KENYA OFF-GRID SOLAR ACCESS PROJECT
(K-OSAP)

ENVIRONMENTAL & SOCIAL MANAGEMENT FRAMEWORK

March 2017

BASIC INFORMATION

1. **Country and Project Name: KENYA OFF-GRID SOLAR ACCESS PROJECT (K-OSAP)**

2. **Project Development Objective:** to increase access to electricity services in underserved counties in Kenya

3. **Expected Project Benefits:**
   Beneficiaries will be households, public and community institutions, enterprises and community facilities that cannot access electricity through the national grid and whose use of electricity will replace kerosene and other fuels for lighting and other activities like pumping water. Another set of beneficiaries of the project will be host communities around refugee camps who will be provided with efficient cooking stoves ("*jikos*") to replace fuel wood and charcoal for cooking

4. **Identified Project Social Risks:**
   Minimal adverse social risks are anticipated under this project because the installation of solar systems will take place within existing households and public facilities.

Recipient: Government of Kenya – Ministry of Energy and Petroleum

Responsible Government/Country Agency for ESMF Implementation: Ministry of Energy and Petroleum (MoEP), Rural Electrification Authority (REA), Kenya Power and Lighting Company Limited (KPLC) and County Governments in the target areas.

Total Project Cost (USD million): 155 Million USD

Date ESMF was Prepared: March, 2017

The Environmental & Social Management Framework (ESMF) has been prepared by Environment & Social Unit, Safety, Health & Environment (SHE) Department of Kenya Power, REA and MoEP.

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 project 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 project locations are finalized.

ENVIRONMENTAL & SOCIAL MANAGEMENT FRAMEWORK: KENYA OFF GRID SOLAR ACCESS PROJECT (K-OSAP)

TABLE OF CONTENTS

List of Figures

List of Tables

LIST OF ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
CFLs	Compact Fluorescent Lamp
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMCA	Environmental Management Act – 1999
ESAP	Environmental and Social Assessment Procedures
ESMS	Environmental and Social Management System
ESSF	Environmental and Social Screening Form
GoK	Government of Kenya
K-OSAP	Kenya Off Grid Solar Access Project
HHs	Households
HIV	Human Immunodeficiency Virus
IDA	International Development Association
IESIA	Integrated Environmental and Social Impact Assessment
IP	Indigenous People
IVA	Independent Verification Agent
ISTS	Integrated Safeguard Tracking System
KP	Kenya Power
KPLC	Kenya Power& Lighting Company
Kshs.	Kenya Shilling
MoEP	Ministry of Energy and Petroleum
NEC	National Environment Council
OM	Operational Manual
OP	Operational Procedure
OS	Operational Safeguards
PBO	Project Based Programs
RAP	Resettlement Action Plan
RoW	Right of Way
REA	Rural Electrification Authority
RPF	Resettlement Policy Framework
PCB	Polychlorinated Biphenyl
PIU	Project Implementation Unit
SESA	Strategic Environmental & Social Assessment
SHE	Safety, Health & Environment
SLA	Subsidiary Loan Agreement
US$	United States Dollars
ToR	Terms of Reference
UN	United Nations
UNCLOS	UN Convention on the Law of the Sea VAT
WB	World Bank

EXECUTIVE SUMMARY

Background to K-OSAP

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.

Driven by the imperative to provide equal opportunities across the entire Kenyan territory as key to achieving Kenya's Vision 2030 and the national target of achieving universal access to electricity by 2020, the GoK now seeks to close the access gap by providing electricity services to remote, low density, and traditionally underserved areas of the country. The proposed K-OSAP directly promotes these objectives by supporting the use of solar technology to drive electrification of households (including host communities around the refugee camps), enterprises, community facilities, and water pumps.

Due to the remoteness and sometimes dispersed nature of the target populations and considering the lifestyles and socio-economic status of those residing in the underserved counties, the project will be designed to address high costs of provision of infrastructure services, low affordability of the potential users, and sustainability of service provision. Therefore, sustainability of the proposed approach to energy access expansion beyond the nationally owned power network is predicated on two primary factors - private sector, county Governments, and local community participation; and institutional capacity of REA, KPLC and the Ministry of Energy and Petroleum (MoEP) as the implementing agencies.

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

Purpose of ESMF

The purpose of this Environmental and Social Management Framework (ESMF) is to provide a procedure for environmental and social assessment of the proposed REA, KPLC and MoEP subprojects. This framework approach was selected because even though the footprint of the project is known (i.e. the K-OSAP geographic areas are known but the selection of which settlements in these areas are to be included in the project is not yet finalized), specific designs and the precise location of the investments are not yet definitively identified. The ESMF will guide MoEP, KPLC & 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.

Objectives of the ESMF

The objective of this ESMF is to ensure that the implementation of the Kenya Off-Grid Solar Access Project (K-OSAP), for which the exact locations of the sub-project sites are not definitively identified at this stage, will be carried out in an environmentally and socially sustainable manner. The ESMF will provide the project implementers with an environmental and social screening process 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 and Social Impact Assessment (ESIA) where applicable.

The Environmental and Social Management Framework (ESMF) seeks to institute a consistent and effective environmental and social screening process for application in all MoEP, KPLC and REA off grid solar access project activities at local and national levels.

Specifically, the following are the objectives of the ESMF:

(i) 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;

(ii) To support and empower Ministry of Energy and Petroleum, Kenya Power and Lighting Company and Rural Electrification Authority 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.

Methodology used

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

- 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.
- Preparation of ESMF

Baseline Information

This section describes the overall baseline condition of Kenya in terms of the bio-physical, socio-economic and cultural environment. The proposed K-OSAP electrification component of the K-OSAP project will be implemented in up to 14 Counties across the country hence the baseline information presented below is for the different counties but is not site specific. The 14 counties targeted by the Kenya Power- Kenya Off-Grid Solar Access Project (KOSAP) collectively represent 72 percent of the country's total land area and 20 percent of the country's population.

Profile of Underserved Counties in Kenya

	Underserved County	Surface area (km2)	Population	Population density (Pax/km2)	Access rate (%)	
					2009	2014
1	Garissa	45,720	623,060	14	11.6	23
2	Isiolo	23,336	143,294	6	18.5	23.9
3	Kilifi	12,246	1,109,735	91	16.7	20.5
4	Kwale	8,270	649,931	79	10.6	16.2
5	Lamu	6,498	101,539	16	17	19.1
6	Mandera	25,797	1,025,756	40	2.5	17.8
7	Marsabit	66,923	291,166	4	7.5	21.7
8	Narok	17,921	850,920	47	5.9	12.2

9	Samburu	20,182	223,947	11	6.2	15.2
10	Taita Taveta	17,084	284,657	17	15	32.8
11	Tana River	35,376	240,075	7	2.5	3.3
12	Turkana	71,598	855,399	12	2.4	2.7
13	Wajir	55,841	661,941	12	3.4	7.5
14	West Pokot	8,418	512,690	61	2.6	3.3
	Total & Averages	**417,210**	**7,574,110**	**18.2**	**8.7**	
	National	**581,296**	**38,610,097**	**66.4**	**23**	**36**
	% of National	**72%**	**20%**			

The underserved counties of Kenya present profound infrastructure deficits, including lack of access to roads, electricity, water, and social services. Many cultures in marginalized areas were historically nomadic, based on pastoralist lifestyles, and with low population densities. There is also significant insecurity in certain areas, giving rise to substantial numbers of displaced persons and livelihood adaptations that further undermine economic prosperity. The total number of un-electrified households is roughly 1.2 million in these 14 counties.

Regulatory, Administrative and Legal Framework

A number of legislations, policies and instruments are available to support environmental management and the Environmental Impact Assessment process in Kenya. The Environmental Management Coordination Act 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.

Kenya Off-Grid Solar Access Project

The project will target 14 out of the 47 counties in Kenya that have been defined as marginalized by the commission on revenue allocation (CRA). The 14 underserved counties collectively represent 72% of the country's total land area and 20% of the total population. The population is highly dispersed at a density of 4 times lower than the national average. These counties are also characterized by infrastructural deficits, including lack of access to roads, electricity, water and social services most of which are soon going to be a thing of the past thanks to devolution. The 14 counties include; Garissa, Isiolo, Kilifi, Kwale, Lamu, Mandera, Marsabit, Narok, Samburu, Taita Taveta, Tana River, Turkana, Wajir and West Pokot. The total number of un-electrified households is roughly 1.2 million in these counties. The K-OSAP is intended to support the Government's initiatives of ensuring increased electricity access to Kenyans, particularly those in remote areas without national grid and those in Off-grid areas.

KOSAP Project Development Objective:
The Project Development Objective is to increase access to modern energy services in underserved counties of Kenya

The project has the following four components:

Component 1: Mini-grids for Community Facilities, Enterprises, and Households

This component will support the electrification of areas where electricity supply through mini-grids represents the least cost option from a country perspective, as underpinned by the geospatial plan. Depending on the number of users to be supplied, and the service level defined for each type of user (households, enterprises, community facilities, etc.), the generation system of each specific mini-grid will combine solar PV, battery storage and thermal units running on diesel. Mini-grids will be developed under a Public-Private-Partnership (PPP) whereby private investment and public funds co-finance construction of generation facilities, and public funding is used to construct the distribution network. A single private service provider (PSP) will be responsible for construction (and partial financing) of the generation system and for construction of the distribution network of each mini-grid. The same PSP will sign two long-term contracts with KPLC: (i) a 7-10 year power purchase agreement (PPA) for the operation and maintenance of the generation system, and recovery of the privately financed part of the investment; and (ii) a 7-10 year service contract for operation and maintenance (O&M) of the distribution network, including revenue cycle services (as required). Ultimately, after the recovery of the private investments, all assets (both generation and distribution) will be in GoK ownership. All electricity consumers supplied through mini-grids will be KPLC customers, and pay the same tariff for each category charged to users connected to the national grid, ensuring effective implementation of a national uniform tariff policy.

The component will be implemented in approximately 120 locations throughout the 14 target counties, typically in mini-grids supplying 100-700 prospective users, with approximate total demand of 20-300kW. These potential sites, capturing approximately 27,000 consumers in total, have preliminarily been identified as part of the geospatial plan. Each service territory will comprise 20 or more mini-grids located in geographically contiguous areas, with 2,000 or more serviceable customers. There will be a mix of more densely populated sites and less densely populated sites in each lot, where possible, to enhance their overall commercial attractiveness. PSPs can bid separately for each lot, with multiple lots potentially awarded to the same PSP.

REA and KPLC will jointly implement the component, with the procurement of lots divided among them. This component will be complemented by technical assistance, under sub-component 4.2, to (i) confirm the sites through further feasibility studies and techno-economic analysis (ii) promote productive and efficient use of energy by users (iii) technical, legal, and procurement support to effectively design the bidding documents and supervise the construction of the mini-grid assets.

Component 2: Standalone Solar Systems and Clean Cooking Solutions for Households

Component 2A: Standalone Solar Systems for Households : This component will support off-grid electrification of households in the 14 target counties where a standalone solar system is the most appropriate technology to deliver energy services, leveraging Kenya's unique off-grid solar market dynamics and innovations. The component will provide incentives for solar off-grid companies currently operating in the more densely populated areas of Kenya to expand to underserved counties and provide services to the off-grid households in these counties. These services, provided through portable solar home systems, are well-suited to some of the population in the underserved counties, as households do not always live in permanent structures. In addition, affordability is increased by allowing households to pay for systems over time. Willingness to pay analysis, confirmed by the preliminary results from the

MTF surveys shows there to be over a half-million households that could theoretically afford a Tier 1 level solar home system[1].

The component will be accomplished via two financing instruments to which eligible solar service providers (SSPs) will have access:

i. *Grant Facility - Competitively awarded expansion grants*, to compensate SSPs for initial, ongoing incremental, and opportunity costs associated with an expansion of operations in underserved counties. A percentage cap will be set within each lot so that multiple service providers will have the opportunity to operate within the space. A competitive approach will be used, whereby service providers will bid based on a grant amount per household connection, with the lowest grant requirements winning. Results-based financing will specify installment payments based on the achievement of pre-agreed connection milestones and satisfactory after sales service support.

ii. *Debt Facility - Debt financing to solar* service providers, to support upfront costs associated with getting hardware inventory into the market, and medium-term consumer financing to enable households to pay off the systems over time. Two typologies of business models underpin the majority of solar service providers that operate in the Kenyan market. First are service providers that sell solar products on an over-the-counter (cash sale) basis. These service providers require shorter term debt in USD or other major foreign currency to finance costs associated with hardware manufacture and transit to Kenya (typically from China) until a sale is made. This cycle typically lasts anywhere from 6 to 9 months. A second prevailing business model is pay-as-you-go, whereby customers pay for the systems in monthly installments (typically between 12-36 months), and SSPs carry the default risk during the payback period. These businesses typically require debt financing that is commensurate with the lending terms that they extend to their customers. Given that service providers' revenues are in local currency, the debt instrument will also offer loans in Kenyan Shillings in addition to USD.

The implementation of this component will be under a direct oversight of MoEP. MoEP will competitively select the expansion debt-grant facility manager, which will be a consortium with demonstrated experience with managing similar instruments in Kenya and similar geographies. An OP 10.00 assessment of financial intermediary financing will be carried out for on the debt facility manager.

Component 2B: Clean Cooking Solutions for Households: This sub-component will support a transition from low-efficiency baseline stoves to cleaner, higher efficiency improved stoves. To accomplish this objective, cleaner household cooking appliances and fuels will be promoted. Activities will begin by focusing on four underserved counties in the northwestern part of the country (West Pokot; Turkana; Samburu; and Marsabit).

During project preparation, a Stove-Market Testing Program is being undertaken in the municipal, town, and densely settled parts of Turkana County. The stoves to be included will be determined following a call for Expressions of Interest for stove manufacturers wanting their products to be exposed to these new markets. To be eligible, a woodstove will have to prove that its efficiency tests it as a Tier 2 stove (roughly 30 percent efficient) and a charcoal stove will have to prove that its efficiency tests as a Tier 3 stove (roughly 40 percent efficient) to be eligible for inclusion in the market tests. These tests will involve exposing both consumers and suppliers (retailers, wholesalers, and distributors) in the urban areas of Turkana County to these improved stoves. The results will be shared with the communities and interested parties. Field testing for additional stoves models may be considered during the project implementation.

This sub-component will operate a window in the grant facility established for Component 2A to support sales of eligible stoves in targeted counties. The grant facility will provide the selected distributors with financial support on a matching grant and results-based scheme to enable them to market their stoves

1 Simulations using 2014 FinAccess household survey data show that in a scenario where 7 percent of household expenditures are made on stopgap lighting, over 500,000 of the 1.2 million off-grid households could afford a PAYG SHS offering (assuming a 3-light point system, offered on a monthly cost of KES 500 and paid off over 36 months).

locally within the target counties; to increase their inventories of the selected higher quality stoves; to purchase and transport them to the target communities in number; and to sell them to willing buyers in the communities.

Component 3: Standalone Solar Systems and Solar Water Pumps for Community Facilities

The community facilities considered in this component are the existing and upcoming: (i) Health facilities (Levels 2 and 3) (ii) Educational facilities (Secondary schools and Technical training institutes); (iii) Administrative offices (for example, assistant County Commissioner offices).

Component 3A: Standalone Solar Systems for Community Facilities. This component will support the provision of electricity services to community facilities in remote areas in underserved counties. A private sector contractor will be competitively selected for each service territory to supply, install, and maintain standalone solar systems in community facilities. A total of about 1100 facilities could be reached via this component.

KPLC, the implementing agency, would sign two (2) contracts with the contractor in each service territory – one for the supply and installation of the standalone solar systems and the second for the provision of maintenance services for 7-10 year duration. The contract would specify the minimum requirements in terms of quality standards in electricity supply for the community facilities, developed by Ministry of Health, Ministry of Education, and Ministry of Interior. Contracts would stipulate the minimum package acceptable as "basic service", but allow room for provision of additional services to community facilities. The proposed project will cover the supply and installation costs and KPLC will pay the contractor for fees under the maintenance contract with allocation or revenues from beneficiary facilities. The costs of maintenance contracts are expected to be passed through into tariff revenues recognized by ERC.

KPLC will take the retail risk of serving these new consumers, for which their payment record for such an arrangement is still unknown. Therefore, a payment risk mechanism would be available to KPLC, to which the proposed project will set aside funds equivalent to 6-12 months of maintenance fees that KPLC can draw upon in case of inadequate revenues to pay the contractor.

Component 3B: Solar Water Pumps for Community Facilities: This component will support financing solar powered pumping systems to increase sustainable access to water supply by equipping new boreholes and retrofitting existing diesel-powered boreholes associated with community facilities within the target counties. A private sector contractor will be competitively selected for each service territory to supply, install, and maintain standalone solar systems in community facilities.

REA, the implementing agency, would sign (2) contracts with the contractor in each service territory to – one for the supply and installation of the standalone solar systems and the second for the provision of maintenance services for 7-10 year duration - similar to the design in Component 3A. The payment for these maintenance services will be recouped on a monthly basis by the community facilities hosting these boreholes.

A payment risk mechanism would be available to REA, to which the proposed project will set aside funds equivalent to 6-12 months of maintenance fees that REA can draw upon in case of inadequate allocation from the beneficiary facilities to pay the contractor.

Component 4: Implementation Support and Capacity Building

Component 4.1: Consumer Education and Citizen Engagement

This sub-component will support the consumer education and citizen engagement activities for the program's key delivery areas (households, community facilities, water facilities in the underserved counties). Consumers in these areas are unlikely to be aware of the new technologies being presented and

have a right to expect clear, thorough information about the advantages of the services and how to access them. The activities supported under this sub-component will provide recurring opportunities for consumers to interact with service providers in order to share their feedback and concerns. For those who have some knowledge of the products, these outreach activities will provide them with the necessary guidance on how to get the best out of the products in the way they use and maintain them. Finally, in these target areas, acceptance and sustained demand is generated when the buy-in of key opinion leaders is obtained. The consumer education and citizen engagement program will employ both Above the Line (mass media tools) and Below the Line (one on one) channels in reaching out to different target audiences while ensuring opportunities for two-way dialogue.

Component 4.2: Implementation Support and Capacity Building

This sub-component will support all technical studies, implementation support, and capacity building of sector and counties. More specifically, the following are included. First, build capacity and address the skill set requirements in KOSAP Project Coordination Unit in MoEP and KPLC PIU and REA PIU. Second, capacity building activities in the sector and counties, for instance related to solar technology, project management, procurement, environmental and social safeguards for the sector entities, and monitoring and evaluation. As such, funding will be used to cover the investment costs (equipment, software, training, etc.) incurred by ERC to establish a monitoring unit. Third, relevant studies and contracts for the investment components of the proposed projects. Fourth, support MoEP in the development of a Strategic Planning and Program Management (SPPM) unit with the objective of providing effective coordination and oversight in terms of policy development, strategic planning, and project design and implementation.

Institutional and Implementation Arrangements

The MoEP will provide overall coordination of the Project and lead in the implementation of Component 2, which will include overall responsibility for safeguards due diligence, and compliance monitoring. MoEP will ensure that Terms of Reference (ToR) for hiring the Facility Management Consortium (FMC) contain clauses that relate to safeguards and Occupational Health and Safety (OHS) competencies and specific tasks related to safeguard monitoring and enforcement. The selected FMC (Grant and Debt Managers) will be responsible for coordinating and supporting the implementation of safeguards, and will prepare Facilities Implementation Manual (FIM) that will include checklist for subprojects, their potential threats, and mitigation measures as well as capacity building for safeguards implementation and compliance monitoring. MoEP will submit FIM to the Bank for review and clearance. Thus, solar companies who bid for any of the subprojects under this component will have to indicate their respective bids how they intend to address environmental and social sustainability issues that could be associated with the provisions of those services. The selected solar companies will be responsible for implementing the safeguards on the ground, including ensuring compliance with occupational health and safety imperatives and dealing with de-manufacturing of out-of-use solar devices, e-waste disposal and recycling. The generation of safeguard reports during implementation of project activities will start from the solar companies and through the FMC to MoEP.

KPLC and REA will jointly be responsible for the implementation of Components 1 and 3; Component-1 (Mini-grids for Community Facilities, Enterprises, and Households**)** will be developed under the Public Private Partnership (PPP) and a single contractor will be responsible for construction of the generation system , the contractor will prepare appropriate safeguards instruments that will be consulted upon, reviewed and cleared by the Bank and locally disclosed. Under Component 3 (Standalone solar systems for community facilities), KPLC and REA have overall responsibility for safeguards due diligence and the private sector contractors hired for supply, installation and maintenance will be responsible for preparing a checklist for subprojects, their potential threats, and mitigation measures as well for safeguards implementation and compliance monitoring. REA will be responsible for managing the carbon finance sub-component from Ci-Dev. KPLC and REA will establish their respective Project Implementation Units (PIUs) to manage their specific components.

Specifically, KOSAP PCU hosted in MoEP will be responsible for the overall coordination of the project implementation and oversight including the following: (i) defining, jointly with the respective county governments, the project areas based on technical and policy development priorities; (ii) resolving in consultation with the county governments challenges requiring high level intervention facing the project; (iii) monitoring the implementation of the project in consultation of the counties; and (iv) consolidating information.

World Bank safeguard policies

The activities in the K-OSAP electrification component are expected to trigger OP/BP 4.01 (Environmental Assessment), OP 4.12, Involuntary Resettlement, and OP/BP 4.04 (Natural Habitats) although only as a precautionary measure, OP/BP 4.10 Physical Cultural Resources is also triggered for this project. The safeguards instruments prepared for any subprojects will address the requirements of any applicable policies.

SAFEGUARDS POLICIES TRIGGERED BY THE K-OSAP	YES	NO
OP/BP 4.01: Environmental Assessment	x	
OP/BP 4.04 Natural Habitats	x	
OP/BP 4.36 Forests		x
OP 4.09 Pesticide Management		x
OP/BP 4.11 Physical Cultural Resources		x
OP/BP 4.10 Indigenous Peoples	x	
OP/BP 4.12 Involuntary Resettlement	x	
OP/BP 4.37 Safety of Dams		x
OP/BP 7.50 Projects in International Waters		x
OP/BP 7.60 Projects in Disputed Areas		x

Environmental and social impacts

Benefits/Positive impacts

- Employment and wealth creation
- Local Material Supplies
- Up Scaling Electricity Access to the Poor
- Improve connectivity due Connection payment model
- 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

Negative Environmental and Social Impacts

- Impact on Natural Vegetation and Biodiversity
- Impacts on air quality from vehicle exhaust emissions

- Risk of sparks/fire from live conductors
- Solid waste
- 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
- Electronic waste from solar panels and disposal of solar storage batteries

MoEP, KPLC, REA Support in Screening Process
Through this ESMF component 1-3 will be screened for potential adverse environmental and social impacts. Based on the screening results, each subproject will include local costs of implementing and monitoring the mitigation measures. This will be done through involvement of National Environment Management Authority (NEMA), REA, KPLC environment and social units and MoEP through the grant and debt facility managers in coordination with the Project Implementation Units (PIUs). This will be complemented by the availability of County Environmental Officers who are the environmental custodians for their own counties.

Screening Process
The environmental and social screening process will take place once sub-projects are identified prior to implementation. This section identifies and illustrates the specific steps to be involved in the environmental and social screening process leading towards the review and approval of the sub projects from environmental and social management aspects. The steps followed incorporate the requirement of both relevant national laws and the World Bank's Operational Safeguards Policies for this Project.

MoEP, REA and KPLC as implementing agencies for the K-OSAP will screen the sub projects per region to identify adverse environmental and social impacts using the screening form provided. Then the institutions will introduce into the sub project design the required measures to mitigate impacts identified from use of the screening form and checklist before submission of the sub project design to the respective implementing units for review and clearance.

In addition, to the Environmental and Social Screening Form, an Environmental and Social Checklist will be prepared and availed to facilitate the identification of simple mitigation measures for K-OSAP sub-projects not requiring a separate EA report. Main features of the checklists will include: a detailed description of the activities to be undertaken, potential adverse impacts (environmental and social concerns), mitigation measures to be undertaken and the organization/person responsible for each activity, and monitoring responsibilities, and cost estimates. MoEP through the consortium of the Grant and Debt Facility Managers will prepare an operational manual that will include environmental and social checklist to guide the solar companies that will be subcontracted to install standalone household systems and providing after sale services for the Component 2 of the Project.

Public Consultations and Participation
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.

One of the key mandates of the Environmental and Social department is to carry out public consultation. The aim is to inform the public on safe use of electricity. A detailed account of public consultation carried

out during the preparation of K-OSAP are presented in the chapter on public consultation.

The forums began with an introduction and description of the K-OSAP 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 emphasized that more consultations will be held with communities that will be proposed as targeted beneficiaries, during the sub-project selection process.

Consultation were based on providing the stakeholder analysis as to the ESMF annex and preceded by disclosing of adequate project information and environmental and social information to ensure that participants are fully informed about K-OSAP. This process will continue throughout the selection of sub-projects and throughout the project implementation as needed. Consultations will be conducted in a timely manner in the context of key project preparation steps, in an appropriate language, and in accessible places. The results of the consultations will be adequately reflected in the project design and in the project documentation. For consultations on this framework ESMF please refer to Chapter 9 and Annex 10 of this document.

Proposed Mitigation Measures

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 safe disposal of PCB and creosote and CCA-treated poles, Occupational (and Public) Health and Safety, and loss of vegetation. The Mitigation measures will be implemented by the contractor based on LOT specific standardized ESMPs with monitoring undertaken by KPLC PIU, KPLC's Environment and Social Unit, and regional staff.

Potential Impacts and Proposed Mitigation Measures

Proposed mitigation measures will have the following positive impacts:

- The use of Environmental Guidelines for Contractors will ensure that environmentally and socially sustainable construction techniques are applied in a standardized manner and construction sites are properly managed.
- Knowledge gained through training on environmental management and importance of mitigation measures will be used in other projects by REA and KPLC.
- Tree planting to replace any trees cut down during construction, though there is expected to be minimal cutting of trees, as KPLC and REA will minimize tree cutting
- Tree planting will directly contribute to elimination of carbon dioxide hence reducing Greenhouse Gas emissions.

Capacity Building for MoEP, REA and KPLC Staff

REA and KPLC have a well-staffed Safety, Health and Environment (SHE) department, MoEP will nominate or recruit environmental and social safeguards staff to support the implementation of Component 2. The SHE staff will support the Project Implementation Unit (PIU) for the K-OSAP sub-component. The MoEP, REA and KPLC PIUs will have a dedicated staff for each - environment and social sections. MoEP, REA and KPLC PIUs staff with help from regional staff will be continuously involved in the implementation of the environmental screening process for subprojects. The K-OSAP project will assist in strengthening MoEP, KPLC and REA PIU staff through support for capacity building in environmental and social management as regards the solar projects. Selected MoEP, KPLC and REA staff from the PIUs and SHE department staff will undergo training in environmental management systems and impact assessment, implementation of the environmental and social screening process outlined in this ESMF,

Strategic Environmental and Social Assessment, Hazardous waste management and pollution control and Occupational Health & Safety.

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 (including sub-project EA implementation) is estimated at approximately **Kshs 16,000,000.00** 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**.**

CHAPTER ONE: INTRODUCTION

1.1 Background

The Government of Kenya has pledged to stimulate economic growth and accelerate job creation to improve the economic wellbeing of Kenyans. Among the many interventions to achieve this is expansion of the new sources of energy to enable more Kenyans to connect to the grid at affordable cost and hence initiate economic activities at the micro-economic level.

The Government of Kenya (GoK)'s strategy for expanding electricity infrastructure to support the achievement addresses among others, issues including the equity of access to quality energy services at least cost manner. The Government's target is to reach 70% electrification rate by 2017, with an immediate target to households in the next five years. Furthermore, to implement the strategy, the government has prepared Least Cost Power Development Program (LCPDP) 2009-2029; the Rural Electrification Master Plan and Kenya Investment and Policy Prospectus. The investments included in the program cover all three elements of strategy for electricity development simultaneously capacity expansion, enhanced security and increased connections.

Driven by the imperative to provide equal opportunities across the entire Kenyan territory as key to achieving Kenya's Vision 2030, and the national target of achieving universal access to electricity by 2020, the GoK now seeks to close the access gap by providing electricity services to remote, low density, and traditionally underserved areas of the country. The proposed K-OSAP directly promotes these objectives by supporting the use of solar technology to drive electrification of households (including host communities around the refugee camps), enterprises, community facilities, and water pumps.

Due to the remoteness and sometimes dispersed nature of the target populations and considering the lifestyles and socio-economic status of those residing in underserved counties, the project will be designed to address high costs of provision of infrastructure services, low affordability of the potential users, and sustainability of service provision. Therefore, sustainability of the proposed approach to energy access expansion beyond the nationally owned power network is predicated on two primary factors - private sector, County Governments, and local community participation; and institutional capacity of REA, MoEP, KPLC as the implementing agencies.

The World Bank's Country Partnerships Strategy (CPS) for Kenya (2014-18) also recognizes the access to basic electricity, as a key developmental issue. The strategy sets improving core infrastructure as one of the projects the Bank will be engaged in. It also emphasizes the importance of mobilizing concessional funding to expand the sector including electricity generation, transmission and distribution to meet the government's economic growth targets.

K-OSAP to be financed by the World Bank Group aims to support the Government's initiatives of ensuring increased electricity access to Kenyans in off grid areas, particularly among the low-income groups.

1.2 ESMF Requirement

This Environmental and Social Management Framework (ESMF) is an environmental assessment and management tool for the K-OSAP components under the World Bank-financed K-OSAP project. The capital works will contribute to improving the access and reliability of power supplies. MoEP, KPLC & REA plans to strengthen off solar access project improve on power supply in the 14 counties hence will improve the network efficiency in Off- Grid areas and reliability, and to meet growing demand for electricity.

The World Bank (WB) Operational Policy OP 4.01 – Environmental Assessment - requires the borrower to prepare environmental safeguard documents (in this instance an Environmental and Social Management Framework [ESMF]) that will enable MoEP, KPLC and REA to assess the environmental and social impacts of its proposed activities before undertaking them, and to delineate the mitigation, monitoring and institutional measures to be undertaken during preparation, implementation and operation of the Project to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable minimal levels.

1.3 Purpose of ESMF

The purpose of this Environmental and Social Management Framework (ESMF) is to provide a procedure for environmental and social assessment of the proposed MoEP, KPLC and REA subprojects. This framework approach was selected because even though the footprint of the project is known (i.e., the IDA-K-OSAP geographic areas are known but the exact locations or sites are not yet identified. Selection of which sites in these areas are to be included in the project is not yet finalized), specific designs and the precise location of the investments are not yet definitively identified. The ESMF will guide MoEP, KPLC, 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

1.4 Objectives of the ESMF

The objective of this ESMF is to ensure that the implementation of the Kenya off Grid Solar Access Project (K-OSAP), for which the exact locations of the project sites are not definitively identified at this stage, will be carried out in an environmentally and socially sustainable manner. The ESMF will provide the project implementers with an environmental and social screening process and procedure that will enable them to identify, assess and propose mitigation measures for the negative environmental and social impacts of project activities, including through the preparation of a site-specific Environmental and Social Impact Assessment (ESIA)/ESMPs where applicable.

The Environmental and Social Management Framework (ESMF) seeks to institute a consistent and effective environmental and social screening process for application in the proposed K-OSAP. Specifically, the following are the objectives of the ESMF:

- 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

- To support and empower REA and KPLC officers to carry out the environmental and social screening process as outlined in this Framework.
- To support the MoEP through the Consortium of Grant and Debt Facility Managers and the contracted solar companies carry out environmental and social screening process

1.5 Institutional and Implementation Arrangements

The MoEP will provide overall coordination of the Project and lead in the implementation of Component 2, which will include overall responsibility for safeguards due diligence, and compliance monitoring. MoEP will ensure that Terms of Reference (ToR) for hiring the Facility Management Consortium (FMC) contain clauses that relate to safeguards and Occupational Health and Safety (OHS) competencies and specific tasks related to safeguard monitoring and enforcement. The selected FMC (Grant and Debt Managers) will be responsible for coordinating and supporting the implementation of safeguards, and will prepare Facilities Implementation Manual (FIM) that will include checklist for subprojects, their potential threats, and mitigation measures as well as capacity building for safeguards implementation and compliance monitoring. MoEP will submit FIM to the Bank for review and clearance. Thus, solar companies who bid for any of the subprojects under this component will have to indicate their respective bids how they intend to address environmental and social sustainability issues that could be associated with the provisions of those services. The selected solar companies will be responsible for implementing the safeguards on the ground, including ensuring compliance with occupational health and safety imperatives and dealing with de-manufacturing of out-of-use solar devices, e-waste disposal and recycling. The generation of safeguard reports during implementation of project activities will start from the solar companies and through the FMC to MoEP.

KPLC and REA will jointly be responsible for the implementation of Components 1 and 3; Component-1 (Mini-grids for Community Facilities, Enterprises, and Households) will be developed under the Public Private Partnership (PPP) and a single contractor will be responsible for construction of the generation system, the contractor will prepare appropriate safeguards instruments that will be consulted upon, reviewed and cleared by the Bank and locally disclosed. Under Component 3 (Standalone solar systems for community facilities), KPLC and REA have overall responsibility for safeguards due diligence and the private sector contractors hired for supply, installation and maintenance will be responsible for preparing a checklist for subprojects, their potential threats, and mitigation measures as well for safeguards implementation and compliance monitoring. REA will be responsible for managing the carbon finance sub-component from Ci-Dev. KPLC and REA will establish their respective Project Implementation Units (PIUs) to manage their specific components.

Specifically, KOSAP PCU hosted in MoEP will be responsible for the overall coordination of the project implementation and oversight including the following: (i) defining, jointly with the respective county governments, the project areas based on technical and policy development priorities; (ii) resolving in consultation with the county governments challenges requiring high level intervention facing the project; (iii) monitoring the implementation of the project in consultation of the counties; and (iv) consolidating information

1.6 Environmental and social screening

The MoEP, REA, KPLC Project Implementation Units (PIUs) - with the help of regional staff - will be responsible for completing the Environmental and Social Screening Form for each

project, and based on the screening results, the appropriate level of environmental work will be determined by MoEP, REA's, KPLC's Environment and Social units and carried out by qualified REA, KPLC, and MoEP staff. The screening process has been developed because the exact locations and scope of the projects have not been definitively identified, and therefore potential adverse localized environmental and social impacts cannot be precisely identified..

1.7 Level of Environmental Work

The appropriate level of environmental work for the K-OSAP electrification component could range from the application of simple environmental mitigation measures (using the Environmental and Social Screening Checklist); to the preparation of a comprehensive ESIA/ESMPs Report; to no environmental mitigation work being required apart from the standard application of safety measures. The environmental and social screening process is consistent with Kenya's environmental policies and laws as discussed in this Framework, as well as with the World Bank's Operational Policy 4.01 - Environmental Assessment.

It is expected that the project will have minimal or limited adverse environmental impacts. Significant adverse environmental and social impacts that would require extensive mitigation measures and possibly the preparation of a comprehensive ESIA are unlikely, given the limited scope of the civil works and that K- OSAP targets Off-Grid area most of which are in remote rural set up.

1.8 Coordination of Environmental and Social Screening at MoEP, REA, AND KPLC

During the implementation of the K-OSAP project; REA and KPLC Safety, Health & Environment (SHE) and Environmental and Social unit will coordinate closely with the infrastructure division and County Environmental Officers in the evaluation of environmental and social impacts and the determination of appropriate mitigation measures. MoEP through the consortium of the Grant and Debt Facility Managers will hire Supervising Consultant Engineer to ensure contracted solar companies installing standalone solar household systems evaluate the potential environmental and social impacts and provide appropriate mitigation measures

1.9 Preparation and Use of this Framework

This ESMF has been prepared by MoEP, REA and KPLC based on previous experience on similar projects. This ESMF will be a living document that will be subject to periodic review to address specific concerns raised by stakeholders, and emerging policy requirements. It will complement the Environmental and Social Impact Assessment and Environmental Audits guidelines provided for operationalization of provisions of the Environmental Management and Coordination Act (EMCA),1999 as Amendment 2015, which guides environmental protection and management.

Potential Users of the ESMF

This framework has been prepared as a reference document for use by key stakeholders who will be involved in the planning, implementation, management and operation of the proposed K-OSAP for MoEP, KPLC and REA. As a reference document the framework is useful to the following proposed project key stakeholders:

- World Bank as the Funding and development partner

- Senior government officials responsible for policy making and project &development planning;
- Government extension workers in the various ministries; and
- Non-Governmental Organizations involved in natural resource management.
- KPLC and REA as the implementing agencies;
- MoEP, Consortium of Grant and Debt Facility Managers and contracted Solar Companies
- National government and County officials responsible for environmental planning and management including NEMA;
- Politicians and local traditional leaders;
- Sector Environmental Management Coordinators
- County Environmental Management Officers and Committees;
- Potential consumers of electricity;
- The private sector;
- Planners and engineers for the preparation of plans and designs of the subproject activities; and
- Engineers, contractors and companies to be involved in implementation of the -project activities.

CHAPTER TWO: METHODOLOGY AND CONSULTATION

2.1 Introduction

Several methods were involved in the preparation of this ESMF to meet the World Bank safeguard policies and Kenyan legal requirements. This ESMF provides a screening process for the potential environmental and social impacts for the planned future project activities and recommends a standardized environmental management plan for addressing the potential positive and negative impacts associated with the project. For the purpose of achieving these targets, the following approaches were used.

2.2 Detailed & In-depth Literature Review

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

Bearing in mind that K-OSAP subproject sites were not definitively identified 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.

Among the documents that were reviewed in order to familiarize and further understand the project included:

(i) World Bank Related Documents

- *World Bank Project draft Appraisal Document for K-OSAP*
- *World Bank Safeguards Policies*
- *World Bank Group Environmental, Health, and Safety Guidelines (known as the "EHS guidelines")*
- *IFC Performance Standards*

(ii) Kenyan Documents

- *Kenyan Constitution 2010*
- *Environmental Management and Coordination (Amendment) Act (2015)*
- *Water Act (2016)*
- *Energy Act 2006*
- *Traffic Act (Cap. 403) of 2015*
- *Land Acquisition Act. Chapter 295. Revised Edition 2010*
- *Community land Act 2016*

- *Public Health Act. Chap 242. Revised Edition 2012*
- *Wildlife Act 2006*
- *Forest Act 2005*

2.3 Stakeholders Consultation and Participation

The objective of this task was to hold structured and comprehensive consultations with various stakeholders in order to understand their perceived view of the project, and assess the extent to which their views need to be taken into account specifically in the project. This task involved the development of structured questionnaires that guided Focus Group Discussions and Key Informant Interviews as follows:

2.3.1 Focus Group Discussions (FGDs)

The national government, county government, NGOs, CBOs, women representatives, youth representative among other groups provided vital qualitative information on the subject that will assist in the implementation of K-OSAP. Discussions were held with various randomly selected groups that will partner with the MoEP, KPLC, REA on the implementation of this project. The selection of these groups was done in each sub-county based on their contributions in the intervention areas of the project. The FGDs were carried out by the MoEP, KPLC and REA project teams in order to ensure that the right information is captured.

The FGDs was guided by structured questionnaires based on the probing technique of participatory question based facilitation. This methodological approach involved inclusive participation with equal treatment of participants and building consensus on various issues in regard to the implementation of K-OSAP.

2.3.1 In-depth key informant interviews

Key informant interviews were undertaken to gather qualitative information on K-OSAP. The choice of the key informants for the in-depth interviews were guided by the perceived level of influence, information expected from the persons interviewed and intentional bias to gather information that meets K-OSAP implementation. These interviews were guided by semi-structured questions developed to cover pertinent issues on K-OSAP. The targeted key informants who were interviewed include:

- National government line ministries at the project area
- Relevant County and sub county government officers
- NGOs and CBOs in the project areas

2.4 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 potential positive and negative environmental and social impacts of the proposed projects;
- Identification of potential environmental and social mitigation measures;
- Preparation of screening procedures to be used while screening K-OSAP project;
- Formulation of a generic environmental and social management and monitoring plan.

CHAPTER THREE: PROJECT DESCRIPTION

3.1 Introduction

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. 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 45% of the households (4.3 million), have electricity access from the national grid or mini-grids. The electrification rate is planned to be increased to 70 % by 2017 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 is under consideration.

Currently, the energy policy and the draft 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, transmission and distribution.

Ministry of Energy and Petroleum, Kenya Power and Lighting Companyd and Rural Electrification Authority will be responsible for implementing K-OSAP. MoEP, KPLC and REA subprojects involve in significant amount of construction work for solar panels foundations, but with minimal environmental impacts. The K-OSAP will be implemented in the 14 Counties considered marginalized in the country shall be subjected to environmental screening so as to determine impacts and propose various mitigation measures on the impacts to be identified and implemented in compliance with the donors' safeguard policies (in the case of K-OSAP, the World Bank Safeguard Policies) as well as relevant National environmental laws and regulations.

3.2 Background

The rationale for the project concept is driven by the imperative to dramatically improve accessibility to electricity supply that underpin economic activity and to sustain electrification. Electricity service interruptions in recent years have a number of contributing causes. They include inadequate generation capacity (especially during dry periods when hydropower availability is reduced), congestion in the transmission infrastructure that constrains power transfers from Mombasa where there is surplus generation capacity to Nairobi and the western regions where there is a deficit, scheduled interruptions for line work and unscheduled interruptions due to a weak network, inadequate preventive maintenance, vandalism, inadequate automation, etc. The project is

designed to increase access to energy services in the underserved Counties of Kenya.

In order to accelerate access to electricity and connectivity rate and achieve annual connections in the range of 1.3 million, it is proposed that a new model be adopted that will help overcome the current bottlenecks in the connectivity pipeline. This new model focuses on availing Off-Grid connections through provision of solar power systems. The county governments are gradually finding their ground and are expected to spur growth of businesses in their jurisdictions as they put more focus on infrastructure development. Coupled with the upcoming Vision 2030 flagship projects with the attendant ripple effect in their vicinity, the proposed strategy is bound to lead to accelerated economic growth and expansion. The K-OSAP comes to complement efforts for increased electricity access.

3.3 Kenya-Off Grid Solar Access Project

The market for solar PV systems has existed in Kenya since the mid-1980s, and by the early 2000s, some 30,000 systems were installed per year – most of them through an unsubsidized, free market. Solar was then (and is now again) the largest source of new electrical connections in rural Kenya. However, the market suffered because most of the systems were poor quality. As a result, depending on the point of view, Kenya's solar PV market approach was reported either as a great success (an unsubsidized market taking off on its own) or a failure (inability to ensure adequate quality and protect consumers from sub- standard products). In 2008, Kenya was selected as one of the two pilot countries for Lighting Africa (see Annex 2). The program soon delivered results. The off-grid solar PV market in Kenya is growing exponentially: 2.7 million quality-certified lanterns and small solar kits have been sold since 2009. In 800,000 in fiscal year 2015. According to the latest national household survey (DHS, 2014), 14 percent of rural households own a solar lantern/home system as opposed to 12.6 percent of households with a grid extension. In addition, the share of quality products improved rapidly – more than 40 percent of the off-grid lighting market now consists of products that have met IFC's Lighting Global standards, up from just 3 percent in 2009. Kenyan private sector players have developed innovative business models to reach "last mile" customers over the past years, including developing efficient supply channels for cash sales of portable lanterns and locally assembled solar home systems. They have also pioneered the roll out of innovative technological approaches such as pay-as-you-go, which enables customers to pay for their solar products in affordable, monthly installments, often via mobile money. Local financial institutions are also actively supporting the sector, providing loans to actors across the value chain.

The Kenya off-grid program to electrify remote centers through mini-grids has been running since the early 1980's. Currently, there are twenty-one mini-grid stations, 19 of which are owned by the Rural Electrification Authority (REA) and managed by Kenya Power (KPLC) while the other two stations are owned and managed by Kenya Electricity Generating Company (KenGen). The total installed capacity for these mini-grids is 24.8 comprising of 23.7MW thermal, 0.55MW wind and 0.569MW solar subsidy. The proposed KOSAP project which will serve the 14 underserved counties in the country.

3.3.1 Targeting

Driven by the imperative to provide equal opportunities across the entire Kenyan territory as key to achieving Kenya's Vision 2030 and the national target of achieving universal access to electricity by 2020, the GoK now seeks to close the access gap by providing electricity services to remote, low density, and traditionally underserved areas of the country. The proposed K-OSAP directly promotes these objectives by supporting the use of mini-grids which will be supplied as a hybrid system (that combine Solar PV, battery storage and thermal units running on Diesel) to drive electrification of households (including host communities around the refugee camps), enterprises, community facilities, and water pumps. Due to the remoteness and sometimes dispersed nature of the target populations and considering the lifestyles and socio- economic status of those residing in underserved counties, the project will be designed to address high costs of provision of infrastructure services, low affordability of the potential users, and sustainability of service provision. Therefore sustainability of the proposed approach to energy access expansion beyond the nationally owned power network is predicated on two primary factors - private sector, County Governments, and local community participation; and institutional capacity of KPLC, REA, MoEP as the Implementing Agencies.

3.3.2 Geographic Scope

The proposed K-OSAP will target 14 of the 47 counties in Kenya that have been defined as "marginalized areas" by the Commission on Revenue Allocation (CRA) and the Constitution of Kenya, 2010. CRA defines these as "communities that have been excluded from social and economic life of Kenya for different reasons" and "geographic location (county or sub-county) where significant populations of underserved communities live" (CRA, 2013). The 14 underserved counties collectively represent 72 percent of the country's total land area and 20 percent of the country's population. Their population is highly dispersed; at a density four times lower than the national average. The table below provides an overview of the underserved counties.

Table 1. Overview of Underserved Counties in Kenya (Source: CRA, 2014, KNBS, 2009, and DHS, 2014)

	Underserved County	**Surface area (km2)**	**Population**	**Population density (Pax/km2)**	**Access rate (%)**	
					2009	**2014**
1	Garissa	45,720	623,060	14	11.6	23
2	Isiolo	23,336	143,294	6	18.5	23.9
3	Kilifi	12,246	1,109,735	91	16.7	20.5
4	Kwale	8,270	649,931	79	10.6	16.2
5	Lamu	6,498	101,539	16	17	19.1
6	Mandera	25,797	1,025,756	40	2.5	17.8
7	Marsabit	66,923	291,166	4	7.5	21.7
8	Narok	17,921	850,920	47	5.9	12.2
9	Samburu	20,182	223,947	11	6.2	15.2
10	Taita Taveta	17,084	284,657	17	15	32.8
11	Tana River	35,376	240,075	7	2.5	3.3
12	Turkana	71,598	855,399	12	2.4	2.7
13	Wajir	55,841	661,941	12	3.4	7.5
14	West Pokot	8,418	512,690	61	2.6	3.3
	Total & Averages	**417,210**	**7,574,110**	**18.2**	**8.7**	

	National	**581,296**	**38,610,097**	**66.4**	**23**	**36**
	% of National	**72%**	**20%**			

The underserved counties of Kenya present profound infrastructure deficits, including lack of access to roads, electricity, water, and social services. Many cultures in marginalized areas were historically nomadic, based on pastoralist lifestyles, and with low population densities. There is also significant insecurity in certain areas, giving rise to substantial numbers of displaced persons and livelihood adaptations that further undermine economic prosperity. The total number of un-electrified households is roughly 1.2 million in these 14 counties.

Household Lighting Fuel Costs in Kenya, a market intelligence note published by IFC's Lighting Global in December 2012, demonstrates, using household survey data, that households[1] in underserved counties without access to grid electricity or solar home systems rely largely on kerosene for lighting, followed by firewood and dry cells, representing household expenditures of up to 2.91 percent, 1.53 percent, and 0.57 percent of annual income, respectively. The median monthly expenditures on fuels was found to be US$1.65 for households with kerosene as primary lighting fuel, and US$3.22 for those citing electricity as primary lighting fuel.

3.4 K-OSAP Project Objectives

The Project Development Objective is to increase access to modern energy services in underserved counties of Kenya

The following are the Project components:

Component 1: Mini-grids for Community Facilities, Enterprises, and Households

This component will support the electrification of areas where electricity supply through mini-grids represents the least cost option from a country perspective, as underpinned by the geospatial plan. Depending on the number of users to be supplied, and the service level defined for each type of user (households, enterprises, community facilities, etc.), the generation system of each specific mini-grid will combine solar PV, battery storage and thermal units running on diesel. Mini-grids will be developed under a Public-Private-Partnership (PPP) whereby private investment and public funds co-finance construction of generation facilities, and public funding is used to construct the distribution network. A single private service provider (PSP) will be responsible for construction (and partial financing) of the generation system and for construction of the distribution network of each mini-grid. The same PSP will sign two long-term contracts with KPLC: (i) a 7-10 year power purchase agreement (PPA) for the operation and maintenance of the generation system, and recovery of the privately financed part of the investment; and (ii) a 7-10 year service contract for operation and maintenance (O&M) of the distribution network, including revenue cycle services (as required). Ultimately, after the recovery of the private investments, all assets (both generation and distribution) will be in GoK ownership. All electricity consumers supplied through mini-grids will be KPLC customers, and pay the same tariff for each category charged to users connected to the national grid, ensuring effective implementation of a national uniform tariff policy.

The component will be implemented in approximately 120 locations throughout the 14 target counties, typically in mini-grids supplying 100-700 prospective users, with approximate total demand of 20-300kW. These potential sites, capturing approximately 27,000 consumers in total, have preliminarily been identified as part of the geospatial plan. Each service territory will comprise

20 or more mini-grids located in geographically contiguous areas, with 2,000 or more serviceable customers. There will be a mix of more densely populated sites and less densely populated sites in each lot, where possible, to enhance their overall commercial attractiveness. PSPs can bid separately for each lot, with multiple lots potentially awarded to the same PSP.

REA and KPLC will jointly implement the component, with the procurement of lots divided among them. This component will be complemented by technical assistance, under sub-component 4.2, to (i) confirm the sites through further feasibility studies and techno-economic analysis (ii) promote productive and efficient use of energy by users (iii) technical, legal, and procurement support to effectively design the bidding documents and supervise the construction of the mini-grid assets.

Component 2: Standalone Solar Systems and Clean Cooking Solutions for Households

Component 2A: Standalone Solar Systems for Households : This component will support off-grid electrification of households in the 14 target counties where a standalone solar system is the most appropriate technology to deliver energy services, leveraging Kenya's unique off-grid solar market dynamics and innovations. The component will provide incentives for solar off-grid companies currently operating in the more densely populated areas of Kenya to expand to underserved counties and provide services to the off-grid households in these counties. These services, provided through portable solar home systems, are well-suited to some of the population in the underserved counties, as households do not always live in permanent structures. In addition, affordability is increased by allowing households to pay for systems over time. Willingness to pay analysis, confirmed by the preliminary results from the MTF surveys shows there to be over a half-million households that could theoretically afford a Tier 1 level solar home system[2].

The component will be accomplished via two financing instruments to which eligible solar service providers (SSPs) will have access:

i. *Grant Facility - Competitively awarded expansion grants*, to compensate SSPs for initial, ongoing incremental, and opportunity costs associated with an expansion of operations in underserved counties. A percentage cap will be set within each lot so that multiple service providers will have the opportunity to operate within the space. A competitive approach will be used, whereby service providers will bid based on a grant amount per household connection, with the lowest grant requirements winning. Results-based financing will specify installment payments based on the achievement of pre-agreed connection milestones and satisfactory after sales service support.
ii. *Debt Facility - Debt financing to solar* service providers, to support upfront costs associated with getting hardware inventory into the market, and medium-term consumer financing to enable households to pay off the systems over time. Two typologies of business models underpin the majority of solar service providers that operate in the Kenyan market. First are service providers that sell solar products on an over-the-counter (cash sale) basis. These service providers require shorter term debt in USD or other major foreign currency to finance costs associated with hardware manufacture and transit to Kenya (typically from China) until a sale is made. This cycle typically lasts anywhere from 6 to 9 months. A second prevailing business model is pay-as-you-go, whereby customers pay for the systems in monthly installments (typically between 12-36 months), and SSPs carry the default risk during the payback period. These businesses typically require debt financing that is commensurate with the lending terms that they extend to their customers. Given that service providers' revenues are in local currency, the debt instrument will also offer loans in Kenyan Shillings in addition to USD.

1 Simulations using 2014 FinAccess household survey data show that in a scenario where 7 percent of household expenditures are made on stopgap lighting, over 500,000 of the 1.2 million off-grid households could afford a PAYG SHS offering (assuming a 3-light point system, offered on a monthly cost of KES 500 and paid off over 36 months).

The implementation of this component will be under a direct oversight of MoEP. MoEP will competitively select the expansion debt-grant facility manager, which will be a consortium with demonstrated experience with managing similar instruments in Kenya and similar geographies. An OP 10.00 assessment of financial intermediary financing will be carried out for on the debt facility manager.

Component 2B: Clean Cooking Solutions for Households: This sub-component will support a transition from low-efficiency baseline stoves to cleaner, higher efficiency improved stoves. To accomplish this objective, cleaner household cooking appliances and fuels will be promoted. Activities will begin by focusing on four underserved counties in the northwestern part of the country (West Pokot; Turkana; Samburu; and Marsabit).

During project preparation, a Stove-Market Testing Program is being undertaken in the municipal, town, and densely settled parts of Turkana County. The stoves to be included will be determined following a call for Expressions of Interest for stove manufacturers wanting their products to be exposed to these new markets. To be eligible, a woodstove will have to prove that its efficiency tests it as a Tier 2 stove (roughly 30 percent efficient) and a charcoal stove will have to prove that its efficiency tests as a Tier 3 stove (roughly 40 percent efficient) to be eligible for inclusion in the market tests. These tests will involve exposing both consumers and suppliers (retailers, wholesalers, and distributors) in the urban areas of Turkana County to these improved stoves. The results will be shared with the communities and interested parties. Field testing for additional stoves models may be considered during the project implementation.

This sub-component will operate a window in the grant facility established for Component 3A to support sales of eligible stoves in targeted counties. The grant facility will provide the selected distributors with financial support on a matching grant and results-based scheme to enable them to market their stoves locally within the target counties; to increase their inventories of the selected higher quality stoves; to purchase and transport them to the target communities in number; and to sell them to willing buyers in the communities.

Component 3: Standalone Solar Systems and Solar Water Pumps for Community Facilities

The community facilities considered in this component are the existing and upcoming: (i) Health facilities (Levels 2 and 3) (ii) Educational facilities (Secondary schools and Technical training institutes); (iii) Administrative offices (for example, assistant County Commissioner offices).

Component 3A: Standalone Solar Systems for Community Facilities. This component will support the provision of electricity services to community facilities in remote areas in underserved counties. A private sector contractor will be competitively selected for each service territory to supply, install, and maintain standalone solar systems in community facilities. A total of about 1100 facilities could be reached via this component.

KPLC, the implementing agency, would sign two (2) contracts with the contractor in each service territory – one for the supply and installation of the standalone solar systems and the second for the provision of maintenance services for 7-10 year duration. The contract would specify the minimum requirements in terms of quality standards in electricity supply for the community facilities, developed by Ministry of Health, Ministry of Education, and Ministry of Interior. Contracts would stipulate the minimum package acceptable as "basic service", but allow room for provision of additional services to community facilities. The proposed project will cover the supply and installation costs and KPLC will pay the contractor for fees under the maintenance contract with

allocation or revenues from beneficiary facilities. The costs of maintenance contracts are expected to be passed through into tariff revenues recognized by ERC.

KPLC will take the retail risk of serving these new consumers, for which their payment record for such an arrangement is still unknown. Therefore, a payment risk mechanism would be available to KPLC, to which the proposed project will set aside funds equivalent to 6-12 months of maintenance fees that KPLC can draw upon in case of inadequate revenues to pay the contractor.

Component 3B: Solar Water Pumps for Community Facilities: This component will support financing solar powered pumping systems to increase sustainable access to water supply by equipping new boreholes and retrofitting existing diesel-powered boreholes associated with community facilities within the target counties. A private sector contractor will be competitively selected for each service territory to supply, install, and maintain standalone solar systems in community facilities.

REA, the implementing agency, would sign (2) contracts with the contractor in each service territory to – one for the supply and installation of the standalone solar systems and the second for the provision of maintenance services for 7-10 year duration - similar to the design in Component 3A. The payment for these maintenance services will be recouped on a monthly basis by the community facilities hosting these boreholes.

A payment risk mechanism would be available to REA, to which the proposed project will set aside funds equivalent to 6-12 months of maintenance fees that REA can draw upon in case of inadequate allocation from the beneficiary facilities to pay the contractor.

Component 4: Implementation Support and Capacity Building

Component 4.1: Consumer Education and Citizen Engagement
This sub-component will support the consumer education and citizen engagement activities for the program's key delivery areas (households, community facilities, water facilities in the underserved counties). Consumers in these areas are unlikely to be aware of the new technologies being presented and have a right to expect clear, thorough information about the advantages of the services and how to access them. The activities supported under this sub-component will provide recurring opportunities for consumers to interact with service providers in order to share their feedback and concerns. For those who have some knowledge of the products, these outreach activities will provide them with the necessary guidance on how to get the best out of the products in the way they use and maintain them. Finally, in these target areas, acceptance and sustained demand is generated when the buy-in of key opinion leaders is obtained. The consumer education and citizen engagement program will employ both Above the Line (mass media tools) and Below the Line (one on one) channels in reaching out to different target audiences while ensuring opportunities for two-way dialogue.

Component 4.2: Implementation Support and Capacity Building
This sub-component will support all technical studies, implementation support, and capacity building of sector and counties. More specifically, the following are included. First, build capacity and address the skill set requirements in KOSAP Project Coordination Unit in MoEP and KPLC PIU and REA PIU. Second, capacity building activities in the sector and counties, for instance related to solar technology, project management, procurement, environmental and social safeguards for the sector entities, and monitoring and evaluation. As such, funding will be used to cover the investment costs (equipment, software, training, etc.) incurred by ERC to establish a monitoring unit. Third, relevant studies and contracts for the investment components of the proposed projects.

Fourth, support MoEP in the development of a Strategic Planning and Program Management (SPPM) unit with the objective of providing effective coordination and oversight in terms of policy development, strategic planning, and project design and implementation.

3.5 Project Implementation, Supervision and management (K-OSAP Electrification)

MoEP, KPLC and REA will be the Implementing Agencies for the K-OSAP Project. KPLC and REA have existing staff with experience to prepare and implement the safeguard policies as demonstrated by the on-going projects financed by development partners, MoEP will nominate or recruit environment and social safeguards to support the implementation of the Project. The involvement of the independent verification agent (IVA) consultant to be recruited through competitive bidding process will reinforce the capacity of the Project Implementation Unit.

3.6 Environmental and Social Assessment

There are no significant and/or irreversible adverse environmental issues anticipated from the K-OSAP electrification Project, as these will all be located in remote and sparsely populated areas. Potential negative impacts are expected to be small-scale and site-specific and appropriate mitigation measures will be included to address these impacts.

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

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

KPLC, MoEP, and REA will provide guidance to communities where the sub-projects will be implemented to ensure compliance with laws and regulations of NEMA as well as World Bank Safeguard Policies. The communities will give their views in regard to the proposed sub-projects and give suggestions on the design and implementation of the sub-projects so that the Project is implemented in a sustainable way taking into consideration of environmental and social issues of those communities.

The environmental and social screening process will be used at the planning stage of the sub-projects to determine potential adverse environmental and social impacts and design of the distribution lines. KPLC, REA and MoEP PIUs staff - with help of regional staff - will complete the environmental and social screening forms. The Implementing Agencies Safeguards units will analyze the forms and advise on the most suitable alternatives as necessary. Nevertheless, it is

essential that timely and informed consultations be held with stakeholders, (particularly those in impacted project areas), early in the sub-projects preparation process. Based on experience to date, KPLC REA and MoEP teams have sufficient capacity to mitigate potential adverse environmental and social impacts. Nevertheless, during Project preparation REA, MoEP and KPLC's capacity to implement World Bank safeguard policies will be closely monitored, and any measures deemed necessary to strengthen this capacity will commence prior to Project approval.

3.7 Monitoring and evaluation of Project Implementation

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

CHAPTER FOUR: BASELINE INFORMATION

4.1 Introduction

This section describes the overall baseline condition of Kenya in terms of bio-physical environment, as well as the socio-economic and cultural. The proposed project will rolled out in the 14 Counties out of 47 counties hence the baseline information presented below will be per the countries where K-OSAP will be implemented.

4.2 Kwale County

Kwale County is located in the coastal zone of Kenya. Its capital is Kwale, although Ukunda is the largest town. The county has a population of 649,931. Kwale is mainly an inland county, but it has coastline south of Mombasa. Diani Beach is part of the Msambweni division. Shimba Hills National Reserve and Mwaluganje elephant sanctuary are other attractions in the county. The county has four constituencies namely: Msambweni Constituency, Matuga Constituency, Kinango Constituency and Lunga Lunga Constituency.

Geography and Climate: Kwale County is located at the coastline of Mombasa and this influences the weather patterns of the area. The county has a low altitude hence flooding occurs in some parts during the heavy rain seasons. The soils are through sedimentation of materials from other parts and this leads to development of very fertile soils that can support a wide range of crops. Kwale County is cooler as compared to other areas in the coast area due to the cool breeze and land cover in the region. Shimba hills located in the area also contribute to the cool temperatures experienced in the area. Soils are sandy loam and have all the major plant nutrients required by Crops grown here.

The climate is generally tropical humid due to the high amounts of humidity that originate from the Indian Ocean. The general altitude of the county is documented to be around 100 to 462 metres above the sea level. Kwale County experience two rain seasons, short rains occur between October and December while the long rains are usually experienced between March and July. The average amount of rainfall received is 400-1200mm per year. Some of the main rivers that supply both domestic and agricultural water are Ramisi, Marere, Mwalunganje.

Socio-Economic Activities: Livestock rearing and farming are the major economic activities in Kwale County. Most of the residents are employed in the various agricultural industries while the rest are self-employed in their own farms. Farmers are able to get some income from sale of animal and animal products that are consumed locally and in the neighboring towns such as Mombasa.

Fishing is also practiced widely in this area; it is approximated that 60% of the income in most of the households is generated from fishing activities while 11% is generated from trade activities such as sale of farm produce in the various markets in the country. Tourism contributes to the economy of the county, there are a number of tourist attraction sites that attract both local and international tourists in any given year.

These sites include Shimba Hills National Reserve that borders Taita Taveta, Tsavo National Park and Marine parks. These tourist attraction areas are protected by the National Museums of Kenya in conjunction with Ministry of Tourism.

Agriculture is also a main economic activity carried out in the area. Some of the crops grown include maize, beans, mangoes and vegetables. Most of the farmers in the county practice mixed farming where they grow crops and rear livestock. Some of the animals kept in the county include dairy and beef cattle, poultry, goats, donkeys, and rabbits. It is approximated that 22% of the residents practice cash crop farming while 18% practice livestock rearing. Due to the hot and dry weather in the area, the most suitable agricultural activity is livestock rearing. Some farmers have also established fish

farms on their land in order to supplement the fish harvested from the ocean. This initiative aims at promoting food security of the area by supplementing the various farm produce from the farms.

Population According to the national census program that was carried out in 1999 the total population of the formerly known as Kwale District was estimated to be 496,133. This is projected to have increased up to 700,000 persons before the next census is carried out.

4.3 Taita Taveta County

Taita-Taveta County is a county in the coastal zone of Kenya. It lies approximately 200 km northwest of Mombasa and 360 km southeast of Nairobi. The capital is Mwatate, although it is the third-largest town in the county after Voi, Wundanyi and Taveta in that order. The population of the county 30 years ago was approximately 45,000 persons but this has shot up to well over 250,000 persons with population densities ranging from 3 persons per km^2. To more than 800 persons per km^2. This is due to the varied rainfall and terrain with the lower zones receiving an average 440 mm of rain per annum and the highland areas receiving up to 1900 mm of rain. The district ranges in altitude from 500 m above sea level to 2,228 m at Vuria Peak, which is the district's highest point.

In 2007, the Taita-Taveta District was split into two districts: the Taita District and the Taveta District. The two were subsequently re-united to form Taita-Taveta County. The county has four constituencies namely: Taveta Constituency, Wundanyi Constituency, Mwatate Constituency and Voi Constituency.

Geography and Climate: The altitude of the county varies between 481m above sea level in the lowlands to 2,200m above sea level for highlands, giving two distinct climatic characteristics, with the hills experiencing lower temperatures (as low as 18.2°C) compared to the lower zones with an average temperature of 24.6°C. The average temperature in the county is 23° C. The county is divided into three major topographical zones. These are the upper zone, lower zone and volcanic foothills. The upper zone is suitable for horticultural farming. Precious gemstones are found and mined in the lower plain, while the volcanic foothills, covering Taveta Division have potential for underground water and springs emanating from Mt. Kilimanjaro.

Taita Hills are some of the geographic features in Taita Taveta County. This includes hills such as Kasigau, Sagalla and Dabida. The tallest of these hills is Dabida which has an altitude of 2,228 metres above the sea level. The county has an average altitude of 418metres in the low lands and 2,200 meters in the highlands. Temperatures range between 18 degrees Celsius and 24.6 degrees Celsius in the lowlands. The total average temperature of the county is estimated to be 23 degrees Celsius. 60% of the total land covered by Taita Taveta County is not suitable for agriculture due to various factors such as high temperatures and low rainfall. The soils in this region have low water holding capacity and lack some of the essential nutrients required for plant growth. This in turn hinders resident from growing certain crops on the land.

The population Taita Taveta county Population is summarized in the table below:-

Table 1: Population of Taita Taveta County

Population: 284,657	(Male – 51.1%, Female – 48.9%)
Population Density	17 people per Km 2
National Percentage	0.7 %
Annual Growth Rate	1.74%
Age Distribution: 0-14 years	(37.7%), 15-64 years (56.9 %), 65+ years (5.4 %)
Number of Households	71,060

Natural Resources: Some natural resources strengths of Taita-Taveta County include: Natural resources such as Forest, Rivers and Wildlife. Tourist Attractions as Tsavo Game Reserve, National Park and Wildlife. It also has water resources such as Lake Chala, Lake Jipe amd Mzima springs that supply the coastal region with water. Large parts of the county lie within the Tsavo East and Tsavo West National Parks some of the country's popular tourist destinations.

Socio-Economic Activities: There are a number of economic activities carried out in the county. This includes crop farming which is mostly practiced in the upper ecological zones of the county. The agricultural products are consumed locally while the surplus is sold in the various agricultural markets in Taita Taveta County.

Tourism also contributes to the economy of the county. One of the tourist attraction sites includes Tsavo Game Reserve and national park which has a rich biodiversity of wild animals and birds. Real Estate developers have built a number of hotels and lodges in and near this tourist attraction sites and this in turn offer employment to some of the residents of the county.

There are six commercial banks and eight micro finance institutions that help to foster economic growth and development in Taita Taveta County. This is achieved through loans that are offered to the residents for business and agricultural purposes. Other businesses in the county include retail and wholesale shops as well as supermarkets and petrol stations. Most of these businesses are located in the urban areas and along the major roads in the county. Taita Taveta County has recently seen great developments in its mineral mining sector after traces of iron ore were discovered in 1992. Asbestos, chalk, limestone, gemstones, construction stones and sand are also among the regions minerals portfolio. The county is also known for its large-scale sisal farming with vast sisal plantations covering the area.

4.4 West Pokot County

West Pokot County is located in North Western Kenya. Its capital and largest town is Kapenguria. The county has a population of 512,690 (2009 census) and an area of 8,418.2 km². The district has four constituencies: Kacheliba Constituency, Kapenguria Constituency, Sigor Constituency and Pokot South Constituency.

Geography and Climate West Pokot covers an area of 9,169.4 sq km. Rainfall varies from 400mm to 1,500mm per annum while temperatures range from 10 °C to 30 °C The county has 3 Local Authorities (County Council of Pokot, Chepararia Town Council, and Kapenguria Municipal Council) Kapenguria Town is the administrative headquarters.

Economy of West Pokot County Communities in West Pokot County practice agro-pastoralism, combining mixed farming with nomadic pastoralism. One of the main power sources in the country is the Turkwel Hydro Power Plant. Tourist attractions include Saiwa Swamp National Park and Prison Museum. The county has a number of irrigation project that take advantage of the regions topography and rivers and the Turkwell Dam.

- Population of West Pokot County Population: 512,690 (Male – 50 %, Female – 50-%)
- Population Density: 56 people per Km 2
- National Percentage: 1.33 %
- Annual Growth Rate: 3.1 %
- Age Distribution: 0-14 years (52.2 %), 15-64 years (45.1 %), 65+ years (2.7 %)
- Number of Households: 93,777

4.5 Narok County

Narok County is situated in Kenya along the Great Rift Valley. It is named after, Enkare Narok, which is the river flowing through Narok town. It covers an area of 17,944 sq km and has a population of 850,920. The temperature range is 12 celcius and average rainfall range of 500 to 1,800 mm per annum. Its geographical coordinates are 1° 5’ 0” South, 35° 52’ 0” East and its original name (with diacritics) is Narok. The Maasai Mara National Park, an important tourist destination, is located in Narok County. It is home to the Great Wildebeest Migration which is one of the “Seven New Wonders of the World”. It constitutes 6 sub-counties namely: Kilgoris, Narok North, Narok South, Narok East, Narok West and Emurua Dikirr. Narok town is the capital Head Quarters of the Narok County and stands as the major centre of commerce in the county.

Geography and Climate: Narok County has an elevation of 1827 meters altitude above the sea level. It has a minimum of 8 and a maximum of 28 degrees Celsius in temperature. The county receives two rainy seasons with an average of rainfall ranging from 500 to 1800 mm per year.

Soils here are sandy loam with high contents of the entire major plant nutrients such as calcium and magnesium. However, in order to fully utilise the soils farmers have to implement certain soil management practises in order to improve soil fertility for agricultural purposes.

Floods are experience in some parts of the county which are low lying and generally flat. However, this only happens during the heavy rainy seasons. Farmers have constructed dams in order to prevent soil erosion and conserve some of the run off for agricultural purposes. Due to the high temperatures experienced in the county, most of the plant species are acacia and other scrubs that have developed certain physiological features that prevent excessive loss of water from the plant. It is also important to note that these climatic figures are subject to variation in the near future due to climate change and global warming.

Forest and water catchment areas: Narok County is one among many productive counties in Kenya, found south of the Rift valley. The Maasai are the greatest inhabitants of that area. Mau forests stretches into Narok County. Mau forest is the largest water catchment area in Kenya and it

also some of the highest rainfall rates in Kenya. Some of the rivers flowing through are; the southern Ewaso Nyiro, Njoro River, Sondu and Mara river originate from the Mau forest

Land cover changes: Land-cover changes in Narok County are the result of a variety of processes of land-use change. For mechanized agriculture, agro-climatic potential and accessibility to the market are the most important explanatory variables. Low altitude plains are preferred, which are easily accessible with heavy machinery. Accessibility is more important than soil quality, as the latter can be improved with fertilizers. Also, the immediate surroundings of water sources are not cultivated. Hence, pastoralists preferentially lease those lands that are further away from water sources, or that are less fertile, and thus have a lower rent value for them

Narok County´s Vulnerability to Climate Change: Climate change is a global issue and affects people and places in different parts of the world, including Narok County. Within the County, there has been an increase in the frequency and intensity of extreme weather events, particularly droughts. Changes in rainfall patterns, marked by delayed onsets have also been witnessed. At the same time, water levels in rivers and streams are continually receding. Some of the impacts include;

a) Wildlife and livestock deaths during droughts.
b) Increased human, livestock and wildlife diseases.
c) Changes of wildlife habitats and loss of biodiversity.
d) Human-human and human-wildlife conflicts.
e) Lifestyle changes necessitated by loss of traditional livelihoods
f) Increased wild winds.
g) Increased poverty levels associated with loss of livelihoods. Low enrolment and poor attendance of schools.
h) Land increasingly being sold/leased out due to its perceived loss of productivity resulting in loss of income/livelihoods.

Socio-Economic Activities Just like in most of the other Counties in the country, Agriculture is main economic activity carried out in Narok County. Most of the residents are either livestock farmers all grow the various crops on large scale or small scale depending and this depends on the size of land available for a particular activity. Some of the crops grown are wheat, maize and barley which are processed and used to make food products such as flour and beer. Some of the farmers have also set up ranches where they keep large herds of cattle and goats. Kenya Meat Commission purchases these animals especially during the dry season and this in turn enables the farmers to meet their various financial needs.

There are also businesses that operate from urban areas such as Narok town. This includes wholesale and retail shops as well as supermarkets and shopping malls. These businesses ensure that the residents get access to all their basic needs without necessary travelling to other cities and towns such as Nairobi. Real estate developers have also built residential homes and hotels that offer affordable accommodation to the residents and visitors who regularly come to the County.

Tourism in this county is a large contributor to the county's economy there are a number of tourist attraction sites in the county that attracts both local and international tourists. These sites include Maasai Mara National Reserve famously known as the seventh wonder of the world for the annual wildebeest migration. It hosts a number of luxurious hotels, lodges, clubs and camp sites too.

The county is also home to the Mau Forest one of the most important water towers in Kenya and an important source of water and livelihood to the growing population and the Maasai Mara Ecosystem.

Population. The total population is 850,920 people, out of which the ration of male and female is 50%. The population density is 47 people per Km^2, covers national percentage of 2.2%. The growth rate is 3.3%.

Natural Resources The major rivers in the county are Ewaso Nyiro and its tributaries, Siapei and Narok. These rivers drain southwards into Tanzania. The Ewaso Nyiro River is a permanent river due to the heavy rainfall in the district during the month of March and the short rains start from September. The only significant hill in the District is Suswa Hill, which is one of the tourist attractions that generate revenue to the county. The district has abundant natural forest resources. The district has a total area of 724 km, 930 km and 480 km of gazetted, non-gazetted and trusts land forests respectively. The county has no forest-based industries to generate employment and foreign exchange for the country. The forests provide timber, fuel wood, fodder for animals and fruits.

4.6 Lamu County

Lamu or Lamu Town is a small town on Lamu Island, which in turn is a part of the Lamu Archipelago in Kenya. Situated 341 kilometers (212 mi) by road northeast of Mombasa that ends at Mokowe Jetty from where the sea channel has to be crossed to reach Lamu Island. It is the headquarters of Lamu County and a UNESCO World Heritage site. Lamu is Kenya's oldest continually inhabited town, and was one of the original Swahili settlements along coastal East Africa, founded in 1370. The town contains the Lamu Fort on the seafront, which commenced construction under Fumo Madi ibn Abi Bakr, the sultan of Pate, and was completed after his death in the early 1820s. Lamu is also home to 23 mosques, including the Riyadha Mosque, built in 1900, and a donkey sanctuary.

Geography and Climate: Lamu County is very close to the Indian Ocean which contributes to its weather patterns. The average temperatures experienced here is 27.3 degrees Celsius. High temperatures are experienced between January and April while the cold temperatures are usually experienced between June and September. The average amount of rainfall is 900mm annually. The rains are usually experienced between the months of April-July while low rainfall is received in October to December. The area is usually hot and dry in most times if the years.

Socio- Economic Activities: According to a survey carried out on all the counties, Lamu County was ranked number seven as one of the richest counties in the country. The poverty level in this county is 31.6% while age Dependency ratio is 100:82.

Tourism is one of the economic activities here due to the many tourist attraction sites in the region that attract both local and international tourists. Examples of sites include Pate Ruins, Lamu Cultural Festival, National Monuments, Manda Island, Matondoni Dhow making village and Malindi Festival. There is a wide variety of marine wildlife that also attracts many tourists who come to study this animal species. Entrepreneurs have also established various commercial businesses such as hotels and retail shops hence residents are able to get easy access to their basic needs. Residents also practice fishing in the ocean, the fish is sold locally and in Mombasa. Fishermen mainly use small boats and fishing nets to carry out the activity.

The anticipated development of Lamu Port has placed the county into focus by investors prospecting for business opportunities. The new Lamu Port will consist of 750 acres with 10 container terminal berths and three bulk cargo berths, an oil jetty and an international airport.
Population Lamu has a population of 101,539 (2009 census) 19.9 % of the total population resides in the urban areas in the county while the rest of the population lives in the sub-urban areas of the county.

Lamu County consists of four main indigenous communities: The Bajuni, Sanye, Aweer (Boni), and Orma. The Bajuni, who are the largest in population of the four groups, trace their origins to diverse groups, primarily Bantu and Arab descent. They mainly derive their livelihoods on fishing, farming, and more recently tourism-related activities. The Orma are pastoralist, while the Cushitic Sanye and Aweer are hunter-gathers primarily living off the forest resources and farming. The Aweer are the smallest of the four groups in population.

Natural Resources: The County covers a strip of northeastern coastal mainland and the Lamu Archipelago, which consists of numerous islands, which extend about 100km south from the Somalia border. The most well-known of the islands is Lamu Island, which is the oldest existing Swahili Settlement. Lamu is not only endowed with biodiversity on the mainland, but additionally has some of the richest marine ecology on the Kenyan coastline. The County has two National reserves: Dodori, and Kiunga Marine. Covering 877km^2, Dodori is a breeding ground for the East Lamu Topi, and consists of a variety of mammals and birdlife including lions, elephant shrew, hippo, pelicans, and many more. It has the most varied species of mangrove forest in Kenya at Dodori Creek. Kiunga Marine Reserve consists of several islands rich with biodiversity including valuable coral reefs, sea grass, extensive mangrove forests, and the endangered sea turtles and dugongs. Kiwayu Island, which is part of the reserve, is deemed as having the most pristine beach in Kenya.

4.7 Samburu County

Samburu County is a county in the Rift Valley , Kenya. It covers an area of roughly 21,000 km² (8,000 mi²) in northern Kenya where the Samburu, Turkana and many other tribes live. It stretches north from the Ewaso Ng'iro River to the south of Lake Turkana and also includes Mount Kulal which lies just east of Lake Turkana. Within Samburu County are the towns of Maralal (capital and largest town), Baragoi, Archers Post, South Horr, Wamba and Lodosoit. It also includes the Samburu National Reserve and Buffalo Springs National Reserve, Mount Ng'iro, Ndoro Mountains, Mathews

Range (Ol Doinyo Lenkiyo), Kirisia Hills, and Loroki Forest. There is a town named Samburu in Kwale County also in Kenya, but is not related to Samburu County or Samburu people.

County Subdivisions: The County has three constituencies: Samburu East Constituency, Samburu Central and Samburu North Constituency. The headquarters of Samburu Central is Maralal, Samburu North is Baragoi and headquarters for Samburu East is Wamba. There has been controversy about the headquarters of Samburu East. Some schools of thought proposed Archers Post, a rapidly growing town, while others proposed Wamba town a less rapidly growing town.

Population of Samburu County Samburu County is sparsely populated with approximately 200,000 people; 80% being the Samburu which is the main ethnic group and 20% unevenly shared by Turkana, Kikuyu, Meru, Somali and others. The county is Semi-arid in nature and notable for its immense potential and contribution to the National Livestock industry particularly the slaughter stock.

Economies of Samburu County Inhabitants of Samburu County are predominantly pastoralists. However, a small percentage practice agricultural related activities in small scale primarily to supplement income from livestock related trade and as additional food sources. It is home to Samburu National Reserve endowed with abundant wildlife resources and a major income earner for the county's economy. The county lies within the northern tourist circuit that has huge untapped tourism potential. Samburu County is the mother of the famous Samburu National Reserve, which is a major source of the revenue to the inhabitants.

4.8 Isiolo County

Isiolo County is a county in the former Eastern Province of Kenya. Its population is 143,294 (2009 census) and its capital is Isiolo. Isiolo County is to be the first county to be developed as part of the Kenya Vision 2030 program. Its capital and largest town is Isiolo. The local topography is arid or semi-arid low plains. Ewaso Nyiro River flows through the county and partly bounds it.

Geography and Climate Isiolo County is located in the upper eastern region of Kenya. It borders seven counties with Garissa to the east, Wajir to the north east, Meru to the south west, Samburu to the east and Marsabit to the north west, with Kitui and Tana River counties to the south west and south east respectively. Temperatures in Isiolo County range from minimum of between 12 degrees C to a maximum of – 28^0C. Rainfall ranges from 150mm to 650 mm per annum typical of ASALs in Kenya.

The county covers an area of 25,336.1 Sq Km with temperatures ranging from12 degrees C to 28 degrees C. Rainfall range between 150 mm to 650 mm per annum typical of Arid and Semi-Arid Locations (ASALS) in Kenya

Population: Isiolo County's population is 143,294, out of which male is 51% and female is 49%. The population density is 5.66 people per Km^2; the National Percentage of 0.37 % and Annual

Growth Rate of 1 45%. The Age Distribution: 0-14 years (44 %), 15-64 years (52 %), 65+ years (4%).

Natural Resources: Some Strengths of Isiolo County in terms of natural resources include: Forests, wildlife, minerals, building sand, water, pasture and land. River Ewaso Nyiro flows through the county and is a critical source of water for the regions wildlife, livestock and human consumption. Tourist Attractions such as Buffalo Springs, Shaba, Bisanadi Game Reserves and the Lewa Downs Conservancy. Potential Minerals: graphite, sapphire, feldspar, muscovite, kaoline, beryl, copper, corundum, garnet, bismuth, silica, iron ore, pyrite

4.9 Marsabit County

Marsabit is County is situated in North East part of Kenya. It is situated in the former Eastern Province and is almost surrounded by the Marsabit National Park and Marsabit National Reserve. The town is located 170 km east of the center of the East African Rift, at 37°58' E, 2°19' N (37.97°E, 2.32 N). It serves as the capital of Marsabit County, and lies southeast of the Chalbi Desert in a forested area known for its volcanoes and crater lakes and others. Marsabit town is a trading and commercial center, with three petrol stations, three commercial banks, post office, shops, restaurants, lodges and even a dry cleaner. The town facilitates the supply and movement of goods and services between Moyale (goods from Ethiopia) and Isiolo (goods from Nairobi). Agriculture also plays a role, as many grow millet and maize to be consumed locally and nomadic people supply beef by selling their cows. Lake Paradise (which attracts game animals such as elephants and buffalo), and Bongole Crater located in the heart of the forest are both local attractions for tourists. The town and surrounding area are of rich cultural interest to anthropologists and other researchers.

Geography and Climate: Marsabit County is situated in the North-Eastern part of Kenya, with approximately an area of 78,078 square km. It is about 560 kilometers from Nairobi the capital of Kenya. Lake Turkana is one of the geographic features in Marsabit County which influences the weather and climate patterns of the county. The area is generally hot with an average of 26 degrees Celsius during the hot months and 8 degrees Celsius during the cold months. March is the hottest month in Marsabit County while July is the coldest. Due to the proximity of the County to Lake Turkana the average amount of humidity in the area is estimated to be 65% all year-round.

The average precipitation received is 254mm making it one of the driest counties in the Kenya. Most of the rainfall is received in March and November however on average six days of the month the area experiences foggy conditions due to its proximity to the lake and other geographic features such as Marsabit Mountain. Due to the high temperatures and low rainfall amounts most of the plant species that survive under this conditions are Shrubs which have certain physiological features such as small leaves and deep roots.

The soils are generally not fertile in most parts of the county with low amounts of basic plant nutrients. However, farmers have incorporated certain measures that improve the status of the soil for agricultural activities. Marsabit County has an altitude of 1138 metres above the sea level and this again affects the climatic certain weather components such as the temperatures and humidity.

Population According to the national census exercise that was carried out in 2009 the population of the county is approximated to be 291,166. The number of males in Marsabit County is estimated to be 151,112 while that of the female is 140,054. 22% of the total population resides in the urban areas in Marsabit County while the rest of the population resides in the rural areas. Marsabit County is composed of different ethnic groups, like Gabbra, Rendile, Borana, Turkana, Samburu, Burji, El Molo, Dassanach, and Waata. Marsabit town also is inhabited by these different ethnic groups and includes a minority from down Kenya like: - Meru, Kikuyu, Luo, Luhya to mention but a few.

Socio-Economic Activities: the County's rich cultural heritage has made the region an important attraction to anthropologists. Cows, sheep and goats are among the most important livestock among the pastoralist communities in the county Crops are grown Highland areas such as around Mt. Marsabit, Mt. Kulal Donyo Mara range due to reasonable rainfall and favorable soils. High temperatures and low rainfall are some of the factors that limit farmers from carrying out certain agricultural activities such as tea or coffee farming. Livestock keeping is one of the agricultural activities carried widely in the county with farmers keeping large herds of cattle, sheep and goats as well as camels. Bee keeping one of the new agricultural activities that have being introduced in the area in a bid to increase honey and other bee products in the country as well as alienate poverty.

The government of Kenya has introduced certain strains of maize plants that are well adapted to growing in the county. Other crops grown in the area includes Sorghum, Wheat, onions, tomatoes and potatoes. Some of these crops are grown in the high area of the county such as areas around Mount Marsabit and Kulal.

Livestock farmers normally practice nomadic livestock keeping method whereby the keep moving from one are to another in search of pastures and water for their livestock as well as for other domestic purposes. The residents have also drilled boreholes and wells in an effort to increase the amount of water available. Due to climate change and global warming the County is adversely affected by the effects which includes frequent drought in any given year.

The main source of income for most of the people is agriculture. This is achieved through the sale of food products which are sold in some of the markets in the county. The surplus is also transported to other towns such as Nairobi and Kisumu. Kenya Meat Commission also buys animals from the residents especially during the dry season and this helps the Marsabit County residents to meet their various financial needs.

Some of the businesses in Marsabit County include whole sale and retail shops, supermarkets and even petrol stations. Entrepreneurs have also started building residential houses that offer affordable housing to person living in the rural areas. Some of the tourism attractions in the county include Marsabit National Park. There are a number of lodges and provide quality accommodation to the tourists. There are a number of banks and micro finance institutions that offer affordable financial services to the residents.

Natural Resources the County has forest cover around Mount Marsabit Mount Kulal biosphere conservation areas others. It has numerous types of wildlife and birds and attractions such as Lake Paradise (inside Marsabit National Park and Reserve) and Bongole Crater. The county has a huge untapped potential as a tourist destination. Other includes volcanoes and crater lakes. Mount Marsabit, Mountain peak and the singing wells. Marsabit National Park & Reserve, Sibiloi and South Island National Park, Lake Sokote, Lake Paradise as also part of Natural resources in Marsabit County.

4.10 Garissa County

Garissa (Somali: *Gaarisa*) is the capital of Garissa County, Kenya. It is situated in the North Eastern part of Kenya . Garissa is located at 0°27′25″S 39°39′30″E. The Tana River, which rises at the Aberdare Mountains west of Nyeri, flows through the Garissa. The Bour-Algi Giraffe Sanctuary, situated 5 km south of Garissa, is home to endangered wildlife including the Rothschild giraffe, gerenuk and other herbivores including Kirk's dik-dik, lesser kudu, warthog and waterbuck.

Geography and climate: the landscape of Garissa County is mostly hot and dry with a desert terrain of scrubs and other plant species such as Cactus that are well adapted to the hot temperatures. One of the factors that contribute to the climate of the region is its proximity to the equator. This result in the region experiencing high temperatures as compared to other areas that is far away from the equator. One of the main sources of water in Garissa County is River Tana which provides water for both domestic and agricultural purposes. The climate of the region is basically warm and hot in most times of the year.

The daily temperature is approximately 33 degrees Celsius on average. The hottest months are January, February and March when the temperatures rise up to 38.3 degrees Celsius while the coldest season is experienced at around June- July. During this time the temperature may drop up to 21.2 degrees Celsius. The County is usually very hot during the day and very cold at night and again this is attributed to the low altitude that ranges between 70m and 400m above sea the sea level. The amount of rainfall received in the region is very low with an average of 150mm to 300mm an year. This results in droughts since the low precipitation received cannot support most of the crops grown for food production such as maize unless under irrigation. The most dominant type soil in this region is sand which has coarse texture and low water holding capacity. Due to the low altitude, areas around River Tana are usually flooded during the rainy seasons.

Socio-Economic Activities: Pastoralism is a major economic activity among the communities who inhabit the county. However, the tourism sector is also growing with a number of hotels and resorts coming up. This compliments attractions such as the bouralgy Giraffe Sanctuary and other wildlife that contribute to the county's tourism industry. The county prides itself in having the only 'long-necked Gerenuk' East African. The dry and arid landscape could be exploited to offer tourism packages that encompass camel-back expeditions and camping activities. The region could also be opened up to dessert rallying activities similar to those carried out in different regions in the world.

The Tana River flowing through the region is a great source of water and if exploited see the region could enter an era of modest agricultural production. Horticultural farming is also carried along river

Tana, some of the fruits grown are paw paws, mangoes, water melon and bananas. Farmers are able to support themselves through the sale of these horticultural products to various food processing companies in the country.

Population: According to the national census program that was carried out in 2009 the population of Garissa County is approximately 623,060. The male population is estimated to be 334,939 while that of the female is 288,121. It is also approximated that the number of people that live in the urban regions of the county are around 146,668 while the rest of the population lives in the rural areas. The total population is expected to increase by around 3% before the next census is carried out.

Natural Resources: Some strengths of Garissa County include:

- Natural resources as livestock, river, pasture, wildlife, land, solar and wind energy, mineral resources, medicinal plants
- Tourist attractions as Giraffe Sanctuary, Arawale & Boni National Reserves.
- The Garissa Community Giraffe sanctuary (GCGS) falls within the immediate sub urban environment of Garissa Town bordering the dry dusty Bour-Algi village.

4.11 Tana River County

Tana River County is a county located in the coastal zone of Kenya. It is named after the Tana River that traverses through the County. It has an area of 35,375.8 square kilometres (13,658.7 sq mi) and a population of 240,075 according to the 2009 census. The capital and largest town is Hola (sometimes known as Galole). The major ethnic groups are the Pokomo, many of whom are farmers, and the Orma and Wardey, who are predominantly nomadic. The county is generally dry and prone to drought. Rainfall is erratic, with rainy seasons in March–May and October–December. Conflicts have occurred between farmers and nomadic peoples over access to water. Flooding is also a regular problem, caused by heavy rainfall in upstream areas of the Tana River. On 22nd August 2012, in the worst violent incident in Kenya since 2007, at least 52 people were killed in ethnic violence in Tana River County between the Orma and Pokomo groups.

Tana River County presents an interesting case of the nexus between conflict and food security. A recent survey prepared by ALMRP, Tana River District and presented to the Tana River District Steering Group (2004) found that the county is 79% food insecure and with an incidence of poverty at 62% (Interim Poverty Strategy Paper (I-PSP), 2000–2003, Kenya). Tana River County comprises several areas of forest, woodland and grassland which are minor centres of endemism. The forests are designated National Reserve status if they have plant endemics and vertebrate endemics (IUCN, 2003). Despite the apparent adequate natural resources, the region remains marginalized from the rest of the country. Efforts at development always seem to centre on the huge River Tana, despite massive failures in all the previous irrigation projects in the district, i.e. Bura, Hola and the Tana delta rice irrigation project which failed after the water works were damaged by the El Niño rains in 1998.

Geography and Climate: Tana River County covers an area of 38, 436.9 sq Km. It is situated in a semi-arid area with annual relief rainfall varying between 400mm and 750mm with a mean annual

temperature ranging between 300C and 330C. Its local authority is the county Council of Tana River. Hola town is the administrative headquarters.

Socio- Economic Activities: Farming and nomadic pastoralism are the main economic activities in Tana River County due to the dry conditions and erratic rainfall patterns experienced in the county. The Tana River is a major water resource in the area. The extensive delta created by River Tana presents great potential for agricultural development in the district. It is a natural habitat to an enormously diverse flora and fauna, which forms an ideal ecosystem for promotion of tourism. It also provides grazing areas during the dry seasons and its water is used for irrigation. The main crops grown in the district are; rice, mangoes, maize, bananas and soya beans. Fishing, forestry and agro forestry are also important activities in the delta.

Population Tana River county has population of 240,075 according to the 2009 census. The capital and largest town is Hola (sometimes known as Galole). The major ethnic groups are the Pokomo, many of whom are farmers, and the Orma and Wardey, who are predominantly nomadic.
The population of Tana County is as follows;

- Population: 240,075 (Male – 47 %, Female – 53%)
- Population Density: 6.2 people per Km 2
- National Percentage: 0.62 %
- Annual Growth Rate: 3.4 %
- Age Distribution: 0-14 years (50.9 %), 15-64 years (46.2 %), 65+ years (2.9 %)
- Number of Households: 47, 414

Natural Resources: Riverine forest, woodland, grassland, bush lands, lakes, open river channels, sand dunes, mangroves and coastal waters contribute to making Tana River County one of the most ecologically diverse habitats and a tourist attraction in the country. Besides the Tana River, there are several seasonal rivers in the district. These are found in the area west of River Tana in northeastern part of the district. Popularly known as "lagas", these rivers flow in a west-east direction from Kitui, Makueni and Mwingi District draining into River Tana and eventually into the Indian Ocean.

4.12 Wajir County

Wajir County is a county in the North Eastern part of Kenya. Its capital and largest town is Wajir. The county has a population of 661,941 and an area of 55,840.6 km². Wajir County has only one local authority: Wajir county council. The county has four constituencies: Wajir North, Wajir West, Wajir East and Wajir South. Wajir County is located in North Eastern Kenya, it borders the following counties; Mandera to the North and North East, The Republic of Somalia to the East, Garissa to the South and South West, Isiolo and Marsabit to the West, and the Republic of Ethiopia to the North West. Wajir Wajir has 6 constituencies namely; Wajir North, Tarbaj, Wajir West, Eldas, Wajir South and Wajir East.

Geography and Climate
Wajir County is one of the driest counties in the country and this hinders the residents from carrying out most of the agricultural activities carried out in other parts of the country that receive high rainfall

and moderate temperatures Sandy soils. The topography of the county is generally flat and this contributes to the regular flush floods that damage property and cause loss of life during the rainy season. Most of these floods originate from Ethiopian highlands where rainfall is very high. The county has an average altitude of 460 metres above the sea level and this explains the high temperatures and low rainfall received in the region.

Average rainfall received range between 250 MM and 700 MM annually hence most crops are not grown since most of them require large amounts of water. The soils are sandy and lack most of the plant nutrients such as calcium and magnesium. Some of the characteristics include low water holding capacity and low humus content. Residents travel long distances in search of water. Scrubs and other herbaceous plants are the major vegetation cover in the county. This is because of their physiological features such as small leaves and deep roots that enable them to survive under low water availability conditions.

Socio-Economic Activities The main economic activity in Wajir County is pastoralism with some agro-pastoralism being practiced in the Northern part of the county. The large tracts of land in the county provide the grazing pastures for the large camel and cattle herds present in the county. Rain-fed agriculture is practiced on a small-scale basis in the higher altitude regions. Groundwater harvesting from numerous wells, earth pans, dams and boreholes is also undertaken due to the high water table. The county has mineral resources such as limestone and sand. It also has solar and wind energy potential.

There are eighty-eight (88) health facilities in Wajir County. This includes dispensaries, district hospitals and health centres. Most of them are not fully equipped to provide quality health services hence the government and other organisations need to improve their status. There are one hundred and twenty-five (125) primary schools and seventeen secondary schools in the County.

Population: According to the national census exercise that was carried out in 2009, the total population of the county is approximated to be 661,941 making it one of the lowly populated counties in the country. 14.6% of the total population resides in the urban areas while the rest of the population resides in the rural areas. Settlements are widely distributed with homesteads far from each other. Most of the land in Wajir County is considered under community land since most of the residents are livestock keepers.

Natural resources as wildlife, livestock, water, pasture, minerals (limestone, sand & stones), wind and solar energy, Tourist Attractions such as Wajir Museum, Wagalla Massacre Site, Orpahey Wells, British and Italian War Bunkers, Old Court House and Yahut Dam.

4.13 Mandera County

Mandera (Somali: *Mandheera*) is the capital of Mandera County situated in North Eastern part of Kenya. It is situated at around 3°55′N 41°50′E, near the borders with Somalia and Ethiopia. Mandera's climate is categorized as arid under the Köppen climate classification. Temperatures tend to be hot throughout the year. Daily temperatures are typically above 30 °C (86 °F), while at night,

they can fall to 20 °C (68 °F). Precipitation is extremely low, with the area receiving a very minimal amount of rain. Droughts are not unusual, often resulting in significant loss of livestock in rural areas where pastoralism is common.

Mandera County is one of the 47 counties in Kenya, located in the North Eastern part of Kenya and borders Ethiopia to the North, Somalia Republic to the East and Wajir County to the South. It is about 1,100km from the capital city of Nairobi by road. The county has an approximate population of 1,025,756 and covers an area of 25,991.5 km^2. Geography and Climate Rainfall is scanty and unpredictable averaging 255mm. It is very hot with temperatures at a mean annual average of 28.3 ^0C but can reach a high of 37 ^0C.

Socio-Economic Activities The climate in Mandera County makes the county a perfect place for solar energy harvesting. Long periods of sunshine with minimal cloud cover set the stage for possible future development in the solar power production sector. Nomadic pastoralism is the major economic activity in this county with camels, goats, sheep and cattle being the main type of livestock reared here. The regions vast pasture lands have allowed this activity to be viable though much more could be done to ensure the county plays its role in the country's beef and milk production markets.

The main water sources in the region are the River Daua, a number of shallow water wells and a few major earth pans. The region has small scale agricultural production with small scale horticultural producers supplying mangoes, pawpaws, onions, kales and bananas to the local markets. Other crops that can be found are cow-peas and maize.

Population: The population of Mandela county is 1,025,756 (Male – 54.6 %, Female – 45.4 %), Population Density: 39 people per Km^2, National Percentage: 2.7 %, Annual Growth Rate: 3.96 %, Age Distribution: 0-14 years (53.7 %), 15-64 years (44.4 %), 65+ years (1.9 %) and Number of Households: 125,497.

4.14 Kilifi County

Kilifi County is located in the coastal zone of Kenya, 56 Kilometers northeast by road of Mombasa. The town lies on the Kilifi Creek and sits on the estuary of the Goshi River. Kilifi is capital of the Kilifi County and has a population of 122,899 (2009 census). The town is known for its beach and for the ruins of Mnarani, including mosques and tombs, dating from the 14th to the 17th century. Like every coastal town, fishing is one of the historical economic activities. With time, the town has slowly been transforming from a fishing village to basic industrial and service.

The growth of the town was mainly fuelled by the cashew nut milling factory between 1976 and 1990; the district has been a producer of cashews since 1930. The town almost became a ghost town when the factory was closed due to decline in nuts supply, mismanagement of the factory and increased global competition. Other industrial activities include milk processing at Kilifi Plantations. Since 2008 with the transformation of the Kilifi institute of Agriculture into Pwani University, there has been substantial expansion of the service sector as a result of this. Banking activity has been growing with about 7 banks (KCB, Barclays, Postbank, Imperial, Equity, Cooperative, Diamond

Trust Bank and most recent National Bank) as well as microfinance institutions. Retail business and hotels have historically been significant economic activities. 3 to 4 star hotels include Mnarani Club, Kilifi Bay Beach Resort and Baobab Lodge.

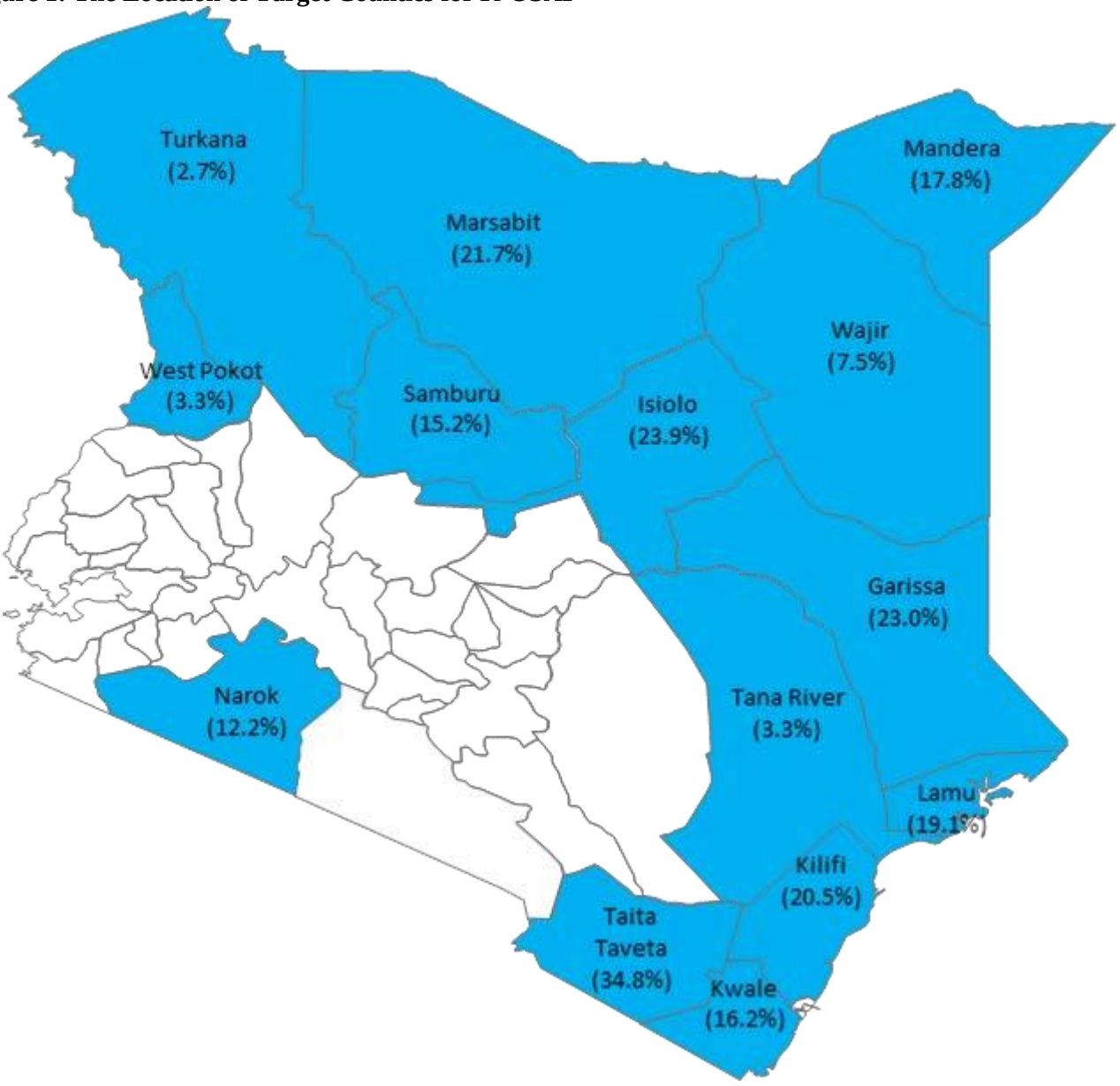
Geography and climate: the topography of the county is dominated by low-range sand-stone hills, and a terrain that generally slopes towards the sea. Kilifi County has 21 forests cumulatively, covering 246 km2. River Sabaki, a perennial fresh water river, runs 150km across the county, supporting various human and livestock activities. Seasonal rivers in the county include the Nzovuni, Rare, Goshi and Wimbi. There are also many seasonal streams found across the county. The average annual rainfall ranges from 300mm in the hinterland parts of the County to 1,300mm along the coastal belt.

Socio- Economic Activities: Tourism and fishing are major economic activities due to its proximity to the Indian Ocean. The county boasts of some of the best beaches and popular resorts and hotels. Other attractions include historical sites such as the Mnarani ruins that dates back to between the fourteenth and seventeenth century. The county has a strong industrial sector with the Mabati Rolling Mill and the Athi River Cement Factory contributing heavily to the region's economy both in employment provision and income generation. Opportunities exist in agriculture particularly dairy and crop farming thanks to fertile soils and a good weather pattern. The county had a successful cashew nut milling industry and opportunities exist in its revival. Agriculture employs up to 85% of the total population of the county.

Population: Based on the 2009 Kenya Population and Housing Census, the county had about 200 000 households and a population of 1,109,735 which accounted for 2.9 percent of the total Kenyan population and Population Density 88 people per Km^2. There are other Kenyan Communities who have also settled in the Country because of their employment or for purposes of doing business. Over time, these people have had close interactions with each other, and fostered the swahili culture and language. Most of the people in Kilifi County are either Christians or Muslims, though other smaller religious communities exist.

Natural Resources: The County has vast resources; arable land, mineral resources like Iron Ore, titanium, world class beaches for lucrative tourist industry. There are forests like, Arabuko sokoke forest and Mangroove Forests, water resources include (Indian Ocean, Kafuloni, Sabaki and Rare Rivers).

Figure 1: The Location of Target Counties for K-OSAP



CHAPTER FIVE: DESCRIPTION OF THE ADMINISTRATIVE, POLICY AND REGULATORY FRAMEWORK

5.1 Introduction

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

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

5.2 Environmental Problems in Kenya

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

5.3 Administrative / Institutional Framework

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

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

(ii) ***The County Environment Committees***. According to EMCA (Amendment) Act 2015, The Governor shall, by notice in the Gazette, constitute a County Environment Committee of the County of the Authority in respect of every County respectively. The County Environment Committees is responsible for the proper management of the Environment within the County in respect of which they are appointed. They are also to perform such additional functions as are prescribed by the Act or as may, from time to time be assigned by the Minister by notice in the gazette. The decisions of these committees are legal and it is an offence not to implement them.

(iii) ***National Environmental Complaints Committee***. The Committee performs the following functions:

To investigate

(a) any allegations or complaints against any person or against the Authority in relation to the condition of the environment in Kenya, on its own motion, any suspected case of environmental degradation, and to make a report of its findings together with its recommendation thereon to the Council;

(b) To prepare and submit to the Council, periodic reports of its activities which report shall form part of the annual report on the state of the environment under section 9 (3); and

(c) To perform such other functions and exercise such powers as may be assigned to it by the Council

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

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

Be binding on all persons and all government departments, agencies, States

Corporation or other organ of government upon adoption by the national assembly.

(v) ***National Environment Tribunal***: This tribunal guides the handling the cases related to environmental offences in the Republic of Kenya.

5.4 The Legal, Regulatory and Policy Framework

5.4.1 The Constitution of Kenya, 2010: Constitutional provisions

Kenya now has a new Supreme law in form of the New Constitution which was promulgated on the 27th of August 2010 and which takes supremacy over all aspects of life and activity in the New Republic. The Constitution is the supreme law of the Republic and binds all persons and all State organs at all levels of government. The Constitution of Kenya, 2010 provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectoral legislative documents are drawn.

In relation to the environment, article 42 of chapter four, *The Bill Of Rights*, confers to every person the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative measures, particularly those contemplated in Article 69, and to have obligations relating to the environment fulfilled under Article 70. Chapter 5 of the document provides the main pillars on which the 77 environmental statutes are hinged.

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

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

"The state shall-

- *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:

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.

(1) 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.

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.

The Constitution of Kenya, 2010, is robust on social issues also, with Public participation and consultations being enshrined in the national values and principles of governance in Article 10. A number of provisions in the Constitution has set out the principles for public participation and consultation including articles 1 **Sovereignty of the people.** (2) The people may exercise their sovereign power either directly or through their democratically elected representatives. Article 10 (2) a, b and c; **The national values and principles of governance** include— (*a*) patriotism, national unity, sharing and devolution of power, the rule of law, democracy and participation of the people; (*b*) human dignity, equity, social justice, inclusiveness, equality, human rights, non-discrimination and protection of the marginalised; (*c*) good governance, integrity, transparency and accountability. Article 27; **Equality and freedom from discrimination** Article 33; **Freedom of expression.** (1) Every person has the right to freedom of expression, which includes— (*a*) freedom to seek, receive or impart information or ideas; (*b*) freedom of artistic creativity; and (*c*) academic freedom and freedom of scientific research. Article 35; **Access to information** article 69 (1) (d) **Obligations in respect of the environment. 69.** (1) The State shall— (*d*) encourage public participation in the management, protection and conservation of the environment; and article 174(d) **Objects of devolution.** The objects of the devolution of government are— (*d*) to recognise the right of communities to manage their own affairs and to further their development. These should be highlighted and made use of by the project as part of the free, prior and informed consultations process that has been alluded to in this ESMF.

5.4.2 Vision 2030

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

5.4.3 The Environment Management and Co-ordination Act, 1999, (Amendment) 2015

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, 2015 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.

MoEP, REA and KPLC are committed to ensuring that all its activities are carried out in an environmentally friendly manner throughout the three major project phases of design, construction and operation of the proposed project. The Act provides for the setting up of the various ESIA Regulations and Guidelines which are discussed below:

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

This regulation provides guidelines for conducting Environmental Impact Assessments and Audits. It offers guidance on the fundamental aspects on which emphasis must be laid during field study and outlines the nature and structure of Environmental Impact Assessments and Audit reports. The legislation further explains the legal consequences of partial or non-compliance to the provisions of the Act. Electrical infrastructure as an activity is listed on section 9 in the second schedule of EMCA as among projects that require full Environmental Impact Assessments before commencement. The project cannot start before the license is granted, upon conducting the EIA. For this reason, KPLC, MoEP and REA have to undertake ESIA studies for their projects.

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

The regulation provides that a waste generator shall use cleaner production methods, segregate waste generated and the waste transporter should be licensed. The notice further states no person shall engage in any activity likely to generate any hazardous waste without a valid Environmental Impact Assessment license issued by the National Environment Management Authority. Hazardous waste will not be generated from this development. The project proponent will ensure that waste is segregated and a licensed waste transporter is contracted to disposed solid waste. KPLC and REA will manage all the construction waste as per the provision of this regulation.

5.4.6 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.

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

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

which exceeds any sound level as set out in the First Schedule of the regulations.

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

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

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

These regulations are described Legal Notice No. 131 of the Kenya Gazette Supplement no. 74, October 2006 and will apply to all internal combustion engine emission standards, emission inspections, the power of emission inspectors, fuel catalysts, licensing to treat fuel, cost of clearing pollution and partnerships to control fossil fuel emissions. The fossil fuels considered are petrol, diesel, fuel oils and kerosene.

5.4.10 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 and social management plan (ESMP) advices the Proponent on safety and health aspects, potential impacts, personnel responsible for implementation and monitoring, frequency of monitoring, and estimated cost. MoEP, KPLC and REA shall observe policy and regulatory requirements and implement measures to safeguard public health and safety.

5.4.11 County Government Act, 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.

5.4.12 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.

5.4.13 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 MoEP, KPLC and REAr subprojects will be located within urban areas and cities.

5.4.14 Land Act, 2012

This Act gives effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources, and for connected purposes. Section 110(1) of the Act provides that land may be acquired compulsorily under this if the Commission certifies, in writing, that the land is required for public purposes or in the public interest as related to and necessary for fulfillment of the stated public purpose. In such an acquisition, this Act, in section 111(1) provides that just compensation shall be paid promptly in full to all persons whose interests in the land have been determined. The procedure for land acquisition is laid out in Part VIII of the Act.

5.4.15 The Land and Environment Court Act, 2011

This is an Act of Parliament to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. The principal objective of this Act is to enable the Court to facilitate the just, expeditious, proportionate and accessible resolution of disputes governed by this Act. Section 13 (2) (b) of the Act outlines that in exercise of its jurisdiction under Article 162 (2) (b) of the Constitution, the Court shall have power to hear and determine disputes relating to environment and land, including disputes:

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

5.4.16 Water Act, 2016

Part II, section 18, of the Water Act, 2016 provides for national monitoring and information system on water resources. Following on this, sub-section 3 allows the Water Resources Authority (WRA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may require to be kept by a facility operator and the information thereof furnished to the authority.

The Water Act Cap 372 vests the rights of all water to the state, and the power for the control of all body of water with the Cabinet Secretary, the powers is exercised through the Cabinet Secretary and the Director of water resources in consultation with the water catchments boards, it aims at provision of conservation of water and appointment and use of water resources. Part II Section 18 provides for national monitoring and information systems on water resources. Following on this, Sub-section 3 allows the Water Resources Authority to demand from any person, specified information, documents, samples or materials on water resources. Under these rules, specific records may be required to be kept and the information thereof furnished to the authority on demand.

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

5.4.17 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.

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

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

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.

5.4.18 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.

5.4.19 Penal Code Act (Cap.63)

Section 191 of the penal code states that if any person or institution that voluntarily corrupts or

foils water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighborhood or those passing along public way, commit an offence. KPLC shall observe the guidelines as set out in the environmental management and monitoring plan laid out in this report as well as the recommendation provided for mitigation/minimization/avoidance of adverse impacts arising from the project activities.

5.4.20 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.

5.4.21 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.

5.4.22 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 workrooms. 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.

5.4.23 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.

5.4.24 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.

5.4.25 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—

- All aircraft whilst in or over any part of Kenya;
- All Kenya aircraft and the crew and other persons on board wherever they may be; and
- 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.

5.4.26 National Land Policy 2009

The National Land Policy (NLP) has a vision to guide the country towards a sustainable and equitable use of land. The land policy calls for immediate actions to addressing environmental problems that affect land such as degradation, soil erosion and pollution. For instance, the policy stipulates the principle of conservation and management of land based natural resources, the principle of protection and management of fragile and critical ecosystems including wetlands and arid lands. The policy further calls for extensive overhauls to current policies and institutions in an attempt to address chronic land tenure insecurity and inequity. The National Land Policy designates all land in Kenya as public, private (freehold or leasehold tenure), or community/trust land, which is held, managed and used by a specific community. This land policy has thus been formulated to address the critical issues of land administration, access to land, land use planning, restitution of historical injustices, environmental degradation, conflicts, unplanned proliferation of informal urban settlements, outdated legal framework, institutional framework and information management.

5.4.27 Electronic Waste Management Regulations-Draft

Kenya has prepared draft guidelines for E-waste management and in 2013, 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 Producer**s** where 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 where the regulations require that NEMA maintain an Electrical and Electronic Equipment producer's register as specified in schedule 3 which shall be opened to the public for inspection. Annual compliance certificate of Producers, the draft regulations, every producer shall obtain an annual compliance certificate upon-
Declaring the previous year's weight of electrical and electronic equipment introduced in the market by product type;

a) Production of an evidence note with a licensed treatment facility;
b) 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 and on the basis of their market share, 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; the total tonnage and categories of electrical and electronic equipment placed on the 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 refurbishes' 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; carry out 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.

5.5 International Conventions and Treaties Ratified by Kenya

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

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

CHAPTER SIX: DESCRIPTION OF WORLD BANK OPERATIONAL SAFEGUARD POLICIES

6.1 Introduction

This ESMF has been designed so that all sub-projects that will be implemented under K-OSAP comply with the Operational Safeguard Policies of the World Bank and all the applicable environmental policies, laws and regulations of the Government of Kenya (GoK). In this chapter, the World Bank's safeguards policies and their applicability are discussed. The World Bank's Operational Safeguard Policies are outlined below and summarized in the table and thereafter a determination has been made on the safeguards that will be triggered as a result of the K-OSAP project.

The World Bank's 10 Safeguard Policies are:

1. Environmental Assessment (OP/BP 4.01)
2. Forests (OP/BP 4.36)
3. Involuntary Resettlement (OP/BP 4.12)
4. Indigenous Peoples (OP/BP 4.10)
5. Safety of Dams (OP/BP 4.37)
6. Pest Management (OP 4.09)
7. Physical Cultural Resources (OP/BP 4.11)
8. Natural Habitats (OP/BP 4.04)
9. Projects in Disputed Areas (OP/BP 7.60)
10. Projects on International Waterways (OP 7.50)

The environmental issues that might arise as a result of the K-OSAP component of the K-OSAP project trigger four of the ten safeguard policies namely:

- Environmental Assessment (OP/BP 4.01);
- Natural Habitats (OP/BP 4.04) and
- Involuntary Resettlement (OP/BP 4.12)
- Indigenous Peoples (OP/BP 4.10)

A complete description of the Bank safeguards and their triggers for applicability is summarized in Annex I to be used as part of the environmental and social screening process presented in chapter 9 of this ESMF.

Table 2: Summary of World Bank Safeguard Operational Objectives

Operational Safeguard	Objective	Trigger for the Policy
Environmental Assessment **(OP/BP 4.01)**	To ensure that Bank-financed projects are environmentally sound and sustainable, and that decision making is improved through appropriate analysis of actions and their likely environmental Impacts assessment and Environmental Management Plan (EMP). When the project is likely to have sectoral regional impacts, sectoral or regional EA is required. The Borrower is responsible for carrying out the EA.	This OP/BP 4.01 is triggered through the mandatory Environmental and Social Screening Process through which the project is assigned a Category based upon its potential environmental and social risks and impacts in its area of influence. This policy is triggered if a project is likely to have potential (adverse) environmental risks and impacts in its area of influence. Depending on the project, and the nature of impacts a range of instruments can be used: EIA, environmental audit, hazard or risk assessment and environmental management plan (EMP). When the project is likely to have sectoral regional impacts, sectoral or regional EA is required. The Borrower is responsible for carrying out the EA. These potential risks and impacts include physical, biological, socio-economic, health, safety, cultural property, Trans-boundary impacts and global impacts including Greenhouse Gas (GHG) emissions and vulnerability to climate change effects. ***Under K-OSAP, SHE has prepared this ESMF and will comply with national EIA regulations which outline the environmental screening process to be applied to sub-projects implementation.***
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.	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).

	The Bank supports, and expects borrowers to apply, 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. Specific objective of the OP includes but not limited to the following • To preserve biological diversity by avoiding, or if not possible, reducing and minimizing impacts on biodiversity; • In cases where some impacts are unavoidable, to endeavor to reinstate or restore biodiversity including, where required, the implementation of biodiversity offsets to achieve "not net loss but net gain" of biodiversity; • To protect natural, modified and critical habitats; and • To sustain the availability and productivity of priority ecosystem services to maintain benefits to the affected communities and to sustain project performance.	This OP/BP can be triggered if a project is to be located in a habitat where there may be potential biodiversity impacts or in areas providing ecosystem services upon which potentially affected stakeholders are dependent for survival, sustenance, livelihood or primary income, or which are used for sustaining the project. It is also triggered if the project is designed to extract natural resources as a main purpose (e.g. plantation forestry, commercial harvesting, agriculture, livestock, fisheries and aquaculture).
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	The policy is triggered when the project is undertaken in areas where Indigenous Peoples are present (with characteristics described in OP 4.10 para 4) in the project area.

	social and economic benefits.	
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 resettlement; and (iv) provide assistance to affected people regardless of the legality of land tenure.	This policy covers not only physical relocation, but any loss of land or other assets resulting in: • Relocation or loss of shelter; • loss of assets or access to assets; • Loss of income sources or means of livelihood, whether or not the 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.

6.2 World Bank's Safeguards triggered by K-OSAP Project

The likely locations for projects under this component of K-OSAP are not yet known, but will most definitely underserved county of Kenya. Further preparatory work needs to be concluded as to the specific geographic reach of the proposed project (e.g. selection and location of infrastructure investment). Further details on the state/county and social/physical environment of the project activities will be provided in the later stage.

The activities in the K-OSAP are for the moment expected to trigger only OP/BP 4.01 (Environmental Assessment), OP/ 4.12: Involuntary Resettlement and OP/BP 4.04 (Natural Habitats) and OP/BP 4.10 Indigenous Peoples. The safeguards instruments prepared for any subprojects will address the requirements of any applicable policies.

Table 3: Operational safeguards triggered by K-OSAP

OPERATIONAL SAFEGUARDS TRIGGERED BY THE K-OSAP	YES	NO
OP/BP 4.01: Environmental Assessment	x	
OP/BP 4.04: Natural Habitats	x	
OP/BP 4.36: Forests		x
OP/BP 4.09: Pesticide Management		x
OP/BP 4.11: Physical Cultural Resources		x
OP/BP 4.10: Indigenous Peoples	x	x
OP/BP 4.12: Involuntary Resettlement	x	
OP/BP 4.37: Safety of Dams		x
OP/BP 7.50: Projects in International Waters		x
OP/BP 7.60: Projects in Disputed Areas		x

Table 4: Justification for Safeguard Policy Triggered by K-OSAP

	SAFEGUARD POLICY	POLICY TRIGGERED	JUSTIFICATION
1	OP 4.01: Environmental Assessment	Yes	The project is proposed as a category B Partial Assessment- assigned to projects that are likely to have limited and reversible environmental impacts, that can be readily be mitigated. There are no significant and /or irreversible adverse environmental issues anticipated from the project sub components to be financed under the Project, as the nature of civil works is limited to construction of the mini-grids in remote areas (Component 1) and the installation of the solar PV for water pumping (component 4). The ESMF includes methodology to apply an environmental and social screening process that will guide in determining the potential environmental and social impacts of subprojects and in the application of appropriate mitigation measures. Site-specific ESMP will be prepared during implementation and before construction as required for the subprojects. Screening of K-OSAP subprojects will be done to determine whether sub-projects would require a full environmental assessment; NEMA approval will be sought before commencement of detailed design to ensure that good practices are included in the technical design. The ESMF will serve as the environmental safeguards document in cases where a full environmental assessment is not deemed necessary based on the findings of the screening. The ESMF also requires that all construction materials (in particular wooden poles treated with creosote) are sourced from firms that have undergone a satisfactory environmental impact assessment/audit and have received NEMA approval.
2	OP 4.04: Natural Habitats	YES	The policy is triggered for K-OSAP though mainly applies to the off-grid electrification component. These could be affected by clearing various natural habitats to create room for pole erection and mini-grid construction. The project activities in K-OSAP areas will not cause conversion or degradation of natural habitats or critical natural habitats as defined by the policy.
3	OP 4.09: Pest Management	NO	The policy is not triggered. The project activities will not involve the use of pesticides for pest management at any stage. No pesticides or application machinery shall be procured. The projects do not include purchase or use of pesticides. Any clearing of vegetation will be undertaken manually.
4	Indigenous Peoples OP/BP 4.10	YES	The fourteen (14) counties targeted by this Project are considered as marginalized areas in Kenya and the people that inhabit these areas are in general categorized as vulnerable and marginalized. Therefore, a Social Assessment (SA) will be carried out to identify and avert any potentially adverse effects from project interventions on vulnerable and marginalized groups and to ensure that project benefits that are culturally appropriate reach these groups in

			an equitable manner, and will include provision of free prior and informed consultations and a grievance redress mechanism. The SA will be disclosed before appraisal of the project. It is likely to be triggered for K-OSAP component given the nature of and K-OSAP integrated settlement in the project areas under this component.
5	OP 4.11: Physical Cultural Resource	NO	The policy is 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 EMPs.
6	OP 4.12: Involuntary Resettlement	YES	This policy was triggered based on the likelihood that the proposed mini grids will require limited land acquisition, since sub projects sites for component A have not been identified at this stage of project preparation, a Resettlement Policy Framework (RPF) has been prepared to guide project investments with regard to land acquisition and compensation of the affected people. The RPF will be disclosed before appraisal of the project. Based on the RPF guidance, each sub –project in Component 1 will be screened, and if RAPs are found to be necessary, they will be prepared, cleared, disclosed and implemented prior to the commencement of civil works, in accordance with World Bank OP/BP 4.12 (Involuntary Resettlement).
7	Safety of Dams OP/BP 4.37	NO	The policy is not triggered as K-OSAP projects under IDA financing will not include construction of dams as defined in the policy.
8	Projects on International Waterways OP/BP 7.50	NO	The policy is not triggered as the project will not undertake any activities in the catchment areas of international waterways and shared aquifers.
9	Projects in Disputed Areas OP/BP 7.60	NO	The policy is not triggered as project activities will not be implemented in any disputed areas.

6.3 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 investments under the K-OSAP.

The EA process takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property) and Trans- boundary and global environmental aspects. However, since the exact location of these investments will not be identified before World Bank appraisal of the project, the EA process calls for the REA and KPLC to prepare an Environmental and Social Management Framework (ESMF).

OP/BP 4.01 is triggered in case of K-OSAP, as the World Bank will finance project works that will ensure increased electricity access to Kenyans, particularly among the in K-OSAP targeted areas.

This report which will establish a mechanism to determine and assess future potential environmental and social impacts during implementation of K-OSAP activities, and then to set 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.

Operational Safeguard 4.01 further requires that the ESMF report must be disclosed as a separate and stand-alone document by the Government of Kenya and the World Bank as a condition for World Bank appraisal. The disclosure should be both in Kenya where it can be accessed by the general public and local communities and at the Banks website and the date for disclosure must precede the date for appraisal of the program/project. The policy further calls for the K-OSAP as a whole to be environmentally screened to determine the extent and type of the EA process. The World Bank system assigns a project to one of the four project categories, as defined below:

6.4 Alignment of WB and GOK Polices relevant to this ESMF

a) Both the World Bank safeguards policies and GoK laws are generally aligned in principle and objective: Both require Environmental Assessment before project design and implementation (which also includes an assessment of social impacts).
b) Both require public disclosure of ESIA reports and stakeholder consultation during preparation.
c) While OP 4.01 of World Bank stipulates different scales of ESIA for different category of projects, Kenya's EMCA requires environmental screening to be undertaken for new projects. In the event that notable environmental impacts will occur as a consequence of the sub- project, then an EIA will be undertaken for those sub-projects. If there would only be minimal impacts for a sub-project then the results of the environmental screening

will be prepared and submitted to NEMA and the World Bank.

d) Where EMCA requires Strategic Environmental Assessments, OP 4.01 requires that an Environmental Assessment be conducted, the complexity and nature of which depends on the project category.
e) EMCA recognizes other sectoral laws while WB has safeguards for specific interests.
f) 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.

In Kenya, it is a mandatory requirement under EMCA 1999 for all development projects (Schedule Two) to be preceded by an EIA study. Thus, under the Laws of Kenya, environmental assessment is fully mainstreamed in all development process consistent with World Bank safeguard policies on EA. All the Sub projects under the K-OSAP are not likely to fall under schedule II of EMCA and thus may not require a full scale EIA process. Further, in order to fully insure against triggers to WB safeguard policies, individual investments will be screened against each policy as part of the EIA project report requirements.

6.5 Requirements for Public Disclosure

This ESMF will be disclosed in line with the World Bank requirements through posting on the Kenya Power's website www.kplc.co.ke, REA's website www.rea.co.ke. The final version will be publicly disclosed through the Bank's Info shop.

CHAPTER SEVEN: ENVIRONMENTAL AND SOCIAL IMPACTS

7.1 INTRODUCTION

The sub-projects described under K-OSAP components on the increased electricity access to underserved counties be located in 14 targeted counties that are considered marginalized in the country. These K-OSAP areas are sparsely populated and with limited infrastructure in place including roads and water and electricity. The following project component will be considered in the environmental and social assessments: Mini-grids for community facilities, enterprises and households, standalone solar systems for household, standalone solar systems for community facilities and solar water pumping for community facilities.

Cumulative environmental impacts are not expected to be significant, as the project -although nationwide - is relatively limited in geographic scope and environmental impact. Induced impacts will be largely positive or being - for example, decreased use of fuel wood and kerosene, improved economic welfare as a result of electricity provision allowing for job creation and opportunities to study after nightfall. The electrification works will not be supported by the construction of large civil works (such as access roads or forest clearing) that may result in loss of biodiversity or impact natural habitat or forested areas.

7.2 Positive Environmental and Social Impacts

7.2.1 Project Beneficiaries

Electricity access will replace kerosene lamps which are expensive to operate. Kerosene is costly both for low income households that buy it, and for governments that subsidize it. In parts of Africa, for instance, kerosene costs make up 10-25% of household monthly budgets according to a report by Lighting Africa market trends report 2013. A study on Energy Kiosks for Lighting up Kenya presented in at Light Africa conference in 2010 found that on average a family spends about Kshs750 per month for lighting kerosene. Empirical data presented by Kenya National Bureau of Statistics found 2013 indicates that a family consuming about 50kw/h of electricity which is mainly domestic paid a bill of Kshs 586 in February 2012, Kshs. 568 in January 2013 and 564 in February 2013 which gives an average bill of 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 Off Grid Electricity Access Project means greater savings on the part of the households.

7.2.2 Expected Impact on Poverty Alleviation

With the implementation of K-OSAP in the off-grid areas, the beneficiaries will be engaging in income generating activities hence improving their economic status.

7.2.3 Employment and wealth creation

The Kenya off-grid solar access project will have a positive impact on both direct and indirect employment levels in the country although the bulk of them will be on temporary basis during construction of the infrastructure. These job opportunities will be made available to the locals

thereby easing unemployment in the targeted 14 counties. In addition, this will translate into incomes at the household levels which will trigger other spending and demand in the local economy.

7.2.4 Local Material Supplies

Another positive impact of the project involves local material sourcing mainly sale of materials for use in the project. Some of these can be expected to be sourced locally and the rest through importation. Therefore, the project will generate new income revenues for the local population across the 14 counties in harvesting and transportation of sands, ballast and gravel. The new income revenues received will create demand for other goods and services causing a trickledown effect to the entire economy.

7.2.5 Up Scaling Electricity Access to the Poor

According to Kenya Power's annual report of 2012/2013, electricity access stood at 4.8milliom customers as at June 2016. This translates to about 60% of the total population accessing electricity. Needless to say, the uptake has been low due to the situation that the cost of connection has to be paid up front keeping in mind that about 46.6% of the Kenyan population is poor. Furthermore, the off-grid areas are disadvantaged due to lack of national grid hence the need for the K-OSAP project.

7.2.6 Social Inclusion

The K-OSAP aims at increasing access of electricity to off grid communities and counties. This is in line with the tenets of social inclusion which the World Bank defines as the process of improving the terms for individuals and groups to take part in society. Further, Social inclusion aims to empower poor and marginalized people to take advantage of burgeoning global opportunities. It ensures that people have a voice in decisions which affect their lives and that they enjoy equal access to markets, services and political, social and physical spaces.

7.2.7 HIV/AIDS

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

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.

The other method of disseminating HIV/AIDs information during project implementation will be through the contractors. The contactors will be expected to disseminate information to the workers as part of their daily tool box talks. SHE department will liaise with NACC to get materials (if they are available at the time) on HIV/AIDS that can be distributed by the contractors during the tool box talk. This will reach more people as the project is being implemented in the targeted counties. During the Environment Social Impact Assessment for other projects the Safety Health and Environment department disseminates HIV/AIDs to the public during public consultations meetings.

7.2.8 Health benefits of the project

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

7.2.9 Benefits to education

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

7.2.10 Improved standard of living

The implementation of this project will result in connecting about 851,149 beneficiaries to the off grid electricity. 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.

7.2.11 Security

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

7.2.12 Communications

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

7.2.13 Gender Considerations

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

Electricity is a basic service especially for lighting but is still a luxury for many rural women and men. Access to modern electricity will go a long way towards alleviating the daily household burdens of women, giving them more time, improving their health and enhancing their livelihoods. The KOSAP will increase access to electricity within 14 counties considered as marginalized. Available literature on gender and energy suggests that providing electricity to communities and homes will promote gender equality, women's empowerment, and women's and girls' access to education, health care, and employment.

Indeed, most gender benefits of the project will occur because women tend to spend more time at home, are responsible for household chores that can be carried out more productively with electricity, and because certain tasks are culturally defined as women's work. Majority of the beneficiaries will use the electricity mainly for lighting and powering low energy gadget such as TV, radio, phone charging, refrigeration and to some extent ironing and cooking. In general, lighting and TV are the first common uses of electricity, accounting for at least 80% of rural

electricity consumption according to a working paper on Energy Gender and Development of the World Bank, 2012. The first and strongest impacts of the project shall occur via lighting and TV. Electricity will definitely displace more expensive candles and kerosene lamps, thereby reducing indoor air pollution, fire, burn risk and providing higher quality light. Women and girls will benefit more from air pollution of kerosene lamps because they spend more time in the kitchen.

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

7.3 Negative Environmental and Social Impacts

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

7.3.1 Impact on Natural Vegetation and Biodiversity

(a) **Flora**: Minimal vegetation will be cleared during construction and installation of the mini grids in the remote areas, installation of solar water pumps and construction of the low voltage distribution lines to connect electricity to new customers. However, this impact is not significant because the spatial extent is minimal. Further, the road sides can be re-vegetated with the same species after construction. Direct impacts, such as habitat destruction and modifications, are regarded immediate, short term and of low significance.

(b) **Fauna**: The project areas are not forested but replete with wild animals such as dik-dik, giraffes, zebras, hyenas and several bird species. The most significant effect of solar power mini grids on the environment is impact on the habitat during site clearing. This may interfere with breeding and displace the animals to increase animal-human conflict. It should be noted that animals generally avoid contact with human structures, but do grow accustomed to structures after a period. While the structures are usually visible, injuries and death of animals do occur sporadically because of accidental contact. An aspect that is of concern is the presence of vehicles on access and infrastructure roads, leading to road kills, particularly amongst nocturnal animals that abound in the study area. While most of the larger animal species are likely to move away from human contact, dangerous encounters with snakes, scorpions and possibly scavengers always remain likely. Similarly, the presence of humans within areas of natural habitat could potentially result in killing of animals by means of snaring, poaching, poisoning, trapping, etc. The likelihood that this impact will occur is low and will be of low –medium significance. If animals graze at the contaminated sites, the chemical might accumulate in the animal body and cause side effect such mineral imbalances leading to anemia. The effluent dumping sites should be fenced off.

7.3.2 Impacts on air quality from vehicle exhaust emissions

The solar power generation will not generate any poisonous or harmful waste gas pollutants. The living facilities such as heating device and cooking range in the project will use electricity as the source of energy, without increasing any air pollution source. The main source of the exhaust emissions are likely to be generated during excavation for construction of the mini grids and during use of fuel-run equipment including vehicles, generators, and compressors. Oxides of nitrogen, carbon monoxide and oxides of Sulphur emitted from internal combustion engines will be released during construction. Motor vehicles that will be used to ferry construction materials would cause air quality impact by emitting pollutants through exhaust emissions.

7.3.3 Dust emissions

Dust emission is likely to occur during the site clearance, excavation and spreading of the topsoil during construction. They are also likely to occur during materials transportation by motor vehicles accessing the site.

7.3.4 Solid waste

The solid wastes in construction period mainly include the construction waste, soil and rock and the domestic waste from construction staff. It is estimated that the whole site can produce approximately 0.02t of domestic waste comprising of waste plastic bag, leftovers, waste packaging materials, rotten fruits, peel among other, per day, for approximately 20 workers based on subproject sites. During construction, solid wastes will be generated. Inappropriate dumping within the site will interfere with the aesthetic status of the area. This has a direct effect to the surrounding community. Disposal of the same solid wastes off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be aesthetic, pest breeding, pollution of physical environment, invasion of scavengers and informal recycling communities.

7.3.5 Land take – Loss of Use

The project areas are predominantly pastoralist but the land will be required for the construction and installation of the mini-grids and may involve involuntary acquisition as most land is regarded as communal land. Relocation will not be necessary as the land is expansive and sparsely populated. Moreover, the Proponent will avoid land that is already settled in acquiring land for the mini grids. However, on the location where the mini grids will be sited, local communities may lose agricultural and grazing land respectively.

7.3.6 Occupation safety and health hazards

As with any construction project, there is potential for impacts on human health and safety to occur as a result of accidents and unplanned events that may occur during the construction of the solar mini-grids. The risk of injury associated with the construction of the facility will be mainly limited to the subcontractors (as the site will be secured to avoid public incursion into the active development area), but there remains some risk of injury to other site users. Loss of life and impairment can occur as a result of accidents from machine operations. Absolute batteries will be collected, transported and recycled by NEMA approved e-waste disposal.

7.3.7 Social Risks Related to Labour Influx

At project implementation, many new workers will be involved and new interactions between local communities and workers undertaking the construction and installation of minigrids, solar standalone systems and solar for water pumping will 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). Other social risks include; Risks of social conflict between communities/clans and within the workforce; increased illicit behavior and crime such as substance abuse and theft; prostitution; gender-based violence; underage pregnancies; child labour and school dropouts.

7.3.8 Increased Demand for Material Consumption

During the construction phase of the project water, energy and construction materials will be used. This will have an impact on the availability of these materials.

7.3.9 Oil Spill Hazards

The machines at site and subproject vehicles require oils during maintenance. The oils will be transported and may be stored at subproject sites. Any major accidental oil spill would impact negatively on the environment as a whole. Cumulatively, small releases of oil would also impact negatively on the environment. Such impacts include creation of new sceneries due to destruction of biological diversity and pollution of water and soil. But these dangers are contained by maintaining the machinery in specific areas designed for this purpose.

7.3.10 Storm water and Waste water

Compaction of surface on the proposed subproject site, access roads and campsite construction will create impervious surfaces (slab environment). There is a likelihood of increased storm water runoff from these sites, which result in gully erosion with time. In addition to creating unattractive terrain, this may cause flood incidences along streams downhill during high rainfall times. The construction and production waste water in the subproject that will come from concrete mixing and curing processes. The domestic waste water from construction staff further forms waste water if discharged directly to the environment.

7.3.11 Noise during construction

Noise and vibrations will occur during transportation and installation of equipment. During the construction phase construction vehicles including excavation equipment and trucks may produce a noticeable increase in noise disturbance. Construction vehicles may create some noise and vibration along access routes. With best practices, noise levels can be kept to below 65 dB, and construction noise should be practically indistinguishable from other background noises at distances of one kilometer.

7.3.12 Visual and Aesthetic Landscape Impacts

Visual impacts would result from the construction of the proposed and installation of mini grids, solar standalone systems and solar water pumping. Visual impacts will occur when changes in the

landscape are noticeable to viewers observing the landscape from their homes or from tourism / conservation areas, travel routes, and important cultural features.

7.3.13 Soil Erosion

The proposed project involves activities that will require clearance vegetation for subproject infrastructure such as access roads, construction and installation of solar minigrids and therefore excavation to construct access roads, levelling the site, vegetation clearance, and ground vibration are expected. Such activities may loosen the soil hence making it vulnerable to erosion due to wind and surface water run-off. The fact that there is minimum vegetation cover on low-slope terrain makes it obvious that without soil erosion prevention measures in place, erosion will take place. The creation of impervious surfaces during site preparation for the subprojects infrastructure could also cause increased soil erosion rates.

7.4 Mitigation Measures

7.4.1 Flora and Fauna

Proposed Mitigation measures: The project proponent will ensure proper demarcation of the project area to be affected by the subproject construction civil works. This will be aimed at ensuring that any disturbance to flora is restricted to the actual subproject area and avoid spillover effects to the neighboring areas. In the same vein, there will be strict control of construction vehicles to ensure that they operate only within the area to be disturbed. The proponent shall put in place a program to plant trees as a way of replacement of the cleared vegetation/trees within the area probably in a public institution like schools.

7.4.2 Impacts on air quality from vehicle exhaust emissions

Proposed Mitigation Measures

a) Drivers of construction vehicles must be sensitized so that they do not leave vehicles idling, that exhaust emissions are lowered.
b) Maintain all machinery and equipment in good working order to ensure minimum emissions of carbon monoxide, NO_X, SO_X and suspended particulate matter;

7.4.3 Dust emissions

Proposed Mitigation measures

a) The construction area should be fenced off to reduce dust to the public
b) Proper scarf folding should be done to minimize dust emissions to the public
c) Sprinkle loose surface earth areas with water to keep dust levels down.
d) Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas;
e) Masks should be provided to all personnel in areas prone to dust emissions during construction
f) Stockpiles of excavated soil should be enclosed/covered/watered during dry or windy conditions to reduce dust emissions.

g) Drivers of construction vehicles must be sensitized so that they limit their speeds so that dust levels are lowered.

7.4.4 Solid waste

Proposed Mitigation Measures

a) Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and the rehabilitation, in the correct order which they were removed that is top soil last;
b) Contractor to put in place and comply with a site waste management plan
c) Provide litter collection facilities such as bins
d) The contractor should comply with the requirement of OSHA ACT 2007 and Building rules on storage of construction materials
e) Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time

7.4.5 Land take – Loss of Use

Purchase of land will be based on willing buyer willing seller principal .Once established, the project should acquire the site by paying appropriate compensation in accordance with the resettlement policy framework (RPF), which would be the replacement cost of the assets lost.

7.4.6 Occupation safety and health hazards

Proposed Mitigation Measures

a) The project shall ensure that contractors provide OHS training that may include hazard awareness, safe work practices and emergency preparedness to their workers to ensure they are appraised to project sites rules of work, personal protection and preventing injury to fellow workers.
b) The Project will require all contractors to implement an Environmental, Health and Safety (EHS) plans which will outline procedures for avoiding health and safety incidents and for emergency medical treatment. This will be achieved by making it a component of contractual agreement.
c) The project will require all contractors provide appropriate Personal Protective Equipment (PPEs) at the work sites to prevent and minimize exposure to injury.
d) Contractors will be required to carry our regular safety inspections to ensure measures to manage potential OHS hazards are in

7.4.7 Public health risk

Proposed Mitigation Measures

a) Awareness creation by the ESIA team to the public/locals prior to construction
b) The contractor is impressed upon not to set a construction camp on site.
c) Further, the contractor will provide public education/information about HIV/AIDS transmission and prevention measures.

7.4.8 Increased Demand for Material Consumption

Proposed Mitigation Measures

a) The contractor should source all building materials such as stone, sand, ballast and hard core from NEMA licensed and approved sites.
b) Ensure accurate budgeting and estimation of actual construction materials to avoid wastage.
c) Reuse of construction materials where possible.

7.4.9 Oil Spill Hazards

Proposed Mitigation Measures

a) In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately.
b) It is proposed that the refueling and maintenance of large vehicles will not take place at the construction site.
c) Contractor to create awareness for the employees on site on company procedures of dealing with spills and leaks from oil storage tanks for the construction machinery through induction and safety training.
d) Vehicles and equipment must be serviced regularly and kept in good state to avoid leaks.
e) In case of spillage the contractor should isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent materials and/or other materials approved by materials.
f) The contractor should also provide security to guard against vandalism when the site is unattended.
g) Proper training for the handling and use of fuels and hazardous material for construction workers
h) All chemicals should be stored within the budded areas and clearly labeled detailing the nature and quantity of chemicals within individual containers

7.4.10 Storm water and Wastewater

Proposed mitigation measures

a) Drainage system should be constructed to ensure surface run off does not affect/spill to the neighbor land
b) Construct the drainage system in a way to run along the road and follow natural drain way
c) Concrete only the required area for the facility and leave the rest of the land with vegetation like grass
d) Construct rain harvesting system on the control buildings and harness into storage tanks for use

7.4.11 Noise and vibration during construction

Proposed Mitigation Measures for Noise and Vibration

a) These proposed mitigation measures aims to ensure that noise generated by construction and operation activities is kept to minimum and adheres to relevant noise standards. They include:

b) Fencing off the construction site with iron sheet during construction
c) Install portable barriers to shield compactors thereby reducing noise levels.
d) Use of noise-suppression techniques to minimize the impact of construction noise at the project site.
e) Use equipment designed with noise control elements.
f) Co-ordinate with relevant agencies regarding all construction.
g) Control the project area to avoid unnecessary access by idlers
h) Limit vehicles to minimum idling time and observe a common-sense approach to vehicle use, and encourage drivers to switch off vehicle engines whenever possible.
i) Set and observe speed limits and avoid raving of engines
j) The Contractor shall ensure that construction activities are limited to working hours (i.e. between 8am and 5pm daily) from Monday to Friday, or as required in terms of legislation.
k) Compliance with the recently issued Noise and Vibration Regulations of 2009 is expected at all the phases of the project.

7.4.12 Visual and Aesthetic Landscape Impacts

The visual negative impacts can be mitigated through putting up a wall round the facility to keep off/screen the project stacks, poles, cables and transformers by the project proponent.

7.4.13 Soil Erosion

Proposed Mitigation measures

a) The contractor shall avoid ground breaking during the seasons of high rainfall to avoid erosion.
b) Monitoring of areas of exposed soil during rainy seasons during construction phase of the project to ensure that any incidents of erosion are quickly controlled.
c) The contractor should ensure recovery of exposed soils with grass and other ground cover as soon as possible.
d) Areas compacted by vehicles during site preparation and construction should be scarified (ripped) by the contractor in order to allow penetration of plant roots and the re growth of the natural vegetation
e) Direct the drainage to follow the natural course way e.g. along the road to avoid draining water into someone land especially once construction is finished.
f) Proper drainage channels and leveling especially of the access road to reduce run-off velocity and increase infiltration of rain water into the soil.
g) Proper compaction will also be done along the access road.

7.4.14 Social Risks Related to Labour Influx

Proposed Mitigation measures

a) Provision of HIV/AIDs education throughout the project cycle
b) Provision of posters within the project enumerating the effects and dangers of HIV/AIDs and other transmission diseases
c) Educating the school going girls of the effect of unwanted pregnancies
d) Child labour should be avoided at any cost in the K-OSAP

e) Provision of casual employment to both male and female throughout the K-OSAP implementation cycle
f) Advocacy of engaging protective sex
g) All gender based violence to be reported and dealt with as per the law.
h) Any child dropout should be reported to the relevant government agency

7.5 Hazardous Waste Mitigation Measure and Management/Disposal Plan

This ESMF contains potential mitigation measures through which the adverse impacts associated with hazardous 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.

7.5.1 Procurement of Electronic Equipment from Credible Manufacturers

K-OSAP will put in place the mitigation measure to ensure that all hazardous and 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 hazardous waste as a result of obsoleteness.

7.5.2 Recycling

Hazardous wastes generated from K-OSAP project will be collected by the contractors/companies that will be subcontracted to operate the mini grid facilities, standalone solar systems and solar water pumps for community facilities, and solar companies doing installation and providing after sale services for the standalone solar system (Component 2) and be transported to Nairobi by NEMA licensed transporters to the East African Compliant Recycling Company facility that recycles E-waste, also people and institutions that will acquire and operate solar standalone systems will be sensitized on the e-waste and be linked to hazardous waste Collection Points (CPs) established across the country and that feed into the East African Compliant Recycling Company. 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.

Kenya is in the early stage of developing a national legislation or regulations on the disposal of e-waste, the guidelines will be used to guide the disposal of hazardous e waste generated from the project (http://www.nema.go.ke/images/Docs/Guidelines/E-Waste%20Guidelines.pdf). The zero draft does not include aspects of spent rechargeable batteries from solar PV systems. The Project will work closely with the National Environmental Management Authority to complete the drafting of the national legislation and regulations on e-waste management. The draft will incorporate aspects related to solid waste from solar PV systems and/or develop a project-specific environmental code of practice (ECOP) as a guidance on approach for the collection, transport, storage and disposal of spent batteries, with the aim of ensuring that risks to the environment and human health are prevented or mitigated. Apart from providing approaches to the management of spent PV batteries, such an ECOP will also seek to inform discussion and build awareness of all

stakeholders, including rural remote community members, vendors/suppliers of products and service providers, around safe management of used batteries.

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:

- Analyze 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, electronics, 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.

CHAPTER EIGHT: THE ENVIRONMENTAL AND SOCIAL SCREENING PROCESS FOR THE KENYA OFF-GRID SOLAR ACCESS PROJECTS

8.1 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 preparation l of the project.

8.2 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 Safeguards Policies. It provides a mechanism for ensuring that potential adverse environmental and social impacts of subprojects by MoEP, REA and KPLC are identified, assessed and mitigated and monitored as appropriate, through an environmental and social screening process (see ***Environmental and social screening form in (Annex 1).*** This will be undertaken by qualified NEMA registered EIA/EA experts within REA and KPLC staff at the national supported by regional staff and the staff that will be recruited or nominated by the MoEP.

The Environmental Management Coordination Act, 1999, (as amended) 2015, 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.

8.3 Application of the Screening processes

The objectives of the screening process are to:

a) Determine the potential adverse environmental and social impacts of the proposed project;
b) Determine the appropriate environmental category as per OP/BP 4.01 environmental assessment;
c) Based on the assigned environmental category, determine the appropriate level of environmental work required (i.e. whether an ESIA is required or not), eligible subprojects will not include Environmental Category A investments; as KOSAP is assigned environmental category B. Screening will further ensure that subprojects that may have potential adverse impacts are recommended for more detailed studies either through preparation of Project Reports (PR) or full Environmental and Social Impact Assessment (ESIA). Prior to commencement of sub-projects, the environmental and social experts at the PIUs will fill out the

screening form attached to this report (Annex 1).

d) 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;
e) Determine the extent of potential solid and liquid waste generation, including hazardous wastes such as PCB, storage batteries and creosote, and appropriate mitigation measures;
f) Determine potential adverse impacts on physical cultural resources, and provide guidance to be applied in the case of chance finds;
g) Incorporate environmental mitigation measures as presented in the screening form and/or separate EA report into the proposed project design;
h) Determine potential adverse social impacts due to land acquisition;
i) 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
j) 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:

a) Proposed project construction/expansion will avoid or mitigate adverse impacts of the project construction / expansion projects on physical cultural resources, including ensuring government authorities responsible for the protection of cultural assets are notified and have the opportunity to document chance finds, etc. "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;
b) 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;
c) Proposed project will not be located within a wetland or on a reservation of surface water bodies.
d) Potential environmental impacts associated with location will be minimized by selection of alternative sites;
e) All stages of the project screening, design and implementation will be done in a participatory manner with public consultation with potential affected persons;
f) 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.
g) The disposal of creosote treated wood, however, is subject to local regulation of disposing

of the Insecticide, Fungicide, and Rodenticide. In case the local regulations will not apply then the international regulations shall apply on the three major wood preservations--namely, creosote, pentachlorophenol, and inorganic arsenicals. Among other things, these rules require that wood which has been treated with creosote should not be burned in an outdoor fire or in stoves or fireplaces; rather, this wood should be buried in a non-hazardous waste landfill unless otherwise required by the law. This requirement was included to ensure that no toxic contaminants would be released as a result of the burning process.

h) 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.

a) The first step in environmental and social assessment will be preliminary screening. The KPLC 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, whereas for the MoEP through the Consortium of Grant and Debt Facility Managers will screen the projects.
b) The completed environmental and social screening form (annex 1 of the ESMF) is attached to the recommendation and submitted to NEMA regional level for review and clearance purposes.
c) In the event that there are likely to be moderate or significant adverse impacts as established from screening the PIUs through the environmental and social experts would be required to prepare an Project Reports (EPR) project and submit it to NEMA county offices for review. NEMA may approve the project to commence at this stage or require the proponent to prepare Terms of Reference (ToR) and proceed to ESIA study. Preparation of Project Reports (PR) and ESIA/EIA study reports are undertaken by consultants registered by NEMA.
d) The environmental and social assessment will be undertaken in a participatory manner and the stakeholder consultations will be documented in the environmental and social assessment documents; in case a consultant will be used, REA and KPLC Environment and Social Unit will prepare TOR and be involved in recruitment of EA consultants. Although currently KPLC has adequate capacity to carryout screening.
e) The Environmental Guidelines for Contractors (annex 4) will be attached to the bidding documents to ensure environmentally and socially sound construction practices.
f) For sites where Environmental assessments will be undertaken, NEMA approval will be sought before commencement of detailed design in order to ensure that good practices are included in the technical design.
g) As regards the approval of environmental and social screening results, NEMA's regional offices will provide review and clearance prior to the commencement of works.
h) MoEP, REA and KPLC Environment Unit will ensure that environmental and social concerns are addressed during planning, design, construction, and operations of the projects and appropriate mitigation measures are in place.

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

The list of measures to mitigate potential adverse impacts as per screening results and/or separate EA reports, including terms and conditions and the sector specific ESMP, supplemented by any additional site specific measures will be attached as a part of the contract specifications. A clause

in the Particular Conditions of Contract will refer to the Environmental and Social Management Plan for a proposed project. The Particular Conditions of Contract prepared by MoEP, REA and KPLC based on the environmental and social management plan will also stipulate that any non-compliance with the mitigation measures set out in the contract will attract the same remedies under the contract as any non-compliance with the contract provisions; such remedies would be instructions, notices, suspension of works, etc. The Instruction to Bidders will highlight the inclusion of the ESMP in the contract specifications and the contractor's obligation of compliance. The performance agreement will carry a clause to the effect that the recipient shall ensure the design; construction; operation and implementation of the proposed projects are carried out in accordance with the ESMF. In addition, ***Environmental Guidelines for Contractors (Annex 3)*** will be implemented and monitored by the MoEP through the Consortium of the Grant and Debt Facility Managers, REA and KPLC Environmental and Social safeguards staff.

8.4 The Screening Process

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

Step 1: Screening of project activities and sites

Prior to going to the field, a desk appraisal of the construction of the Minigrids, including transformers, and distribution lines designs, standalone solar systems and solar water pumping for community facilities, will be carried out by REA and KPLC/PIUs and Environment and Social units staff or selected consultant REA and KPLC PIUs 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 oil pollution, soil erosion, the need for safe disposal of creosote treated poles, PCB, safe disposal of e-waste, 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 Environmental Impact Assessment (ESIA)/ESMPs and/or Resettlement Action Plans(RAPs) and/or IPPS/VMGPs.

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

MoEP through the Consortium of Grant and Debt Facility Managers will carry out screening for the standalone solar systems and will prepare the operational manual that will include environmental and social checklist and Environmental Code of Practice to be used by contracted solar companies to manage e-waste associated with solar batteries, other Solar PV components.

Step 2: Assigning the Appropriate Environmental Category

The environmental and social screening form, when completed, will provide information on the assignment of the appropriate environmental category to a particular subproject. World Bank is responsible for assigning the appropriate environmental category to the proposed K-OSAP Project in accordance with the requirements of OP/BP 4.01, Environmental Assessment.

Step 3: Carrying Out Environmental and Social Impact Assessment

The ESIA 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 ESIA process for each project. ***Environmental and Social checklist (Annex 2)*** will be used in identify the likely impacts for this project and ***Generic EA TOR in Annex 5*** will guide EA study for the same.

Preparation of the EIA, the ESMP be carried out in consultation with the relevant sector Ministries and 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.

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 MoEP, REA and KPLC Environmental and Social experts and Validated by NEMA at the County level. Where an ESIA 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.

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 ESIA make recommendations to the County Environmental Committee for approval/disapproval of the screening results and proposed mitigation measures. As regards to ESIA reports, County Environmental Officer will recommend ESIA reports to the NEMA for approval while RAPs will be implemented by implementing agencies in conjunction with assistance of NLC.

Step 5: Public Consultations

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

mitigation of social impacts will be enhanced.

Step 6: Environmental Monitoring

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

Step 7: Environmental Monitoring Indicators

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

CHAPTER NINE: PUBLIC CONSULTATION AND PARTICIPATION

9.1 Introduction

Public Consultation and Participation to disclose and deliberate on the ESMF has been done. The exact subproject sites are not yet identified, and once they are established Environmental Impact Assessments (EIAs) for Component 1 and Environmental and Social Management Plans (ESMPs) for Component 3 will be prepared as required by NEMA and World Bank Operational Safeguards Policies and further public consultations and stakeholder engagements will be conducted during project implementation stage.

The objectives of consultation were to disclose information on K-OSAP and disclose the draft safeguard document to relevant stakeholders, particularly the communities affected 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 components. 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) has been developed. The specific objectives of Public Consultation are:

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

9.2 Consultation Process

During the K-OSAP ESMF preparation extensive consultation has been conducted. Such consultations will continue to be ensured during further design and implementation stage of the project. These have been undertaken at a minimum, at selection of the component, during environmental screening, and assessment, if undertaken, and while formulating the ESMPs. A comprehensive framework for the participatory consultation including an effective feedback mechanism and information disclosure has been developed and incorporated for implementation during the entire duration of the K-OSAP project.

A critical element in K-OSAP project was planning a participatory consultation program that 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 K-OSAP project, the following participation techniques were used followed:

a) Information dissemination and information sharing techniques was be used to inform the stakeholders regarding the action taken in K-OSAP project sites through personal communication to make them aware about the project as well as to incorporate users input at different stages of the project.
b) Information gathering techniques to gather quantitative and qualitative information about the K-OSAP individual schemes through questionnaires survey.
c) Focused Group Discussion (FGDs) were conducted covering different components of the K-OSAP 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. These had 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, county government, development organizations, development partners. The Environmental and Social Specialists monitored and contact the stakeholders as and when necessary. The experts conducted the FGD in consultation and coordination with the designated stakeholders, PIU and project Engineers
d) Key Informant surveys were carried out among the knowledgeable and elderly people of the project area to incorporate their views and suggestions from their long experiences and knowledge.
e) Hot Spot Consultation were conducted in problematic locations of the K-OSAP schemes with participation of knowledgeable and affected people, local elite, public representatives, officials and NGO people to mitigate adverse impact considering their views suggestions from their practical experiences as per local needs and demands.
f) Participatory workshops were organized with the participation of different types of representative stakeholders.

9.3 Instruments for Use during Consultations

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

Kenya Power, REA and MoEP were 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 /vulnerable and marginalized people.

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

The public consultations were done carried out on the different platforms at the national level, county level and sub county level on different dates. On the National level the County executives of Energy and Environment were involved. The land acquisition matters, compensation of property and capacity building were main discussions among others. MoEP, REA and KPLC representatives assured them that of transparency and proper mechanisms have been put in to place. This forum was held on 31st November 2016(See Annex10).The county and sub county consultations were held on different dates in the following eight counties; Narok, Turkana, Garissa, Kwale, Kilifi, West Pokot, Taita Taveta and Tana River. Among the issues of concern raised and discussed included project impacts, job opportunities, partnerships, community land for project sites , site selection and electricity connection fees e.t.c . The issues were addressed and comments taken. (See Annexes 14, 15,16,17,18 and 19). The analysis have been done for all the forums. (See Annexes 10)

CHAPTER TEN: GRIEVANCE REDRESS MECHANISM

10.1 Introduction

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 Group 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 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 5: Grievance Management Process

Process	Description	Time Frame	Other Information
Identification of grievance	Face to face; phone; letter, e-mail; recorded during public/community interaction; others The responsible party to receive the grievances will be the engineer in charge i.e. of the project to the contact person. The grievance can also be passed through the administrators such as the chief office because the public are more conversant with this office. The chief would then pass the complaint to the KPLC contact person	1 Day	Email address; hotline number
Grievance assessed and logged	Significance assessed and grievance recorded or logged (i.e. in a log book) It will be prudent to have a grievance record book where the grievances are recorded for follow up	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	3 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	

MoEP, REA and KPLC as proactive organizations have developed a grievance Redress Mechanism procedure to use in case of any incidence or complaint from the public or affected persons. **See Annex 9.** It should be noted that if complainants are not satisfied with the grievance process, even after arbitration they have the right to present their complaint through the court system.

CHAPTER ELEVEN: MITIGATION MEASURES

11.1 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 three: physical, socio-cultural and socio-economic. Physical measures relate to issues of project sitting, re-vegetation and preventive measures like bush clearing, erosion, sedimentation and pollution control and good construction / farming practices, waste management, and application of Environmental Guidelines for Contractors. Socio-economic measures will include education and awareness, hygiene and sanitation training, rules and regulations, institutional support (including skills training), and recruitment of qualified personnel while socio-cultural measures could include allowing limited and monitored access to restricted areas for cultural reasons where applicable.

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

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

A summary of typical environmental and social impacts and the corresponding typical mitigation measures for the types of activities likely to be undertaken by MoEP, KPLC and REA are as shown in Table 4 and 5. The tables are not intended to be exhaustive in content but rather to indicate in general the scope of ESIAs and ESMPs. It is entirely possible that additional impacts will be identified during impact assessment studies or audit preparation and will require additional mitigation measures. In the ESIAs and ESMPs, impacts shall be categorized according to project phase (planning, construction, operation, and decommissioning) and for all project types.

Table 6: ESMP and Mitigation Program

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

		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					
3.	Public health risk At project implementation many new workers will be involved and new interactions between workers and local communities are likely to take place. These interactions are likely to pose risks to the social fabric of the society. Such risks include public health related issues such as (HIV/AIDS, communicable and sexually transmitted diseases (STDs).	• Public awareness of the public health issues identified. • Provision of condoms • Distribution of HIV & AIDS awareness materials in collaboration NACC	Inspection	Safety Engineer/ Project Engineer	Availability of Condoms No of public health awareness sessions with workers	Construction	150,000
4.	Impact on Natural Vegetation	• KPLC to plant trees as a way of compensation 'offset' for the cleared ones	Inspections	Environmentalist	No of trees planted	Construction & operation	2,000,000

	The project will involve short service lines within the 600m radius mainly along the road reserve. No tall growing trees will be allowed below the lines or along the way leave trace. Grass and short vegetation will be cleared to pave way for erection of poles.	• Clear limited areas only where the pole will be erected • Select alternative alignments to avoid sensitive natural features					
5.	Construction material sourcing- wooden poles. Majority of these distribution lines are constructed using wooden poles. This would impact on the environment significant number of wooden poles will be required to connect electricity to new users from the mini grids	• Plant more trees to compensate 'offset' for the poles used • Ensure accurate budgeting to ensure only necessary material is ordered • Proper storage to ensure minimal loss • Supply tree seedlings to schools & farmers to increase forest cover/establish woodlots	Inspection	Environmentalist/ project Engineer	No wooden poles used No of trees planted	Construction period	1,500,000
6.	Impacts on air quality from vehicle exhaust emissions	• Drivers shall not leave vehicles idling so that exhaust emissions are lowered.	Inspection	Project engineer	No vehicle idling onsite	Construction	Nil

	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.	• Maintain all machinery and equipment in good working order to ensure minimum emissions are produced.			Vehicle maintenance Records		
7.	Solid waste Little if any solid waste will be generated which includes conductor and tree cuttings.	• All left over conductor cuttings to be disposed appropriately or be returned to the store for proper disposal • Proper budgeting of materials to reduce wastage • practice 3 Rs of waste management: reduce, reuse, recycle of materials • Manage storage, transfer, and disposal of transformer oils according to industry standards	Inspection	Project Engineer	No waste on site Records of material return to store if any	Construction & Decommissioning	
8.	Noise	• Proper servicing of vehicles • Not necessary for power lines of such low voltage. However contractor should ensure minimal noise generation during construction and decommissioning phases • Maintain all work equipment at optimal operating condition	Inspection	Project Engineer / Safety Engineer	Vehicle maintenance Records	Construction & decommissioning	Nil

		• Monitor noise levels at sensitive receptors (residential areas, schools, hospitals) • Work through community liaison officers to agree on working hours and to respond promptly to complaints.					
9	Risk of Fire from live conductors and Transformers- Potential adverse impacts related to fire hazards remain a main feature of this project. The Transformers will have combustible products like the transformer oil and the risks associated with fire hazards form a significant adverse impact on the human health and environment	• No burning of vegetation along the distribution lines rights-of-way • Timely maintenance of the right of way • Time maintenance of transformers	Routine maintenance	Operation and Maintenance Engineer	Way leave and Transformer maintenance Records	Operation	1,000,000
10.	Damage to crops and trees-	Compensation for loss of crops and trees to the owners	Verification with owners of crops	Socio- Economist	Records of payments made	Construction and operation	Nil
11	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.	Close monitoring of the contractor	Environmental specialist	Records of any chance finding and report to the NMK	Construction	20,000

		Chance find procedures will be included in contracts and in the environmental documents.					
12.	Oil Leaks -The refilling and empting of the transformer oil can lead to accidental oil spills. There is a possibility of oil leaking from the transformers can lead to oil spills. This may lead to potential contamination of surface and groundwater as well as soil.	• Need to design appropriate protection devices against accidental discharge of transformer oil substances. • Frequent inspection and maintenance of the transformers should be done to minimize spilling. • All waste oils from maintenance of transformers and other associated equipment should be segregated and disposed properly by a reputable/registered waste handler in accordance with the waste disposal plan.				Operation and decommissioning	400,000

Table 7: Typical impacts and mitigation measures for Way Leave acquisition and Component 1and 3 for the K-OSAP project

Project Activities/ Environmental Aspects	**Potential Associated Impacts**	**Mitigation Measures**
Acquisition of Right of Way (ROW)	Anxiety among potentially affected landowners and users	Work through community liaison officers to keep public fully informed
	Dissatisfaction with compensation; disruption of livelihoods	Prepare and implement compensation plan in accordance with the RPF guiding principles and way leave regulations
	Loss of natural habitat	• Give preference in site selection to land already converted • Select alternative alignments to avoid protected areas and other sensitive natural features
	Loss of or damage to cultural resources	• Select alternative alignments to avoid physical cultural resources

		• Where avoidance is impossible, comply with World Bank OP 4.11 on Physical Cultural resources and consult with national authorities and/or local leaders on best way to preserve or relocate cultural property. • Formulate and implement chance finds procedure
Clearance of Brush	Loss or fragmentation of or increased access to natural habitat, leading to reduction in biodiversity, possible impacts on rare or endangered species	• Give preference in site selection to land already converted • Minimize width of cleared area • Use labor-intensive mechanical clearing methods to maximize employment opportunities and avoid impacts of herbicides
	Accumulation of brush and debris	• Use appropriate disposal techniques; prohibit burning
Pole installation and Cable Stringing; Equipment Delivery and Installation	Soil / groundwater contamination from accidental fuel/engine oil spill refueling	• Store fuel and chemicals on an impermeable surface with a bund that will hold 110% of the capacity of fuel and chemicals stored. • Train personnel in safe fuel handling • Use drip pans to contain any spills during refueling activities
	Onsite noise and vibration and other hazards.	• Maintain all work equipment at optimal operating condition • Enforce use of PPE • Implementation of weekly Health and Safety (H&S) training • Daily tool box talks
	Disturbance by noise and vibration in surrounding communities	• Maintain all work equipment at optimal operating condition • Monitor noise levels at sensitive receptors (residential areas, schools, hospitals) • Work through community liaison officers to agree on working hours and to respond promptly to complaints. • Sensitize workers to reduce noise during working hours in sensitive areas
	Risk of accidents to life and property	• Set and enforce speed limits • Mandatory driver training • Use warning signs and, where necessary, personnel to direct traffic
	Damage to roads and other infrastructure caused by transit of heavy trucks	• Routine inspection, and prompt repair of any damage
	Working at heights and in confined spaces.	• Adequate ladder should be provided • Provision of climbing shoes • Provide safety harness

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

11.2 Environmental and Social Management Plan (ESMP)

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

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

Thus, the provided ESMP (annex 6) (i) describes the potential adverse environmental and social impacts of future projects; (ii) outlines proposed mitigation measures to be adopted and indicate parties responsible for implementing mitigation measures; (iii) identifies parties that will carry out the monitoring of the implementation of the mitigation measures; (iv) outlines the time horizons for the various activities; and (v) detail the associated costs and sources of funds. The ESMP will be included in the Project Implementation Manual and the cost estimates for implementing the ESMP will be included in project cost tables.

11.3 Monitoring Plan

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

a) Play the role of facilitating the implementation of the projects
b) To produce annual and periodical reports to the bank indicating the actions that has been undertaken towards the implementation of projects on the environmental status.
c) Drawing up project objectives for monitoring purposes
d) Develop the key indicators for monitoring purposes with the bank and ensure the monitoring capabilities.
e) Carrying out Environmental awareness campaigns and collaborates with other stakeholders where these projects will be implemented.
f) MoEP, REA and KPLC will be fully involved in the implementation of the project.

The capacity building is needed for MoEP, REA and KPLC safeguards units in terms of training which will involve regional safety engineers/officers and environmental and social units staff in KPLC, REA and MoEP since they will be involved directly in implementing the subprojects and in carrying out environmental and social screening and monitoring. These trainings will ensure the safeguardsstaffs have adequate manpower in all aspects of environment and social for sustainable development. Provision of necessary equipment for better execution of their duties and proper monitoring of these subprojects to ensure continuity and sustainability should be provided. The following course shall be offered to the environmental and social safeguards staff who will oversee the environmental and social aspects of the proposed projects. They include;

a) Environmental and Social Management Systems and Impact Assessment& Implementation of the ESMF, Hazardous Waste Management and Pollution Control and
b) Strategic Environmental and Social Assessment (SESA) & Project Management and Monitoring and evaluation

c) Social Impact Assessment
d) NEBOSH International Certificate in Occupational Safety & Health
e) REA environmental and social unit needs additional staff to cope with its many tasks, which include the donor funded projects.

CHAPTER TWELVE: INSTITUTIONAL CAPACITY FOR ENVIRONMENTAL MANAGEMENT

12.1 Responsibilities for Environmental and Social Monitoring

Environmental and social monitoring will be carried out by the MoEP, REA and KPLC PIUs in conjunction with the relevant government departments that have been given that responsibility by the Kenyan laws. Monitoring of environmental and social safeguards will be undertaken by the environmental and social experts that support the MoEP, KPLC, REA PIUs, reporting will done on quarterly basis during the implementation of the subprojects, as well as during operation and maintenance of the subprojects, the reports will be submitted to the World Bank on quarterly basis and during implementation support missions. The table below provides some of the key environmental and social monitoring indicators, to be adapted to the projects as necessary.

Table 8: Key Environmental and Social Monitoring Indicators

ISSUE	REMARKS
Reduction in soil erosion	
Increase in re-afforestation	
Drainages around infrastructures	
Wayleave acquisition	
Hectare 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 Labour Influx related risks associated with the implementation of K-OSAP	
Number of people employed from project surrounding areas	
Construction Works of the proposed projects	
Hectarage of land clearance	
Project areas where infrastructure will be constructed	
Number of pit latrines for workers at camp site	
Number of water points for workers at camp site	
Number of environmental mitigation measures implemented and financed by projects	
Implementation status of safe disposal of creosote-treated poles	
Implementation status of the Environmental Guidelines for Contractors	
Number of staff and other personnel having completed	

environmental training	
Implementation status of safe disposal of PCB	
Number of complaints on inconveniences caused by the construction works (complaints against dust)	
Number of Accidents	
Number of cases contravening health and safety procedures	
Number of disposal sites for wastes from the construction sites and camp sites	
Number of Disposal sites that will be restored to original or better state in terms of environmental degradation.	

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

12.2 Monitoring, Evaluation and Reporting

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

12.3 Capacity Building and Environmental Training

Capacity building should be undertaken for the REA environmental department, MoEP safeguards unit and KPLC SHE department and Regional Safety Officers/Engineers to ensure that the ESMF is effectively operationalized. The MoEP, REA's, and KPLC PIUs and regional staff involved in environmental and social matters have to be exposed to formal training in the management of environmental and social issues. The training program for various role players will include an orientation program on the ESMF to be done by MoEP safeguards unit, REA environmental and social unit and KPLC SHE department which will include environmental and social 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 MoEP, REA, and KPLC PIUs and regional staff as well as some staff of the environmental and social units 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 analyze potentially adverse environmental impacts, to prescribe mitigation approaches and measures, and to prepare and supervise the implementation of environmental and social management plans. This training will address such matters as community participation methods; environmental assessment; using the ESMF; and project supervision and monitoring;
- The community members will be trained on better methods of environmental conservation and management.

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

Environmental conservation and management;	Project management;
SEA Trainings	Climate change among others.
ESMF implementation and Monitoring Trainings	Environmental quality assessment and monitoring
Monitoring and evaluation;	Ecological assessment trainings on Fauna and Flora
Waste management;	

CHAPTER THIRTEEN: 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 from implementing division/departments/ sections such as projects, environmental and social units, SHE, Network Management, Chain Supply Management and Finance will enable them to screen, review and monitor environmental issues in the sub-projects to ensure compliance with requirements of the National policies, laws and regulations as well as World Bank safeguard policies. Based on experience from other related assignments the estimated cost for technical assistance for capacity building would be Kshs. 10,000,000.00

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. The estimated costs for such processes would be Kshs. 6,000,000.00
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 Kshs. 3,000,000.00.

Table 9: Estimated level of costs for ESMF Implementation

S/NO	ESMF Proposed Actions	Concerned Institution	Level of cost (Kshs.)
1	Training and capacity Building	MoEP, KPLC and REA Environmental and Social Units, Procurement, infrastructure and Network Management	20,000,000
2	Screening and reviewing	Project Implementation Unit	3,000,000
3	Monitoring activities	PIUs, NEMA	3,000,000
	Total Costs		**26,000,000**

The cost implications for implementing this ESMF are reflected in table 6 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.

CHAPTER FOURTEEN: CONCLUSIONS 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 components that are to be identified and cleared under the K-OSAP.

This ESMF is meant to ensure that the implementation of the K-OSAP, of which the specific 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 Amended EMCA, 2015 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 with precision.

The framework delineates 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;

- Training needs. Staff who will be appointed to the Project Implementation Units (PIU) for K-OSAP Project, 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 ESIA processes and methods, impact analysis, EIA review, the role of the public and stakeholders, ESIA experience in Kenya, and case studies. Other training needs are explained in chapter 10.

- The implementation of K-OSAP 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 K-OSAP project as well as its subprojects must comply with the Kenyan Policies and Laws as well as World Bank Polices as defined in Chapter 5 and 6.

- Adherence to ESMF requirement. 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 K-OSAP. Furthermore, appropriate roles and responsibilities, for managing and monitoring environmental and social concerns related to sub-projects should also be followed.

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ANNEXES