THE KENYA POWER AND LIGHTING COMPANY LIMITED

Environmental and Social Impact Assessment Report for the Proposed Kisii-Awendo, 132kv Transmission Line

Final Project Report

Nicholson Court, Nicholson Drive
Off Ngong Road
P.O. Box 10677
00100 – Nairobi, Kenya.
Tel: +254 20-2712156
Fax :+254 202017254
E-mail: info@logassociates.com
Http: www.logassociates.com

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We wish to thank PAPs, local communities and the provincial administration, graciously provided pertinent data and/or information, documents and actively participated in the many consultative meetings, discussions, and public participation that were carried out during the assessment process.

LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ASALs	Arid and Semi Arid Lands
EMF	Electro-Magnetic Fields
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental Management Plan
HIV	Human Immunodeficiency Virus
KPLC	The Kenya Power and Lighting Company limited
KCAA	Kenya Civil Aviation Authority
KETRACO	Kenya Electricity Transmission Company
kV	Kilo volt – 1,000 volts
KWS	Kenya Wildlife Service
MW	Megawatts
NEMA	National Environmental Management Authority
OTHL	Overhead Transmission Lines
PAPs	Project Affected Persons
PS	Performance Standards
RAP	Resettlement Action Plan
ROW	Right of Way
WB	World Bank
ILO	International Labour Organization

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EXECUTIVE SUMMARY

Background

The Government of Kenya is expecting to receive funds from World Bank to finance the construction of approximately 44km of a single circuit 132 kV transmission line from Kisii to Awendo.

The study conducted conformed to the requirements of the World Bank environmental and social policies, guidelines and assessment procedures in addition to those of National Environment and Management Authority (NEMA) as stated in The Environmental Management and Coordination Act (EMCA) 1999 and stipulated in the Environmental (Impact Assessment and Audit) Regulations 2003 Legal Notice No. 101.

Objective

The objective of the assignment was to:

I. Identify and assess potential environmental and social impacts of the proposed project
II. Identify all potential significant adverse environmental and social impacts of the proposed project and recommend mitigation measures
III. Verify compliance with the environmental regulations and industry's standards
IV. Generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the project life cycle
V. Recommend cost effective measures to be implemented to mitigate against expected impacts
VI. Prepare an Environmental Impact Assessment report compliant with the Environmental management and Coordination Act (1999) and detailing findings and recommendations
VII. Identify and quantify different categories of project-affected people (PAPs) who would require some form of assistance, compensation, rehabilitation or relocation
VIII. Provide guidelines to stakeholders participating in the mitigation of adverse social impacts of the project
IX. Verify the adherence and compliance of the World Bank's Safeguard Policies

Methodology

Review of documents

The consultant reviewed relevant documents relating to the assignments to have in-depth understanding and to gain sufficient background information regarding the project. A review of various policies, regulatory and relevant legal documents was also carried out.

Participatory methodology

The consultant adopted a participatory methodology during the study. The consultant carried out extensive field visits between 30 September 2009 and 9 October 2009. During the field visits, several consultative meetings were conducted with the client's representatives, the communities, the provincial administration and other key stakeholders. Several public consultation meetings were also conducted with the Project Affected Persons (PAPs), provincial administration and the communities in general.

Angle Points

Since survey of the proposed lines has not been done, the consultant used the angle points in the Feasibility Report which guided the consultant in establishing the location of the proposed line.

Proposed Project Cost

The total calculated project cost is approximately USD 10 million. This value is exclusive of duties and taxes, wayleave costs and 5% contingency. A detailed breakdown of costs associated with compensation for lost assets of project affected people is given in the RAP Report. Environmental monitoring cost estimates are given in Section 8 of this Report.

Findings

1. **Project Phasing**

The proposed project was noted to have four overlapping phases of implementation. These are the pre-construction phase, construction phase, operational phase and the decommissioning phase.

2. Legislative Framework

The project will comply with World Bank (WB) Environmental Guidelines on Projects and EIA Studies. There exist also a number of local legislations and regulations that the project shall have to comply with. The Environmental Management and Coordination Act, 1999 and regulations 2003 provide overall guidelines to project implementation. Together with several other local laws mentioned in Chapter Two of this report, these local legislations shall have to be complied with throughout the project life.

Kenya is also a signatory to several international conventions, protocols and treaties and is therefore bound by the requirements of these conventions and protocols. Some of the relevant global policies include:

- The convention on biodiversity
- Convention on the conservation of migratory species
- The Ramsar Convention on wetlands
- Various World Bank Operational Policies
- United nations Framework Convention on Climate Change

3. Consultation with PAPs

Consultations carried out were generally with the communities that lived within the vicinity of the proposed line. The consultant, in collaboration with the provincial administration consulted with the specific PAPs along the entire 44 km of the proposed line. Three Barazas were held along the line.

4. Project Impacts and Mitigation Measures

The environmental and social impacts of the project shall be spread through the four project phases. There will be both positive and some minor negative project impacts. The following section briefly describes some of the major impacts and proposed mitigation measures within each of the project phases.

a. Pre-Construction Phase

The first site activities before mobilization of equipment will be survey required for final design of line and tower foundations. There will be negative impacts on land associated with the construction of camps (temporary loss) and storage of construction materials, and foundations for the towers (permanent loss), especially if such construction is carried out on agriculturally productive land. Expectations of improvement in livelihood among locals should be addressed through public participation. Construction contracts will include environmental monitoring and management procedures and requirements. These must be in place prior to the commencement of any construction activities

b. Construction Phase

This phase of the assignment will have both positive and negative impacts. The positive impacts are employment opportunities offered to the construction workers and any other labourer who will be hired to provide their services during the construction phase. The negative impacts would include wastes generated, accidents, health and safety, air, dust and noise pollution, vegetation clearance, soil erosion, socio-environmental issues, loss of trees, and compaction of soil. Most of the above negative impacts are minor and temporary. However, on mitigating the other negative impacts, the contractor shall ensure that all staff had adequate protective clothing and were adequately trained and follow the guidelines for contractors. The vegetation cleared from site will also be shared with local communities as firewood. The whole range of mitigation measures are however, outlined in the ESMP.

c. Operational Phase

With the establishment of the proposed transmission lines, The Kenya Power and Lighting Company limited will be able to increase its electric power reliability and provide additional electric power capacity. The proposed project will have minimal negative effects which include: perceived dangers of electrostatic and magnetic force, electrocution, loss of aesthetic value, Corona sound effect from high voltage lines, vibrations and telecommunication interference.

d. Decommissioning Phase

As with any project, the facilities, such as towers and cables and substations' equipment used in this Project will have a lifetime after which they may no longer be cost effective to continue operation. At that time, the project would be decommissioned, and the existing equipment removed. Where possible KPLC may want to re-power the site (replace existing project equipment with new project equipment on the same site). Decommissioning also occurs when KPLC ceases to have interest on the existing line or have other reasons that make it mandatory to leave the existing line.

Potential environmental impacts caused during decommissioning are those, which will be mitigated as provided environmental management plan. These include dust and noise to the surrounding environment, fire, oil spills and public safety.

The disposal of materials from the decommissioned Transmission line is not seen as a high-risk matter. Much of the material would be recyclable (steel structures and cabling) or inert (insulators, concrete foundations, etc.). These materials would however, need to be disposed off at a formal waste disposal or recycling centre. There are no hazardous materials associated with the Transmission line itself.

Conclusions

Based on the above, the consultant wishes to document the following conclusions:

- It is unlikely that the Project will have significant adverse social and environmental impacts. Most adverse impacts will be of a temporary nature during the construction phase and can be managed to acceptable levels with implementation of the recommended mitigation measures for the Project such that the overall benefits from the Project will greatly outweigh the few adverse impacts.

- All the negative impacts will either be moderate or lesser in rating and could be easily mitigated.

- Generally, the proposed line will result in appreciable benefits to the people in the project area of influence and bring opportunities for development to the country. The main social impact management issues revolve around relocation of people along the transmission line corridor and acquisition of the right of way and way leave of the transmission line.

- Detailed survey and pegging of the proposed line has not yet been done. This is urgently needed to aid in the preparation of a comprehensive Resettlement Action Plan.

Recommendations

From the foregoing, the following recommendations have been made:

1. Line Survey

KPLC should carry out a survey and mark the boundaries of the proposed transmission line. The consultant and KPLC will jointly inspect the surveyed line. This will aid in ascertaining the exact Project Affected Persons (PAPs).

2. Annual Environmental Audits

KPLC should undertake an environmental audit (EA) of the projects, in accordance to NEMA Regulations, twelve (12) months after completion of the project to confirm the efficacy and adequacy of the ESMP. This can be done by seeking the services of Environmental Consultants who should be Lead Agents registered by NEMA. The team should consist of the following experts as a minimum:

- Lead Environmental Consultant (Senior Environmentalist/Team leader)
- Sociologist

In addition to this KPLC should also conduct regular Self Audit of the same.

3. Implementation Plan

The consultant recommended that the proposed projects be implemented in compliance with all the relevant legislation and planning requirements of Kenya at all times. In addressing the environmental issues, the contractor and/or KPLC must follow the mitigation guidelines provided under EMP. This will ensure the safety of operators and the neighbouring communities. It is also recommended that a safety officer should be stationed at every site, during the whole construction phase. The safety officer will make sure that a first aid kit is always available and that all the skilled workers follow the safety rules.

4. Corporate Social Responsibility

Kenya Power and Lighting Company shall consider supporting the affected communities in water provision, and rural electrification.

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Chapter 1

1.0 INTRODUCTION

1.1 Purpose

This Report has been prepared following a request by the Client-***The Kenya Power and Lighting Company limited***, to the consultant ***Log Associates***, to carry out *Environmental & Social Impact Assessment of the proposed Kisii-Awendo 132kV Transmission Line*.

1.2 Background

The Government of Kenya is expecting to receive funds from World Bank to finance the construction of approximately 44km of a single circuit 132 kV transmission line from Kisii to Awendo.

The study conducted conformed to the requirements of the World Bank environmental and social policies, guidelines and assessment procedures in addition to those of National Environment and Management Authority (NEMA) as stated in The Environmental Management and Coordination Act (EMCA) 1999 and stipulated in the Environmental (Impact Assessment and Audit) Regulations 2003 Legal Notice No. 101.

1.3 Objectives

The objective of the assignment was to:

I. Identify and assess potential environmental and social impacts of the proposed project
II. Identify all potential significant adverse environmental and social impacts of the proposed project and recommend mitigation measures
III. Verify compliance with the environmental regulations and industry's standards
IV. Generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the project life cycle
V. Recommend cost effective measures to be implemented to mitigate against expected impacts
VI. Prepare an Environmental Impact Assessment report compliant with the Environmental management and Coordination Act (1999) and detailing findings and recommendations
VII. Identify and quantify different categories of project-affected people (PAPs) who would require some form of assistance, compensation, rehabilitation or relocation
VIII. Provide guidelines to stakeholders participating in the mitigation of adverse social impacts of the project
IX. Verify the adherence and compliance of the World Bank's Safeguard Policies

1.4 Scope

The ESIA was carried out in compliance with the Government of Kenya's Environmental Management & Co-ordination Act of 1999 and the Environmental (Impact Assessment & Audit) Regulations, June 2003, World Bank's Environmental and Social considerations policies among other relevant laws, regulations, and guidelines standards. To meet the objectives stated in section 1.3 above, the consultant undertook the following tasks.

i. **Literature review:** gathering environmental and social information pertaining to the project

ii. **Description of the baseline environment:** collecting and present baseline information on the environmental characteristics

iii. **Detailed Description of the proposed project:** describing the proposed project, its geographic location, ecological, general layout of facilities including maps at appropriate scale where necessary

iv. **Legislative and Regulatory Framework:** identifying and describing all pertinent regulations and standards governing environmental quality, solid and liquid waste management, health and safety, protection of sensitive areas, land use control at the national and local levels and ecological and socio-economic issues including compliance issues.

v. **Identification of potential Impacts: A**nalysis and description of all significant changes expected due to the proposed project

vi. **Occupational Health and Safety Concerns:** Analysis and description of all occupational health and safety concerns likely to arise as a result of the construction of the proposed project

vii. **Public Participation:** Consultations with the public on the positive and negative impacts of the proposed project

viii. **Mitigation Measures:** Proposing feasible mitigation measures for the negative impacts that could result from the proposed transmission line project.

ix. **Environmental Management Plan:** Developing an Environmental Management Plan to mitigate negative impacts:

x. **Monitoring Plan:** Developing an Environmental Monitoring Plan

xi. **ESIA Report:** Preparing and submitting an Environmental and Social Impact Report.

Chapter 2

2.0 METHODOLOGY

2.1 Our Approach

To enrich this review and ensure optimal participation of all the stakeholders, a participatory and collaborative approach was adopted. Emphasis was put on consultations between, KPLC, the communities and other stakeholders. The consultant concisely described the project and its geographic, ecological and general layout of facilities. Additional information on size and capacity of pre-construction activities, construction activities, schedule, support, material/facilities and services and operation and maintenance activities were also taken into account. In addition to environmental and social impacts of the project were identified with subsequent mitigation measures.

2.2 Methodology

2.2.1 Desk Review

The consultant reviewed relevant documents relating to the assignments to have in-depth understanding and to gain sufficient background information regarding the project. The following documents formed part of this review:

- Final Feasibility Report by SMEC
- World Bank safeguards policies.
- Revised NEMA guidelines
- The Agricultural Act, Cap 318
- The Energy Act of 2006
- The Occupational Safety and Health Act, 2007
- Kenya Electricity Grid Code
- The Public Health Act
- The Constitution of Kenya
- The Environmental (Impact Assessment and Audit) Regulations, 2003
- The Occupational Safety and Health Act 2007
- The Water Act 2002
- The Wildlife (Management and Conservation) Act
- The Forests Act 2005
- Government Lands Act, Cap. 280 (revised 1984)
- Chief Authority Act
- Trust Lands Act Cap. 288 of 1962 (revised 1970)
- Local Government Act, Cap. 265 (revised 1986)
- The Land Adjudication Act, Cap. 284 of 1968 (revised 1977)

- Registered Lands Act, Cap. 300 of 1963 (revised 1989)
- Physical Planning Act, Cap. 286
- The Physical Planning Act (Cap 286)
- Geothermal Resources Act No. 12 of 1982
- Employment Act No 11 of 2007
- Labour Institutions Act No. 12 of 2007
- Building Code 1997
- Use of Poisonous Substances Act rev. 1983 Cap 247
- Traffic Act Cap 403
- Penal Code Cap 63
- Standards Act Cap 496
- Antiquities and Monuments Act, Cap 215
- Lakes and Rivers Act, Cap 409
- Public Roads and Roads Act, Cap 22
- Wayleaves Act Cap 292
- Relevant International Conventions and Treaties

2.2.2 Data Collection Tools

Before starting the review, the consultant prepared the assessment data collection tools to adequately gather the required information. These tools included:

i. Household questionnaire
ii. Observation checklist
iii. Public consultation guide
iv. Digital Camera

2.2.3 Observations and Measurements

The assessment team conducted field observations along the proposed lines to obtain further data and consult the stakeholders. We established the location (into more details from the initial site visit) and nature of the surroundings which included existing infrastructure and social set up of the local communities whose normal daily activities would be and/or likely to be affected by the construction of the project.

Estimates of the affected areas around the wayleave were also taken and are provided in detail in the Resettlement Action Plan.

2.2.4 Public Consultation Forums

The consultant organized and convened a public consultation meeting between:

a) Client- To share the project information in terms of its implementation and predicted impacts.
b) Communities- To convey the consultation theme

c) Individuals- Project Affected Persons (PAPs)
d) Provincial administration

A total of twelve public consultation meetings (*barazas*) were held along the proposed line. The person contacted was the chief or the assistant chief in the area who facilitated the meeting. They were also assisted by village elders. The meetings had the following agenda:

1. Opening prayer
2. Introduction of team and issue by local leader
3. Presentation of the proposed project by the consultants
4. Demonstration of the approximate location of the power line, either by showing computerized maps or by drawing in the sand and giving reference points and distances
5. Community comments and discussions on the proposed projects
6. Summary of issues to be included in the report.
7. Signing of participant list. Names of illiterate persons were entered by a literate participant.
8. Closing prayer

2.2.5 Data Management

1. Data Collection, Entry and Cleaning

The consultant used MS Excel 2007 for data management. Data entry was conducted concurrently with data collection in the field. After the data entry, cleaning was done to ensure the data entered was in the form that enabled the ease of analysis.

2. Data Analysis

All the data collected was analysed using MS Excel and other data analysis tools that were deemed necessary. The consultant drew inferences from the qualitative data collected based on professional understanding and experience. The findings from the analysis of field data and document reviews guided the basis of the recommendations and conclusions made in this report.

Chapter 3

3.0 LEGISLATIVE FRAMEWORK

This ESIA has been prepared to fully comply with environmental legislations and procedures in of the World Bank and those of Kenya. These World Bank Safeguard policies will be taken into account along with Kenyan legislations during project implementation.

3.1 World Bank Safeguard Policies

3.1.2 Environmental Assessment: OP/BP 4.01

The objective of this policy is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is triggered if a project is likely to have potential (adverse) environmental risks and impacts on its area of influence. OP 4.01 covers impacts on the natural environment (air, water and land); human health and safety; physical cultural resources; and trans-boundary and global environment concerns.

A range of instruments can be used to conduct Environmental Assessments i.e. EIA, environmental audit, hazard or risk assessment and environmental management plan (EMP). The Borrower is responsible for carrying out the EA. The Kisii-Awendo line has already been subjected to an EIA to meet this policy requirement which makes the proposed project eligible for the World Bank financing.

3.1.2 Natural Habitats: OP/BP 4.04

This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal, and marine ecosystems. They include areas lightly modified by human activities, but retaining their ecological functions and most native species.

This policy is triggered by any project (including any subproject 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 impacts assessment postulates no significant conversion or degradation of natural habitats. Potential impacts on habitat, project and site alternatives have been identified and mitigation measures proposed and given due consideration in the Environmental and Social Management Plan (ESMP).

3.1.3 Forests: OP/BP 4.36

The objective of this policy is to assist borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development and protect the vital local and global environmental services and values of forests. Where forest restoration and plantation development are necessary to meet these objectives, the Bank assists borrowers with forest restoration activities that maintain or enhance biodiversity and ecosystem functionality. The Bank assists borrowers with the establishment of environmentally appropriate, socially beneficial and economically viable forest plantations to help meet growing demands for forest goods and services.

This policy is triggered whenever any Bank-financed investment project

i. Has the potential to have impacts on the health and quality of forests or the rights and welfare of people and their level of dependence upon or interaction with forests; or
ii. Aims to bring about changes in the management, protection or utilization of natural forests or plantations.

The area along the proposed line does not have any forest. However there are many individually owned tree plantations which will be fell down. The policy should ensure therefore that the affected persons are compensated for any tree that KPLC will cut.

3.1.4 Physical Cultural Resources: OP/BP 4.11

The objective of this policy is to assist countries to avoid or mitigate adverse impacts of development projects on physical cultural resources. For purposes of this policy, "physical cultural resources" are defined as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or underwater. The cultural interest may be at the local, provincial or national level, or within the international community.

This policy applies to all projects requiring a Category A or B Environmental Assessment under OP 4.01, project located in, or in the vicinity of, recognized cultural heritage sites,

and projects designed to support the management or conservation of physical cultural resources. Physical cultural resources and cultural heritage sites are not located in the project area and thus, it will not trigger OP 4.01

3.1.5 Indigenous Peoples: OP/BP 4.10

The objective of this policy is to

i. Ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples;
ii. Ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and
iii. Ensure that indigenous peoples receive culturally appropriate and gender and inter-generationally inclusive social and economic benefits.

The project will affects people living in the project area thus triggering OP/BP 4.10. The inhabitants here are mainly the Luos and Kisiis. Some with small portions of land will have to be relocated while others will be compensated for the ROW easement.

3.1.6 Involuntary Resettlement: OP/BP 4.12

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:

i. Relocation or loss of shelter;
ii. Loss of assets or access to assets;
iii. Loss of income sources or means of livelihood, whether or not the affected people must move to another location.

It 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.

The proposed project is going to displace people and some will lose their land and other property. Displaced persons should be assisted by KPLC in their efforts to improve their former production levels, income carrying capacity, and living standards, or at least restore them to levels they would have been without the project. The cost associated with this has been provided in RAP report for the same.

3.1.7 Projects in International Waters: OP 7.50

The objective of this policy is to ensure that Bank-financed projects affecting international waterways would not affect:

i. Relations between the Bank and its borrowers and between states (whether members of the Bank or not); and
ii. The efficient utilization and protection of international waterways.

The policy applies to the following types of projects:

a) Hydroelectric, irrigation, flood control, navigation, drainage, water and sewerage, industrial and similar projects that involve the use or potential pollution of international waterways; and
b) Detailed design and engineering studies of projects under (a) above, include those carried out by the Bank as executing agency or in any other capacity.

This policy is triggered if
(a) Any river, canal, lake or similar body of water that forms a boundary between, or any river or body of surface water that flows through two or more states, whether Bank members or not;
(b) Any tributary or other body of surface water that is a component of any waterway described under (a); and
(c) Any bay, gulf strait, or channel bounded by two or more states, or if within one state recognized as a necessary channel of communication between the open sea and other states, and any river flowing into such waters.

There are no transboundary rivers, canals, lakes or similar body of water in this area. It is only dominated by small springs, streams and rivers that are used by residents mainly for domestic use. This means therefore that this policy will not be triggered.

3.1.8 Projects in Disputed Areas: OP 7.60

The objective of this policy is to ensure that projects in disputed areas are dealt with at the earliest possible stage:

a) so as not to affect relations between the Bank and its member countries;
b) so as not to affect relations between the borrower and neighboring countries;
c) so as not to prejudice the position of either the Bank or the countries concerned.

This policy is triggered if the proposed project will be in a "disputed area". Questions to be answered include:

- Is the borrower involved in any disputes over an area with any of its neighbors?
- Is the project situated in a disputed area?
- Could any component financed or likely to be financed as part of the project be situated in a disputed area?

The consultant did not come across any disputed area along the proposed line.

Table 3.1: Summary of World Bank Safeguard Policies

World Bank Safeguard Policy	Triggered (√)	Not Triggered (×)
OP/BP 4.01-Environmental Assessment	√	
Natural Habitats: OP/BP 4.04		×
Forests: OP/BP 4.36		×
Physical Cultural Resources: OP/BP 4.11		×
Indigenous Peoples: OP/BP 4.10	√	
Involuntary Resettlement: OP/BP 4.12	√	
Projects in International Waters: OP 7.50		×
OP 7.60 Projects in Disputed Areas		×

3.2 Kenya's Environmental Legislation

The preparation of this ESIA has taken into account the requirements for Environmental Assessment under Kenyan laws, mainly under Section 58 of the Environmental Management and Co-ordination Act, 1999. The section also requires project proponents to obtain an EIA License before the implementation of a project. Some of the relevant laws in Kenya are:

3.2.1 National Environment Management Authority (NEMA) Environmental Laws

1. Environmental Management and Co-ordination Act (EMCA)

The Environmental Management and Co-ordination Act, 1999, is the legislation that governs Environmental Impact Assessment (EIA) studies. The Kenya Power and Lighting Company limited carried out this Environmental Impact Assessment (EIA) as per the second schedule of this act. This schedule lists the projects required to undergo EIA studies in accordance with section 58 (1-4) of the act. Electrical infrastructure is covered in part 10 of this schedule and this includes electrical transmission lines; and electrical sub-stations which is the core of this project. The Proposed Kisii-Awendo 132 kV transmission Line can also be classified as rural, peri-urban and urban development.

The Act provides for the National Environmental Management Authority (NEMA) whose objective and purpose is to exercise general supervision and coordination 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.

With the introduction of Environmental Impact Assessment and Audit Regulations, 2003 issued through Kenya Gazette Supplement No. 56 of 13 June 2003, the submission of environmental reports became mandatory. KPLC is conducting this assignment in order to comply with these regulations.

2. The Environmental (Impact Assessment and Audit) Regulations, 2003

Environmental Impact Assessment (EIA) is a critical examination of the effects of a project on the environment. The goal of an EIA is to ensure that decisions on proposed projects and activities are environmentally sustainable. This EIA is conducted in order to identify impacts of the project on the environment, predict likely changes on the environment as a result of the development, evaluate the impacts of the various alternatives on the project and propose mitigation measures for the significant negative impacts of the project on the environment.

The EMCA,1999 requires that during the EIA process a proponent shall in consultation with the Authority seek views of persons who may be affected by the project or activity through posters, newspaper, radio and hold at least three public meetings with the affected parties and communities. The Project proponent pays for the entire EIA process. The fee payable to NEMA is 0.1% of the project cost. The consultant held three public meetings with the affected persons during the EIA process.

Environmental Audit (EA) is the systematic documentation, periodic and objective evaluation of activities and processes of an ongoing project. The goal of EA is to establish if proponents are complying with environmental requirements and enforcing legislation. The purpose of EA is to determine the extent to which the activities and programs conform to the approved environmental management plan. A comprehensive EA ensures a safe and healthy environment at all stages of project operations and decommissioning.

An initial environmental audit and a control audit are conducted by a qualified and authorized environmental auditor or environmental inspector who is an expert or a firm of experts registered by the Authority. KPLC will undertake an initial environmental audit study to provide baseline information upon which subsequent environmental audits shall be based.

Self Audits are carried out after the environmental impact assessment study report has been approved by the Authority or after the initial audit of an ongoing project. The KPLC shall take all practical measure to ensure the implementation of the environmental management plan by carrying out a self auditing study on a regular basis.

3. Water Quality Regulations

Water Quality Regulations apply to water used for domestic, industrial, agricultural, and recreational purposes; water used for fisheries and wildlife purposes, and water used for any other purposes. Different standards apply to different modes of usage. These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources.

The objective of the regulations is to protect human health and the environment. The effective enforcement of the water quality regulations will lead to a marked reduction of water-borne diseases and hence a reduction in the health budget.

The regulations also provide guidelines and standards for the discharge of poisons, toxins, noxious, radioactive waste or other pollutants into the aquatic environment in line with the Third Schedule of the regulations. The regulations have standards for discharge of effluent into the sewer and aquatic environment. While it is the responsibility of the sewerage service providers to regulate discharges into sewer lines based on the given specifications, NEMA regulates discharge of all effluent into the aquatic environment.

The regulations provide for the creation of a buffer zone for irrigation schemes of at least fifty (50) metres in width between the irrigation scheme and the natural water body. Standards for irrigation water are given in schedule nine of the regulations.

During construction of the proposed line, the contactor and KPLC will refrain from any actions, which directly or indirectly cause water pollution. It is an offence to contravene the provisions of these regulations with a fine not exceeding five hundred thousand shillings.

4. **Waste Management Regulations**

The Minister for environment and natural resources gazetted these regulations in 2006. These Regulations may be cited as the Environmental Management and Co-ordination (Waste Management) Regulations, 2006. Waste Management Regulations are meant to streamline the handling, transportation and disposal of various types of waste. The aim of the Waste Management Regulations is to protect human health and the environment. Currently, different types of waste are dumped haphazardly posing serious environmental and health concerns. The regulations place emphasis on waste minimization, cleaner production and segregation of waste at source. Since this is an OHTL, the solid wastes that will be generated by the project will be minimal.

5. **Environmental Management and Coordination (Controlled Substances) Regulations, 2007 (Legal Notice No.73 of 2007)**

The Controlled Substances Regulations defines controlled substances and provides guidance on how to handle them. This regulation mandates NEMA to monitor the activities of persons handling controlled substances, in consultation with relevant line ministries and departments, to ensure compliance with the set requirements. Under these regulations, NEMA will be publishing a list of controlled substances and the quantities of all controlled substances imported or exported within a particular region. The list will also indicate all persons holding licenses to import or export controlled substances, with their annual permitted allocations.

The regulations stipulate that controlled substances must be clearly labelled with among other words, "Controlled Substance-Not ozone friendly") to indicate that the substance or product is harmful to the ozone layer. Advertisement of such substances must carry the words, "Warning: Contains chemical materials or substances that deplete or have the potential to deplete the ozone layer."

Producers and/or importers of controlled substances are required to include a material safety data sheet. Persons are prohibited from storing, distributing, transporting or otherwise handling a controlled substance unless the controlled substance is accompanied by a material safety data sheet.

Manufacturers, exporters or importers of controlled substances must be licensed by NEMA. Further, any person wishing to dispose of a controlled substance must be authorized by NEMA. The licensee should ensure that the controlled substance is disposed off in an environmentally sound manner. These regulations also apply to any person transporting such controlled substances through Kenya. Such a person is required to obtain a Prior Informed Consent (PIC) permit from NEMA. No controlled substances will be used during construction process and therefore, it is not necessary for KPLC acquire a license from NEMA for importation or disposal of the same.

6. Conservation of Biodiversity

Kenya has a large diversity of ecological zones and habitats including lowland and mountain forests, wooded and open grasslands, semi-arid scrubland, dry woodlands, inland aquatic, and coastal and marine ecosystems. In addition, a total of 467 lake and wetland habitats are estimated to cover 2.5% of the territory. In order to preserve the country's wildlife, about 8% of Kenya's land area is currently under protection. The proposed line in Kisii-Awendo area does not pass through any known protected area which is specified in this regulation.

Kenya has established numerous goals, as well as general and specific objectives that relate to these issues, among others: environmental policies and legislations; involvement of communities; documentation of national biological resources; sustainable management and conservation of biodiversity; fair and equitable sharing of benefits; technical and scientific cooperation; biodiversity assessment; dissemination of information; institutional and community capacity building; and integration of biodiversity concerns into development planning

Aside from increasing the coverage of protected areas and establishing new special status sites, Kenya also intends, through its Strategy for Revitalizing Agriculture, to achieve by 2014 comprehensive development of the agricultural sector at all levels for the benefit of the population. On the subject of conservation of species, specific targets and programmes have been established regarding, among others, mangroves, coral reefs, turtles, and black rhinos.

7. Draft Air Quality Regulations, 2008

This regulation is referred to as "The Environmental Management and Coordination (Air Quality) Regulations, 2008". The objective is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources such as mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act, 1999. It also covers any other air pollution source as may be determined by the Minister in consultation with the Authority. Emission limits for various areas and facilities have been set. The regulations provide the procedure for designating controlled areas, and the objectives of air quality management plans for these areas.

The following operations (provided they are not used for disposal of refuse), are exempt from these regulations:
(a) Back-burning to control or suppress wildfires;
(b) Fire fighting rehearsals or drills conducted by the Fire Service Agencies
(c) Traditional and cultural burning of savanna grasslands;
(d) Burning for purposes of public health protection;

This policy should be adhered to because air and dust emissions will be an issue during the construction of access roads and clearing of vegetation along the ROW, especially since it is recommended that construction take place during the dry season. However, the impact is not expected to be major.

8. Environmental Management (Noise and Excessive vibration Pollution Control) Regulation 2009, Legal Notice 61.

This law has given general prohibitions on excessive vibrations, and permissible noise levels. It gives provision related to noise from certain sources such as radio and television, and other sound amplifiers, parties and social events, hawkers, peddlers, touts street preachers, machinery, noise from motor vehicle, construction at night and noise, excessive vibrations from construction, demolition, mining or quarrying sites. This law should be adhered to since noise resulting from access road and transmission line construction may disturb neighbouring communities and local fauna.

9. The Environmental Management and Co-Ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009,Lecal Notice No. 19

The regulations seek to ensure the protection of wetlands, catchment areas, river banks, lake shores, and sea shores. The regulations require project proponents with projects likely to affect wetlands, river banks, lake shores or sea shore to conduct Environmental

Impact Assessment. Since the area has many rivers, KPLC should be careful not to cause pollution to these rivers.

3.2.2 Energy Act No 12 of 2006

The Energy Act 2006 became law on 2nd January 2007. The Act establishes an energy commission, which is expected to become the main policy maker and enforcer in the energy sector. This commission among other things shall be responsible for:

- Issuing all the different licenses in the energy sector.
- Prescribing the licensing processes
- Setting and enforcing energy policies
- Collecting and disseminating energy data
- Public education and enforcing energy conservation

With this act, all the different aspects of energy e.g. electricity, petroleum and renewable energy are brought under one ambit unlike the case as was before.

i. Generation, Transmission, Distribution

The act prescribes the manner with which licenses shall be obtained for generating, transmitting and distributing electricity. It clearly exempts private users from these licensing requirements for any power less than 1MW generated at the user's premises. However, a license is required if:

- Generating is more than 1MW or
- The power requires a transmission system from the generation site to the consumption site or
- The power will be distributed to others (members of the public)

The specific requirements e.g. how much to pay for a license shall be determined by the energy commission. There is an unclear clause exempting power up to 3MW from some licensing issues, but this seems to be excluded by the specific exemptions that use the 1MW figure. Section 41(A) makes provisions for treating several licenses belonging to the same licensee as one e.g. if you have several wind energy sites and you wish to compile one amalgamated annual report. The act requires electrical installations to be done by a registered electrician. The act also requires that all accidents and fatalities at energy facilities be reported officially to the commission.

ii. Rural Electrification Authority

The act in section 67 establishes a rural electrification authority. Among other tasks, this authority is mandated to:

- Facilitate the access to electricity in rural areas

- Promote the development of renewable energy (including solar, wind and micro hydro)
- Levy a fee on all electricity sold for the rural electrification fund
- Nothing in the act prevents the authority from using funds collected under the rural electrification fund for financing renewable energy - it is not a special fund just for grid electricity

3.2.3 The Wildlife Conservation and Management Act, Cap 376

This Act was enacted to consolidate and amend the law relating to the protection, conservation and management of wildlife in Kenya. Section 9 of the Act states that 'the Director of Wildlife Conservation shall, through the officers of the service, control, manage and maintain all national parks'. It also states that within the National Park, the Director may:

- Reserve or set aside any portion of the park as a breeding place for animals or as nurseries for vegetation;
- Authorize the construction of such roads, bridges, airfields, buildings and fences, the provision of such water supplies, and the carrying out of such other works, as may be necessary for the purposes of the park;
- With the approval of the Minister, let sites for the erection of hotels, or other accommodation for the visitors to the park:

Provided that nothing in any document connected with the letting shall be construed as in any manner abridging the overall control of the Park by the Service, or as preventing the Director from giving directions as to the manner in which the premises concerned shall be managed

The Act controls activities within the park, which may lead to the disturbance of animals. Unauthorized entry, residence, burning, damage to objects of scientific interest, introduction of plants and animals and damage to structure are prohibited. KPLC will ensure that minimum damage is done to the vegetation at Hell's gate and seek authorization before entering the park.

3.2.4 The Agricultural Act, Cap 318

Legislative control over soil conversation and land development are mainly controlled within this Act, and many of the provisions can be generally applied beyond those lands suitable for agriculture.

The Minister administering the Act, after concurrence with the Central Agricultural Board and consultation with the District Agricultural Committee, can impose land conservation orders on lands to control cultivation, grazing and clearing. These controls may be necessary to protect the land against soil erosion, to protect fertility, and to maintain catchments. Local authorities are generally empowered to administer these sections of the Act, and the District Agricultural Committee is entitled to make

regulations relating to these controls. Agricultural Rules are prescribed under the Act, whereby vegetation clearing in steep slopes areas or adjacent watercourses, without authorization, is controlled. Since this is an OHTL, there will be minimum disturbance of the soil and consequently, less soil erosion.

3.2.5 The Occupational Safety and Health Act No 15 of 2007

This Act applies to all workplaces where any person is at work, whether temporarily or permanently. The purpose of this Act is to secure the safety, health and welfare of persons at work, and protect persons other than persons at work against risks to safety and health arising out of, or in connection with, the activities of persons at work. Some of the areas addressed here are machinery safety, chemical safety and health, safety and welfare special provisions are also provided in the ILO conventions on safety and health in construction recommendation, 1988 R175. KPLC will comply with this act but ensuring that all its employees and those of contractors wear protective gear while at work.

3.2.6 Public Health Act 1986, Cap 242

The public Health Act regulates activities detrimental to human Health. An environmental nuisance is one that causes danger, discomfort or annoyance to the local inhabitants or which is hazardous to human health. Although the Act is primarily concerned with domestic water supplies and sources of water used for human consumption, its regime may be extended to cover rivers, streams, lakes and underground water resources since these are the basic water sources for the majority of Kenya's population.

The Act prohibits activities (nuisances) that may be injurious to health. The primary purpose of the Act is to secure and maintain public health. It defines nuisances on land and premises and empowers public health authorities to deal with such conditions.

Part IX, section 115, of the Act states that no person/institution shall cause nuisance or condition liable to be injuries 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 injuries or dangerous to human health.

On responsibility of the Local Authorities Part XI, section 129, of the Act states in part "It shall be the duty of every local authority to take all lawful, necessary and reasonably practicable measures for preventing any pollution dangerous to health of any supply of water which the public within its district has a right to use and does use for drinking or domestic purposes. Section 130 provides for making and imposing regulations by the local authorities and others the duty of enforcing rules in respect of prohibiting use of water supply or erection of structures draining filth or noxious matter into water supply as mentioned in section 129. This provision is supplemented by section 126A that requires

local authorities to develop by laws for controlling and regulating among others private sewers, communication between drains, power lines, and sewers as well as regulating sanitary conveniences in connection to buildings, drainage, cesspools, etc. for reception or disposal of foul matter. Part XII, Section 136, states that all collections of water, sewage, rubbish, refuse and other fluids which permits or facilitates the breeding or multiplication of pests shall be deemed nuisances and are liable to be dealt with in the matter provided by this Act.

3.2.7 Factories and Other Places of Work Act (Cap, 514)

Before any premises are occupied or used, a certificate of registration must be obtained from the chief inspector. The occupier must keep a general register. The act covers provisions for health, safety and welfare.

Safety

The Act provides for a provision that ensures that for the interest of public that all dangerous points of the projects are clearly marked or 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. Adequate and suitable means for extinguishing fire must be provided in addition to adequate means of escape in case of fire must be provided. KPLC will provide safety clothing, train its employees and will have fire extinguishers where fire is likely to occur.

Health

The premise must be kept clean, daily removal of accumulated dust from place of work. The circulation of fresh air must secure adequate ventilation of workrooms. There must be sufficient and suitable lighting in every part of working place. There shall 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 shall 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 expose to wet or to any injurious or offensive substances.

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 shall be provided to enable them take advantage of any opportunity for resting. Section 42 stipulates that every premise shall be provided with maintenance, readily accessible means for extinguishing fire and person trained in the correct use of such means shall be present during all working periods. Section 45 states that 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. Section 55B provides for development and maintenance of an effective programme 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 to.

3.2.8 Local Government Act, Cap 265

The Local government Act is concerned with a wide range of matters that affect the day to day activities of individuals and organizations. The sections, which have the most direct relevance, are Sections 145, 146, 147 and 163:

Section 145 is concerned with the miscellaneous powers of local authorities. Subsection (w) empowers a local authority to take measures that may be necessary or desirable for the preservation or protection of wildlife, and provide amenities for the observation of wildlife. Section 146, Subsection (d) empowers a local authority, with the consent of the Minister, to make grants for the establishment and maintenance of game parks and other related facilities. Section 147, Subsection (d) controls the cutting of timber and the destruction of trees and shrubs. KPLC will ensure that there will be minimal destruction of trees and shrubs were they appear.

Section 163, Subsection (e) empowers municipal councils, town councils and urban councils to control or prohibit all businesses, factories and workshops which by reason of smoke, fumes, chemicals, gases, dust, smell, noise or vibration or other cause may be a source of danger discomfort or annoyance to the neighbourhood and to prescribe the conditions subject to which business, factories and workshops shall be carried on.

3.2.9 Kenya Electricity Grid Code & Kenya Safety Code

The consultant also reviewed the Kenya Electricity Grid Code, which sets out detailed arrangements for the regulation of the Kenya electricity supply industry and is enforceable under the Electric Power Act, No 11 of 1997. In addition to the Kenya Electricity Grid Code, the consultant reviewed the Kenya Safety Code, which recognizes the Factories Act, 1962 (Rev.1972) which requires an employee to use any means or appliance provided by the Employer for securing safety and also not willfully to do anything likely to endanger himself or others.

3.2.10 The Water Act, Cap 372

The water Act, 2002 provides the legal framework for the management, conservation, use and control of water resources and for the acquisition and regulation of right to use water in Kenya. It also provides for the regulation and management of water supply and sewerage services. In general, the Act gives provisions regarding ownership of water, institutional framework, national water resources, management strategy, requirement for permits, state schemes and community projects. Part IV of the Act addresses the issues of

water supply and sewerage. Specifically, section 59 (4) of the Act states that the national water services strategy shall contain details of:

(a) Existing water services
(b) The number and location of persons who are not being provided with basic water supply and basic sewerage
(c) Plans for the extension of water services to underserved areas
(d) The time frame for the plan; and
(e) An investment programme

3.2.11 The Constitution of Kenya, Cap 0

The provisions of Chapter V (Protection of Fundamental Rights and Freedoms of The Individual) shall have effect for the purpose of affording protection to those rights and freedoms subject to such limitations of that protection as are contained in those provisions, being limitations designed to ensure that the enjoyment of those rights and freedoms by any individual does not prejudice the rights and freedoms of others or the public interest. The constitution protects citizens from deprivation of property. No property of any description shall be compulsorily taken possession of, and no interest in or right over property of any description shall be compulsorily acquired, except where it is necessary for public interest. This means therefore that an agreement should be reached between KPLC and PAPs before using their land.

3.2.12 Forests Act 2005, Cap 385

The Act highlights the integration of the community on the management, utilisation and conservation of forests and its resources. It prohibits wanton destruction of the forests. As hydro dams depends on good water catchments protection and management, on the upstream and around the reservoirs the enforcement of this Act will minimise the flow of sediments into the rivers which are being utilised for generation of hydro electric power generation. There are no formally identified forests along transmission line routes, but there are some localities with significant tree and vegetation cutting needs.

3.2.13 Land Acquisition Act, Cap 295

It is possible, under the provisions of this Act, for land to be acquired or granted access to for the purposes of new projects. Acquisition or access must be shown to be in the public benefit and compensation must be provided to the landowners whose land is acquired or damaged.

We have in Kenya a plethora of enactments all governing land and transactions in land. Thus the substantive land law is to be found in two different statutes while the adjectival land law is to be found in five different statutes not forgetting the customary land law of the various tribes in Kenya.

There are two systems of substantive land law, three systems of conveyancing and five systems of registration. The two systems of substantive law are under:

- The Indian Transfer of Property Act 1882 as amended by 1959 Amendment Act
- The Registered Land Act

The three systems of conveyancing are those applicable to land registered under:

- Government Lands Act Cap 280, part X Laws of Kenya and Land Titles Act Cap 282, Part III Laws of Kenya
- Registration of Titles Act
- Registered Land Act.

- ***Registration Systems***

The five registration systems are those under:

- The Government Lands Act (G.L.A)
- Registration of Titles Act (R.T.A)
- The Land Titles Act (L.T.A)
- The Registration of Documents Act Cap 285 Laws of Kenya (R.D.A)
- The Registered Land Act (R.L.A)

The Registration of Documents Act is not peculiar to land law, as documents completely unrelated to land are registrable under it.

- ***Land Ownership***

Absolute or complete ownership can be said to be in the state. Under G.L.A the commissioner of Lands, on behalf of the Republic of Kenya grants leases of town plots for any term not exceeding ninety nine (99) years and of agricultural land for 999 years. The grantee becomes owner and subject to the terms and conditions of the lease he possesses the bundle of rights of ownership. The 999-year leases can be converted into freehold and the 99 years to 999. On conversion or expiry of lease the new grant may be issued under R.T.A or R.L.A. All unalienated land other than trust land and all reversion of government leases are vested in the government. Others whether held on freehold or leasehold are vested in grantees as owners having the rights over them.

The power of the state to qualify (extinguish) property rights in the public interest is embodied in Section 75 of the Kenyan Constitution. The section however makes the exercise of that power subject to the process of law. Section 117 of the Constitution further provides that an Act of Parliament may empower a county council to set apart trust land for: The use and occupation of any public body or authority for public

purposes; or Prospecting or mining purposes; or The use and occupation of any person or persons for a purpose which is likely to benefit the residents of the area.

Section 117 part 4 stipulates that the setting apart is void unless the law under which it is made makes provision for the prompt payment of full compensation. The Trust Land Act, in Sub-sections 7 to 13, makes provision for the setting apart of land and payment of compensation with regard thereto. All land in urban areas of Kenya and much of the land in rural areas has a registered title. The title to land is either freehold or leasehold. The development and use of freehold title is controlled by land planning regulations which are administered by both the Central Government and the Local Authority in which the Land is situated. (A Local Authority is either a County Council or a Municipal Council whose activities are established and controlled by Local Government Legislation).

Leasehold land is held on leases from the Central Government or, less frequently, from the Local Authority and such leases will contain provisions governing the development of the land and the use to which the land can be put. The leases frequently contain provisions against any dealing with the land without the consent of the landlord. The Central Government administers its land through a Department of Lands which is headed by a Commissioner of Lands.

- *KPLC Land Acquisition Procedure*

Power Lines for Low Voltage

A reconnaissance survey is first done to search for the best possible route. It is KPLC policy to avoid existing structures as much as possible. Once the best route has been established, a meeting between the KPLC staff, the locals and the local administration is arranged. During this meeting KPLC formally requests for permission to survey the area. Once this is agreed upon, the surveyor moves to site and takes detailed profiles of the area and also places pegs where the poles are to be located. The surveyor then prepares a cadastral map of the area showing the plot numbers and the route of the power lines as well as the position of the poles.

The Way leaves section of the KPLC then prepares a wayleaves agreement showing the specific affected plot and the proposed route. The individual owner is then approached with this proposal and his consent is requested. The owner is compensated for buildings or crops that are on the land. However, the owner is not allowed to grow anything higher than 12 feet within five meters of the poles or line.

KPLC also consult with other relevant institutions such as Telkom Kenya, County Councils, Airport Authorities, Kenya Pipeline Company, Kenya Ports Authority, Department of Defence, Kenya Wildlife Service, Conservatoire of Forests and Ministry of Public Works and Housing to ensure that their proposal is in harmony with other proposed developments.

High Voltage Lines

A similar procedure is undertaken in assessing the best route as in the case for the low voltage lines. The land required is of 30 meters width. Once the best route is established the landowner is approached with this proposal and his consent is requested. The owner is compensated for the land through negotiations to agree on a compensation rate. The owner is also compensated for buildings or crops that are on the land.

3.2.14 Government Lands Act, Cap. 280 (revised 1984)

This Act deals with all actions, suits and proceedings by or on behalf of the Government respecting; Government land or any contract relating to Government land or any breach of any such contract, any trespass on Government land or any damages accruing by reason of such trespass, the recovery of any rent, purchase money or other monies in respect of Government land, any damages or wrongs whatsoever in any way suffered by the Government in respect of Government land or any other land, the recovery of any fine or the enforcement of any penalty under this Act

The Government may at any time enter upon any land sold, leased or occupied under a licence under this Act, and may there set up poles and carry electric lines across such land, and may lay sewers, water-pipes or electric lines therein, without paying compensation, but making good all damage (Sec 86). Where any damage or loss has been caused to any land by or as a result of entry thereon under section 86 or section 87 by reason of the injury or destruction of trees, bushes or shrubs planted thereon, a reasonable sum, not exceeding the market value of the standing trees, bushes or shrubs, shall be paid by way of compensation for the damage or loss notwithstanding that compensation is not otherwise payable under any of those sections. KPLC will compensate the Project Affected Persons as per the RAP report.

3.2.15 Trust Lands Act Cap. 288 of 1962 (revised 1970)

This Act applies to all land which for the time being is Trust land. Under section 38 a way leave license may be granted to any person empowering him and his servants and agents to enter upon Trust land vested in the council and to lay pipes, make canals, aqueducts, weirs and dams and execute any other works required for the supply and use of water, to set up electric power or telephone lines, cables or aerial ropeways and erect poles and pylons therefore, and to make such excavations as may be necessary for the carrying out of any such purposes, and to maintain any such works as aforesaid. However compensation for loss of the use of land in any case where the usefulness of the land for agricultural purposes is impaired must be made before the license is awarded.

3.2.16: Land Adjudication Act, Cap. 284 of 1968 (revised 1977)

This Act applies to any area of Trust land where the county council in whom the land is vested so requests; and the Minister considers it expedient that the rights and interests of persons in the land should be ascertained and registered; and where the Land Consolidation Act does not apply to the area.

3.2.17 Physical Planning Act (Cap 286)

An Act of Parliament to provide for the preparation and implementation of physical development plans and for connected purposes enacted by the Parliament of Kenya Under this Act, no person shall carry out development within the area of a local authority without a development permission granted by the local authority under section 33. The local authority concerned shall require the developer to restore the land on which such development has taken place to its original condition within a period of not more than ninety days. If on the expiry of the ninety days notice given to the developer such restoration has not been affected the concerned local authority shall restore the site to its original condition and recover the cost incurred thereto from the developer.

3.2.18 Registered Lands Act, Cap 300 of 1963

This is an Act of Parliament to make further and better provision for the registration of title to land, and for the regulation of dealings in land so registered, and for purposes connected therewith. KPLC should ensure that the owners of the parcels of land have title deeds as per the act.

3.2.19 Geothermal Resources Act No. 12 of 1982

This act is geared towards licensing of geothermal wells while taking into consideration the need to dispose the waste products from the geothermal processes appropriately. Whilst part of the projects enters into a geothermal power station and reserve, it is not expected this legislation will impact on the project.

3.2.20 Employment Act No 11 of 2007

The Act is enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations and federations. Its purpose is to promote sound labour relations through freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute the protection and promotion of settlement conducive to social justice and economic development for connected purposes. This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the

environment within the energy sector. This act will be adhered to when sourcing for employees during construction process.

3.2.21 Labour Institutions Act No. 12 of 2007

The purpose of the Act is to establish labour institutions and to provide for their function, powers and duties. The Act provides for the establishment of National Labour Board, which provides advice to the Minister on all matters concerning employment and labour. Any advice and disputes which is labour related should be directed by KPLC to this board.

3.2.22 Building Code 1997

The Local Government By-Laws are Building By-Laws that give the Municipalities or County Councils powers to approve building plans. Such plans are expected to provide for public buildings and factories among others. The By-Laws covers factory chimney shafts, stairs, lifts, rain water disposal, refuse disposal, ventilation of buildings, drainage, sanitary conveniences, sewers, septic and conservancy tanks, fire and means of escape in case of fire. Compliance with this Act in up scaling of power supply is necessary. 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. KPLC will ensure that they do not construct structures or buildings on sewer lines and under power lines.

3.2.23 Use of Poisonous Substances Act rev. 1983 Cap 247

This Act under Sections 3,4,6,8 imposes restrictions and conditions on the use of poisonous substances and requires that persons concerned with storage, transportation and disposal or use of poisonous substances be registered or licensed. It also requires observance of precautions against poisoning and provides for periods of exposure to risk of poisoning. No poisonous substances will be used in this proposed project.

3.2.24 Traffic Act Cap 403

This Act specifies that motor vehicles use proper fuel. The Traffic regulations promulgated under the Act specifies that every vehicle is required to be so constructed, maintained and used so as not to emit any smoke or visible vapour. The vehicles to be used during construction should be serviced and be in good condition so that it does not emit any smoke.

3.2.25 Penal Code Cap 63

Section 191 of the penal code states that if any person or institution that voluntarily corrupts or foils water from public springs or reservoirs, rendering it less fit for its

ordinary use is guilty of an offence. Section 192 of the same act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighbourhood or those passing along public way, commit an offence. KPLC should adhere to recommendations in ESMP regarding pollution of water resources.

3.2.26 Standards Act Cap 496

The Act is meant to promote the standardization of the specification of commodities, and to provide for the standardization of commodities and codes of practice; to establish a Kenya Bureau of Standards, to define its functions and provide for its management and control. Code of practice is interpreted in the Act as a set of rules relating to the methods to be applied or the procedure to be adopted in connection with the construction, installation, testing, sampling, operation or use of any article, apparatus, instrument, device or process.

Specification under the Act means a description of any commodity by reference to its nature, quality, strength, purity, composition, quantity, dimensions durability, weight, grade, durability, origin, age or other characteristics with which, or the manner in which, any commodity may be manufactured, processed, treated, tested or sampled.

The members of the Kenya Bureau of Standards are appointed by the minister on advice from the National Standards Council established under section 6 of the Act. The council may, at the request of any person, carry out or order to be carried out any study or examination in respect to a particular commodity or a comparative study between different commodities. In this respect, the council has wide ranging powers to determine how trade is carried out and what products access the market.

Under section 9 of the Act the council may by notice in the gazette declare any specification or code of practice prepared by the Bureau to be a Kenyan standard. Once a Kenyan standard has been declared, the minister shall, by order in the gazette, prescribe a date after which any manufacturer or seller of that commodity shall be obliged to comply with the relevant specification of code of practice.

Under section 12 of the Act, if KPLC is issued with a permit shall if requested by the council in writing, furnish within the specified period samples of any commodity to which the permit relates and such other information as may be specified in the request. Failure to comply with such request constitutes an offence. The minister may, at the request of the council, appoint inspectors for the purposes of the Act.

On conviction of any offence under the Act, the court may, in addition to the penalty imposed, make an order confiscating all or any part of any goods in respect of which the offence was committed; and prohibiting the manufacture or sale of that commodity unless it complies with the relevant Kenyan standard (section 15(2) of the Act).

The schedule to the Act provides for the procedure of meetings of the national standards council. The minister has the power, in consultation with the council, to promulgate rules under section 20 of the Act for the better carrying out of the provisions of the Act. In exercise of those powers, the minister has made rules prescribing the procedure for applying for standardization mark permit and paying fees requisite thereof.

3.2.27 Antiquities and Monuments Act, Cap 215

This is an act of parliament that aims at preserving Kenya's nation heritage. The application of this act shall extend to monuments and antiquities on the sea-bed within the territorial waters of Kenya. KPLC shall not move a monument or object of archaeological or palaentological interest from the place where it has been discovered otherwise than in such manner and to such place as may be allowed or by written permit from the Minister.

3.2.28 Lakes and Rivers Act, Cap 409

It is an act of parliament to regulate dredging and the use of steam vessels on certain lakes and rivers. It provides for protection of rivers, lakes and associated flora and fauna. The provisions of this act may be applied in the management of the project.

3.2.29 Public Roads and Roads of Access Act, Cap 399

This is an Act of Parliament to provide roads of public travel and access to public roads. The Act consolidates the law relating to traffic on all public roads. It also prohibits encroachment on and damage to roads including land reserved for roads. It shall be competent for KPLC to provide due notice to any person who might be affected by construction of any access road.

3.2.30 Wayleaves Act Cap 292

Under this act, the Kenya Civil Aviation Authority (KCAA) has to authorize and approve the height of transmission lines when they are flight paths so as to ensure the safety of flying aircraft over the proposed project area. The project will comply to this act by ensuring that the towers do not exceed 35 m as per KCAA recommendations.

KPLC shall also make good all damage done, and shall pay compensation to the owner of any tree or crops destroyed or damaged, in the execution of any power conferred by this Act. In the event of disagreement as to the amount of the compensation to be paid or as to the person entitled to receive compensation, any person interested may apply to the District Commissioner, who shall award to the person entitled to receive compensation such compensation as he thinks reasonable; and that award, subject to appeal to the Provincial Commissioner, shall be final.

3.3 Relevant International Conventions and Treaties

Kenya is signatory to several international conventions and treaties that would need to be adhered to in implementing this project and are geared towards environmental protection and conservation. Some of these include;

a) ILO Conventions ratified by Government of Kenya- Kenya have ratified 43 ILO conventions and those that are relevant to this study includes
   - Safety and Health in Construction Recommendation, 1988
   - Recruiting of Indigenous Workers Convention, 1936 (No.50)
   - Contracts of Employment (Indigenous Workers) Convention, 1939 (No. 64)
   - Minimum Age Convention, 1973 (No.138) *Minimum age specified: 16 years*
   - Migrant Workers (Supplementary Provisions) Convention, 1975 (No.143)

b) Convention on Wetlands or the Ramsar Convention
c) Convention on Biodiversity
d) The Convention on International Trade in Endangered Species (CITES)
e) Convention on the Conservation of Migratory Species
f) United Nations Framework Convention on Climate Change
g) United Nations Convention to Combat Desertification
h) Important Bird Areas
i) The World Heritage Convention
j) UNESCOs Man and Biosphere
k) New Partnership for Africa Development (NEPAD)
l) East African Community.

The Ministry of Foreign Affairs deals with international treaties at the primary stages of negotiation. The ministry offers advisory guide to the government on the need to ratify such a treaty if considered to be of national interest. Implementation portfolio then moves to the line ministry, relevant departments and co-operating agencies.

Chapter 4

4.0 DESCRIPTION OF THE PROPOSED PROJECT

The baseline environmental information in the project area is summarized under the following thematic areas as follows:

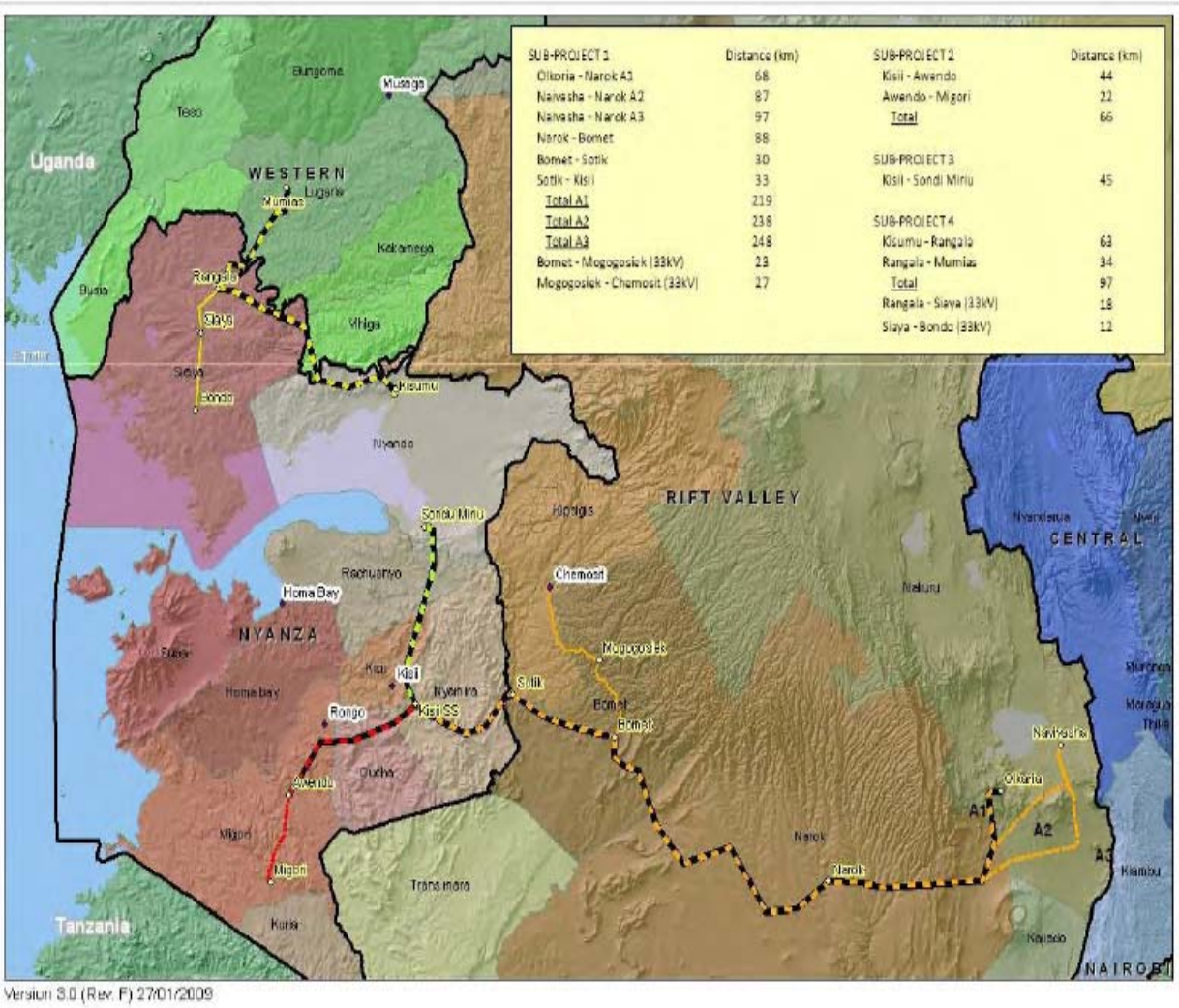

Fig 4.1: The Proposed Route of the Transmission Line

4.1 Location

1. Kisii-Nyakekogi Section

The transmission line will begin from Kegati substation Located approximately 1Km from Kisii town, located in south-western Kenya, in Kegati District, Kegati sublocation The

substation can be accessed through Kisii – Sotik road and is about fifty metres off the road (construction work is ongoing).

Fig.4.2: Kegati Substation under construction

The area is densely populated Settled areas are within a radius of 500 metres away from the site. Within the vicinity of the substation are homesteads practicing arable farming and livestock keeping. The main types of crops grown are Maize, Bananas and Beans. Eucalyptus trees are also apparent in this area. There are existing power lines trespassing some of these homesteads. Soils are mainly highly productive volcanic.

Figure 4.3: Some of the common crops grown within the vicinity of kegati substation

The line will cross the Kisii – Sotik road and traverse homesteads and un-tarmacked road network on the Southern part of Kisii town, passing through expansive tea plantation and eucalyptus trees and on some instances will cross small rivers to Nyakekogi market in Basii chache location where angle point two (AP 201) is located approximately 7.8 Km from kegati. Here the main socio-economic activity of the residents is growing food crops such as maize, beans and Bananas. Tea is the major cash crop grown due to an existing Kahau tea factory. The line will pass next to Nyakekogi primary school on the right of the existing 33 Kv line and then continues to follow the existing 33kV line which is a few metres from the tarmac road. Here Tall Eucalyptus trees, Maize beans and tea plantation

are a common feature. Coffee and tea farming is extensively practiced in this section as the main cash crop. Soils are predominantly highly productive volcanic.

Figure 4.4: Existing 33 kV line

2. Nyakekogi-Awendo Section

From Nyakekogi, the line will avoid major centres and Schools and will trespass homesteads to angle point three within the vicinity of Rongo The area is very hilly through most of the section and densely populated with most people practicing arable farming and livestock keeping.

Figure 4.5: Undulating terrain on Northern parts of Rannen Hills.

From AP203 the line follows an undulating terrain to AP204 at Rannen Hills. Rannen hills are found in Rongo district, Kanyamamba location. The main characteristic of this area are Eucalyptus trees, sugarcane plantation small shrubs and bushes. The line passes through a densely populated area with many people concentrated within the sugarcane plantation.

From Rannen Hills, the line will avoid Rannen centre and trespass homesteads found on the western side of the centre .The line will find its route through the expansive sugarcane plantation of Sony Sugar nucleus estate passing on the western side of Awendo substation, Sony water treatment plant and Sony Sugar Factory respectively. Angle point Five (AP 205) is located approximately 200 metres from Ranjira Labour camp on the western side of Sonny sugar in Rongo district, Central Sakwa location. Sugarcane is the main cash crop in this area. The main Physical features here are Omboo hospital which is located approximately 500 metres from AP 205.The area here is densely populated and the line trespasses many households.

Figure 4.6: The line passes on the western side of Sony sugar Water treatment plant.

3. Awendo-Migori Section

The line will follow the western side of the A1 Highway avoiding Awendo town centre destined to Migori. The line will follow the existing 33 kV line traversing portions of sugarcane plantation and crossing roads to AP 206 which is found in Uriri District, Kanyamkago location. Angle point six is next to Kangekech Primary school and Winyadong SDA church. There are many households next to the line who practice mainly arable farming with Sugarcane being the main cash crop in the area. Other crops found in the area are Maize, Bananas. Eucalyptus trees are also evident.

Figure 4.7: Expansive Sugarcane plantation on western part of A1 Highway.

4.2 Operation and Maintenance Activities

A permanent area (30m in width, i.e. 15m clear of the route centre line) of land will be required to accommodate the transmission line, when completed. A parallel strip of land through those sections of the route which pass through vegetation shall be completely cleared. The width of the strip may vary according to the mean height of the vegetation and shall be determined. Any tree that may fall in the direction of the overhead line shall be cleared unless located more than 15 m plus the height of the tree clear of the route centre line.

Routine maintenance is carried out along the ROW to ensure the appropriate clearances between towers, conductors and vegetation and other objects are maintained according to the required safety/operation specifications. A 5m wide path along the line route will be required in the absence of a public road. Maintenance is normally carried out twice a year (dependent on site conditions).

4.3 Area of Impact

The area of immediate impact will be the Line corridor Right-of-way (ROW) which will be 30m in width by 44 km in length from Kisii to Awendo. A parallel strip of land through those sections of the route which pass through vegetation will also be completely cleared of all trees, scrub and undergrowth above a height of 150mm during the construction stage. Appropriate clearance between conductors and vegetation/structures along this corridor will be maintained throughout the life of the transmission line. Cropping and grazing beneath the conductors is normally permitted.

4.4 Project Implementation

In line with similar projects implemented by KPLC, construction is expected to start after contract signing following international competitive tendering. Pre-construction activities associated with design work include soil investigations and detailed survey of the transmission line route and substation location. Actual mobilization for construction work will follow within six months of final design. The mobilization period includes activities for preparation of material storage areas, water, power, communication and other site facilities.

Construction of the transmission line will then start by preparation of tower foundations, followed by tower erection and conductor stringing.

The dominant land use along the transmission line route is rain fed agriculture and crops are normally grown during the rainy season. The land is left to fallow and/or used for grazing during other times of the year. During this period and due to the absence of paved roads it will not be possible to transport material or to carry out construction work. Also

during heavy rains it will be very expensive to properly store building materials, especially cement.

For these reasons most of the site works should proceed during the dry season when there is no cultivation. This will facilitate construction and reduce impact on crops to a minimum. Working during the dry period will also provide job opportunities for local people after the busy cultivation season.

4.2 Project Cost

The total calculated project cost is approximately USD 10 million. This value is exclusive of duties and taxes, wayleave costs and 5% contingency. A detailed breakdown of costs associated with compensation for lost assets of project affected people is given in the RAP Report. Environmental monitoring cost estimates are given in Section 8 of this Report.

Chapter 5

5.0 BASELINE DATA

Kisii District is one of the twelve districts of Nyanza Province in southwest Kenya, and is divided into five local authorities and eleven administrative districts. The district capital is Kisii. The district is mostly hilly and is dissected by rivers flowing west into Lake Victoria, notably the River Gucha and River Mogusi. It lacks infrastructure like electricity, telecommunications and good roads, inhibiting the full exploitation of resources. The hilly nature of the district leads to serious soil erosion and makes road communication difficult, especially in the rainy season when many roads (only 10% of which are tarmacked) become impassable.

From Kisii, the line passes through Migori district. It is an administrative district in the Nyanza Province of Kenya. It is located in southwestern Kenya. Its capital town is Migori. The district has a population of 514,897 and an area of 2,005 km². The district has four constituencies: Rongo, Migori, Uriri and Nyatike. Along the nationwide creation of new districts in 2007, Migori District has been split into two districts: Rongo (North) and Migori (South) districts. The headquarters of Migori District remain in Migori, but those of Rongo District moved to Rongo town. The slit occurs between Suba and Uriri Division.

Rongo is a small upcoming town along Kisii to Migori Highway. It is the junction to Homa Bay Town and also junction to Ogembo and Kilgoris towns in Gucha District. It is a very busy place with lots of social and economic activities from Farming, Shops, Offices, Hospital, BAT leaf Center, Kuja School for the Deaf, Catholic Pastoral Center, Police Station and many good schools around it. Most of the residents are very friendly and welcoming people.

5.1 Physical Environment

Reference to study area in the following section refers to the area covering the proposed line route as described in Section 4.0.

5.1.1 Topography and climate

Kisii district lies on a highland equatorial climate, and as such it receives rain almost throughout the year, although there are two rainy seasons (March to May and October to November). The average rainfall is over 1500 mm and is quite reliable, helping to support cash crops (such as coffee, tea and pyrethrum) and subsistence crops (maize, beans, millet and potatoes). Temperatures can range from 10 °C to 31 °C.

The terrain is very hilly with some abrupt elevation rise and fall but with elevations falling from high point at Kisii towards lower land at Rongo and onwards towards Awendo.

5.1.2 Soils

From Kisii area, the soils are predominantly highly productive volcanic. This is favorable for a wide range of crops.

5.2 Biological Environment

5.2.1 Vegetation

The area's land is classed medium agricultural potential, Agro-Climatic Zone III and contains concentrated agricultural activities; including food and cash crops, and dairy farming. Also coffee and tea farming is extensively practiced across the higher land in this Kisii section. In Awendo cash crops such as sugarcane, tobacco and dairy farming is practiced especially in the lower land. There are no natural forests and vegetation within the district since they have been cleared to pave way for cultivation and settlements. Reforestation has been taking place in the above-mentioned places through planting of various varieties of trees, i.e. both indigenous and exotic species.

5.2.2 Wildlife

The area here does not have wildlife because it is densely populated with people practicing intensive agriculture. This does not favour wildlife

5.3 Socio-economic Characteristics

5.3.1 Social Characteristics

A number of ethnic groups in Kenya reside along the planned power line route. None of them are to be considered as vulnerable ethnic minorities. The main ethnic groups in the project area are the Gusii, and Luos.

Gusii

The Gusii language (also known as *Kisii* or *Ekegusii)* is a Bantu language spoken in the Kisii district in western Kenya, whose head-quarters is Kisii town, (between the Kavirondo Gulf of Lake Victoria and the border with Tanzania). The Kisii are regarded as one of the most economically active communities in Kenya, blessed with rolling tea estates, coffee, and banana groves. However, Kisii district has a very high population density. It is one of the most densely populated areas in Kenya (after the two cities of Nairobi and Mombasa), and the most densely populated rural area.

Luo

The Luo (also called *Jaluo*) are an ethnic group in Kenya, eastern Uganda, and northern Tanzania. The Luo are the third largest ethnic group (13%) in Kenya, after the Kikuyu (22%) and the Luhya (14%). The Luo population in Kenya was estimated to be 3,185,000 in 1994. The traditional occupation of the Luo is fishing, though many are also farmers or work jobs in the larger cities. They speak the Dholuo language, which belongs to the Western Nilotic branch of the Nilo-Saharan language family spoken by other Luo-speaking peoples such as the Lango, Acholi, Padhola and Alur (all of Uganda).

5.3.2 Economic Characteristics

The majority of the populations affected are;

- Subsistence farmers
- Small and medium business operators and
- People in formal and informal employment

5.3.3 Land Use

The proposed transmission line traverses various districts which includes; Migori, Gucha, Uriri, Nyamira, Rongo, and Kisii Central. The main ethnic groups along the Kisii-Awendo line comprise mainly the Kisii and the Luo ethnic groups. Due to the high population density, almost all land is put to maximum agricultural use. Most of the crops grown include maize, beans, millet, sorgum, potatoes, bananas, avocado, coffee, tea and sugar cane. The majority of farmers pursue rain-fed agriculture.

Cultivation practices have generally shaped the settlement profile. Most of the areas where small-scale subsistence farming is the predominant agricultural practice farmers tend to be located on their properties. Where roadside villages occur, families tend to take advantage of commercial opportunities presented through the traffic by establishing small kiosks and other income generating activities.

5.3.4 Women

The economic, social and political status of women in the entire Project affected area is relatively weak. Apart from land ownership, most women are subjected to early marriages after which their roles are largely confined to household management and agricultural production. They are generally economically dependent upon men who tend to make the decision as to how many children the family should have.

In rural areas in particular, women are burdened by back-breaking work. In addition to all food preparation, child rearing and domestic chores, they are responsible for land preparation, planting and weeding. Women are also the principle collectors of water and firewood, and in some instances, they have to walk long distances to acquire these

resources for drinking and cooking. Women's access to formal education is low in the affected areas. This is projected in table 5.1 which shows that 40% of the female respondents did not attend school. This percentage was relatively high compared to that of the males.

Table 5.1: *Level of education of the respondents*

Gender	Highest level of education of respondent				
	Primary	Secondary	Post Secondary	Never attended	Total
Male	38.8%	29.6%	8.2%	23.5%	100.0%
Female	33.3%	20.0%	6.7%	40.0%	100.0%
Total	38.1%	28.3%	8.0%	25.7%	100.0%

The reason for this gender parity as regards to education levels is due to the fact that families tend to privilege male children due to scarcity of education facilities and therefore literacy levels amongst girls and women are therefore significantly lower. With little access to formal employment, they consequently represent a negligible proportion of persons employed in professional, technical and administrative occupations.

5.3.5 Children

Children are the most vulnerable members of the population due to the effects of displacement and disintegrations of families. Related displacements due to political interferences were witnessed in Kisii and Gucha districts.

We also assessed infant mortality rate in the project affected areas. Our observations were that the rates were generally low due to the ongoing government interventions through IFAD and the presence of NGOs such as APHIA II Nyanza who are working in the region to help reduce cases of infant mortality.

5.3.6 Housing

The quality of housing in the project affected area consists of a mix of permanent, semi-permanent houses and grass thatched houses. Figures 5.1a and 5.1b highlight some of the houses within the project area.

***Fig 5.1a**: Homestead affected in Kegati*

***Fig 5.1b:** Homestead affected in Bassi Chache*

5.3.7 Food Security

The area around Kisii is agriculturally productive. Households within these areas practice a mix of subsistence farming and cash crop farming. The subsistence farming consist crops such as maize, beans cowpeas, bananas and fruit crops. The harvest from these crops is used for household consumption and for sale. This has enhanced food security within these areas. The cash crops grown in these areas include tea, coffee and sugarcane. The proceeds from the sale of these crops further contribute to the food security situation in these households.

Fig.5.2: *Affected agricultural land in Kegati, Kisii*

5.3.8 Public Health

HIV-AIDS is a severe health threat in Kenya, and HIV-positive prevalence is very high, at almost 7% of the population of ages 15-55. HIV/AIDS is a big problem and it ranks among the top ten diseases in the project area. During power line construction work, the project employees will interact with the local communities and this can have serious public health impacts. The other common diseases reported in Kenya are respiratory diseases, malaria, skin diseases and diarrheal diseases.

Chapter 6

6.0 ENVIRONMENTAL AND SOCIAL IMPACTS

An assessment of the social and environmental impacts associated with the project based on field inspections and literature sources indicates that most impacts associated with the project are of a temporary nature resulting during construction and can be minimised by implementation of appropriate safeguards.

Table 6.1 provides a summary of the potential of the environmental and social impacts.

Table 6.1 **Summary of Potential Impacts**

Environmental and Social Impact	Positive/ Negative	Direct/ Indirect	Temporary/Permanent	Major/ Minor	Occurrence	
					Construction	Operation
Employment Opportunities	Positive	Direct	Temporary	Minor	Construction	Operation
Additional Power Capacity	Positive	Direct	Permanent	Major		Operation
Impacts to Agricultural Land	Negative	Direct	Permanent	Major		Operation
Impacts on Surface Waters and Water Resources	Negative	Indirect	Temporary	Minor	Construction	
Loss of Aesthetic value	Negative	Indirect	Temporary	Minor		Operation
Effects of Electromagnetic fields (EMF)	Negative	Direct	Permanent	Minor		Operation
Clearing on Natural Vegetation in the ROW	Negative	Direct	Temporary	Minor	Construction	
Impact on wildlife	Negative	Direct	Temporary	Minor	Construction	
Land Excavation and Access Roads	Negative	Direct	Temporary	Minor	Construction	
People falling on dug holes	Negative	Direct	Temporary	Minor	Construction	
Noise, Ozone and Corona	Negative	Direct	Permanent	Minor	Construction	Operation
Impact on Settlements and Community facilities	Positive/ Negative	Direct	Temporary	Minor	Construction	
Solid Waste generation	Negative	Direct	Temporary	Minor	Construction	
Social Impacts	Negative	Direct	Permanent	Major	Construction	Operation

Impact on Ambient Air	Negative	Direct	Temporary	Minor	Construction	
Health Issues	Negative	Direct	Temporary	Minor	Construction	
Safety Issues	Negative	Direct	Temporary	Minor	Construction	
Property Owner Issues	Negative	Direct	Permanent	Major	Construction	
Displacement/Relocation of existing households	Negative	Direct	Permanent	Major	Construction	Operation
Noise levels	Negative	Direct	Temporary	Minor	Construction	
Radio and Television Reception Interference	Negative	Direct	Permanent	Minor		Operation

6.1 Potential Positive Impacts

Employment opportunities will be offered to the construction workers and any other person who will be hired to provide her/his services during the construction phase. With the projected expected to run for 18 months, Seventy (70) locals at any given time will be employed as casual laborers. With a daily wage of KSh 350, they will have an average income of KSh 8,400 per month.

6.1.1 Employment Opportunities

Employment opportunities will be offered to the construction workers and any other person who will be hired to provide her/his services during the construction phase.

61.2 Additional Power Capacity

With the additional substations and power lines, The Kenya Power and Lighting Company limited will be able to increase its electric power reliability and power supply capacity. This additional capacity would have a positive impact on the increasing power demands across the areas, in terms of economic empowerment, because KPLC would be able to supply more electric power which cannot be supported by the existing 33kV line.

6.2 Potential Negative Impacts before Commissioning

Power transmission lines characteristically generate impacts such as acquisition and maintenance of the right of way, clearing of vegetation from sites and line corridor; construction of access roads, and tower pads, are the most obvious sources of construction-related impacts. The construction phase is the period where most disturbances to the environment will occur. Broadly, key negative impacts of the development are likely to include:

6.2.1 Impacts to Agricultural Land

Transmission lines can affect farm operations and increase costs for the farm operator. Potential impacts depend on the transmission line design and the type of farming. Transmission lines can affect field operations, irrigation, aerial spraying, wind breaks, and future land development.

In agricultural property, there was a concern over the effects of placement of transmission line structures within areas that are being actively farmed. The inconvenience caused by working around the transmission line structures, as well as occasional damage caused by the contact of farm machinery with the structures are the dominant effects attributable to the transmission line easement. This was a concern especially along Kisii-Awendo section where residents have small pieces of land

For many transmission lines, KPLC should repair much of the damage that can occur during construction and provide monetary compensation for damages that cannot be easily repaired.

6.2.2 Impacts on Drainage, Surface Waters and Water Resources

Kisii and its surroundings is characterized by many rivers. The construction of towers may interfere with the natural drainage systems and modify flow of surface water, and these changes can contribute to soil erosion, flooding, channel modification, downstream scouring and sedimentation in streams and other drainage channels. Although temporary in nature, these impacts can be ongoing if adequate drainage works are not constructed to prevent erosion. Siting of towers away from drainage lines and floodways can also minimise interference to natural drainage systems.

No water will be used for technological purposes. The OTHL route crosses some few rivers. The towers will be placed so as to leave a protection zone of 15 m when crossing rivers and streams with the span ranging of 10-15 m, and 5 m when crossing any drainage channels. There will be no wastewaters from construction process because construction workers will be staying at the nearest shopping centers along the proposed lines.

6.2.3 Potential Aesthetic Impacts

The overall aesthetic effect of a transmission line is likely to be negative to most people, especially where proposed lines would cross natural landscapes. The tall steel or wide “H-frame” structures may seem out of proportion and not compatible with agricultural landscapes or wetlands. Landowners may find transmission lines bordering their property particularly disruptive to scenic views. Some people however, do not notice transmission lines or do not find them objectionable from an aesthetic perspective. To some, the lines or other utilities may be viewed as part of the infrastructure necessary to sustain our

everyday lives and activities. To others, new transmission lines may be viewed in a positive light because it represents economic development.

Aesthetic impacts depend on:

- The physical relationship of the viewer and the transmission line (distance and sight line)
- The activity of the viewer (living in the area, driving through or sightseeing)
- The background, or context, of the transmission line, such as whether the line stands out or blends in

A transmission line can affect aesthetics by:

- Removing a resource, such as clearing fencerows that provide visual relief in a flat landscape
- Degrading the surrounding environment (intruding on the view of a landscape).
- Enhancing a resource (evoking an image of economic strength in a developing business or industrial area)

The proposed development will have minimal effects on the landscape. The OHTL route was established so as to meet the co-inhabitance requirements imposed by the natural landscape, objects, buildings, and facilities in the neighborhood, assuring it's framing into the existing landscape and with an impact on as limited land areas as possible.

6.2.4 Electric Power Lines

Ionizing radiations/Electric and Magnetic Fields

Electric overhead lines are considered a source of power frequency, electric and magnetic fields, which may have a perceived health effect. The strength of both electric and magnetic fields is a function of the voltage, distance from the conductors to the ground and the lateral distance from the line to the receptor. Many studies published during the last decade on occupational exposure to Electro-Magnetic Fields (EMF) have exhibited a number of inconsistencies and no clear, convincing evidence exists to show that residential exposures to electric and magnetic fields are a threat to human health. However, the EMF decrease very rapidly with distance from source and there should be no potential health risks for people living outside the 30 m wide way leave corridor.

Vibration

Kenya Power and Lighting Company will install anti-vibrating devices over the entire over head transmission line (OHTL) length to damp vibration caused by the conductors exposed to the dynamic load of wind.

6.2.5 Impacts on Natural Vegetation

The proposed line will pass through small pieces of land used for cultivation. These pieces of land have different types of exotic trees such as Eucalyptus, Grevellia Robusta and Pine trees. While impact on woody vegetation is going to be permanent, impact on grasses and herbs is mostly transient.

In order to minimize the environmental impact it is recommended that clearing is done manually as much as possible with no burning of the cleared vegetation.

6.2.6 Impact on Wildlife

There are no protected wildlife conservation areas along the alignment so there is likely to be only minor impacts on wildlife during the construction phase as a result of disturbance from movement of people and machinery and loss of habitat from the establishment of the 30m ROW along the length of the route (44km). The proposed route passes mainly through a landscape that has already been greatly disturbed by mixed subsistence farming, mechanised farming and mixed grazing.

6.2.7 Risk of Bird Collision

Once established, the transmission line may cause increased risk of collision of birds in flight, however this risk is expected to be minimal since the route does not pass through any known migratory bird routes.

6.2.8 Land Excavation and Access Roads

The construction of access roads can impact the environment through vegetation clearance and compaction of land and a permanent loss of land. Provided temporary access roads are rehabilitated and existing roads/tracks are used for access to minimise the number of new roads required, the impact is not expected to be significant.

The building of foundations for transmission line towers can potentially exacerbate soil erosion. In addition to the loss of productive land due to soil erosion and land acquisition for tower construction, soils can be impacted as a result of disposal of waste materials, and compaction with heavy machinery used for the establishment of towers and the transmission line. These impacts can be managed by restricting the use of heavy machinery and vehicles to designated work areas and installing soil protection works in areas sensitive to erosion prior to construction.

6.2.9 People Falling on Dug Holes

Since the proposed lines passes through settlement areas, the danger might occur where holes are dug and left uncovered. This can be avoided by covering tower holes and pole holes immediately after digging them and especially at night.

6.2.10 Noise, Ozone and Corona

During the construction, permissible/acceptable human noise levels can be temporarily exceeded due to the operation of Lorries and equipment in the working zone of the OHTL site. Noise abatement measures will be taken in the zones crossing the residential areas, including adequate work scheduling.

Corona or electrical discharges into the air are produced around high voltage power lines. It is sometimes visible on a humid night or during rainfall and can produce noise and ozone. Both the noise levels and ozone concentrations around power lines have no health consequence and are localized impacts.

6.2.11 Social Impacts

The area from Kisii to Awendo has a dense population and most of the area is characterized by small-scale farming and peri-urban type of settlements. There will likely be large negative impacts due to; dense population in the route corridor, farms and related private properties and institutions. A detailed survey had not been done and the consultant was not able to identify the number of institutions that will be affected.

Other specific social concerns on the project include fragmenting cultivated lands thereby compromising productivity and incomes, loss of crops and fruit trees. Project impacts such as importation of labour into the areas coupled with establishment of workers camp sites and temporary access roads as well as the right of way are likely to bring negative impacts to the areas. While attention will be focused on loss of income due to temporary disturbance to crops or grazing areas, and on health conditions related to the influx of workers from outside the area (HIV/AIDS being the major concern), positive opportunities to Project Affected Persons may be presented in form of temporary employment, as well as through income generated by the sale of food to immigrant workers. The implementation of the Resettlement Action Plan will address all major key concerns relating to social issues.

6.2.12 Archeological and Historical Sites Impacts

Archeological and historical sites are protected resources. They are important and increasingly rare tools for learning about the past. They may also have religious significance. Transmission line construction and maintenance can damage sites by digging, crushing by heavy equipment, uprooting trees, exposing sites to erosion or the

elements, or by making the sites more accessible to vandals. Impacts can occur wherever soils will be disturbed, at pole locations, or where heavy equipment is used.

The consultant did not find any historical, archeological and cultural sites that will be damaged by the selected route.

Chance Find Procedure

In the event that an archeological resource is discovered during the construction process a Chance Find Procedure will be implemented. A Chance Find Procedure, as described in Performance Standard 8 of IFC, is a process that prevents archeological sites from being disturbed until an assessment by a competent specialist is made and actions consistent with the requirements of PS8 are implemented. It is a project-specific procedure that outlines what will happen if previously unknown physical resources are encountered during project construction or operation. The procedure includes record keeping and expert verification procedures, chain of custody instructions for movable finds, and clear criteria for potential temporary work stoppages that could be required for rapid disposition of issues related to the finds. In accordance with this Procedure, work will cease on a site where archaeological material is found. The site Environmental Officer will inspect and secure the site, and will then contact Museums of Kenya for advice and arrange for a survey or salvage work as appropriate.

6.2.13 Impact on Settlements and Community facilities

Most of the impact on social life along the transmission line will be during the construction period. The impacts will be both positive and negative. Positive impacts include temporary markets for goods and services, including sources of employment for certain tasks during construction. Some of the recreation requirements of the work force are likely to cause negative impacts. Use of alcohol among the working crew may affect the local population negatively through increased violence and abuse of local women. There will also be an increased risk for spreading of sexually transmitted diseases among them HIV/AIDS in the project area.

6.2.14 Solid Waste

There will be loss of existing under growth during the clearing of the wayleaves in readiness for the stringing work. There will be no major excavation work, thus, the solid waste will be minimal. Solid topsoil wastes from the sites will be the main form of solid waste. Some of the excavated soil will be reused as backfill while the rest will be disposed off to the designated areas. Other solid wastes will include metallic pieces, wooden planks, and stone debris. All the wastes will be disposed off according to the legislation guiding the same.

6.2.15 Impact on Ambient Air

The air emissions from construction machinery and traffic will be minor and they will have negligible impact on ambient air quality.

6.2.16 Health Issues

Influx of workers from outside communities brings risk of spreading communicable diseases such as HIV/AIDS to local communities. Both workers and communities should be made aware of health implications and preventative measures provided by the Project.

The control building for equipment and control facility will be supplied with portable water and shall have sanitation and wastewater facility. Periodical investigations and maintenance and remedy of failures and accidents will be performed by specifically trained staff.

6.2.17 Safety Issues

During the construction phase, the work will involve the use of sharp objects, noisy machineries and dusty environment. The constructor will be required to provide his workers with the relevant protective gears like boots, gloves, protective clothing dust masks and earmuffs. These should be provided for in the project budget. Warning signs will be expected to be displayed next to dangerous points and machines so as to restrict the movement of unauthorised personnel on site during construction and to warn heavy load vehicles that will be at the site against possible danger. All litter and debris will be picked up and disposed in a central disposal site so as to avoid subsequent injuries during and after the construction work is complete.

The power lines may have negative safety impacts on the immediate environment including flora and fauna. However, Kenya Power and Lighting Company will put in place measures towards protecting vegetation and organisms beneath the power lines by constructing the lines within the standard height. In the project design every steel tower and pole will have a danger sign and an anti-climbing barbed wire for the safety purposes. Danger/Hatari cable markers will also be laid along the cable routes.

Placement of low slung lines or lines near human activity (e.g. highways, buildings) increases the risk for electrocutions. Also, towers and transmission lines can disrupt airplane flight paths in and near airports and endanger low-flying aircraft, such as those used in agricultural management activities. A safety campaign along the transmission alignment should be conducted will minimise impacts on PAPs.

A safety officer will be at the construction site during the construction phase, at all times. The safety officer will make sure a first aid kit is always available and that the skilled workers are aware of the safety rules.

6.2.18 Property Owner Issues

ROW Easements

Property owner issues are often raised by individuals or communities along proposed transmission line routes. Two common issues are users versus payers and property owner rights versus public good. There is often a feeling of unfairness between those that use electricity and those that bear the impacts of the facilities required to support that use. The money paid to landowners for ROW easements is meant to compensate them for having a transmission line cross their property. These easement payments should be negotiated between the landowner and KPLC. Some landowners do not regard the payments as sufficient to truly compensate them for the aesthetic impacts and the loss of full rights to their own land. Also, people who live near the line but not on the ROW might be affected but do not receive an easement payment. Finally, the policy of corridor sharing favors the placement of new transmission lines within or next to existing infrastructure, causing some landowners to be burdened by multiple easements. KPLC should balance these hardships against the potential to reduce environmental impacts caused by the development of new transmission corridors.

6.2.19 Displacement

The proposed development will displace people within the wayleave, and will be forced to relocate their buildings. KPLC will acquire the wayleaves using the company's policy on land acquisition which is based on mutual agreement with the affected land owners. Kenya Power and Lighting Company will compensate all affected persons adequately, taking into consideration the following for those who may be required to relocate to another different location:

- Compensation for land and assets lost to people developing land for resettlement,
- logistical provision for resettling the people
- Compensate the people in terms of earnings (loss of current earnings)

The consultant however noted that majority of the persons affect by the wayleave will just move their buildings within their own pieces of land without need for relocating to another site altogether.

6.3 Potential Impacts after Commissioning

6.3.1 Noise

Overhead transmission lines will produce noise. The noise is characterized by a crackling sound (corona effect). During operation phase, the corona effect around live conductors will generate some noise, which will have limited impact on the health and comfort of

people who live in the immediate vicinity (within 100 m) of the OHTL. The lines will be transposed three times to minimize and/or reduced the corona effect

Noise resulting from access road and transmission line construction may disturb neighbouring communities and local fauna. This impact will be of a temporary nature only and can be minimised by adopting appropriate mitigation including maintaining equipment and vehicles to manufacturers standards and limiting operating times to daylight hours.

6.3.2 Radio and Television Reception Interference

Transmission lines do not usually interfere with normal television and radio reception. In some cases, interference is possible at a location close to the ROW due to weak broadcast signals or poor receiving equipment. If interference occurs because of the transmission line, the electric utility is required to remedy problems so that reception is restored to its original quality. Kenya Power and Lighting Company will also incorporate appropriate buffer zones as a further precaution.

Chapter 7

7.0 CONSULTATIONS AND PUBLIC PARTICIPATION

Community participation and consultation were undertaken among people living along the proposed transmission line corridor and area of influence as an integral part of the ESIA study. These meetings enabled interested and affected parties to contribute their concerns (views and opinions on the proposed development) which might have been overlooked during the scoping exercise. A synopsis of the views of the project affected people as well as representatives of the Local Councils in the districts through which the project traverses were interviewed and are presented and incorporated in predicting impacts and the development of the EMP.

The consultant particularly gave close attention to persons within the proposed wayleave trace. The views of these stakeholders were considered and their names, identification numbers and contacts were taken for future references as required by NEMA.

During the study, the consultant and KPLC further explained to the public and relevant stakeholders that the proposed development would involve construction of 44 km of 132kV transmission line from Kisii to Awendo and also answered any questions that the public might sought to know about the project.

Three public consultation meetings (barazas) were held in areas judged to be affected by the planned power line and sufficiently densely populated. The provincial administration facilitated the meetings.

The following is the summary of the discussions:

Meeting 1: Meeting at Nyakekogi market in Basii chache Location in Gucha district on 02/03/2009 at 10:00 a.m to 11.30 a.m.
In attendance: 53 locals and 2 consultants

Summary of issues that were raised:

- Locals welcomed the proposed project
- Community participation in implementation of the project
- The project should target Health centres and schools.
- The mode of compensation should have clear guidelines.

Meeting 2: Meeting at Rapogi chief's centre in Uriri district on 05/10/2009 at 11.30 a.m to 12:55pm
In attendance: 19 locals and 2 consultant

Summary of the issues that were raised:

- The proposed project was welcomed by locals
- The project should target schools, Hospitals in the area
- Local labour should be employed
- Mode of compensation to be addressed.

Fig 7.1: Meeting at Rapogi chief's centre

Meeting 3: Meeting at KegatiChief's centre in Kisii town on 06/10/2009 at 10.00 am to 11:35 a.m
In attendance: 28 locals and 1consultant

Summary of issues that were raised:

- The mode of compensation to be addressed
- Community involvement.
- Issue of lack of title deeds to be addressed.
- Lack of compensation from previous projects.
- Power line congestion in some parcels

The following table shows a summary of the public participation forums (Barazas) held by the consultant along the line.

Table 7.1: **Public Consultation Meetings**

Line Section	Public Consultation Meeting		No. of Participants	Date
	Location	**Place**		
Kisii-Awendo Line	Basiichache	Nyakekogi Market	53	2/10/2009
	Central Kanyumkago	Chiefs Camp (Rapogi)	19	5/10/2009
	Kegati	Chief's Camp (Kisii Town)	28	6/10/2009

Chapter 8

8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The Environmental and Social Management Plan (ESMP) provides a link between the impacts of project activities and the mitigation measures put in place to minimize these impacts and enhance the positive impacts. Pertinent mitigation of the project activities on the local population has been addressed in section 8.1. The predicted environmental and social impacts for which mitigation is required has also been provided in the table under section 8.2. The respective mitigation measures have also been addressed amicably in the table.

8.1 Mitigation of Impact on Local Population

The consultant recommends that where the property or productive assets are to be infringed upon, they should be sufficiently and promptly compensated. KPLC has guidelines for this and incorporates rates provided for by the Ministry of Agriculture on matters of crop and trees value. Due forces of negotiations between KPLC and the stakeholders should be facilitated and:

1) All properties be enumerated, evaluated and the corresponding values be recorded
2) Advanced payment for residential property to give ample time for owners to relocate.
3) Trees/Crop damage be paid immediately after their cutting or confirmation of removal
4) Land compensation be done proportionately to market value and level of adversity and the impact
5) A grievances/redress-committee should be instituted by KPLC to resolve, communicate and give opportunity to affected parties.
6) Compensation for house structures and relocation should be done prior to erections of towers and stringing.

8.2 Environmental and Social Mitigation Measures

The following table details the impacts identified by LOG Associates and proposed mitigation measures.

Table 8.1 Environmental and Social Management Plan

Possible Impacts	Mitigation Measures	Monitoring Indicators	Timing	Responsible Party	Costs (Ksh.) Mitigation and Monitoring
Pre Construction Phase					
Work site Survey and Pegging	Survey the proposed line with a level and peg. Jointly inspect the surveyed alignment	Surveyed line with marked boundariens	Before commencement of construction	KPLC	1,100,000
Community Consultation	Inform all communities along transmission route of schedule of implementation of Project and their rights to compensation	Properly convened meetings	Before the commencement of construction	Contractor/KPLC	250,000
Land Acquisition • Loss of land due to construction of temporary and permanent access routes leading to the transmission lines, tower sites and sub-stations • Permanent loss of land to the establishment of towers • Temporary loss of land	Complete all necessary land acquisition in accordance with RAP and entitlement Framework prior to the commencement of any construction works.	Competed acquisition process	Before the commencement of construction	KPLC	13,500,000

Possible Impacts	Mitigation Measures	Monitoring Indicators	Timing	Responsible Party	Costs (Ksh.) Mitigation and Monitoring
during establishment of the ROW					
Training	Organize environmental management and safety training. All Contractors and Supervising Consultant Field Supervisor/s shall attend the training	Informed workers	On site At least 1 month prior to commencement of construction	Contractor	50,000
Public & Occupation Health and Safety • Accidents resulting from sharp and falling objects	Preparation of a Health and Safety Plan for workers and impacted communities addressing issues including: • Education of workers and impacted communties • Provision of personal protective equipment to workers during construction • Use of child labour to be prohibited Provision of protective gear(gloves, gumboots, helmets and raincoats)	Protected workers at sites Consultation with public Workers using gloves, gumboots, helmets and raincoats	Before commencement of construction	Contractor	265,000

Construction Phase					
Soil waste and stone debris	Reused excavated soil as backfill while the rest will be disposed off to the designated areas	Clean site	Project Duration	Contractor/KPLC	300,000
People falling in dug holes	Cover tower holes and pole holes immediately and always at night	Covered holes especially at night	During construction	KPLC and Contractor	
Lack of toilets for site workers	Use available toilets/ latrines within the area	Availability of toilets	During construction	Contractor	Nil
Visual character of local landscape	• All transmission towers should be erected away from residential areas • Use common corridors/way leaves to minimise impacts on undisturbed areas • The transmission lines should be as straight as possible • Straightness and symmetry during line construction	Residential to be at least 50 m from the towers Lack of zigzag transmission line Straight and symmetrical power lines.	Project lifetime	KPLC and Contractor KPLC and contractor	Nil
Noise levels during construction and operations	Provision of Ear plugs	Use of ear plugs	Throughout construction period	Contractor	10,000
Loss of aesthetic values	Plant trees at 10 trees per hectare	Undisturbed environment	Throughout the project duration	Contractor	625,000
Ecological Impacts. (disturbance of existing	Restrict wayleave width and avoid unnecessary vegetation disturbance/	More trees planted	Throughout the project duration	KPLC	1million

habitats and land uses)	clearing Replanting trees	 Restored and undisturbed vegetation cover			
Destroyed fields, trees and crops	Compensation for destroyed trees and crops and replanting of trees	Adequately compensated PAPs and more trees planted	Throughout construction	KPLC	10 million
Socio-environmental issues	• Advise the local community of project plans in advance of construction, and involve them in the site / construction planning process • Avoid disturbances near residential areas where possible • Control run-off and manage sediment near residential areas	Public participation meetings Culturally sensitive sites identified	-Prior to commencement of works and throughout construction Throughout construction	Contractor/KPLC/ Community	1 million
	• Arrange for local people to be employed and trained • Include women, poor & vulnerable groups in the implementation of the Project activities • Negotiate and agree on with the community about disposal areas and stockpile sites • Hire additional site for damping	Public consultation meetings	Prior to commencement of works and throughout construction	Contractor/KPLC/ Community	2 million

	• Water provision	Boreholes, Water pans	Project life	KPLC/Contractor/ Community	100 million
	• Rural electrification	Access to electricity	Project life	KPLC/Contractor/ Community	100million
Operation Phase					
Safety from electrocution	• "Danger / Hatari" warning signs and cable makers around risky places and cable routes respectively and substations • Putting anti-climbing barbed wires on towers and poles	Warning signs and markers Anti- climbing barbed wire	Project life Project life	KPLC KPLC	500,000 3 million
Perceived dangers of electrostatic and magnetic force	• Organise awareness creation workshops/ rallies (Education) regularly • Discourage permanent residence in the high voltage right of way (wayleave)	More informed community Approved standards	Project life Project life	KPLC KPLC	1million p.a
People walking under the power line	Protect the people by constructing the power lines within the recommended standard height	Lines constructed within standard height	Project life	KPLC and contractor	Nil
Corona sound effect from high voltage lines	• Adequate wayleave • Ensure the height is standard	Reduced and lower corona effect sound	Project lifetime	KPLC	Nil

Vibration	Installation of ant-vibrating devices, appropriate cable and tower spacing & sagging	Installed ant-vibrating devices	Project duration	Contractor and KPLC	12.5 million
Hazard to low flying aircrafts	Towers should be clearly marked and should be of recommended height as provided by KCAA	Properly marked towers	Throughout project life	Contractor	5 million

Decommissioning Phase					
Site decommissioning	• Tower removal and disposal • Electrical system removal • Re-vegetation Establish a site revegetation plan. Where possible involve local community to provide materials and implement revegetation The revegetation plan shall include: • Name(s) of contact landowner/community group • Summarised outcome of discussions, and decisions on what will be planted; and • List of seedlings/stock to be provided and by whom	Towers and all conductors and related line infrastructure removed from site Vegetation growth in the area	End of economic life of the project	Contractor/KPLC/ Community	1.5 billion

NB

- The estimated number of workers on site is 50

8.3 Environmental Monitoring

The overall objective of environmental and social monitoring is to ensure that mitigation measures are implemented and that they are effective. The activities and indicators that have been recommended for monitoring are presented in the ESMP. Environmental monitoring will be carried out to ensure that all construction activities comply and adhere to environmental provisions and standard specifications, so that all mitigation measures are implemented.

Monitoring should be undertaken at a number of levels. Firstly, it should be undertaken by the Contractor at work sites during pre-construction, construction, under the direction and guidance of the Supervision Consultant who is responsible for reporting the monitoring to the implementing agencies. It is not the Contractor's responsibility to monitor land acquisition and compensation issues. It is recommended that the Contractor employ local full time qualified environmental inspectors for the duration of the Contract. The Supervision Consultant should include the services of an international environmental and monitoring specialist on a part time basis as part of their team. The following aspects will be subject to monitoring:

- Encroachment into protected and sensitive areas
- Vegetation maintenance around project work sites, workshops and camps
- Works safety elements, including a log of accidents
- HIV/AIDS programme implementation and levels at local health centres

Environmental monitoring is also an essential component of project implementation. It facilitates and ensures the follow-up of the implementation of the proposed mitigation measure, as they are required. It helps to anticipate possible environmental hazards and/or detect unpredicted impacts over time. Monitoring includes:

- Visual observations;
- Selection of environmental parameters at specific locations;
- Sampling and regular testing of these parameters.

Periodic ongoing monitoring will be required during the life of the Project and the level can be determined once the Project is operational.

8.3.1 Internal Monitoring

It is the responsibility of the KPLC to conduct regular internal monitoring of the project to verify the results of the Contractor and to audit direct implementation of environmental mitigation measures contained in the ESMP and construction contract clauses for the Project. KPLC also have the direct responsibility to implement and monitor land acquisition and compensation issues as outlined in the RAP. Their Project teams should include an environmental monitoring and management specialist as well as

a sociologist experienced in land acquisition and compensation issues. The monitoring should be a systematic evaluation of the activities of the operation in relation to the specified criteria of the condition of approval.

In undertaking the same, KPLC through KRU will be responsible for implementing resettlement and compensation activities and it will therefore be their responsibility to undertake regular internal monitoring of the process.

The objective of internal monitoring and audit will be:

a. To find out any significant environmental hazards and their existing control systems in force.
b. Meeting the legal requirements as stipulated in the Environmental Management & Coordination Act, EMCA-1999.

The responsibility for mitigation monitoring during the operation phase will lie with the Environmental Section in KPLC. Environmental monitoring of the following parameters is recommended as a minimum for the Project.

8.3.2 External Monitoring and Evaluation

The Consultant recommends that a consultant should be hired to carry out Annual Environmental Audits in line with NEMA requirements. NEMA has the overall responsibility for issuing approval for the Project and ensuring that their environmental guidelines are followed during Project implementation. Its role therefore is to review environmental monitoring and environmental compliance documentation submitted by the implementing authorities and they would not normally be directly involved in monitoring the Project unless some specific major environmental issue arose.

KPLC through the consultant will therefore provide NEMA with reports on environmental compliance during implementation as part of their annual progress reports and annual environmental auditing reports. Depending on the implementation status of environmentally sensitive project activities, NEMA will perform annual environmental reviews in which environmental concerns raised by the project will be reviewed alongside project implementation.

The Consultant recommends that relevant representatives from World Bank should be incorporated. The project affected persons should be represented through relevant PC and public participation forums should be held during the audits.

Table 8.2 Monitoring Plan

Environmental Component	Parameter	Standard	Location	Frequency	Duration	Implementation	Supervision
Pre-Construction Phase							
Land Acquisition and Compensation	Ensure compensation paid as per RAP	RAP	Along ROW for all PAPs	Monthly until its compete		KPLC	Supervision Consultant
Construction Phase							
Noise levels	Noise levels on dB (A) scale	NEMA guidelines	Noise level meter kept at a distance of 15m from edge of ROW	As directed by the supervision consultant	Readings to be taken at 15 second interval for 15 min every hr and then averaged	Contractor	Supervision Consultant
	Noise levels on dB (A) scale	NEMA guidelines	At equipment yards	Monthly as required by the supervision consultant		Contractor	Supervision Consultant
Soil Erosion	Turbidity in stormy water	NEMA guidelines	As identified by KPLC	During and after the rainy seasons		Contractor	Supervision Consultant
Vegetation Clearing	Monitor clearing to ensure consistent with ESMP	ESMP	Along ROW and works area	As required		Contractor	Supervision Consultant
Accidents	Safety training for workers, accident reports, community consultations	ESMP	Along ROW	Monthly		Contractor	KPLC
Health	Signs, posters displayed, health awareness lectures, mosquito nets in malarial areas for each worker, health checks for workers.	ESMP	Along ROW, work camps and surrounding areas	Monthly		Contractor	KPLC

8.4 Training

The Table 8.3 outlines the proposed training for KPLC staff as well as employees of the Contractor. The training is aimed at the practical aspects of environmental monitoring and management. The KETRACO staff who will be involved in this project will also be included in the training programme.

Table 8.3: Training Programme

No	Training Recipients	Mode of Training	Environmental Aspects to be Covered	Training Conducting Agency
1	KPLC/ KETRACO Environmental Staff	Lecture System Workshops Group Discussion Visit to Case Study	-Environmental overview -Environmental regulations and acts -Environmental management plans -Environmentally sound construction management	Environmental and social experts, Supervision Consultant
2	KPLC /KETRACO Operation/Maintenance Staff	Seminar Workshop Lectures	-Environmental Management Plan implementation -Environmental pollution associated with transmission projects -Best environmental practices	Environmental and social experts, Supervision Consultant KPLC Environmental Department
3	Contractor's Staff	Seminar Workshop Lectures	-Environmental overview -Environmental Impact Assessment -Environmental regulations and acts -Environmental management plans -Environmental pollution associated with transmission projects -Transmission projects and environmental issues	Environmental and social experts, Supervision Consultant KPLC Environmental Department

8.5 Institutional Arrangements

The following institutional arrangement will be responsible for project implementation.

The National Environmental and Management Authority (NEMA): will ensure that all the relevant rules and regulations concerning the environment are adhered to in line with the EMCA, 1999 and the Regulations 2003.

Kenya Power and Lighting Co (KPLC): It has been vested with the overall responsibility for the coordination, planning and implementation of the Project.

Environmental steering committee: This committee will comprise representatives from KPLC, NEMA, Financing institutions (World Bank), KWS, KCAA, Civil society and the community. This will ensure that the actual implementation of the environmental monitoring and management is carried out.

Supervision Consultant: This shall be a lead environmentalist and will supervise and ensure that the contractor complies with the relevant laws.

Contractor: The contractor will be responsible for actual construction work.

Figure 8.1 summarizes the institutional arrangements.

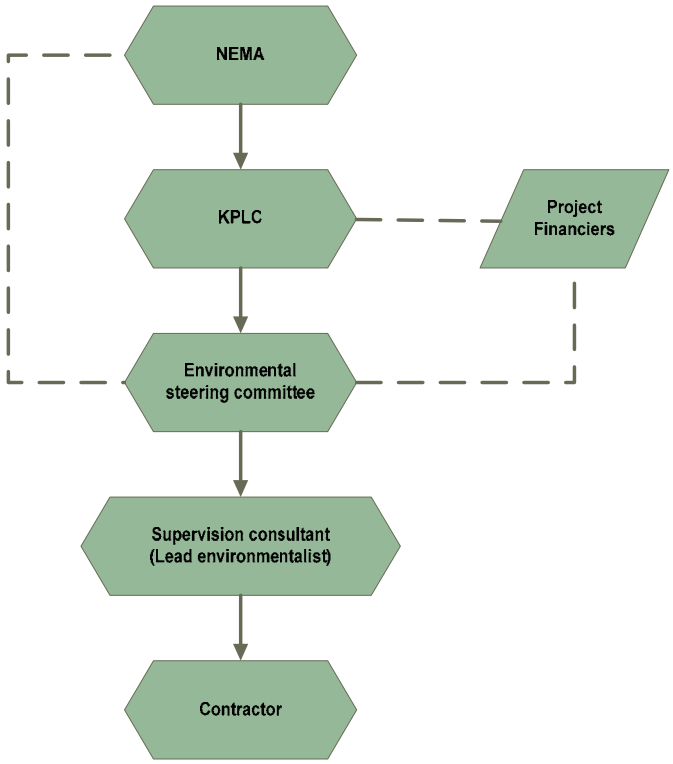

Figure 8.1: Summary of institutional arrangements

8.6 Complementary Initiatives

8.6.1 Conservation Measures

This activity will mitigate and respond to the potential impacts of the project on protected areas. It will review the approach and methodology for the conservation campaigns and monitor the effectiveness of the proposed mitigation measures. The activity will take place during construction and operation, and will recommend new mitigation measures where those proposed are not effective. Emphasis on collaboration with the Kenya Wildlife Service and local communities will ensure success of the proposed conservation measures.

8.6.2 HIV/AIDS Component

The activity will involve implementation of the proposed HIV/AIDS Awareness/Prevention Campaign. There will be a review of mid-term likely effectiveness of the approach and methods adopted in case new approaches and strategies are deemed appropriate. The activity will thus be re-oriented as necessary to achieve its full potential in lasting benefits to project affected communities by the end of the construction period.

8.7 Estimated cost

The estimated cost of the environmental management plan is KES 251 million excluding decommissioning expenses.

8.8 Implementation schedules and reporting

The implementation will be rolled out as required for each project component in line with the construction timetable and frameworks established for surveying and consultation, management and monitoring. KPLC will have responsibility for social and environmental aspects of the projects. Supervision undertaken will also cover these aspects.

Chapter 9

9.0 DECOMMISSIONING

As with any project, the facilities, such as towers and cables and substations' equipment used in this Project will have a lifetime after which they may no longer be cost effective to continue operation. At that time, the project would be decommissioned, and the existing equipment removed. Where possible KPLC may want to re-power the site (replace existing project equipment with new project equipment on the same site). Decommissioning also occurs when KPLC ceases to have interest on the existing line or have other reasons that make it mandatory to leave the existing line.

When the project moves into the decommissioning stage, negative impacts that may result from decommissioning activities will have to be mitigated. Decommissioning may require outside contractors. The components of negative environmental mitigation that will be addressed in include, risk management analysis and emergency response. Implementation and monitoring of environmental, health, and safety issues with regards to legislations outlined in the legislative framework in chapter two of this report and the laws of Kenya will have to be put into consideration.

It will also be necessary for KPLC to undertake comprehensive environmental audits and inspections before and after decommissioning and submit the respective audit reports to NEMA for evaluation and approval.

There are typically such requirements as personal protective equipment, maintaining a safe workplace, fire prevention, safe work practices, etc., as provided in the Kenya Safety Code, Grid Code , Occupational Health and Safety Act and the Factories Act, that the contractor must adhere to during decommissioning. Contractors are expected to comply with these requirements as a minimum. Contractor must avail his safety plans for the decommissioning work and this must be reviewed for compliance. The contractor's best safety practices will then be incorporated into the decommissioning plan as appropriate.

The things that the contractor will have to keep abreast include checking of potential hazards and risks, development of a risk register (The risk register is an evergreen document that will be used and be updated on a continuous basis to identify and mitigate risks as they surface), contractor's personnel will be expected to regularly observe work practices and provide positive reinforcement and guidance to fellow employees, work practices that may be considered to place employees or the environment at risk will be identified, evaluated, and modified as necessary to eliminate or substantially reduce the risk.

9.1 Decommissioning Plan

The goal of project decommissioning will be to remove the installed power towers, cables, and line equipment partly or as a whole and return the site to a condition as close to a pre-construction state as feasible. The major activities that will be required for the decommissioning of Kisii-Awendo line are:

1. Tower removal
2. Electrical system removal
3. Structural foundation removal
4. Re-vegetation

It is noteworthy that the specific requirements and approach for each activity may not be as exactly as it was before commissioning because the technologies and construction techniques available when the project will be decommissioned may have changed. The disassembly and removal of substation equipment will essentially be the same as its installation, but in reverse order.

Potential environmental impacts caused during decommissioning and those, which will be mitigated as per the provided environmental management plan, are dust and noise to the surrounding environment and public safety.

9.2 Transmission Line Removal

Assuming the transmission line no longer serves a purpose for the area, it will be disassembled and removed. Initially, the wires will be removed from the tower hangers, collected and be transported to safe place. The tower structures would then be disassembled and removed, including grounding rods. The areas around the poles, along with any access roads that were necessary, will be reclaimed.

9.3 Structural Foundation Removal

When towers are removed from their foundations, the foundations need to be removed too so as to enable re-vegetation of the land. The concrete and steel in the foundations will be broken-up and removed to appropriate depth. All concrete and steel debris will be removed from the site.

9.4 Public safety

A safety officer, hired by the contractor, will have the authority or responsibility of keeping all members of the public away from the decommissioning zone, especially if members of the public choose to ignore posting signs or requests for them to keep some distance from the decommissioning zone.

1. **Dust Impacts**

Temporary and localized impacts from dust would occur from the decommissioning phase as a result of vehicle traffic, and other soil disturbances.

Mitigation: During decommissioning some localized increase in dust levels will be unavoidable. To minimize these levels, the contractor will use water to control dust, and traffic speed will be held to appropriate levels. Disturbed areas will be re-vegetated or otherwise covered as soon as possible following disturbance.

2. **Noise Impacts**

Local noise levels will be affected temporarily by decommissioning activities but no impacts are anticipated to residences or businesses. Impacts during decommissioning are expected to be limited to workers on-site.

Mitigation: All decommissioning will take place during daylight hours. Through communications with the local communities, KPLC and the contractor will be kept informed of any dust or noise complaints. If significant dust or noise complaints are received, dust and noise measurements will be taken along the project boundary or near the complaint sources to ascertain the true dust or noise levels. If the levels are found to be unsatisfactory, alternative mitigation measures will be explored.

9.5 Fire and Oil Spill Prevention

Fire will be prevented during decommissioning by ensuring that there are adequate availability of fire extinguishers onsite. The personnel undertaking the removal of the equipment will have to be trained on fire fighting and if possible, reasonable fire grills will have to be done to enhance awareness and safety. In case of oil spills, all the equipment and machines that will have the potential of spilling or leaking oil will be checked regularly. However, careful handling will be done to avoid spilling at all times.

9.6 Manpower

Project decommissioning activities would be similar to project construction activities, and would primarily involve the dismantling and removal of the transmission line. Actual dismantling, removal, and closure activities would be expected to take as long as or less than the construction period thus it will require the same manpower used in construction.

Chapter 10

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusions

Based on field work and consultations with Project affected people, locals, the client, and provincial administration, it was concluded that:

- It is unlikely that the Project will have significant adverse social and environmental impacts. Most adverse impacts will be of a temporary nature during the construction phase and can be managed to acceptable levels with implementation of the recommended mitigation measures for the Project such that the overall benefits from the Project will greatly outweigh the few adverse impacts.

- All the negative impacts will either be moderate or lesser in rating and could be easily mitigated.

- Generally, the proposed line will result in appreciable benefits to the people in the project area of influence and bring opportunities for development to the country. The main social impact management issues revolve around relocation of people along the transmission line corridor and acquisition of the right of way and way leave of the transmission line.

- Detailed survey and pegging of the proposed line has not yet been done. This is urgently needed to aid in the preparation of a comprehensive Resettlement Action Plan.

10.2 Recommendations

From the foregoing, the following recommendations have been made:

I. Line Survey

KPLC should carry out a survey and mark the boundaries of the proposed transmission line. The consultant and KPLC will jointly inspect the surveyed line. This will aid in ascertaining the exact Project Affected Persons (PAPs).

II. Annual Environmental Audits

KPLC should undertake an environmental audit (EA) of the projects, in accordance to NEMA Regulations, twelve (12) months after completion of the project to confirm the

efficacy and adequacy of the ESMP. This can done by seeking the services of Environmental Consultants who should be Lead Agents registered by NEMA. The team should consist of the following experts as a minimum:

- Lead Environmental Consultant (Senior Environmentalist/Team leader)
- Sociologist

In addition to this KPLC should also conduct regular Self Audit of the same.

III. Implementation Plan

The consultant recommended that the proposed projects be implemented in compliance with all the relevant legislation and planning requirements of Kenya at all times. In addressing the environmental issues, the contractor and/or KPLC must follow the mitigation guidelines provided under EMP. This will ensure the safety of operators and the neighbouring communities. It is also recommended that a safety officer should be stationed at every site, during the whole construction phase. The safety officer will make sure that a first aid kit is always available and that all the skilled workers follow the safety rules.

IV. Corporate Social Responsibility

Kenya Power and Lighting Company shall consider supporting the affected communities in water provision, and rural electrification.

APPENDICES

APPENDIX I: PUBLIC CONSULTATION LIST

Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form Kiplabotwa location

No.	Name	Location	ID Number	Address	Tel Number
1	KIPROTO ARAP KOECH	KIPLABOTWA	2319596	131, AWALO	0714 805218
2	JOHN MARITIM BETT	"	3338294	"	0714 687787
3	CHEPKWONY A. SANG	"	07 03624711	"	0721 366170
4	WILLIAM G.K. MASAS	"	1363617	94, LOLGISA	0728674559
5	ROTICH DAVID	"	11794308	"	0727227948
6	SITIENEI JOHN	"	20339859	95, LOLGISA	0728801216
7	JOEL SEGERGER	"	11432818	94, LOLGISA	
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Log Associates, October 2009 1

Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Kip labotwa

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	WILLIAM KIPLANGAT CHERCHIR	KIPLABOTWA	2280860	BOX 90, AWALO	0724 662538
2	TECKLA CHEPKOECH CHERCHIR	"	9729936	"	0728 769942
3	SUGUNA KILUSITO ARAP	"	3827569	"	
4	TAPOTANY CHEPKORIR KILETI	"		"	
5	KIPTANGUS ARAP CHEPTIRGEI	"		"	0723987619
6	JOSEPH KIRUNYET	"	0282350	BOX 59, LOLGISA	0723711151
7	KIPKEMEI JOSEPH BARCHOK	"	1363140	BOX 15, AWALO	
8	KIPNGENO ARAP KIYUMI	"		BOX 94, LOLGISA	0711568511
9	MARIA CHEPOBUN KALYAS01	"		BOX 94, LOLGISA	0729641792
10	RICHARD ROTICH	"		BOX 94, LOLGISA	
11	RIPORA MOLEL	"		"	
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	Kores Ololosi Kai	Nairasiasa	–	–	
2	Lange inalolelange	Nairasiasa	–	–	
3	Mbakuanik Ndarasuna	Ngalatr.	8814160	Lower Melili	
4	Nairimu Lucy	Lower melili			
5	Edward Tikani	Nairasiasa			
6	Peter Seventu	Nairasiasa			
7	Stanley Maleto	Lower Melili			
8	Joseph Sunkuli	Lower Melili			
9	Meshack Okuni	Lower Melili			
10	Natana Sadira	Lower Melili			
11	James Sepek	Lower Melili			
12	Mauagi Lerolwo	Lower Melili			
13	Jane Matero	"			
14	Selelo Kisongo	"			
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	FIORENCE ACHIENG	CENTRAL SAKWA	21341184	44 Awendo	0729968 060
2	JULIETA ANYANGO	CENTRAL SAKWA	—	—	—
3	PATRICIA ATIENO	CENTRAL SAKWA	10965141	99 SARE	0724571005
4	VICTORINE ADHIAMBO	RANJIRA LABOUR	—	—	0710289677
5	KENNEDY ODHIAMBO OWUOR	CENTRAL SAKWA	20242060	47 SARE	0713631271
6	GIDEON OYULI	KELATI LOC	26755 38	590-40511	0729519748
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	DINAH NYANGNESO	B. CHACHE	857497	1539	0714910226
2	Simion M. Onyango	BSS CHACHE	70090050	1539	0726167943
3	Atemes Nyamichaba	B. chache	25828214	368	0715180282
4	DELPHIN NYABUTO	B. Cheche	—	—	0717640983
5	Lilian Kwamboka	B - Chache	—	3338 Kisii	
6	Obed Keobia	B. chache	—	368	—
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	SAMMY ABERA	KPLC	6422445	BOX 151 KSM	0722457886
2	CARLOS OMOKE	IBENO	20244675	BOX 31 KEUMBU	0722908323
3	ASSA O. MURUKA	BOITANGARE	22315524	BOX 40 KEUMBU	0724281586
4	Peter Bakora	Basii chache	22040099	Box 733	0712029237
5	William Ekebasi	Bassi chache	5801714	BOX 592 Kisii	0713847863
6	Ronald Mutuni	Bassichache	13746993	BOX 2247 Kisii	0710395219
7	Joseph Nyandika Nyakeya	Basiichache		BOX 592	—
8	Nanzera K. Oyega	Bassi chache	4958799	BOX 592 Kisii	0725005466
9	Roda K. Nyandusi	Basiichache	21195440	BOX 592 Kisii	
10	Simon Nyandisi	Basiichache	14606446	BOX 592 Kisii	0714072052
11	Gladys Momanyi	Basii chache	1375373	BOX 592 Kisii	0729706029
12	LIBANUS ONDERA RATEMO	BASSI CHACHE	1627128	BOX 733 Kisii	0714778610
13	VERONICA				
14	HENRY S. ONDIEKI	BASSI CHACHE	10661762	Box-1539	0727700625
15	ANN NYAKARA ONGORO	Bassi chache	6554025	BOX 733	0712017442
16	TERESA NYABOKE	Bassi chache	1534382	BOX 733	0716798511
17	RAEL KERUBO NTABO	Bassi chache	1627967	BOX 733	—
18	GRACE MORAA MOKUA	Bassi chache	2674296	BOX 1549	0725808122
19	SAMWEL MOCHA	Bassi chache	6554332	BOX 733	0713107891
20	ONTOBO MATOKE	Bassi chache	0444719	BOX 733	

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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	Onsare Richard Elijah Mvera	Bassi Chache	13084948	3385	0722617624
2	Ciguaro Osoro	Basii Church	0379111	733	0728270058
3	Simon Nyangau Moloo	Basii Church	3332381	733	0734713015
4	Abel Mymanyi Onyiego	Basii Chache	24751705	733	0721290997
5	CHARLES OMWENA	BOCHI Church	7573221	64 Mangere	0728841633
6	NORAH NYABOKE	BOCHI	—	—	0716255300
7	JOHN ONDIEKI	BOCHI	—	64 Mangere	—
8	MARTHA MWERU	BOCHI	—	64 Mangere	—
9	EPHANS OMACHE	BOCHI	23055954	64 Mangere	—
10	Hellen Kabiki	BOCHI	—	64 Mangere	0725464566
11	Robert Onyoke	BOCHI	—	64 Mangere	—
12	Evans Onani	BOCHI	—	64 Mangere	0715884982
13	ROBERT Tengeya	BOCHI	00117016	64 Mangere	0714196790
14	John Ogega.	Bubasi	6555864	—	0120252386
15	Calless N. Kedo	Bass Cha	12605170	64 Mangere	0710908487
16	Juash Akuku	Kangunikagos	9648640	—	0716746648
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18	Rose Auma Migoya	Kangunkago	7281112	—	—
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	Benson Mogire	Bassi Chacha	2558676	1539	0726346632
2	James Otuoto Keengu	Bassi Chache	0357782	3385	0713709053
3	Ester Kembo	Nyamarambe			0721782432
4	Sons Onchari	Nyamarambe	21510521		0726266392
5	Salome Kwamboka	Nyamarambe			0717772081
6	AYIECHA Ogwozi				0725046167
7	Michael O. Omwange	Bogetenga	24535176		
8	Geoffry Nyamolani	Bogetenga	24745893	1 Nyamarambe	0724975986
9	Peter Mogaka	Nyakembene	26418750	1 Nyamarambe	0728730766
10	Maobe Samuel	Nyakembene	25531423	1	0723839362
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	CHARLES ABIAGO MBAKA	Basii docle	8125598	7	0724355326
2	JOHN D. NYAKECH	CENTRAL KANYAMKAGO	7245507	2, URIRI	0721320331
3	CHARLES O. MIGOYA	CENTRAL KANYAMKAGO	20548400	100-40288-URIRI	0723985420
4	SOLOMON. OKELLO	WEST KOBUM	14550955	196 RANEN	
5	TIMINA MBOGA	C. KANYAMKAGO		Box 49 RAPOGI	
6	AGNEN AUMA JAKOYO	C. KANYAMKAGO	2741875	Box 16 Rapogi	0715383881
7	DOMNIC OGOL GITO	C. KANYAMKAGO	-	Box 41 URIRI	-
8	JOHNES OWALO OSONGO	C. KANYAMKAGO	6762466	Box 13 RAPOGI	
9	JULIUS ONYANGO ODIRA	C. KANYAMKAGO	2742156	Box 13 Rapogi	-
10	SAMWEL ODONGO YAMO	C. KANYAMKAGO	2743807	Box 16 Rapogi	-
11	MICHAEL OWITI	C. KANYAMKAGO	14484657	Box 45 URIRI	0736992108
12	NOAH OTIENO EBINDI	C. KANYAMKAGO	6473378	Box 147 Rapogi	0724703982
13	PIUS KIAGO OYOLA	C. KANYAMKAGO		Box 13 RAPOGI	
14	OSEMA OPIYO	C. KANYAMKAGO		Box 13 Rapogi	
15	ALEX OZITI	C. KANYAMKAGO	1565816	Box 13, RAPOGI	0711427127
16	DANIEL OBARA	C. Kanyamkago		P.o Box 13 Rapogi	
17	VITALIS LIECH NERE	C. KANYAMKAGO	6762860	Box 134 SARE	—
18	JACOBO OUMA NERE	C. KANYAMKAGO	20467852	Box 16 RAPOGI	0711738155
19	JENIFA DEDE NERE	C. KANYAMKAGO	—	Box 16 Rapogi	
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DINY OWACHO CHIEF'S OFFICE
CENTRAL KANYAMKAGO LOC.
P. O. BOX 100 RAPOGI
DATE 5/10/2009

John Okoyo Signature
CHIEF CENTRAL KANYAMKAGO

5/10/09

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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	Asst. Chief Charles Moeri Obwoyo	Kegati	10927693	590	0726476564.
2	Chief Gideon D. Bisonso	Kegati	2675338	590-Kisii	0729519748
3	John Nyamweya Nyaboga	Kegati	0412421	883 Kisii	0711355875
4	Benedict Nyamori	Kegati	0378209	412 Kisii	0710421734
5	Wilson Makori	Kegati	0413031	" "	—
6	Isaac Moge Mokaka	Kegati	2672437	" "	0713411634
7	Juvinalis O. Kerandi	Kegati	13481687	" "	0721464675
8	David Mogere	Kegati	10692343	" "	0712766086
9	Henry Kebwaro K.	Kegati	1614233	" "	0714099020
10	Richard Moses Nyanchoka	Kegati	3489755	" "	0711772887
11	Patrick Oriwa Orangi	Kegati	1622925	"	0725035386
12	Joseph Nyamari Mokano	Kegati	1619515	"	0727764975
13	Robert Mombo	Kegati	0836800	2554 Kisii	0721327424
14	Stephen Mabeya Mokere	Kegati	10693501	412 Kisii	0715753616
15	Sabastiano Ombati Mogere	Kegati	21942898	29 Kisii	0710729519
16	Francis Onchwari Otwoma	Kegati	0302163	1950 Kisii	—
17	Phedus Osugu Gisege	Kegati	1619525	1950 Kisii	—
18	Samuel Maina Orangi	Kegati	8509591	1414 Kisii	0723881625
19	Christopher N. Nyakoe	Kegati	13139337	575 Kisii	0721760191
20	James Ogoro Obwoge	Kegati	4141205	575 Kisii	0725970110.

AG. CHIEF KEGATI LOCATION 6/10/2009

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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	Linet N. Nyamabaga	Kegati		1950 Kisii	0715287583
2	Charles O. Nbere	Kegati	1619633	1950 Kisii	0726540612
3	Agnes M. Isaac	Kegati		412 Kisii	0724661762
4	Stellah B. Simion	Kegati	—	412 Kisii	0724661762
5	Beta Onyiego Omamba	Kegati	6550135	1950 Kisii	—
6	Philip Ondieki Ondimu	Kegati	13746742	412 Kisii	0733497441
7	DAVID MASESE	Kegati	265176	540 KISII	0714115306
8	ISAIAH MAGOMA	Kegati	11484710	—	0722329824
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AG. CHIEF KEGATI LOCATION 6/10/2009

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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number	SIGN
1	MARIN MOMANYI MABEYA	KEGATI	6550990	Box 218 KISII	0722283568	
2	ELICI OGOTI MABEYA	KEGATI	8533449	Box 442 KISII	0710314525	
3	JUVENALIS OGEGA NYABAYO	KEGATI	1618743	Box 286 KISII	0712831826	
4	ALEXINA NYABOKE MOGOI	KEGAT	2621222	Box 412 KISII		
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KODHOCH

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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Ramula DO place.

7/10/09

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number	SIGN
1	MICHAEL OGAI	KODHOCH WEST	1522809	173 KADONGO		
2	MINGOCHO O. JAMES	" "	16021896	113 KADONGO	0729755951	
3	JOSHUA O. OBUON	RAMULA	0411637	71, KADONGO	0727386208	
4	JACOB A. NYANJONG	KODHOCH W.	1502160	BOX 29, KADONGO	0725555737	
5	DIXON O. SAMBA	KASEWE	8020484	Box 50 KADONGO	0713919992	
6	HESBON.O.ASERO	KASEWE	5888007	BOX 151, KADONGO	0721774279	
7	JOEL D. SANGORO	KODHOCH WEST	1522879	BOX 237 Kadongo	072791190	
8	Lucas Modi Raila	Kodhoch	1522218	Box 195		
9	VINCENT AWENDO	KASEWE	1527197	BOX 151 KADONGO		
10	WILSON N. ODERO	KASEWE	5890451	BOX 15 KADONGO	0727439626	
11	~~JANE NYANDIKO~~	~~KASEWE~~	~~3978926~~	~~Box 15 Kadongo~~	~~0722984962~~	
12	PAUL OCHIENG DUMA	KASEWE	12460973	BOX 127 KADONGO	0711973482	
13	JOASH MITEMA ACAL	KODHOCH WEST	11801379	112 KADONGO	0724662509	
14	JANE ADHIAMBO NYANDIKO	KASEWE	3978926	Box 15	0722984962	
15	MAGDALINE ATIENO OMUGA	KASEWE		Box 127		
16	MESHACK ANUNDA A.	KODHOCH. W	1522246	BOX 194	0717498465	
17	Charles Ouma	Kasewe	5887756	BOX, 127		
18	GEORGE OCHIENG O	KODHOCH WEST	22567637	Box 195	0715044390	
19	JULIUS OTIENO AYUKA	KASEWE	11665897	BOX 157 KAD	0727494946	
20	KENNETH KAUNDA AKUMU	KODHOCH W.	12905153	Box 113	0726657833	

Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Ramula DO's place

1/10/09

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number	SIGN
1	ENOS OWACK OKUNGA	KASEWE	1865330	Box 179 KADONGO	0714708400	
2	CHARLES DETE	KODHOCH WEST	10963600	BOX 119 KADONGO	0729545277	
3	TOBIAS OTIENO OLOTO	KODHOCH - WEST	12597325	Box 113 KADONGO	0729011971	
4	ZEDEKIAH NYANGOR AGWANDA	Kodhoch West	8252986	Box 113 KADONGO	0720565181	
5	GEORGE OUMA AGWANDA	KODHOCH-WEST	11122047	BOX 113 KADONGO	0722430465	
6	SILVANUS OKEYO MINGOCHO	KODHOCH WEST	13884528	BOX 113 KADONGO	0712787430	
7	HARRISON OSWAGO	" "	1523548	Box 129 Kadongo	0721231515	
8	David Ogada Nyakjang	" "	1522018	Box 113 Kadongo	0710194749	
9	JOSHUA ODHIAMBO PILO	KODHOCH WEST	4411736	Box 113 Kadongo	0726469984	
10	SARAH ATIENO OGOLLA	KODHOCH WEST		Box 113 Kadongo	0716494021	
11	EPHRAIM O. MAGERO	RAMULA Lo.	8621669	Box 114 Kadongo	0723583007	
12	Leonard Odhiambo	Kasewe	11124305	151 Kadongo	0724057699	
13	Richard Ochieng	OBOCH	13777336	92 oboch	0725695474	
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KEMERA.

Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

5/10/09

Kiogoro primary school

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number	SIGN
1	Samson O. Mamayi	Kemera	5803760			
2	Pius Akara	"				
3	James Nyabicha	"				
4	Rosa Osando	"				
5	SAMWEL MACHIEGWA	"				
6	OMWENGA AREBA	"				
7	CHARLES OKWERA OMURA	"	5299132			
8	Simion O. Opiku	"	5806094			
9	Charles Motari	"	11994322			
10	Yuvenalis Omwasi	"	4137566			
11	Helen K Mallow	"	2754694			
12	Kerubo Joshua	"				
13	Frida Morangi	"				
14	HENRY OGETO	"	11135270			
15	Aluts Nyamamba	"	13329434			
16	Evans Angwenyi	"	7630413			
17	Albert Onsongo	"	—			
18	James Arake Onsinci	"	—			
19	Thomas Onsongi	"	—			
20	Evans Onsongi	"	—			
21	Berard Mollaya Mose	"	10931617			

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KEMERA LOC.

Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	CHARLES OBIYE	KEMERA	7844826	784-40200 Kisii	0725074774
2	Aloys ONDICHO	KEMERA	1595318	1135 Kisii	0725672153
3	Peter Nyamoti	Kemera	10783989	5-40221	0722445270
4	THOMAS GESEMBE OSEKO	KEMERA	26601486	2- OMOGONCHORO	0734818656
5	SHADRACK MARANGA	KEMERA	6133038	2 - Omogonchoro	0720008297
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KEGATI LOCATION

2/10/09

Chief's place.

Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number	SIGN
1	GIDEON O. BISINDO	KEGATI	2675538	590 KISII	0729519748	
2	BENEDICTO OMURWA	KEGATI	9910226	590 KISII	0725808237	
3	JOSEPH NYASANI OIRA	KEGATI	2672084	412 KISII	0722873809	
4	WALTER OREGI ONDIMU	KEGATI	22093329	412 KISII	0721726922	
5	GEORGE ATANDI ONYONI	KEGATI	23013080	3021 KISII	0712796751	
6	RAPHAEL NYAMWAYA	KEGATI	11496081	1650 KISII	0725693824	
7	CHARLES M. OBONYO	KEGATI	10927693	590 KISII	0726476564	
8	ORPHAH K. NYAKUNDI	KEGATI	16072736	BOX 218 KSI	0720575955	
9	CHARLES M. OSINDE	KEGATI	5298284	P.O. BOX 412	—	Mogesi
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number	SIGN
1	MARGRET GESARE NYAACHI	KEGATI	20713135	412 KISII	0729696582	
2	CHRISANTU MOSÉ MABEYA	KEGATI	2673956	412 KISII	0714981918	
3	JOSHUA NYAKONI	KEGATI	20599685	904 KISII		
4	FLORENCE WACHERA KINYUA	KEGATI	22717648		0725350552	
5	JARED NYANDUSI	KEGATI	26276809	3595 KISII	—	
6	DAVID NYAMAKALI NDEGO	KIOGORI	13481748	1804 KISII	— 0713628589	
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

(Kataka Centre)

Held at Ngareta location, Oleteshua Sublocation — chief. Nelson Naisenya.

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	WILSON SAOLI	Ngareta location	22331297	155	0724694020
2	'MORIJOI NKURUMUS	Nkareta			0728517820
3	NTEPAPA ROIKO	"	20569499	"	0723317646
4	JOSEPH SAOLI	"	22610975	155	0729645262
5	KOSIOM TIKAN	"		"	0716106477
6	SIRERE ROIKO	"	24488133	"	0726251521
7	MWAANS NKURUMUS	"			0710518507
8	SAINKO NKURUMUS		21128594		0728674527
9	KEMEIS SAOLI		24483356		0710927702
10	KIROTIE KIMORGO		20836797		0725814508
11	LEON SAOLI				0724260086
12	CRISI SAOLI				0710554044
13	RAKITS KIMORGO				
14	ISAACK NKURUMUS		22607863		0727351666
15	TEKETI PERE				0710460118
16	MOKIRE PERE				
17	MOSES K SAOLI	"	21554549		0723776916
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Meeting held at Cheboi location – "Farmers Centre"

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	Judy Mitai	Chesoi		96 Longisa	
2	Raeli Mitgo	Chesoin		96 Longisa	
3	Sarah Langat	Chesoin		96 Longisa	
4	Zeborah	Chesoin		96 Longisa	
5	Hellen Rotich	Chesoin		96 Longisa	
6	Linah Langat	Chesoin		96 Longisa	
7	Linah Rotich	Chesoin		96 Longisa	
8	Richard Koech	Chesoin		96 Longisa	
9	Peter Langat	Chesoin	~~1899~~8725682	96 Longisa	0720610510
10	Moses Rotich	Chesoin	2353751	~~96~~ 85 Bomet	0712512186
11	Edwin Koech	Chesoin	2015391	85 Bomet	0712864086
12	Jonathan Ngetich	Chesoin	–	96 Longisa	–
13	Clementina Kendagor	Chesoin	–	96 Longisa	–
14	Wesley Kori	Chesoin	1553421	96 Longisa	–
15	Nicholas Langat	Chesoin	–	96 Longisa	–
16	Mitei Richard	Chesoin	~~0724918037~~ 7063576	16 Longisa	0724918037
17	Samuel Rotich	Chesoin	4731777	16 Longisa	0718937531
18	Geofrey Mutai	Chesoin	2021672	73 Longisa	0728531318
19	Onesmus Langat	Chesoin	~~0230~~0173	16 Longisa	0719789953
20	Philip Koech	Chesoin	6375086	16 Longisa	0725200569

Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	[illegible] Marie	Chesoin	0781594	96 Longisa	0724721249
2	Stanley Cheruiyot	Chesoin	20166902	96 Longisa	–
3	Kipruto Sigei	Chesoin	23509658	96 Longisa	0716618735
4	Thomas Koech	Chesoin	1862354	16, Longisa	0724875965
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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Meeting Held at Kipsoen Trading Centre 08/10/2009

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	David Towett	Cheboin	5342329	Box 52 Sin	0712957131
2	Philip Kirui	Cheboin	11432825	Box 90 Longisa	0729809528
3	Joel mutai	Cheboin		89 Longisa	–
4	Mathew Soi	Cheboin	6890909	Box 90 Longisa	0720883798
5	Chirchir mike	Cheboin	24503897	Box 190 Longisa	072937 9982
6	Philip langat	Cheboin			
7	Julias Mosonik	Cheboin	20789631	Box 90 Longisa	0725221711
8	David kosgei	Cheboin	5996345	Box 90 Longisa	–
9	Koech Peter	Cheboin	23191923	Box 90 Longisa	0724040501
10	Emanuel Ngetich	Cheboin	23954145	Box 90 Longisa	0726066017
11	Julias Kirui	Cheboin	14633394	Box 90 Kongisa	–
12	Julias langat	Cheboin	0736024	Box 90 LNG	0725048019
13	Wilfred soi	Cheboin	4755647	Box 90 LNG	
14	Margaret Chebkorir Bore	Cheboin	0711287765	Box 90 Lng	0713507122
15	Caroline Chepkurui	Cheboin	25324263	Box 90 Lng	0713122569
16	Joyce Chepkemoi	Cheboin	21704989	Box 90 Lng	0728084275
17	Philip Ngetich	Cheboin	5996508	Box 90 Lng	0727279198
18	Julias mutai	Cheboin		Box 90 Lng	–
19	Michael Kirui	Cheboin	10542105	Box 90 Lng	–
20	William Soi	Cheboin	27772565	Box 90 Lng	0713456184
21	Stephen Towett	Cheboin	7623210	Box 90 Lng	0721704030
22	Ernest Bartai	cheboin	0871344	Box 90 Lng	0727930072

Log Associates, October 2009

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Consultancy Services for carrying out Environmental and Social Impact Assessment and Resettlement Action Plan of the Proposed Olkaria-Narok-Bomet-Sotik, Kisii-Awendo, Kisii-Sondu 132kV Transmission Line

Meeting Held at Kipsoen Trading Centre 08/10/2009.

Public Participation Form

No.	Name	Location	ID Number	Address	Tel Number
1	Geoffrey Koech	Cheboin	–	Box 90 Lng	0711194717
2	Weldon Kiplangat Sonoiya	Cheboin	9435863	Box 16 Longisa	0720006957
3	Joel Rotich	Cheboin	11368221	Box 90 Longisa	0720650799
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Log Associates, October 2009

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Appendix II: Environmental Guidelines for Contractors

General Environmental Management Conditions

General

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

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

(b) Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.

(c) Ensure that existing water flow regimes in rivers, streams and other natural or irrigation channels is maintained and/or re-established where they are disrupted due to works being carried out.

(d) Upon discovery of ancient heritage, relics or anything that might or believed to be of archeological or historical importance during the execution of works, immediately report such findings to the Supervising Engineer so that the appropriate authorities may be expeditiously contacted for fulfillment of the measures aimed at protecting such historical or archaeological resources.

(e) Discourage construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities.

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

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

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

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

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

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

Work site/Campsite Waste Management

6. All vessels (drums, containers, bags, etc.) containing oil/fuel/surfacing materials and other hazardous Chemicals shall be bonded in order to contain spillage. All waste containers, litter and any other waste
Generated during the construction shall be collected and disposed off at designated disposal sites in Line with applicable government waste management regulations.

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

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

New extraction sites:

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

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

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

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

Soil Erosion Prevention

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

15. Always remove and retain topsoil for subsequent rehabilitation. Soils shall not be stripped when they are wet as this can lead to soil compaction and loss of structure.

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

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

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

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

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

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

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

Water Resources Management

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

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

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

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

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

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

Traffic Management

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

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

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

Disposal of Unusable Elements

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

Health and Safety

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

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

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

Repair of Private Property

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

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

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

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

39. Within 6 weeks of signing the Contract, the Contractor shall prepare an EHS-MP to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works. The Contractor's EHS-MP will serve two main purposes:
For the Contractor, for internal purposes, to ensure that all measures are in place for adequate EHS management, and as an operational manual for his staff.

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

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

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

EHS Reporting

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

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

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

44. It is advisable to include such records, as well as copies of incident reports, as appendixes to the bi-weekly reports. Example formats for an incident notification and detailed report are given below.
Details of EHS performance will be reported to the Client through the

Supervising Engineer reports to the Client.

Training of Contractor's Personnel

45. The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project EMP, and his own EHS-MP, and are able to fulfill their expected roles and functions. Specific training should be provided to those employees that have particular responsibilities associated with the implementation of the EHS-MP.

General topics should be:

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

Cost of Compliance

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

Example Format: EHS Report

Contract: **Period of reporting:**

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

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

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

Changes:

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

Concerns and observations:

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

Signature (Name, Title Date):

Contractor Representative

Example Format: EHS Incident Notification

Provide within 24 hrs to the Supervising Engineer

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

Location of incident:

Name of Person(s) involved:

Employing Company:

Type of Incident:

Description of Incident:

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

Immediate Action:

Immediate remedial action and actions taken to prevent reoccurrence or escalation

Signature (Name, Title, Date):

Contractor Representative

Example Format: Detailed EHS Incident Report

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

1. **Incident Summary**

2. **Specific Details**

Date

Time

Place

Weather/Visibility

Road conditions

3. **Persons Involved**

Name/s
Age/s
Experience
Date joined Company
Last Medical Check
Current Medical Treatment
Evidence of Drugs/Alcohol
Last Safety Meeting attended
Infringements/Incidents record

4. **Equipment Involved**
5. **Description of Incident**

6. **Findings of Investigation Team Interim/Final**

Investigation Team Members
Persons Interviewed
Recommendations & Remedial Actions
Investigation Methodology

7. **Signature (Name, Title, Date):**

8. **Attachments**

Photographs
Witness Statements and Incident Notification Report