS PHOTOS

KPLC (on behalf of REA) consultations with Representatives of Indigenous peoples Organizations on the KEMP Safeguards Instruments -- List of Participants -January 12, 2014, Stima Plaza, Nairobi, KENYA

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