ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED RUMURUTI – MARALAL HIGH VOLTAGE TRANSMISSION LINE PROJECT

ESIA BY

Joint Venture of Tingori Consultancy Ltd. and Savannah Consulting Ltd.

P. O. Box 65861-00607

Nairobi.

Tel; 0724384088

DONOR

The World Bank
P.O. Box 30577- 00100
Nairobi
Tel; +254202936000

PROPONENT

Kenya Electricity Transmission Co. Ltd.

P. O. Box 34942-00100

Nairobi.

Tel. 020 4956000

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Project Title; Environmental and Social Impact Assessment Study Report for the Proposed Rumuruti - Maralal Transmission Line

Name and address of firm of Experts

Tingori Consultancy Ltd

P. O. Box 65861- 00607

Nairobi.

Registration Number of the Firm of Experts; 9512

Signed; _____ _____

Tingori Consultancy Ltd Date

Name and address of Proponent

Kenya Electricity Transmission Company

P. O. Box 34942 – 00100

Nairobi.

Name: Dr. (Eng.) John Mativo.

Designation: Ag. General Manager, Technical Services.

Signed; _____ _____

Kenya Electricity Transmission Company Date

This Environmental and Social Impact Assessment study report is being submitted in accordance with the terms and conditions of the contract signed and TORs (submitted to NEMA) in respect to provision of consultancy services for conducting ESIA for the proposed Rumuruti – Maralal 132kV Transmission Line. The document has been prepared in accordance with Environmental (Impact Assessment and Audit) Regulations, 2003 of the Kenya Gazette supplement No. 56 of 13th June 2003, Legal Notice No. 101

Executive Summary

The GoK is seeking financial support of US$370 million from the World Bank for Kenya Electricity System Improvement Project (KESIP), to be implemented by Kenya Power and KETRACO. The project's main objective is to increase the capacity of the transmission system and increase electricity access in Kenya. Part of this fund will be used for the Rumuruti–Maralal 132kV Transmission Line Project.

The Rumuruti–Maralal 100km 132kV Transmission Line Project is aimed at enhancing the adequacy, reliability, and security of electricity power supply in Samburu and Laikipia Counties.

This report is an Environmental Impact Assessment Study Report for the Transmission Line. The objective of the assessment was to identify significant potential impacts of the project on environmental and social aspects, and to formulate recommendations to ensure that the proposed project takes into consideration appropriate measures to mitigate any adverse impacts to the environment and people's health through all of its phases (construction, implementation, and decommissioning phases).

The key activities undertaken during the assessment included:

- Understanding the project.
- Site assessment to collect baseline information.
- Consultations with key stakeholders.
- Identification and assessment of all potential environmental and social impacts.
- Recommendation of cost-effective mitigation measures, proportionate to the nature and scale of risks and impacts identified, to avoid, minimize, or remedy anticipated negative impacts
- Analyzing alternatives and
- Report writing.

From the baseline survey, the proposed project largely falls in rural areas and traverses areas with few settlement and human activities. Sensitive ecosystems that may be affected include; the Mugie Conservancy (18km long), riverine vegetation in about 20 locations, Engare Narok forest, threatened/rare/endangered species include; Wild Olive(*Olea oleaster*), Red-Cedar (*Juniperus procera),* Podo, Sandalwood, Elephants, Grevey Zebras, Reticulated Giraffes, Rhinoceros, Wild dogs, Martial eagles, African Vultures, and Grey Crowned Crane.

The ESIA identified that, the project will affect over five hundred (500) parcels of land which are privately owned and six (6) Community Ranch Groups. Within these land parcels, a number of structures and trees and Shrubs of various age, height, width, and species will be affected. World Bank Safeguard Policy OP 4.12, and KETRACO's Resettlement Policy Framework developed under this project observes that, should a project affect more than 200 PAPs then a full Resettlement Action Plan (RAP) must be conducted. This therefore, calls for the client to conduct an elaborate Resettlement Action Plan (RAP) to ensure that affected individuals and households and displaced communities are meaningfully engaged and consulted and are timely, adequately, and fairly compensated.

The project area is inhabited by Vulnerable and Marginalized Groups (VMGs). The Samburu, Turkana, Borana, Pokot, Somali, Maasai and the Ogiek (assimilated into the Samburu culture). These communities meet the World Bank OP 4.10 requirements. Further, since the Ogiek, a minority VMG community is present in the project area and sharing project benefits and opportunities with majority VMGs and other communities, the proponent has undertaken a Social Assessment study which subsequently informed the preparation of a VMGP. The VMGP has outlined appropriate mitigation measures including the application of the Free Prior Informed Consent (FPIC) process. The FPIC process will ensure VMGs understand the full extent of project risks and impacts that may affect them, and the proponent will obtain and document the Free Prior Informed Consent. The VMGP will also ensure VMGs have equal access to social and economic benefits and opportunities that are also culturally appropriate. Further, the proponent will implement project structured interventions to ensure vulnerable individuals and households (present among VMGs and non-VMGs) effectively participate in, and benefit from the project.

Baseline water quality for all the water resources and noise levels for specific locations were identified and will help KETRACO monitor if project implementation has effects on water quality and noise levels.

The identified potential negative impacts include;

- Way-leave acquisition (resettlement and loss of use).
- Project induced labour Influx.
- Impacts on culture, heritage, and norms.
- Community health and safety.
- Impacts on pastoralism.
- Destruction of existing vegetation and habitat.
- Disturbance to wildlife.

- Avi-fauna disturbance and mortality.
- Impacts on surface and underground water reserves.
- Workers health and safety.
- Waste handling, storage, and disposal.
- Noise and vibrations.
- Air pollution.
- Soil erosion.
- Impacts on archeological and historical sites.
- Air craft navigation safety.
- Traffic disruption on road crossings during stringing.
- Visual and aesthetic impacts.
- Fire outbreaks and
- COVID-19.

Some mitigation measures proposed included; development and implementation of management plans including resettlement, social assessment, gender mainstreaming, livelihood restoration, labor management, local recruitment, labor influx management, community development, stakeholder engagement, fire management, and GBV management; ensuring the health and safety of community is safeguarded; selective clearance of vegetation; avoiding locating towers within the riparian zones; implementing all necessary measures to ensure health and safety of the project workers; sound management of solid and liquid waste; ensuring noise and vibrations from machinery, vehicles and construction activities are kept at a minimum; water sprinkling to suppress dust emission; speed limits; chance find procedures; seeking all necessary approvals; and provision of all necessary PPEs.

This reports, among others, recommend that, a noise modelling be carried out, and a biodiversity management plan be prepared, prior to mobilization as these may have implications on resettlement and realignment.

An Environmental and Social Management Plan (ESMP) outline has been developed to ensure sustainability of the site activities from construction through operation to decommissioning. The plan provides a general outlay of the activities, associated impacts, and mitigation action plans. Implementation timeframes and responsibilities are defined. Where practicable, the cost estimates for recommended measures are also provided. The estimated cost for implementation of the ESMP during the pre-construction and construction phases is Kenya Shillings thirteen million, three hundred and ten thousand (13,310,000). A

monitoring plan has also been developed and highlights the social and environmental performance indicators that should be monitored.

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List of Abbreviations

ACC	Assistant County Commissioner
AfDB	African Development Bank
CBO	Community Based Organization
CRC	Community Resettlement Committee
dB	Decibels
dB(A)	A-weighted sound pressure level
dBC	Decibels relative to the Carrier
EA	Environmental Audit
EMCA	Environmental Management and Coordination Act
EMF	Electro-Magnetic Field
EMoP	Environmental Monitoring Plan
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
EPRA	Energy and Petroleum Regulatory Authority
FGD	Focus Group Discussions
FPIC	Free Prior and Informed Consent
GBV	Gender Based Violence
GDC	Geothermal Development Company

GoK	Government of Kenya
GPS	Global Position System
GRC	Gross Replacement Cost
GRM	Grievance Redress Mechanism
ID	Identity Card
IDP	Internally Displaced Persons
IP	Indigenous Peoples
IUCN	International Union for Conservation of Nature
KCAA	Kenya Civil Aviation Authority
KDRIP	Kenya Development Response Displacement Impacts Project
KENHA	Kenya National Highways Authority
KenGen	Kenya Electricity Generating Company
KETRACO	Kenya Electricity Transmission Company
KESIP	Kenya Electricity System Improvement Project
KFS	Kenya Forest Service
KM	Kilometer
KPLC	Kenya Power
KSEIP	Kenya Social Economic Inclusion Project
KSh.	Kenya Shilling
kV	Kilo Volt
KWH	Kilo Watt Hour
KWS	Kenya Wildlife Service
LCPDP	Least Cost Power Development Plan
LILO	Line In Line Out
LMCP	Last Mile Connectivity Plan
L.R	Land Registration
M&E	Monitoring and Evaluation
MoE	Ministry of Energy
MW	Mega Watts
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NMK	National Museums of Kenya
OHL	Over-Head Line
OP	Operational Policy
OSHA	Occupation Safety and Health Act
OVI	Objectively Verifiable Indicators

PAP	Project Affected Person
PIN	Personal Identification Number
PIU	Project Implementation Unit
PCR	Physical Cultural Resources
RAP	Resettlement Action Plan
REREC	Rural Electrification and Renewable Energy Corporation
RPF	Resettlement Policy Framework
SHE	Safety Health and Environment
SS	Sub-Station
STD	Sexually Transmitted Diseases
TL	Transmission Line
UNCBD	United National Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework for Convention on Climate Change
UTM	Universal Transverse Mercator
VMGP	Vulnerable and Marginalized Groups Plan
VMGF	Vulnerable and Marginalized Groups Framework
WIBA	Work Injury Benefit Act
WB	World Bank
WRA	Water Resources Authority

CHAPTER 1: INTRODUCTION

1.1: Background

Vision 2030 is Kenya's development blueprint covering the period 2008 to 2030. The objective of Vision 2030 is to help transform Kenya into a, "middle-income country providing a high quality of life to all of its citizens by the year 2030". The Vision outlines the Government of Kenya's economic growth objectives.

Vision 2030 recognizes the energy sector as one of the infrastructure enablers of the economic, social and political pillars underlying the Vision. The Sessional Paper No. 4 of 2004 on Energy recognizes that affordable, quality and cost-effective energy services is an important prerequisite for attainment of accelerated social and economic growth and development. In view of these considerations, energy sector development is a key policy concern for Kenya's development.

To guide the energy sector development, the Ministry of Energy in 2011 developed the Least Cost Power Development Plan (LCPDP), in pursuit of the provisions of section 5 (g) of the Energy Act, which mandates the EPRA to prepare indicative energy plans. The LCPDP was updated in 2017 to cover the period 2017 -2037.

According to LCPDP, the demand for electric power continued to rise significantly over the five years preceding 2017, driven by a combination of normal growth, increased connections in urban and rural areas as well as the country's envisaged transformation into a newly industrialized country as articulated in Vision 2030 and in The Big 4 Agenda. However, the power market remained unbalanced with this demand not fully met by supply. This was mostly due to system constraints and weather challenges.

From the Kenya Power annual report for 2017/18, the electricity peak demand grew by 8% from 1,656MW to 1,802MW. The number of customers connected to the national grid in the financial year 2017/2018 increased by 9.4% from 6,182,282 to 6,761,090. The customer base had increased by 1.2 million new customers in 2016/17.

This increase in number of customers was as a result of the "Last Mile Connectivity Plan (LMCP)" which was launched in 2015 to scale up connectivity in rural and peri-urban areas by providing subsidy for grid extension to enable customers get electricity supply at affordable cost. Implementation of LMCP is organized in four distinct phases.

- Phase I and II are funded by African Development Bank (AfDB) and targets to connect 549,152 customers.
- Phase III is funded by the World Bank and aims to connect 200,000 customers (this project falls under this phase).
- Phase IV is funded by the French Development Agency (AFD), and aims to connect 296,649 customers.

As at 30th June 2018, Kenya had an installed electricity generation capacity of 2,351MW comprising of hydro (826.5MW), thermal (808MW), geothermal (662MW), wind (26MW), biomass/cogeneration (28MW), and solar (0.8MW).

The total transmission network (220kV and 132kV) stood at 4,766kms by June 2017 of which 839.11kms (132 kV), 374.59km (220 kV) and 585km (400kV) were under KETRACO while the rest were managed by KPLC.

The existing transmission system capacity is constrained particularly during peak hours when system voltages in parts of Nairobi, Coast, West Kenya and Mount Kenya drop below acceptable levels, causing occasional load shedding despite the availability of generation capacity.

To address these constraints, the Kenya Electricity Transmission Company (KETRACO) has identified the need for a number of new transmission projects. Among these projects is Rumuruti – Maralal 132kV Transmission Line.

The GoK is seeking financial support of US$370 million from the World Bank for Kenya Electricity System Improvement Project (KESIP), to be implemented by Kenya Power and KETRACO. The project's main objective is to increase the capacity of the transmission system and increase electricity access in Kenya. Part of this fund will be used for the Rumuruti – Maralal 132kV Transmission Line Project.

The Rumuruti – Maralal 132kV Transmission Line Project is aimed at enhancing the adequacy, reliability, and security of electricity power supply in Maralal and Laikipia Counties. The project will also help meet the increasing demand for power supply, help meet the objectives of The Big Four Agenda (industrialization), and minimize the frequency of power outages in the two counties.

The current energy supply for Maralal is from Isiolo and Rumuruti towns and is at 33kV. To allow for expansion of the area supplied and to accommodate increased energy demand, a new 132kV overhead transmission line from Rumuruti to Maralal and a 132/33kV substation in Maralal have been proposed. Supply of electricity to a larger area than at present will then be possible. Locations, which could previously not be serviced, up to a distance of 50 km (depending on the loads) could be reached with 33kV OHLs.

To connect the proposed 132kV OHL, the existing 132kV switchgear at the new Rumuruti substation shall be extended with one more bay. A busbar might also be required. It has been established that, space is available in the switchyard and in the control building to accommodate the new equipment.

At Maralal, a new 132kV substation is proposed. Only one bay with a circuit breaker for the 23MVA 132/33kV transformer shall be provided, but the substation shall be designed in such a way, that it shall be possible to install an additional transformer and connect two additional OHL in future. 33kV switchgear shall also be installed in the new Maralal substation, equipped with one bay for the incoming feeder from the 132/33kV transformer, three bays for outgoing 33kV lines and one bay for the auxiliary transformer.

The length of the proposed 132kV overhead transmission line is approximately 100 km and the tentative line of traverse is indicated in the diagram below.

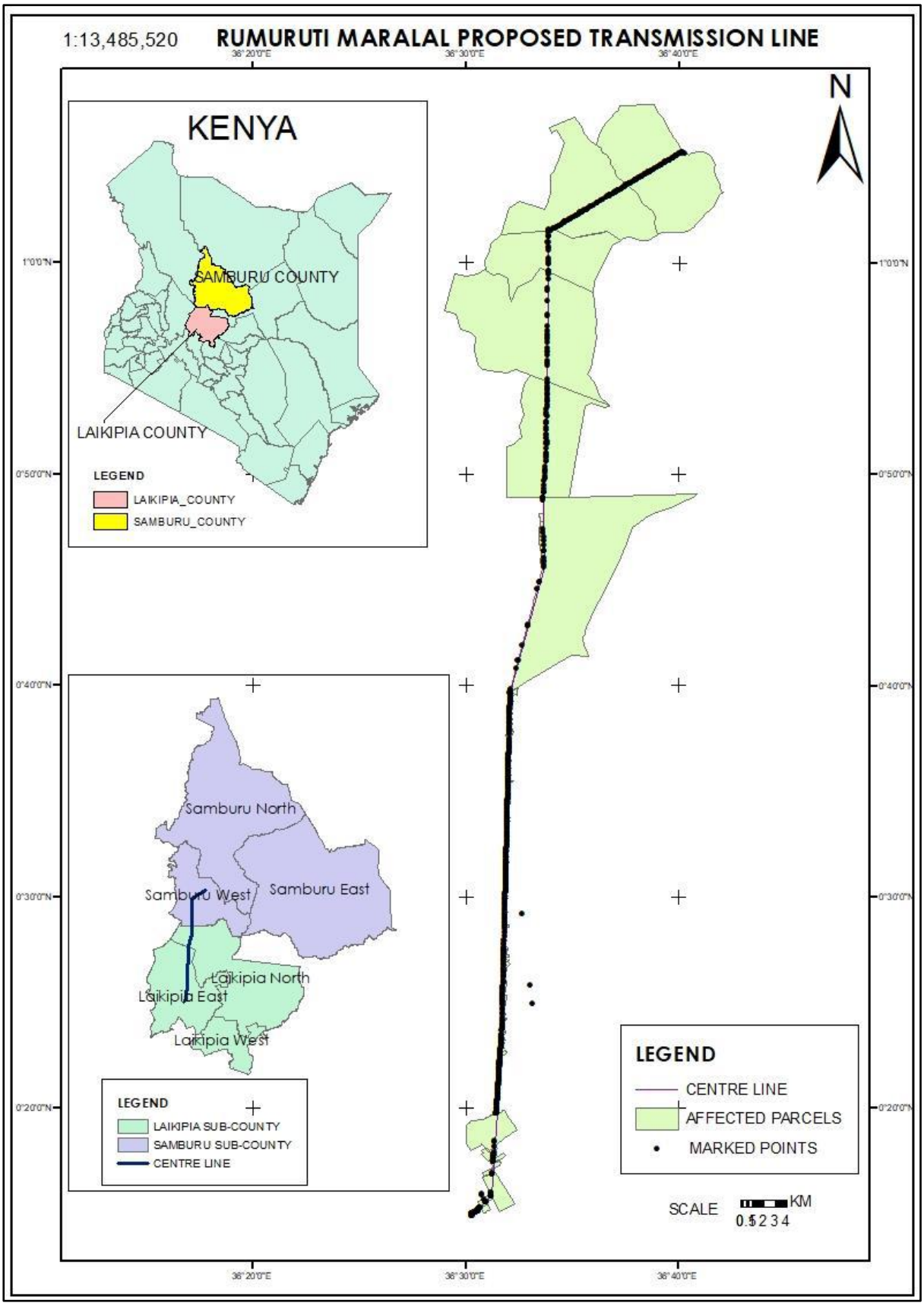


Figure 1.1; proposed 132kV Rumuruti–Maralal transmission line route

KETRACO in line with its principle of environmental conservation and social inclusivity, ensures that negative impacts associated with the transmission line project are avoided, minimized or compensated, while their positive impacts are enhanced.

The Joint Venture of Tingori Consultancy Ltd and Savannah Consulting Ltd has been contracted to undertake preparation of Environmental and Social Impact Assessment (ESIA), Resettlement Action Plan (RAP), Social Assessment, and Vulnerable and Marginalized Groups Plan (VMGP) for Rumuruti – Maralal Transmission Line. This report will focus on environmental and social considerations while the other reports will be undertaken in the subsequent proposed RAP studies.

The Kenya Government policy on all new projects requires that an Environmental and Social Impact Assessment (ESIA) study be carried out at the project planning phase in order to ensure that significant impacts on the environment are taken into consideration at the construction, operation and decommissioning stages.

This Environmental and Social Impact Assessment has identified both positive and negative impacts of the proposed project to the environment and proposes mitigation measures in the Environmental Management Plan developed to address potential negative impacts, during the construction, operation and decommissioning phases of the project, for overall environmental sustainability.

1.2: Study Objectives

The principal objective of this assessment was to identify significant potential impacts of the project on environmental and social aspects, and to formulate recommendations to ensure that the proposed project takes into consideration appropriate measures to mitigate any adverse impacts to the environment and people's health through all of its phases (construction, implementation, and decommissioning phases).

The specific objectives of this ESIA were to:

- Identify and assess all potential environmental and social impacts of the proposed project;
- Review policy, legal, and administrative frameworks;
- Develop an Environmental Management System for the project;
- Generate baseline data that will be used to monitor and evaluate the mitigation measures implemented during the project cycle;

- Recommend cost effective measures to be used to mitigate against the anticipated negative impacts;
- Prepare an Environmental and Social Impact Assessment Report compliant to the EMCA, Cap 387 and the Environmental (Impact Assessment and Audit) Regulations (2003), detailing findings and recommendations.

1.3: Terms of Reference (TOR) for the ESIA Process

Detailed TORs as approved by NEMA are given in appendix I. The TORs included; -

- Description of the baseline environment (physical, biological, social, and cultural)
- Detailed description of the proposed project
- Review of legislative and regulatory framework that relate to the project
- Identification of potential environmental impacts that could result from the project
- Carrying out public consultation on positive and negative impacts of the project
- Proposing mitigation measures against identified environmental and social impacts of the project
- Development of an Environmental Management Plan to mitigate negative impacts
- Development of an Environmental Monitoring Plan
- Preparation of an Environmental and Social Impact Assessment Report

1.4: Scope of the Study

The study has been conducted to evaluate the potential and foreseeable impacts of the proposed transmission line on the environment and social set-up within the locations it will pass in Laikipia and Samburu Counties. The physical scope is limited to the proposed site and the immediate environment as may be affected or may affect the proposed project. Any potential impacts (localized or delocalized) are also evaluated as guided by EMCA, Cap 387 and the Environmental (impact assessment and Audit) Regulations, 2003. This report includes an assessment of impacts of the construction, operations, and decommissioning of the proposed project, site, and its environs.

1.5: ESIA Approach and Methodology

The approach to this exercise was structured such as to cover the requirements under the EMCA Cap 387, the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019, the World Bank Safeguard Policies triggered under this project including; Environmental and Social Impact Assessment, Involuntary Resettlement, Indigenous Peoples (known in Kenya as Vulnerable and Marginalized Groups – VMGs), Forests, Natural Habitats, and Physical Cultural Resources, and frameworks developed under this project (RPF, VGMF and ESMF) and World Bank Group/IFC EHS Guidelines on electrical transmission and

distribution. It involved largely a screening exercise and an understanding of the project background, the preliminary designs and the implementation plan, as well as commissioning. In addition, baseline information was obtained through physical investigation of the site and the surrounding areas, desktop studies, survey, photography, public consultations with members of the community in the project areas, and discussions with key informants (local administration and heads of departments).

The key activities undertaken during the assessment included the following:

- Screening of the project to evaluate the need of conducting an ESIA and the level of study.
- Mapping of the project area which involved use of digital technology to generate various maps including natural resources maps, land use, topography etc.; literature review; and a transect walk through the proposed transmission line route.
- Assessment of the baseline conditions of the project area which involved a study on the surface water resources (including water quality analysis), ecological study (flora, fauna, and avifauna), social impact assessment, noise level measurements, and an anthropological and archaeological study.
- Stakeholders mapping and analysis;
- Consultations with the key project stakeholder including the project proponent, community members, National and County administration, opinion leaders, church elders, Community Based Organizations (CBOs), NGOs, and National and County Government departmental heads. The consultations were based on the proposed project, site planning, project benefits, anticipated impacts, and the project implementation plan;
- Physical inspections of the proposed project area (site assessment) which included observation of available land marks, photography and interviews with the local residents;
- Evaluation of the activities around the project site and the environmental setting of the wider area through physical observations and literature review;
- Review of available project documents;
- Identification and assessment of all potential environmental and social impacts of the proposed project e.g., land take and resettlement, disruption of livelihoods, disruption of habitats, noise and vibration, dust emission, creation of employment opportunities, labour influx, social conflicts, Gender Based Violence, among others;
- Proposition of alternatives

- Recommendation of cost-effective measures, proportionate to the nature and scale of risks and impacts identified, to be used to mitigate against the anticipated negative impacts;
- Report writing, review and submissions.

The steps that were followed during this assessment included; -

1. Screening
2. Scoping Exercise and Development of TORs
3. Literature Review
4. Review of Laws, Regulation and Policies
5. Site Assessment
6. Social Impact Assessment
7. Public Consultation
8. Impact prediction/ identification and analysis
9. Formulation of mitigation measures
10. Environmental and Social Management Plan (ESMP)
11. Environmental and Social Monitoring Plan
12. Analysis of Alternatives
13. Reporting

Table 1.1; Table of activities

DATE	VENUE	ACTIVITY
09/05/2019	KETRACO Offices, Nairobi	Meeting with the KETRACO team
13/05/2019	World Bank Offices, Nairobi	Meeting with the World Bank Team
27/05/2019	Consultant Offices, Nairobi	Recruitment of Enumerators
28/05/2019 - 29/05/2019	Field	Reconnaissance Survey
01/06/2019	Castle Gardens Hotel, Nairobi	Training of enumerators and testing data collection tools
09/07/2019	World Bank Offices, Nairobi	Presentation of the Inception Report
11/07/2019	KETRACO Offices, Nairobi	Project planning meeting with the KETRACO team
28/07/2019 - 27/09/2019	Field	Data Collection

A detailed technical approach and methodology for ESIA as outlined in the inception report is given in appendix II.

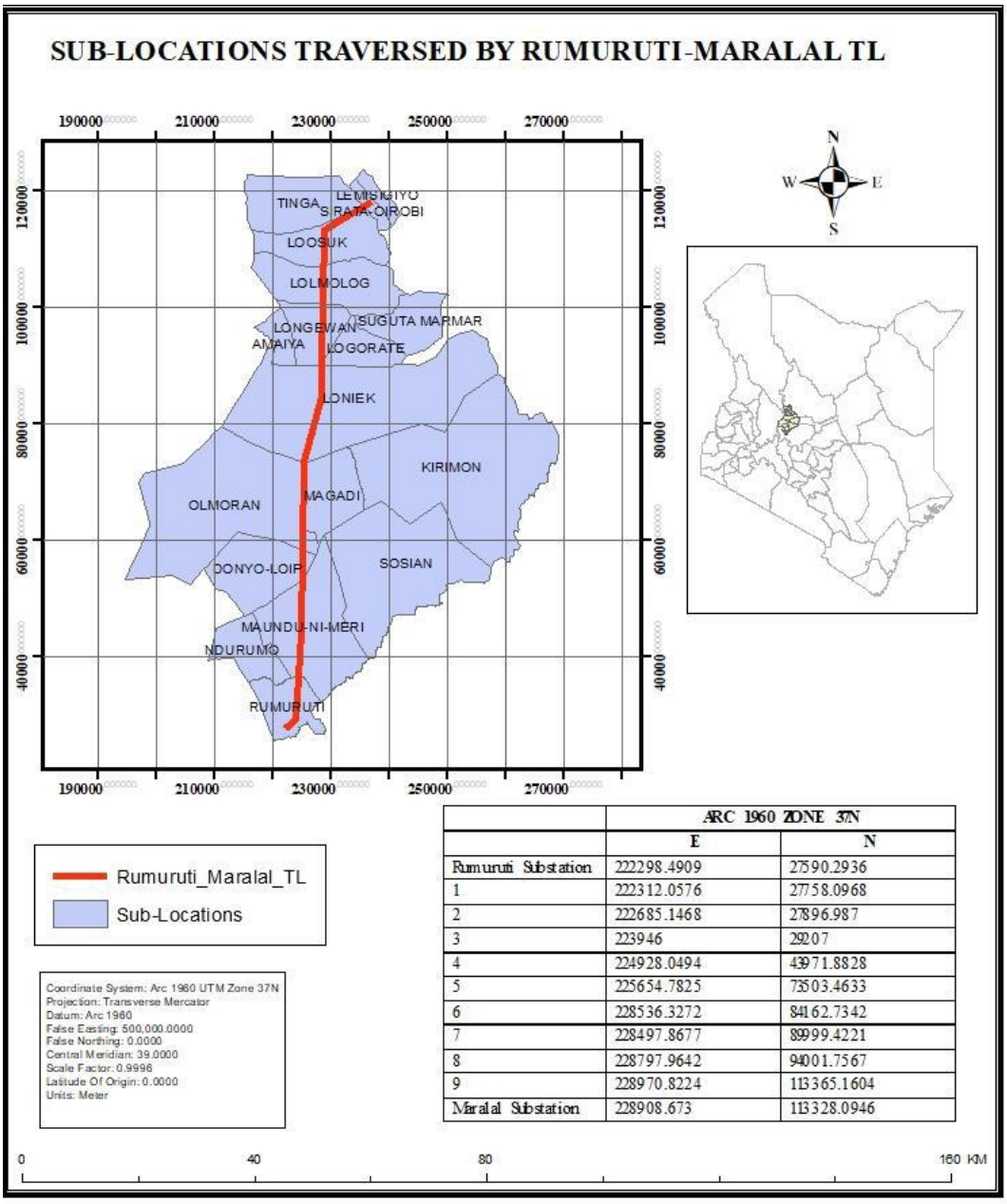
CHAPTER 2: PROJECT DESCRIPTION

2.1: Introduction

The project will essentially involve the construction of a 100km, 132kV, Overhead Transmission Line from Rumuruti substation in Laikipia County, and terminate in Maralal Township in Samburu County.

2.2: Transmission Line Route

The route of traverse of the transmission line is shown on the map below;-



	ARC 1960 ZONE 37N	
	E	N
Rumuruti Substation	222298.4909	27590.2936
1	222312.0576	27758.0968
2	222685.1468	27896.987
3	223946	29207
4	224928.0494	43971.8828
5	225654.7825	73503.4633
6	228536.3272	84162.7342
7	228497.8677	89999.4221
8	228797.9642	94001.7567
9	228970.8224	113365.1604
Maralal Substation	228908.673	113328.0946

Figure 2.1: GPS coordinates of the TL

The TL will start at the KETRACO Rumuruti Substation (UTM 37N 222416, 27455) which is about 4km from Rumuruti Town in Kahuho Village, along Nyahururu - Rumuruti tarmac road.

Rumuruti substation is part of 132kV Nanyuki - Rumuruti Transmission Line Project. At the time of the study, the substation had not been energized since stringing of the transmission line serving it had not been completed yet. Towers for the Nanyuki-Rumuruti TL exist in this area but they are yet to be stringed and eventually energize the Rumuruti Substation.

Plate 2.1: Existing Rumuruti substation

Kahuho Village is generally sparsely populated despite being at the peri-urban section of Rumuruti Town. The village is served by a murram road which passes next to Rumuruti Substation. There are some settlements around the substation mainly composed of semi-permanent structures in plots not bigger than ½ acre. Some greenhouses belonging to Mwanzi Farm can be seen across the Rumuruti-Sipili tarmac road about a kilometer away.

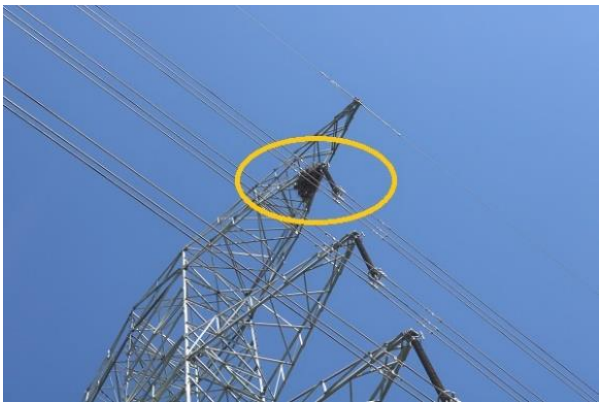


Plate 2.2: Bird nest; Loyangalani-Suswa TL

Plate 2.3: Bird nest; Nanyuki-Rumuruti TL

Immediately after overflying the Rumuruti - Sipili tarmac road, the TL will maintain the general north-eastern direction passing through Mwanzi farm. In this farm, the wayleave corridor will mainly affect avocado trees. There is a man-made dam in the farm (GPS Coordinates UTM 37N 223078, 28450) which is about 100m west of the proposed Transmission line.

The TL will make a turn to the north, about 500 metres from Mwanzi farm at Bobong'i Village (UTM 37N 223964, 29552). This area is characterized by short acacia and euphorbia trees (which are the dominant species) including bushes and relatively tall grass growing in a flat terrain with loam soils. The TL then enters Bobong'i Village in a firm owned by the Nyahururu Women Group. Bobong'i Village is sparsely populated and is dominated by semi-permanent houses. Agriculture and livestock keeping are the main economic activities in this area.

Plate 2.4: Vegetation and terrain in Bobongi area

Plate 2.5: Access road to Bobong'i Village

The TL then pass through Bhola firm which is an expansive land with tall bushes and mainly used by the local community as a grazing field. The line then cross a murram road at (UTM 37N 223964, 29552) which form an access road the remote villages and the boundary to the next expansive land which according to the area Chief Mr. Richard Chepyator, is un-allocated and is under the custody of the local government. The land is bushy and used by the local community to graze livestock and as a source for fuelwood. The terrain is generally flat. Mount Kenya can be seen in the horizon on a clear day. The TL will cross River Kadatura/Kamnyangor at a location with GPS coordinates UTM 37N 224192, 31681 which local communities use for domestic purposes and for their livestock.

Plate 2.6; River Kadatura/Kamnyangor

After crossing River Kandutura, the TL will maintain the general northern course, traversing plain fields mostly dominated by scrublands and bushlands consisting of mainly euphorbia species. There are a few sections of grass patches. The TL continues northwards and crosses Ngare Mare – Rumuruti murram road at UTM 37N 224235, 34054.

The TL will cross Southern Ayiam River around UTM 37N 224387, 36528 in an area where acacia forms the major riverine vegetation and some rock outcrops on the flat terrain. Ayiam River is seasonal and drains into Ngare Narok River.

Plate 2.7: Southern Ayiam River

Plate 2.8: Northern Ayiam River

The transmission line moves northwards into Ngare Mare/Namojong area. The area is relatively arid and is characterized by acacia trees and thickets. Namojong River which is

about a kilometer from the transmission line route drains into Ayiam River. At the time of the assessment, it was dry with few sections having pockets of stagnant water.

The proposed Rumuruti- Maralal TL will move further north to cross Northern Ayiam River UTM 37N 224660, 40848, moving away from the thick acacia vegetation to barer land/plain fields up to the point where it starts running parallel to the 400kV Loyangalani - Suswa TL at (0^0 23' 40" N and 36^0 31' 46" E) in Samangurin Village. The terrain is flat with black cotton soil which has been affected by agents of erosion, majorly water. Short acacia trees, not more than about 4 metres high can be seen including sections of dry short grass.

The proposed TL will then traverse Dam Nyekundu area maintaining northward direction along the existing Loyangalani Suswa Transmission Line. The local chief reported that the line will traverse an area with a proposed school in Dam Nyekundu Village on land parcel no. 1574 which is about 12 acres. Re-routing the line to avoid the school land shall be a difficult option given that the southern side of the TL is the Loyangalani – Suswa Line and the northern end is the big stretch of the school land. The easier option, given that the school is yet to be built and has only been proposed, is to overfly the school compound (no tower in the school compound) but the client to offer the school, land for land compensation. The replacement land must have productive potential and locational advantages equivalent to or higher than the advantages of land taken. It is suggested that, the compensated land be adjacent to the school land and that the affected land remains the school property. Land to compensate the school is available for purchase in this area. Alternatively, the proponent can give an in-kind compensation which would involve implementation of a social investment project in the school as compensation for land impacted.

The Dam Nyekundu area has several small wetlands that are near the proposed line route. Dam Nyekundu dam will be traversed by the proposed transmission line at UTM 37N 225157, 49792 Elevation 1925m near Tower 549 of Loyangalani-Suswa TL. The proposed TL will continue northwards until tower 543 of Loyangalani Suswa TL which marks the end of Sosian Land Block.

Plate 2.9: a wetland in Dam Nyekundu area

Plate 2.10: Dam Nyekundu

Ol Mutonyi Village is the next place that the TL will pass through in a sparsely populated area (very minimal human settlement), similar to Samangurin Village at UTM 37N 225145, 50907, maintaining the northern direction, and still parallel to the Loyangalani - Suswa TL. Short acacia trees form the dominant vegetation with the ground being almost bear with loam soils. The TL will traverse Ol Motonyi Murram Road which will be used as an access road at UTM 37N 225198, 52823.

Sipili Land Block starts at Tower 542 of Loyangalani-Suswa TL (UTM 37N 225182, 53084 Elevation 1944m). Small wetlands are observed along the line route between Tower 541 and Tower 538 of Loyangalani-Suswa TL. The area around Tower 536 (UTM 37N 225233, 55748 Elevation 1922m) of Loyangalani-Suswa TL is characterized by rocky terrain which spans over 1 km. In this section, the contractor may require blasting to construct the tower foundations. The TL continues northwards through this rocky section and crosses a small seasonal stream in Ol Motonyi at UTM 37N 225339, 58322, Elevation 1900m.

Plate 2.11: Rocky terrain in Ol Motonyi area

Plate 2.12: Seasonal River in Ol Motonyi

The major activity in Ol Motonyi area and its environs is pastoralism but small-scale farming was also observed. A local reported that wild animals like hyenas, zebras and lions are found in Ol Motonyi area and its environs. The proposed TL will move further north along

Loyangalani–Suswa TL into Ol Moran area. The TL will cross an unnamed seasonal river in Ol Moran at 37 N 0225309 UTM 0058207 Elevation 1889m).

The TL will mainly traverse farmlands in Ol Moran area and will cross Kaijeria Dam which spans over 100 m at UTM 37N 225233, 58753. The local community uses water from Kaijeria Dam for domestic purposes and irrigation. Parariro Dam which will not be traversed by the proposed TL is also located about 1 km from Kaijeria Dam and 500m from the TL. At this section the TL will go up a hill, run on a flat terrain atop the hill before going down a steep gradient into Ol Moran village. The TL will traverse Ol Moran Village before passing through Magadi Village as it overflies a small seasonal stream (Airewa Stream which originates from Nagum Dam) with a rocky riverbed and rock outcrops around the stream. Some marshes, acacia and weeds grow in this area and are part of the dominant vegetation.

The TL will then cross Ol Moran - Survey murram road UTM 37N 225331, 58165, near Tower 514 of Loyangalani- Suswa TL as it heads towards Mugie Conservancy and Luoniek area. An 11kV Kenya Power distribution line runs along the murram road towards Mugie Conservancy.

The TL will overpass KETRACO's Repeater Station (37N 225474, 67599) which is served by a Kenya Power line from Ol Moran.

Plate 2.13: KETRACO's Repeater station along the TL corridor

After the repeater station, the TL will move further north along the Loyangalani- Suswa TL to enter Luoniek village. The area is characterized by a generally flat terrain with bushes and few acacia trees. The TL will cross Long'ndai River (UTM 37N 225620, 71687) in an area characterized by rock outcrops that span over 500m.

After crossing Long'dai River, the TL will traverse an area with thick bushes and will cross Luoniek – Posta Road that borders Mugie Conservancy at Tower 497 of Loyangalani – Suswa TL (37N 0225642 UTM 0073118 Elevation 1922m).

The TL will then traverse the peripheries of Mugie Conservancy for a distance of about 17km. Mugie conservancy is home to a variety of wildlife including, lions, cheetahs, leopard, elephants, rhino, buffaloes, gazelles, waterbucks, giraffes, birds among others. The conservancy is also home to a variety of important local tree species including the Red Ceder and the Wild Olive (Mutamayo). It is an important tourist destination and has for a long time enjoyed its pristine condition until recently when a number of national developments including the Loyangalani-Suswa and Rumuruti-Maralal TL and the Rumuruti-Maralal Highway were proposed. Within Mugie Wildlife Conservancy, the TL will overfly an expansive wetland at UTM 37N 226454, 76380. The contractor here will be required to follow soil erosion prevention measure suggested in the ESMP and avoid locating any of his tower in the wetland.

Plate 2.14: Mugie Conservancy

On its route, the TL will pass near Lera Dam (UTM 37N 227489, 85830) which is about a kilometer from the TL and in Luoniek Location. This is a permanent dam and brought about by surface runoff water during rainy seasons. However, sometimes the water volume reduces during the dry season. Lera Dam is a habitat for various fauna including mudfish, crocodiles, wild ducks and elephants as reported by a local. The dam is used for domestic purposes by

the villagers. It has a spillway when the dam is overflowing, creating a lagga that leads into the Mugie Conservancy.

The TL enters Samburu County immediately it leaves Mugie Wildlife Conservancy. It will pass through the wilderness composed of bushlands and grasslands as it approaches Longewan Centre. An interesting herb in Longewan according to the locals is the loliondo herb (popular from the time people flocked to Tanzania for the herb which is said to have healing powers). Along this section, the TL will pass parallel to the Luoniek – Longewan Road. The team observed that, the center line of the TL falls a few meters from the road reserve and the contractor should ensure that, the TL towers don't fall on the road reserve. Tower foundation works and debris during construction should also not close the entire road.

The TL will pass through the rural parts of Longewan Location overflying a number of rural access roads. The TL will pass less than a half a kilometer from Ntimnariko water pan (UTM 37N 228457, 92789) in Ntimnariko Village, just before Longewan Centre. This water pan is purely used by livestock and the water is relatively clean. Ntimnariko Borehole (solar powered) is located a few meters from Ntimnariko water pan which provides the community with water for domestic use and livestock. Wildlife mainly zebras and gazelles are common in Longewan area.

Plate 2.15: Ntimnariko water pan

The TL will cross Terienkwe seasonal river (UTM 37N 228875, 98590), Longewan-Lolmolok murram road (UTM 37N 228916, 102985) and Lolmolok River in Lolmolok as it continues to move north towards Loosuk.

The TL then makes a north-eastern angular turn at Loosuk, Nobringi village to deviate from the Loyangalani - Suswa TL and moves towards L'partuk in the outskirts of Maralal Town. The turn ensures that, the TL, does not traverse Loosuk Centre which is highly populated. Nobringi Village is bushy with thick dense shrubs and has dominant tall euphorbia, acacia trees and sisal besides trees such as *"misigeyi", "litingei", "ladat"* and *"serai".* A murram access road which the TL will overfly at (UTM 37N 229183, 113488) leads to the angle point. The terrain in this area is generally flat with loam soil.

Plate 2.16: Point where the TL will make an angle turn

Plate 2.17: Livestock kept in Nobringi Village

The TL will then traverse Loosuk seasonal River (UTM 37N 230248, 114127, Elevation 1991m) and Loosuk-Poro - Baragoi road (UTM 37N 236652, 117944).

The TL will pass through Ngare Narok Forest in Tinga Sub-location. Locals reported that Ngare Narok forest is home to a variety of wildlife including elephants, monkeys, hyenas, cheetahs and leopards. There is a human-wildlife conflict problem as reported by the locals due to elephants that often destroy their crops. The TL will also cross Ngare Narok River (UTM 37N 235709, 117469, Elevation 1955m) within Ngare Narok Forest.

Plate 2.18: Ngare Narok Forest

Plate 2.19: Ngare Narok River

The TL then passes through sections of thick vegetation in undulating terrain, with very sparse population, overflying River Nkengu - Emuny (meaning “leg of a rhino” in the local dialect) - (37N 0237453, 118432, Elevation 2014) which used to host a number of rhinos as reported by a local, moving further east and overflying River Nontoto at (UTM 37N 239208, 119449). River Nontoto flows in a gulley surrounded by huge rock outcrops with relatively clean water and used for domestic purposes.

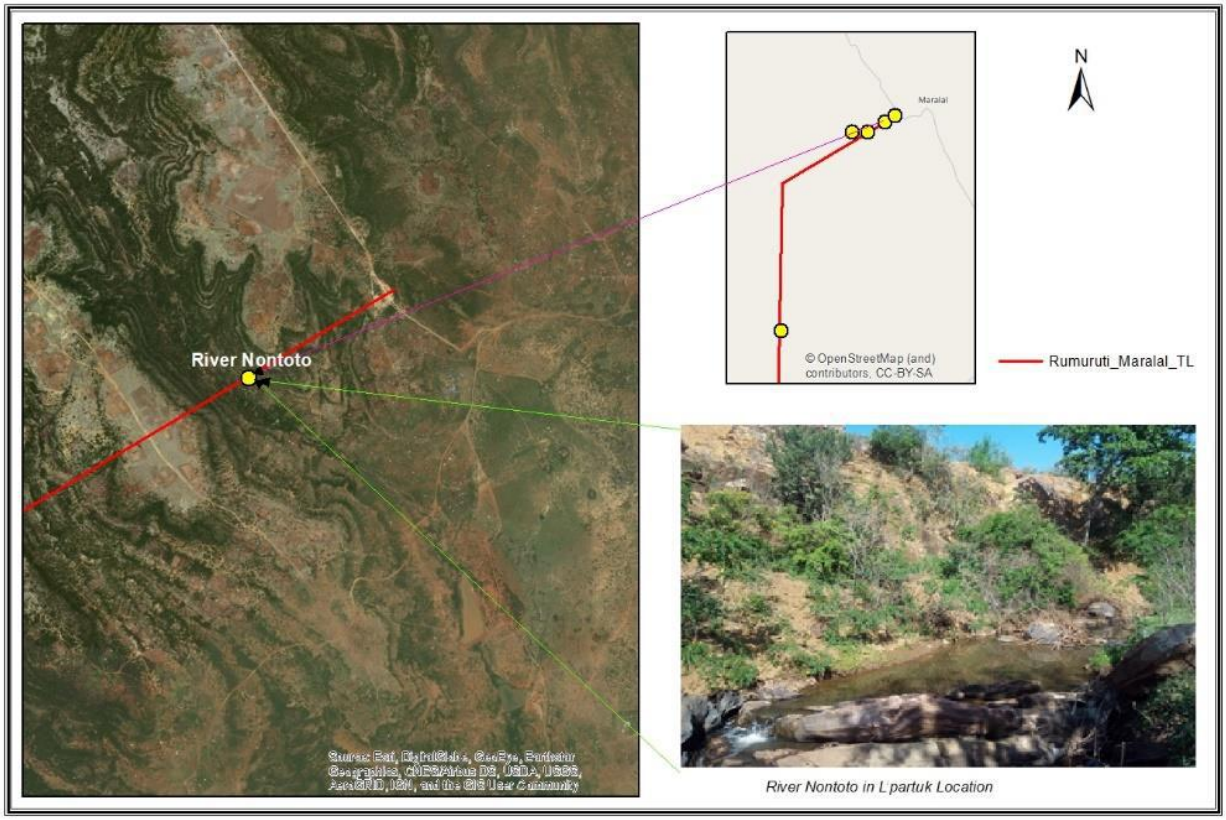


Plate 2.20; River Nontoto

The TL will terminate at the proposed Maralal Substation at (1^0 05' 06" N and 36^0 40' 11"E) in Momotio Village (approximately 3 kilometers from Maralal Town) which is in L'partuk Location after overflying a small river called River Lonywanyi and Lerosion stream (37N 240003, 119891, Elevation 2000m) which acts as the boundary between Momotio and Lemisikiyo villages.

Plate 2.21: The proposed substation site in L'partuk area, Maralal

2.3: Construction Procedures

2.3.1; Wayleave Acquisition

The very first procedure in the implementation of the transmission line project shall be the acquisition of the wayleave corridor. The way-leave corridor is recognized as the safety corridor outside of which negative impacts from transmission lines are assumed to be negligible. For this project, the wayleave corridor will be 30m. Within this corridor, structures or trees with a capability of growing taller than 6 feet (1.8m) will have to be cleared. Other activities like farming and grazing are allowed. Land ownership titles for the land under right of way will not be transferred but instead will remain the land owner's property. KETRACO will only register grant of easement on the titles.

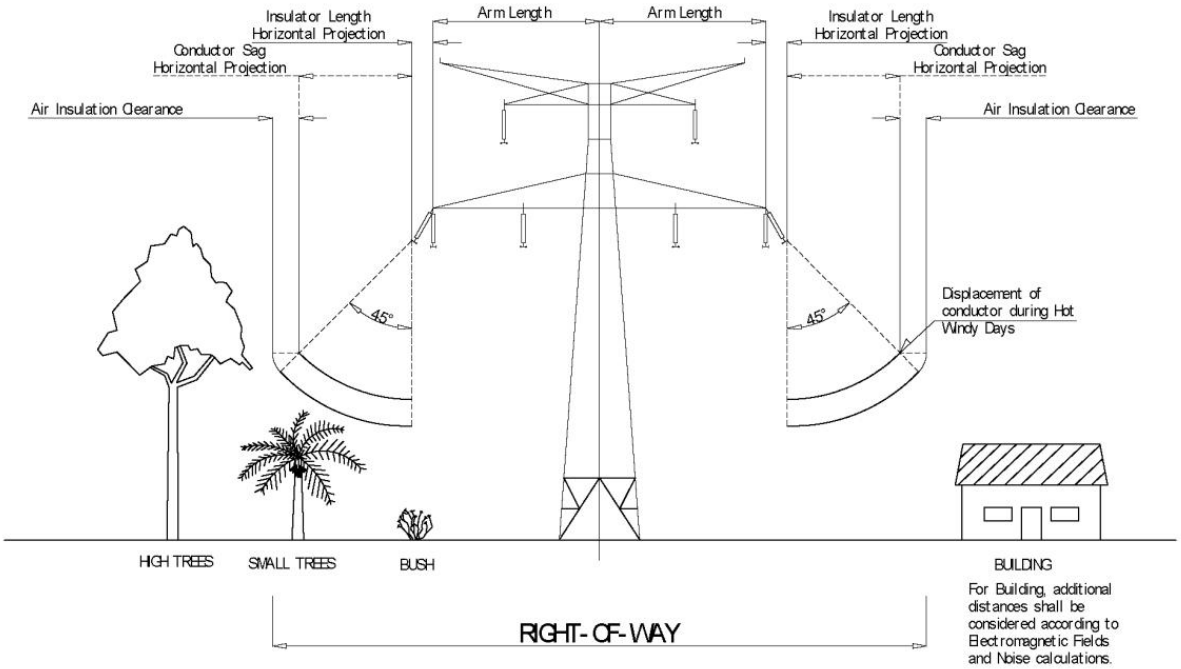


Figure 2.2: An illustration of a Way-leave Corridor; courtesy of KETRACO

The process of acquiring the wayleave starts by route survey, environmental impact assessment, and conducting a resettlement action plan (RAP), specifying the procedures to be followed and the actions to be taken to properly resettle and compensate affected people and communities. The RAP must identify the full range of people affected by the project and justify their displacement after consideration of alternatives that would minimize or avoid displacement. It outlines eligibility criteria for affected parties, establishes rates of compensation for lost assets, and describes levels of assistance for relocation and reconstruction of affected households.

According to the KETRACO RPF developed under this project, PAPs will be compensated at full replacement cost. Full Replacement Cost for agricultural land, is the pre-displacement market value of land of equal productive potential or use located in the vicinity of the affected land, plus the cost of preparing the land to levels similar to those of the affected land, plus the cost of any registration and transfer taxes. For land in urban areas, it is the pre-displacement market value of land of equal size and use, with similar or improved public infrastructure facilities and services and located in the vicinity of the affected land, plus the cost of any registration and transfer taxes. For houses and other structures, it is the market cost of the materials to build a replacement structure with an area and quality similar to or better than those of the affected structure, or to repair a partially affected structure, plus the cost of

transporting building materials to the construction site, plus the cost of labour and contractors' fees, plus the cost of any registration and transfer taxes. For crops, this means, when arrangements cannot be made to allow for harvest, the market value for lost cash crops is paid. For trees, “where markets exist, the value of a tree of a specified age and use can be used to determine compensation rates. Where markets do not exist, surrogate values must be determined. For timber trees, the value of a tree equals that of the lumber. For fruit or fodder trees, the value is equal to the cumulative value of the fruit crop for its productive life (and any timber value). If replacement trees are provided, good practice indicates that compensation be based on the value of the harvests lost until the replacement trees come into full production (typically, 7–10 years). In the case of immature trees, a less costly alternative may be to directly supply seedlings as a replacement and provide compensation for the resulting delay in reaching fruit-bearing capacity”. In determining the replacement cost, depreciation of the asset and the value of salvage materials are not taken into account, nor is the value of benefits to be derived from the project deducted from the valuation of an affected asset. Where domestic law does not meet the standard of compensation at full replacement cost, compensation under domestic law is supplemented by additional measures so as to meet the replacement cost standard. Such additional assistance is distinct from resettlement measures to be provided under other clauses in OP 4.12, para. 6.

Implementation of RAP shall be done by KETRACO’s Project Implementation Team (PIT). The PIT should ideally comprise of staff members from all relevant departments including Engineering, Survey, Socio-Economist, Land-Economist, Environment, Communication, Accounts, Legal, and Finance. Wayleave Officers (a minimum of 2 – hired from the project area) and a Social Safeguards Officer should be engaged to ensure day-to-day running of RAP implementation and assisting the PIU in stakeholder engagement among other tasks. To ensure smooth running of the project, the proponent should build the capacity of the Wayleave Officers and the Social Safeguards Officer. Any dispute/grievance that may arise will be received and resolved by the Grievance Redress Mechanism established at the on-set of the project.

2.3.2; Bush Clearing

Specific sites for structures such as towers, staging areas, and areas for tower assembly must be cleared of any interfering vegetation. Bush clearing involves cutting down of trees with a capability of growing taller than 6 feet (1.8m) and shrubs and bushland that may hinder construction activities. This is important so as to make the wayleave accessible (to allow large equipment including drill rigs, concrete trucks and crane to be delivered to the site) during construction process.

Plate 2.22: Example of a TL way-leave corridor cleared of bushes; Courtesy of KETRACO

For this project, it is highly recommended that, the proponent conducts selective clearing of vegetation on the way-leave corridor and avoid unnecessary vegetation clearing. Most trees/bushes found in the project area don't have the capability of growing taller than 6ft (1.8m) and need not be cleared.

2.3.3; Access Routes and Other Ancillary Facilities

The transmission line generally passes near motorable access roads but in some sections, these roads may be at a significant distance from the transmission line. In such sections, the contractor, may be required to create their own temporary access routes.

Ancillary facilities for this project may include project camp site, materials holding and storage facilities, quarries, etc.

Land for access routes and ancillary facilities will be acquired by the contractor on a willing seller willing buyer basis, while ensuring that, if land for access routes and ancillary facilities is to be acquired in unregistered Community Group Ranches where the willing seller, willing buyer principle does not apply, the contractor will be required to strictly adhere to the provisions governing unregistered community land and as per the Community Land Act 2016. Further, in most KETRACO projects, land for contractor camping sites are leased. If this is to be the case, an agreement between the community/county representatives and the contractor shall be signed.

The Contractor shall be responsible for maintaining agreed access routes in a usable condition without undue widening for the duration of the construction period. The land occupier and members of the neighbouring communities shall not be put to any inconvenience in gaining access to their land or buildings. No unauthorized access routes shall be taken by the Contractor.

2.3.4; Tower Foundation

Plate 2.23: Tower foundation; Courtesy KETRACO

The type of the foundation to be casted at any location depends upon the type of soil, sub–soil water level and the presence of surface water. These include; -

1. Normal Dry Foundation: used at locations where normal dry cohesive soils are met and where sub-soil water is met below the foundation base level.
2. Wet Foundation: used where sub-soil water is met at 1.5 metres or more below the ground level or in cases where there is surface water for long periods with water penetration not exceeding one metre below the ground level, e.g., paddy fields or sugar cane fields.
3. Partially Submerged Foundation: used at locations where sub-soil water table is met between 0.75 and 1.50 metres below the ground level.
4. Fully Submerged Foundation: used at locations where sub-soil water table is met within 0.75 metre below the ground level.
5. Black Cotton Soil Foundation: used at locations where soil is clayey/expansive type, not necessarily black in colour, extending to the required depth of excavation of the pit, which shrinks when dry & swells when wet resulting in differential movement of the soil.
6. Soft Rock or Fissured Rock Foundation: used at locations where decomposed or fissured rock gravel, kankar, limestone, laterite or any other soil of similar nature is met.
7. Hard Rock Foundation: used at locations where chiselling, drilling and blasting is required for excavation of hard rock type foundations.
8. Sandy Soil Foundation: used where soil with negligible cohesion is met.

While excavating, the earth is cut vertically/tapered/in steps as per the soil conditions at site to avoid any kind of mishap caused by collapsing of the pit sides during the course of excavation and foundation work. The excavated earth is kept at a sufficient distance so that it does not create any burden on the sides of excavated earth pits.

During excavation in sandy soil or water bearing strata, and particularly in black cotton soil where there is every likelihood of collapsing of the sides of the pits, shoring and shuttering made of wooden planks of sufficient thickness or steel frames of adequate strength is necessary. Where water is encountered during excavation, dewatering shall be carried out manually or by mechanical means. Excavation in soft rock is done with the help of chisels. For excavation in hard rock, blasting can be resorted to.

After the excavation is completed, the sides of the stub setting template are assembled and placed on the four sides of the location. The sides are then connected together, taking into consideration the type of tower (normal or with extension) to be erected, to form the shape of the template with the four corners located in the excavated pits. The stubs are then fixed on the legs of the template.

Former boxes of the shape, size and dimensions for the individual type and make of tower are then fabricated. The chimney and pyramid portions are adequately braced to retain proper shape while concreting. To avoid honeycombs in the concrete, the former boxes are sufficiently tightened to prevent cement slurry from coming out. A window is provided on the upper part of one face of large size frustums so that concrete may be placed easily in the lower part. This window is fitted back after placing concrete in the lower part.

When casting the foundation, all wet locations must be kept completely dewatered both during the placing of the concrete and for 24 hours after completion. The base pad of required depth is then placed using specified concrete mix and allowed to set.

After the frustum part is poured, the earthing connection is fitted on the designated stubs. Earthing is provided on Leg 1. Additional earthing, if required, is provided on Leg 3. Counterpoise earthing is provided on all legs.

The concrete is then poured into the chimney portion. After pouring of every 450mm of concrete, poking rod or vibrator is used so that no empty spaces are left inside.

Former boxes are normally removed 24 hours after concreting. After removal of the former boxes, the pits are back filled with earth, which is free from grass, dung, wooden waste, postures & fodder, woods, shrubs, thorns, etc. This is done in layers not exceeding 150mm, sprinkled with water, and well compacted.

2.3.5; Tower Erection

Tower erection works shall mainly be carried out by derrick pole. Derrick pole is a tubular steel pipe structure of around 6m in length attached with hooks at one end and fitted with a single sheave block at the other end. It is basically a load carrying tool used to lift the tower members for erection. The four main legs of the tower are individually attached to stubs using cleats, plates, and bolts. Since the legs are not self-supported, they are anchored individually using polypropylene ropes. Unsupported legs are supported by guy ropes which are anchored on ground by crow bars or existing trees. The cross braces of the first section which are already assembled on the ground are raised one by one as a unit and bolted to the already erected leg angles. This process leads to the basic tower structure with leg extensions installed.

Plate 2.24: Tower erection; Courtesy of KETRACO

At this point one corner of the diagonal frame at which derrick can be installed and supported is chosen. The hook of the derrick is attached to the leg of the tower by means of ropes. Polypropylene ropes of adequate length are drawn through the block of the derrick and passed through one more block at the bottom of tower attached to the stub leg with the free end being available for pulling either manually or by use of a tractor. The other end of the rope through the derrick will be taken down and secured with the tower member to be lifted. Prior to the lifting process, the top of the derrick is anchored to the ground using ropes in the direction opposite to that of the lift to obtain balance during the lifting process.

For assembling the second section of the tower, two derrick poles are placed on each other on top of the diagonally opposite legs and are supported by guy ropes. These two poles are used for raising parts of the second section. The leg members and braces of the section are then hoisted and assembled. The derrick poles are then shifted to the top of the members to raise the parts of the third section of the tower. Derrick poles are thus moved up as the tower grows. This process is continued till the complete tower is erected. Cross arm members are assembled on the ground lifted up and fixed to the main body of the tower using the same procedures from top towards the bottom.

2.3.6; Stringing

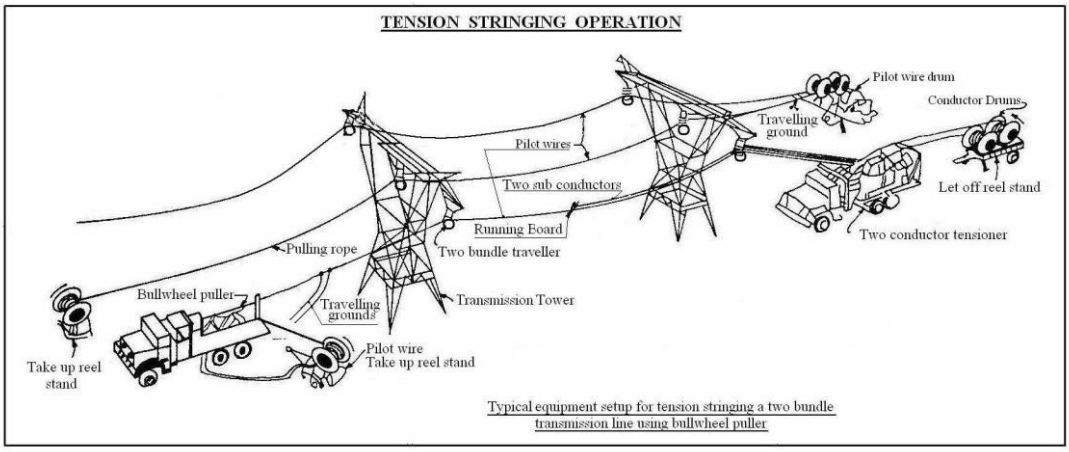


Figure 2.3: Stringing Operation; Courtesy construction manual for TL by Rajasthan Transco

The process of attaching conductor cables to the insulators suspended from the towers is called conductor stringing. It generally involves pulling the conductor off of a truck-mounted spool. Specifically, conductors are pulled from one tower to the next through a pulley system which is temporarily placed on the tower. Trucks, heavy equipment and sometimes helicopters are used in this process.

Before hoisting, all insulators are cleaned in a manner that will not spoil, injure or scratch the surface of the insulator. Disc insulators shall be examined for any cracks, chipping, or any other damage. Disc insulators having any hair cracks or chipping or defective glazing or any other defect shall not be used.

One person should be posted on each tower with red and green flags and whistle so that he can give a signal, which is relayed to the pulling end by other similarly placed persons, to stop the paying out operation if any roller gets stuck or any mid span joint gets stuck in any roller or any other emergency occurs. Walkie – Talkie sets may also be used for this purpose. Walkie

- Talkie sets stationed at the tensioner, puller and intermediate spans, as required, should be used specially for tension stringing.

Apart from the conductors and insulators, other accessories to be installed in the transmission line include; aviation warning markers, bird diverters, spacers and galloping devices.

2.3.7; Energizing and Hand-Over

This is the last stage in the construction phase of the transmission line project. It is conducted after final checking of towers, conductors, and all other associated equipment and there are no defects/shortcomings in the work of the transmission line.

The concerning Executive Engineer shall be present at the time of charging the transmission line who shall ensure that all testing and checking has been done and approval of the relevant authorities has been obtained.

2.4: Transmission Line Design

2.4.1; Air Space Protection

Where it is likely that the power line is hazardous to aviation and avi-fauna safety because of its height and location, spherical markers will be used to identify overhead wires. The Kenya Civil Aviation Authority (KCAA) regulations, establish standards for determining obstructions in navigable airspace. Issues such as size and height of towers, right-of-way needs, maintenance access, and impacts to the approach zone, clear zone, or safety zone has to be evaluated and approved by KCAA to utilize property near airports and airstrips.

2.4.2; Conductor Clearances

Conductor Vertical Clearances

The following are the minimum vertical clearances to be ensured from the line conductors at maximum sag (inclusive of 0.3m included in sag calculations to accommodate conductor creep) to ground level or objects and crossings as described (Ref; Feasibility Studies for Transmission Lines Assignment III by Lahmeyer International for KETRACO TLs 2014).

Condition	**Clearance in M**
Above terrain in general, including minor roads/tracks	7.0
Above main (paved) roads	8.0
Above secondary (unpaved) roads	8.0
Above railways	8.5

Above steep or swampy ground, inaccessible to vehicles < 3.0m, and above water at max. flood level, except navigable rivers	6.5

Design Factors of Safety

The following design factors are for steel lattice towers and are true for 132 kV lines

Conductors, earthwire and optical fibre earthwire at final maximum working tension based on ultimate nominal breaking load.	3.00
Conductors, earthwire and optical fibre earthwire at still air everyday temperature final tension based on ultimate nominal breaking load	5.00
Tension clamps and mid-span joints based on conductors, earthwire and optical fibre earthwire ultimate nominal breaking load.	0.95
Insulators and Fittings (based on failing load)	
▪ under normal working conditions	3.00
▪ under broken string conditions	3.00
Steel Lattice Towers	
▪ Steel towers under normal working conditions	2.00
▪ Steel towers under broken wire conditions	1.50
▪ Steel towers under maintenance conditions	2.00
▪ Cascade Collapse for suspension towers	1.00
Foundations	
▪ Foundations under normal working conditions	2.50
▪ Foundations under broken wire conditions	1.75
▪ Foundations under maintenance conditions	2.00
▪ Factor against overturning/uprooting	1.20

2.4.3; Tower Layout

Plate 2.25: TL Tower; Courtesy KETRACO

Possible Tower Configurations

With regard to line design, there are four (4) different variants, which are technical feasible:

Conventional overhead line (Steel lattice towers with individual foundations)

- Advantages: cost effective design (regarding investment cost); ease of construction (no heavy equipment required).
- Disadvantages: space requirements (easement / permanent land take), visual impact (in urban areas).

Compact overhead line (Self-supported steel lattice towers with monoblock foundations for suspension towers.)

- Advantages: economic design, ease of construction,
- Disadvantages: slightly higher cost for (heavier) suspension towers, access to crane is required.

Tubular steel pylons / Pre-stressed concrete poles.

- Advantages: reduced easement / land take (because of smaller base), visual impact.
- Disadvantages: considerably higher cost than for steel lattice towers, requirements concerning access (temporary land take / destruction) and construction (heavy equipment/ noise).

As per the feasibility study, the towers to be used will consist of self-supporting lattice towers and the most common ones used by KETRACO are the steel lattice towers with individual foundations.

2.4.4; Tower Type Family Recommendation

Taking into account the cost and space available the best option is to use tower structures of the self-supporting lattice-type galvanized steel frame with square bases, individual concrete foundations per leg, body and leg extensions, cross arms for phase and earth conductors. Corrosion protection shall be of hot dip galvanization (minimum 610 g/m^2).

The towers shall be fitted with anti-climbing devices at 3m from the ground, step-bolts on two diagonally opposite legs starting above the anti-climbing to the top, name plate and phase plates following the specifications of the Client.

Taking into account the possible theft of tower members, the towers shall be fitted with anti-theft bolts from ground level to the anti-climbing device level.

Tower dimensions

Regardless of dimensions such as footprint, member slope, cross-arms attachment to body width, which is the results of the static calculation and experience of the designer, a tower is defined by other typical dimensions listed below:

- phase to phase distance
- phase to earthwire distance in regards of the location of the earthwire to ensure an optimum against lightning strikes
- attachment height to ground of the suspension and tension string
- phase to structure clearance (which has to be followed by the strings as well as the jumpers of the tension towers)

The footprint square cross section dimension will depend on the type of the tower (angle, tension, or suspension tower) but on average is about 5m square.

Tower Height

The minimum tower height H is calculated and equals the sum of the following:

- h1 - Minimum permissible ground clearance
- h2 - Maximum sag (at highest conductor temperature)
- h3 - Vertical spacing between conductors
- h4 - Vertical clearance between ground wire and top conductor

$H = h1 + h2 + h3 + h4$

KETRACO towers range between 30 and 80m high from the ground level.

2.4.5; Definition of Spans

Each type of tower is characterized by a set of spans called "Typical spans" whose values are involved not only in the calculation of distances between phases, distance to ground, height above ground, but also in the calculation of forces acting on the structures (weight, wind load, etc.).

Those typical spans are:

The basic span is the most economical horizontal distance between two consecutive towers. It is the basis for determining the height of attachment above the ground conductor of the lowest points. It therefore affects mostly the normal height of the tower.

The maximum span is the maximum horizontal distance that can separate two towers. It is the basis for determining the characteristic dimensions of the tower cross-arms and mainly distances between conductor and earthwire

The wind span is mainly used to determine the horizontal force acting on the tower structure. For anchoring supports, wind range is the distance over which the wind is expected to act perpendicularly to the cable. It is equal to the arithmetic mean of adjacent spans of a support.

The weight span is the horizontal distance between the points where the tangent to the parabola is the horizontal distance between the points where the tangents to the curve of the two adjacent spans are horizontal.

For this project, a standard span of 300m is recommended.

2.4.6; Selection of Conductors

The phase conductors used by KETRACO are all of ACSR type, namely with Code Names LYNX, CONDOR and HAWK. The project will try to us, as far as possible, the same conductor types:

Voltage Level	Phase Conductor Type ACSR
132 kV	1 x LYNX

2.4.7; Selection of Shield Wires

Conventional Earth Wire – Type ACS

The earth wire fulfils two functions:

- Shielding the phase conductors from direct lightning strikes
- Reliable high capacity communication channel by using OPGW (Optical Ground Wire).

Because earth wires are usually required to have less sag than the phase conductors, they are normally either ACS or steel construction.

Standard earth conductors used in most of the lines are aluminium-clad steel conductors. They are standardised according to IEC 61089, EN 50182, Table F21 or ASTM B416. The standard earth wire is type ACS at KETRACO.

2.4.8; OPGW Shield Wire

Fibre optic cable links are today the foundation of communications systems, since they have the advantage of large capacity, high speed, and long distance transmission. At the same time they are not influenced by electromagnetic fields and do not show any cross-talk, which is very important for installations on high voltage (HV) lines.

The most common method for this is to install an **OP**tical **G**round **W**ire (**OPGW**), which contains optical fibres, as a substitution of an existing ground wire.

The main characteristics of an OPGW are:

- the mechanical strength, which is mainly determined by the amount of steel;
- the short time current capacity, which is mainly determined by the amount of aluminium (alloy); and
- the number of optical fibers.

The fibres OPGW shall follow the following specifications and recommendations:

Optical fibre:	CCITT (recently ITU-T) recommendation, IEEE 1138, Annexure A for short circuit tests
IEC 60794	Optical Fibre Cables
IEC 61395	Creep test for stranded conductors
EN 187 000	Optical Fibre Cables (Generic specification)
EN 187 100	Optical Telecommunication Cables (Sectional specification)
EN 187 200	Sectional Specification: Optical Cables to be used along Electrical Power Lines (OCEPL)
EN 187 201	Family specification OPGW
EN 187 204	Family specification OPPC
EN 188 000	Optical Fibres (Generic specification)
IEC 60104	Aluminium-magnesium-silicon Alloy Wire for Overhead Line Conductors
IEC 60304	Fibres and binders colours
IEC 60865-1	Short-circuit Currents - Calculation of Effects.
IEC 60889	Hard Drawn Aluminium Wire for Overhead Line Conductors

IEC 60949	Calculation of Thermally Permissible Short-circuit Currents, taking into Account Non-adiabatic Heating Effects.
IEC 61089	Round Wire Concentric Lay Overhead Electrical Stranded Conductors.
IEC 61232	Aluminium-clad Steel Wires for Electrical Purposes
IEC 61597	Overhead Electrical Conductors – Calculation Methods for Stranded Bare Conductors
ITU G.652	Characteristics of a Single-mode Optical fibre

2.4.9; Foundation Design

The foundations shall be of pad and chimney concrete reinforced type. Piles may be employed in bad and buoyant terrain (lake and river crossing). The foundations capacity shall be determined in regards of a soil investigation.

The safety factors shall be as per “Design Factors of Safety”:

- 2.50 in regards of the yield strength of the steel for normal load cases
- 1.25 in regards of the yield strength for exceptional load cases

For the purposes of classification, foundation type selection, the basically soils to be found in the project area have been divided into the groups as per following table.

Soil Type	Soil Conditions
S1	Rock such as granite (with different levels of different minerals included), lightly weathered
S2	Very good soil such as hard clay, dense sand, very weathered rock
S3	Good/Normal soil such as medium-dense or loose soils, such as firm clay and medium sands
S4	Poor soft soil / backfill material
S5	Very poor soil such as waterlogged soils, swamps, soils below water table for a significant period of the year

2.4.10; Tower Footing Resistance

Lightning strikes to towers lead to an increase of the tower’s potential, which is essentially determined by the tower footing resistance. If this potential exceeds the electric strength of the insulators, back-ward flashovers occur across the insulators, which, especially when they occur in the direct vicinity of the switchgear, can cause high over-voltage and over-voltage

with high rates of change. Here, linking the last towers to the switch gear earthing system as a remedial measure is a suitable method if significantly reducing the tower footing resistance and of preventing backward flashovers across the insulators of these towers. For economic reasons however, this measure is generally restricted to portal and first tower seen from the substation.

Earthing of tower structure shall be made as required by soil conditions and the value of earth resistance at each tower location. One or more ground rods per tower shall be installed depending on the requirements. The design is dependent of the soil resistivity to be performed during the survey by the Contractor.

KETRACO's values for the nominal footing resistance of steel lattice towers are:

Voltage (kV)	Footing Resistance Ω
132	10
225	10
275	10
400	10

The use of ground rods of a 35 x 35 x 4 mm diameter cruciform and 3.0 metre long steel rods is proposed. Ground rods shall be hot-dip galvanised. The ground rods shall be buried or driven at the base of the tower leg foundation. In order to avoid vandalism of the earthing material it is propose to connect the foundation steel and tower leg to the earth conductors beneath the soil surface; this is a proven practice at ESKOM South Africa.

Where the measured tower footing resistance is greater than the required value, earth improvements shall be made by additional ground rods or earthing counterpoise cable connected to each tower leg. Earthing cables (counterpoise) shall be of galvanised steel wire with 11.5mm diameter.

The terminal towers shall be connected to the substation earthing grid.

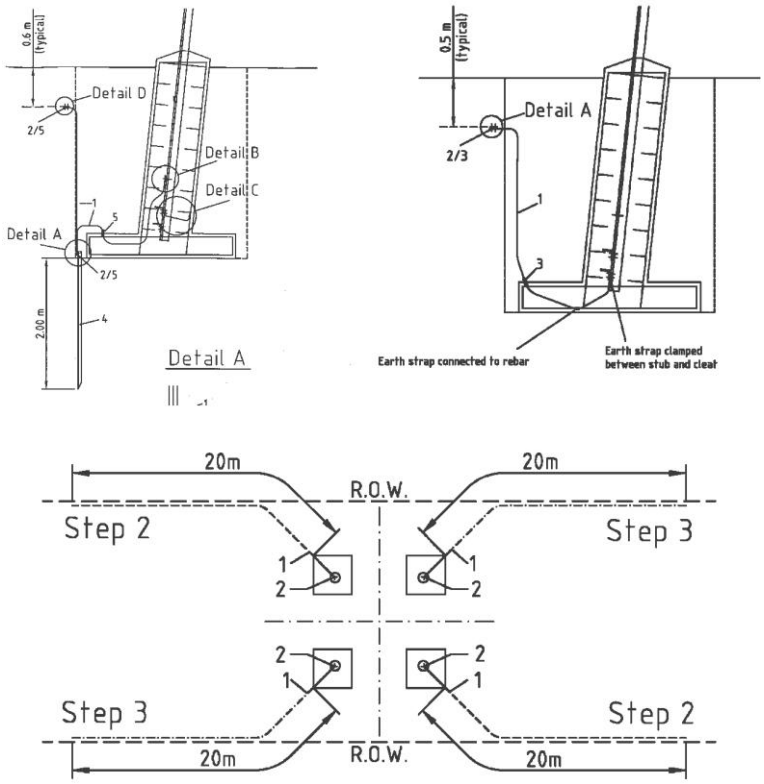


Figure 2.4: Tower Footing; Courtesy of KETRACO

2.4.11; Other Accessories

The following equipment must be included:

- Tower number plates, phase plates, warning plates;
- Anti-climbing devices, and Spacers for bundled conductors;
- Anti-theft protection bolts.

2.5: Project Justification

Currently electricity is accessible to less than 20% of the total population and approximately 5% of rural population. The government's goal is to accelerate access rate to 40% of rural population by 2040. This will be achieved by among others, improvement and expansions of the system networks. This project will contribute in the expansion of the transmission network.

2.6: Project Budget

Being part of the KESIP project, the cost for implementation of the project will be sought from the development partners. The 132kV Rumuruti-Maralal Electricity Transmission Line project is expected to cost approximately US Dollars fourteen million, two hundred and sixteen thousand, and four hundred (US$ 14,216,400). However, cost for wayleave acquisition and compensation thereof, to be determined after the RAP process, shall be a counterpart funding from Government of Kenya.

2.7: Target Group for the ESIA Report

The ESIA Report has been prepared for use by different stakeholders to be involved in the construction, operation, and decommissioning of the proposed project. The report contains useful information on policies and procedures to be adhered to, implementation modalities, analysis of potential environmental and social impacts and suggested mitigation measures at various stages of project activities. The information will be useful in planning, implementation, management and maintenance of the transmission line project.

In this regard, the report is useful to the following stakeholders:

- World Bank as the Project financier.
- Relevant government ministries and agencies for policy implementation.
- Project Affected Persons and Interested Parties.
- Planners and Engineers to be involved in preparation of designs and plans for the project.
- Proponent
- Contractors to be engaged in the project.
- People to be involved in the management and operation of the project.

CHAPTER 3: ENVIRONMENTAL SET-UP OF THE PROPOSED AREA

3.1: Background

Laikipia County

Laikipia County is one of the 47 counties in the Republic of Kenya in the Central Rift Valley region. It is listed in the first schedule of the Kenya Constitution 2010 as county number 031. The gazetted county headquarter is Rumuruti Town but has been hosted in Nanyuki Town since inception of devolution in 2013. Laikipia is cosmopolitan with about 23 communities comprising of Maasai, Samburu, Rendile, Somali, Pokots, Kalenjins, Meru, Kikuyu, and Turkana among others. The county is largely rural in settlement with the main economic activities being crop farming, livestock rearing, tourism, retail and wholesale trade.

The County borders Samburu County to the North, Isiolo County to the North East, Meru County to the East, Nyeri County to the South East, Nyandarua County to the South, Nakuru County to the South West, and Baringo County to the West. The County lies between latitudes 0^0 18" South and 0^0 51" North and between longitude 36^0 11' and 37^0 24' East. It covers an area of 9,462 square kilometers

Samburu County

Samburu County borders Turkana County to the North West, Baringo County to the South West, Marsabit County to the North East, Isiolo County to the East, and Laikipia County to the South. The County lies between latitudes 0^0 30' South and 2^0 45' North and between longitude 36^0 15' and 38^0 20' East. The County lies within ASAL region, in the northern parts of Great Rift Valley in Kenya, and covers an area of 21,022 square kilometers.

3.2: Climatic Conditions

Laikipia County

The county experiences a relief type of rainfall due to its altitude and location. The annual average rainfall varies between 400mm and 750mm. The areas nearest to the slopes of Mt. Kenya and the Aberdare Ranges record higher annual rainfall as compared to the drier northern areas. The long rains are experienced between March and May and short rains in October and November. The annual mean temperature of the county ranges between 16^0 C and 26^0 C.

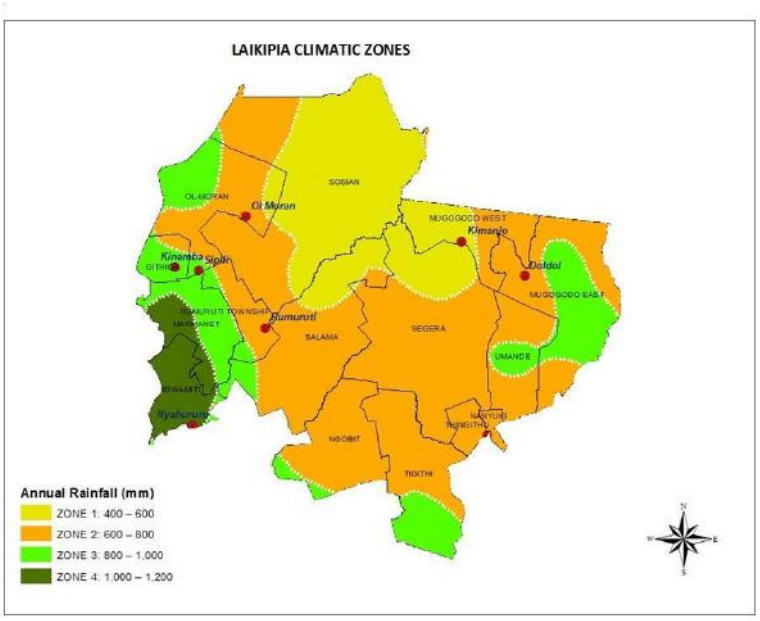


Figure 3.1; Laikipia climatic zones

Samburu County

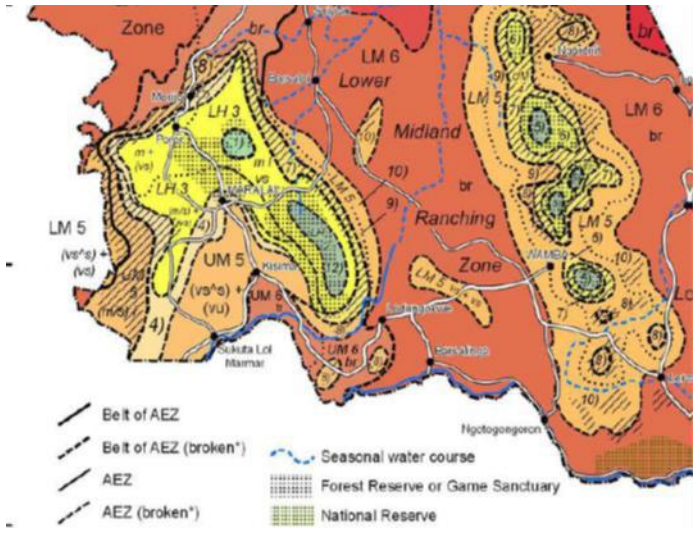


Figure 3.1b; Agro-ecological zonation in parts of Samburu

The County Experiences Tropical climatic conditions. The driest months are January and February. The long rainy season falls in the months of March, April and May. The short rains occur during the months of July and August, sometimes extending into September. The central basin and the plains east of the Matthews Range (where the project area lies) are the driest parts of the county with annual rainfall of between 250 mm and 500mm. The County has annual mean temperature of 29^0C with the maximum range being 33^0C and a minimum of 24^0C. The central plains and the region east of the Matthews Range have the highest temperatures while the highland belts in the North Eastern side of Lorroki Plateau are cooler.

3.3: Ecology

This section describes details of the Rumuruti-Maralal TL routing and the ecological characteristics arising from the field study (full report is in appendix III). The study focused on the entire 100 km proposed Transmission line route with special emphasis on ecologically sensitive sites (Figure 3.1). The proposed TL line traverses an arid and semi-arid area. The most fragile sites in such areas are either riverine systems, with gallery forests, wildlife conservation areas, riparian areas. Due to environmental conditions in such areas, any riparian or water body also tends to attract wildlife and avian species.

3.3.1; Vegetation

The vegetation of the Laikipia-Samburu ecosystem is dominated by wooded grassland with an underlying large cover of perennial and annual grasses and a number of Acacia species. A wide range of habitats are linked with the elevation and climatic gradients that characterize the region: from cool, wet highlands in the south to hot, dry lowlands in the north.

The main type of vegetation in the ecosystem is considered a rangeland type with the higher grounds being characterized by upland dry forests while some of the lowland areas are wetlands. Close to 40 families and 170 species of plants can be found in the ecosystem. A total of six vegetation communities have been identified and mapped in Laikipia-Samburu ecosystem. Based on location and/or type, they were categorized as:

The bushland vegetation communities form a transition between upland forest and the Acacia dominated associations in the lowlands. Chikamai *et al*, (1999) list two of such associations as *Combretum-Tarchonathus-Hyparrhenia* and *Euphorbia-Croton-Aristida.*

Acacia drepanolobium is the most widespread species found on poorly drained and seasonally waterlogged soils at altitudes (1000-1800 m.a.s.l), mostly in the central areas of the complex. It is also the major species being cleared for charcoal. Acacia mellifera association is confined to the drier northern parts of Mukogodo and the lower valleys of Ewaso Narok and Ewaso Ng'iro Rivers.

Degraded or unstable ecosystem in the area is indicated by the presence of *Acacia bravispica*, and is confined to the drier steep, well drained sites with rocky or shallow soils. *Euphorbia candelabrum, A.bravispica, Croton dichogamus, Aloe londetia* and *Hyparrhenia* spp are the dominant species on the bare rock, escarpment where they help in the rehabilitation of the degraded lands.

Three main vegetation types characterize the Laikipia-Samburu ecosystem; woodland dominated by whistling-thorn acacia (*Acacia drepanalobium*), which is the most common vegetation type (Young et al., 1997); savanna dominated by perennial grasses with widely spaced trees and shrubs; and bushland with a discontinuous layer of perennial grasses and >30% canopy cover dominated by *Acacia mellifera*, *Acacia etbaica*, *Acacia brevispica*, and *Grewia tenae*.

The vegetation in Samburu County can be described in four categories: woodland, dwarf shrub bushland, shrubland and thickets. Woodland only develops with subsidiary water supply along channels and permanent rivers as gallery or riverine forests. The differentiation of bushland and shrubland is correlated with soil properties. While bushland covers loamy and sandy sites, shrubland is confined to clay soils which are characterized by low infiltration rates. Thicket formation especially occurs on eroded valley sediments.

The bushland is characterized by *Acacia reficiens*, *A.mellifera*, *A.*drepanolobium, *A.seyal*, and *A.brevispica*. Other species are *Acacia tortilis*, *Commiphora africana*, *Grewia spp* and dwarf shrubs such as *Lippia carviodora* and *Vernonia cinerascens*.. Thickets are mainly composed of *Acacia horrida* and *Acacia reficiens*.

The shrubland which is characterized by *Acacia mellifera*, *A. Paolii* and several species of the Capparaceae family. The major river in the landscape, the Ewaso supports a riverine forest dominated by *Acacia elatior* (river acacia) and *Vachellia xanthophloea* (fever tree), which attracts large numbers of animals in the dry months. The diverse plant community supports an equally diverse fauna.

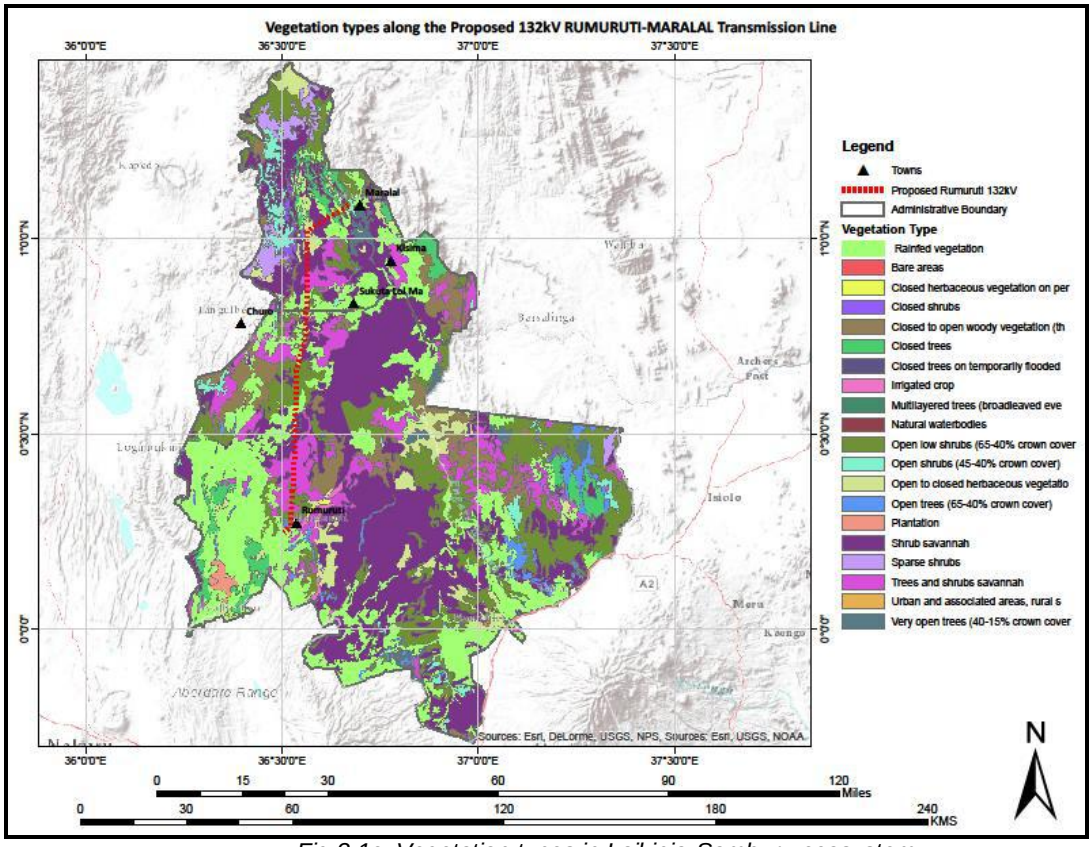


Fig 3.1c: Vegetation types in Laikipia-Samburu ecosystem

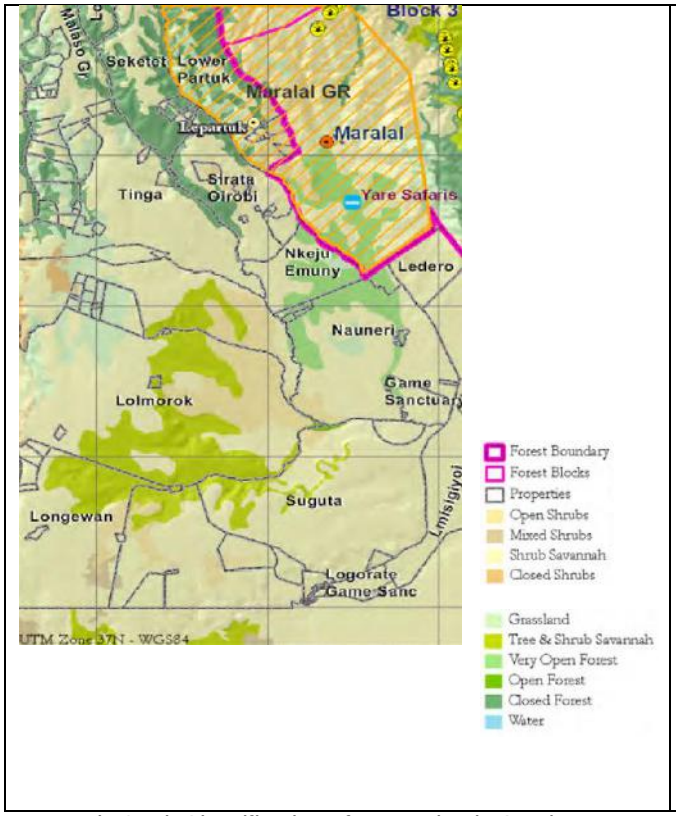


Fig 3.1d: Classification of vegetation in Samburu

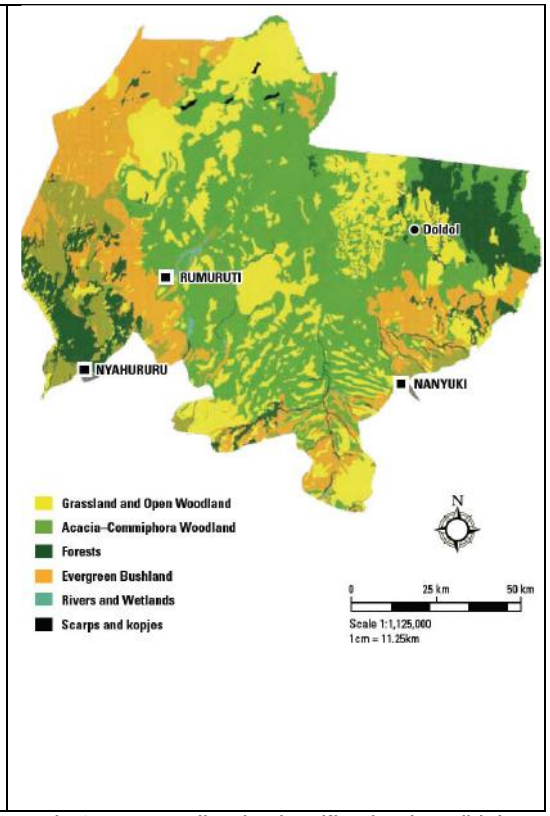


Fig 3.1e: Woodlands classification in Laikipia

3.3.2; Wildlife

Laikipia-Samburu ecosystem, although a semi-arid region, is very rich in biodiversity. The tourism industry is based not only on the wildlife but also on the adverse avifauna. Outside the gazetted parks all in Kenya, Laikipia-Samburu ecosystem has the largest diversity and population of wildlife, which are mainly found in private ranches and the communal lands. The Grevy's zebra (*Equus grevyi*) population of which 93% of global population occurs in Samburu-Laikipia ecosystem, estimated national population of about 2,571. The ecosystem also contains community and private conservation areas.

The Laikipia-Samburu ecosystem as a whole can be considered a biodiversity hot-spot in the sense of having a wide diversity of endemic and/or endangered species. The main conservation significance of the ecosystem is that it is large area of relatively natural habitat, which is still large enough to contain large wide-ranging species, and thus can sustain a full range of ecosystem processes. Further, the ecosystem hosts some globally endangered species whose populations have declined over recent years. Laikipia-Samburu is of particular significance for lions, wild dogs, Grevy's zebra, eland, elephants, reticulated giraffes and patas monkeys. The biodiversity value and ecosystem integrity within the Laikipia-Samburu ecosystem can be summarized as follows:

- Second largest functional ecosystem after Tsavo.
- Second highest wildlife densities after the Mara.
- Highest wildlife diversity in the country.
- More threatened and endangered mammals than anywhere else in Kenya.
- 50% of Kenya's black rhino population.
- Largest elephant population outside Tsavo.

The ecosystem harbours a number of wild ungulate species such as Grevy's zebra (*Equus grevyi*), Somali ostrich (*Struthio camelus molybdophanes*), beisa oryx (*Oryx beisa*), Grant's gazelle (*Nanger granti*), gerenuk (*Litocranius walleri*) and reticulated giraffe (*Giraffa camelopardalis reticulata*). Laikipia holds the second greatest wildlife abundance in Kenya after the Masai Mara National Reserve, with lion densities estimated at 5 to 6 individuals per 100 km^2 and well established wild dog, leopard, spotted hyaena and cheetah populations In addition to elephants, the ecosystem is home to other large mammals that include reticulated giraffe (*Girrafa camelopardalis*), plains zebra (*Equus quagga*), Grevy's zebra (*Equus grevyi*), Cape buffalo (*Syncerus caffer*), impala (*Aepyceros melampus*), defassa waterbuck (*Kobus ellipsiprymnus defassa*), and common waterbuck (*Kobus ellipsiprymnus*). Other animal species found in the landscape but in relatively fewer numbers include beisa oryx (*Oryx beisa*), eland (*Taurotragus oryx*), and gerenuk (*Litocranius walleri*).

The Laikipia-Samburu ecosystem spans approximately 25,000 square kilometers and is defined by the Ewaso N'giro river watershed. The proposed transmission line crosses this ecosystem from around Rumuruti to around Logologo.

About one quarter of all mammals found in the country are bats. Kenya has about 110 bat species divided into 10 families. Kenyan bats are distributed throughout the country and inhabit virtually all types of physical and natural geographical and environments state. In Samburu, there are abundant bats in Losuk area and also Mugie. Threats to bats by human activities include- disturbances of their roosts, environmental pollution, persecution (cultural beliefs) and fragmentation. Common bats species include: Macinnes mouse-tailed bat (Rhinopoma *macinnesii*), Hamilton's tomb bat (*Taphozous hamiltonii*) and Kenyan big eared free-tailed bat (*Tadarida lobata*).

3.3.3; Wildlife Connectivity

The high level of wildlife species diversity in Laikipia is primarily dependent on two factors. The first is the extent of different types of natural habitat. The second factor contributing to Laikipia's diversity of wildlife is "connectivity", the degree to which the landscape facilitates or impedes wildlife movement among and between these natural habitats. Together Laikipia and Samburu Counties form the Laikipia-Samburu ecosystem and stand as key dispersal areas for wildlife from neighbouring protected areas (Esilaba et al. 2007; Georgiadis et al. 2007), and are crucial for the connectivity of East African wildlife populations (Riggio & Pimm 2011).

3.3.4; Avifauna

In Samburu and the surrounding Loroki plains, up to Laikipia, there are threatened species of birds that include the endangered Martial Eagle, the Kori bustards, the Secretary birds and Somali ostriches all classified as vulnerable. These species are also protected species according to Kenya's Wildlife laws. In the bush lands are found five species of Bustard birds ie Black-bellied, White-bellied, Hartlaub's, Buffcrested and Kori Bustard. The Kori Bustard can weigh up to 18 kg and is the largest flying birds in tropical Africa – and is also threatened. Other bird species are the Helmeted and Vulturine Guinea fowls. Both are big-bodied birds and forage in flocks of 50–60 individuals. There are also six hornbill species at least in Laikipia: Von derDecken's, Red-billed, Eastern Yellow-Billed, African Grey and Crowned Hornbills are denizens of the dry bush lands.

Martial and Verreaux's Eagles are among the largest raptors found in the ecosystem. The raptors visit Laikipia seasonally, as they migrate to and from summer breeding grounds in

Eastern Europe and western Asia. Commonly seen visiting birds include Pallid Harriers, Sooty and Red-footed Falcons and Lesser Kestrels. The International Convention for the Conservation of Nature (IUCN) considers the Lesser Kestrel 'Vulnerable' to extinction, The oddest raptor of the grasslands is the Secretary Bird often seen in the grasslands of Loroki. There also five species of Vulture – White-faced, White-backed, Lappet-faced, Rüppell's and Egyptian.

3.3.5; Detailed Description of TL Sections

During the field study of the proposed TL route, various ecologically sensitive sites were identified. These are shown in general in Figure 3.2. However, a detailed analysis for the different sections of the route is provided in the following sub-sections.

Rumuruti substation to Loyangalani-Suswa TL Junction

This section starts at the proposed Rumuruti sub-station, located about 4km south west of Rumuruti Town, at 00º 14.714" N and 36º 30.425" E at an altitude of about 1,900 m above sea level. The area is mainly composed of a mixture of farmlands and patches of open wood and shrub-land modified vegetation. This section ends at the junction with the Loyangalani-Suswa line at GPS point N 00º 23.68"N, E 36º 31.787" at an altitude of 1895m above sea level. The dominant vegetation in this section of the TL line includes *Acacia drepanolopium* on heavy soils, *Acacia geriadii, Acacia tortilis* and *Acacia seyal* on the flat to the very gentle undulating soils. Grasses on the range include *Themeda triandra, Pennisetum*

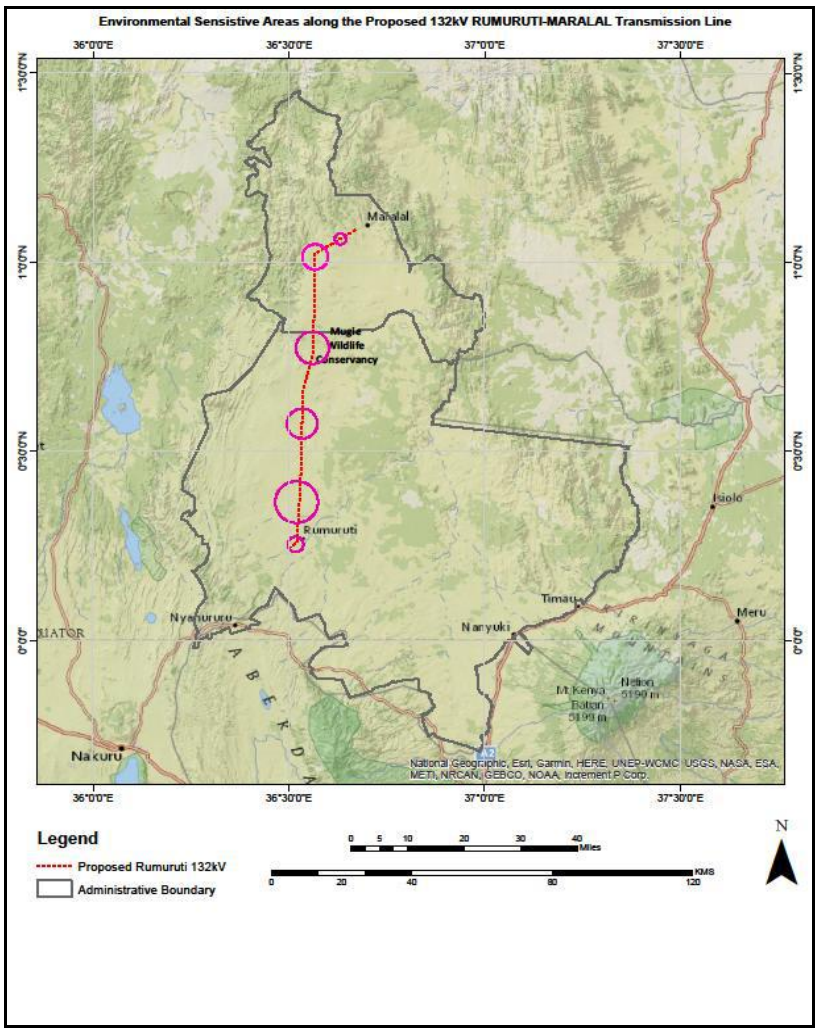


Figure 3.2; Environmentally sensitive areas along the TL

stramineum, Pennisetum mezianum and Cynodon dactylon. Further north, the vegetation changes to mixtures of *Acacia tortilis, Acacia seyal, Euphorbia candelabrum, Senna didymobotrya* and *Rhus natalensis, Carissa edulis* and Croton dichogamus. Shrubs and other herbaceous species include *Solanum* spp, *Lippia javonica*, *Euclea divinorum*, *Psiadia puniculata*. There are also scattered trees of *Grevillea robusta*, and *Eucalyptus* spp. Common grasses include *Chloris roxburgiana* and *Setaria verticillata*. Few wildlife were reported in this area except few small game associated with the nearby wildlife conservancies. Most of the shrubs are used by the local community as fodder (mainly goats) and some as medicinal plant. Larger trees provide habitats for nesting of birds. A checklist of various plant species and their significance/uses by the local communities is given in appendix III.

Plate 3.1: Rumuruti Substation

Plate 3.2: Lipia javonica

Plate 3.3: Euclea divinorum

Plate 3.4: Croton dichogamus

Plate 3.5: *Carissa edulis*

Plate 3.6: *Euphorbia candelabrum*

Plate 3.7: *Agave sisiliana*

Plate 3.8: *Setaria verticillata and Acacia spp*

Plate 3.9: *Acacia spp*

Plate 3.10: *Agave sisiliana*

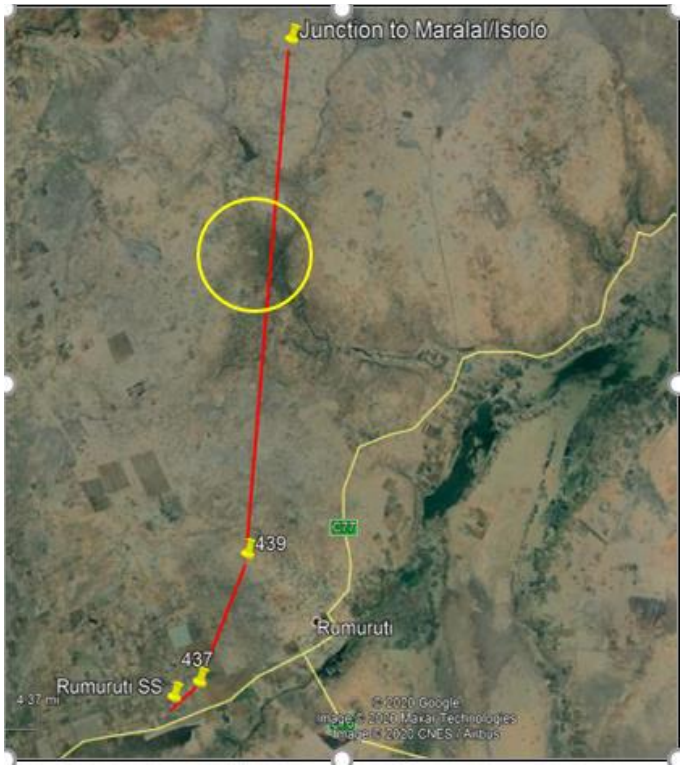


Figure 3.3: ecologically sensitive areas, Rumuruti SS to junction

Plate 3.11: *Acacia tortilis at Junction 1*

Plate 3.12: *Small game at Junction 1*

Plate 3.13: *Livestock at Junction 1*

Loyangalani-Suswa TL Junction to Mugie

This section starts at the junction of Loyangalani-Suswa line at N 00º 23.680", E 036º 31.787" to the edge of Mugie Conservancy at N 00º 41.268', E036º 32.544' at 1945 m asl. Most of the riverine or gallery forests and riparian area at km 11 is dominated by *Acacia xanthophloea* (Fever tree), *Acacia gerrardi, A. gracilior,* water pear *Syzygium guineense*, water berry *Syzygium cordatum*, cape chestnut *Calodendrum capense*, and figs *Ficus spp*. The more common grasses (*Poaceae*) include *Pennisetum stramineum*, *Pennisetum mezianum, Brachiaria lachnantha, Themeda triandra, and Setaria sphacelata*. There is also a heavy presence of *Senna didymobotrya*. This section contains several sensitive sites as riparian area that contains a variety of birds.

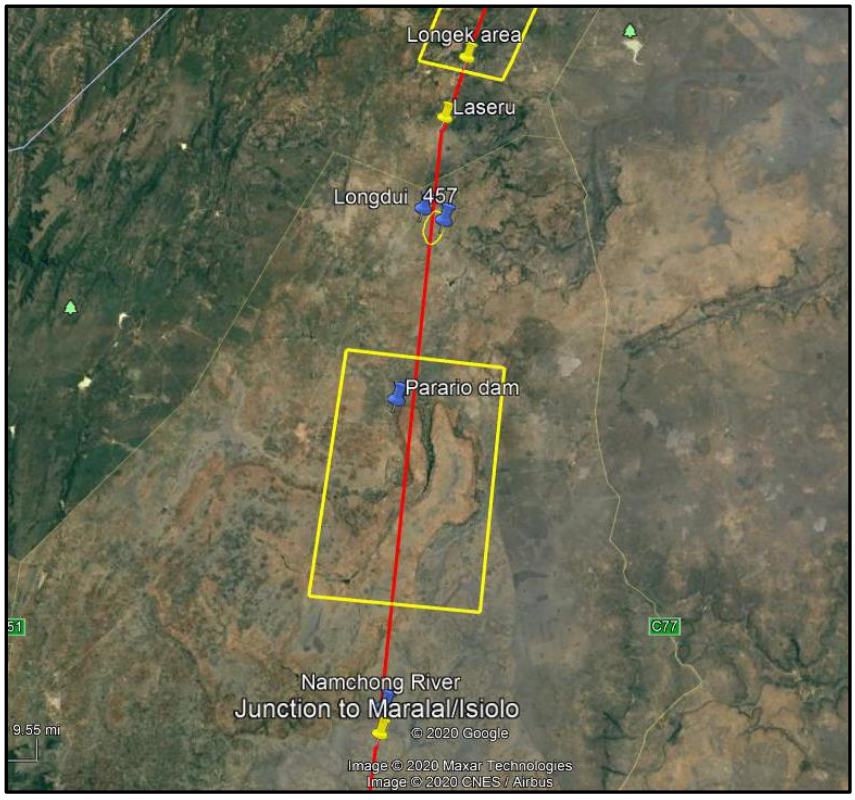


Figure 3.4: ecologically sensitive areas, junction to Luoniek

Plate 3.14: Sensitive site South of Mugie

Plate 3.15: Cyperus rotundus

Plate 3.16: Ipomoea hildebrandtii and Rhus natalensis

Plate 3.17: Setarria verticillata grass-and tortoise

Plate 3.18: Acacia gerardii

Plate 3.19: Croton dichogamus

Plate 3.20: Akocanthera schimperi

Plate 3.21: Olea africana

Plate 3.22: Carissa edulis

Plate 3.23: Euphorbia candelabrum

Mugie conservancy and surround area up to Km 70

The proposed TL will traverse an approximated 18km inside Mugie Conservancy starting at N 00º 41.268', E036º 32.544' and ends at 70 km from Rumuruti SS located at N 00º49.998', E036º 33.799' at 2046 m. Mugie conservancy is located astride the Nyahururu-Maralal road within the Laikipia plateau and consists of 46,000 acres of which 22,000 have been set aside as a wildlife conservancy. The Conservancy's habitat is characterized by open Acacia savannah to the East and thicker and scrubbier bush and olive tree forest to the West. As well as hosting a diverse range of more mainstream wildlife species, this range also plays home to several endangered animals, including elephants, reticulated giraffe, Grevy's zebra, Jackson's hartebeest, lion, cheetah and wild dog. In total, Mugie is home to 70 species of animals, 280 species of birds such as the Martial eagles (which are vulnerable), tawny eagle, and African vultures (which are either critically endangered or endangered).

Plate 3.24: Mugie landscape to the west

Plate 3.25: Riparian zone at Mugie to the west

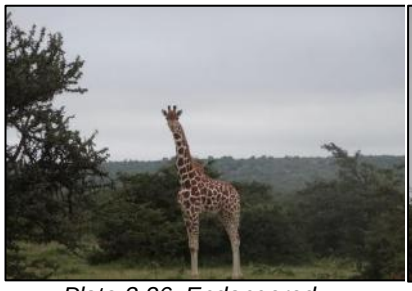


Plate 3.26: Endangered Reticulated giraffe at Mugie conservancy

Plate 3.27: Endangered Grey crown crane at Mugie conservancy

Plate 3.28: Zebra at Mugie conservancy

Figure 3.5: Mugie conservancy

Mugie forms an essential corridor for connecting West Laikipia with the Mt. Kenya highlands and more specifically dispersal to Loisaba Conservancy, Tungai Community Conservancy and Laikipia Nature Conservancy. Figure 3.5 shows the location and extent of the conservancy. For this, the Kitenye Wildlife Corridor, which at its narrowest point is 800 meters wide, was created. This corridor spans across several different habitats: from Loisaba's dry Ewaso acacia scrubland, through the vast open plains of Kitenye, and finally rising to the olive forests of Mugie and the Lorogi plateau at 1,800 metres asl. Other wildlife species include elands, buffalos, elephants, hyenas, cheetahs, lions and other plains animals. Apart from hosting several threatened and endangered species on the property, the National Museums of Kenya has designated the conservancy as an important breeding habitat for the endangered Grey Crowned Crane (see Appendix III for checklist of important wildlife).

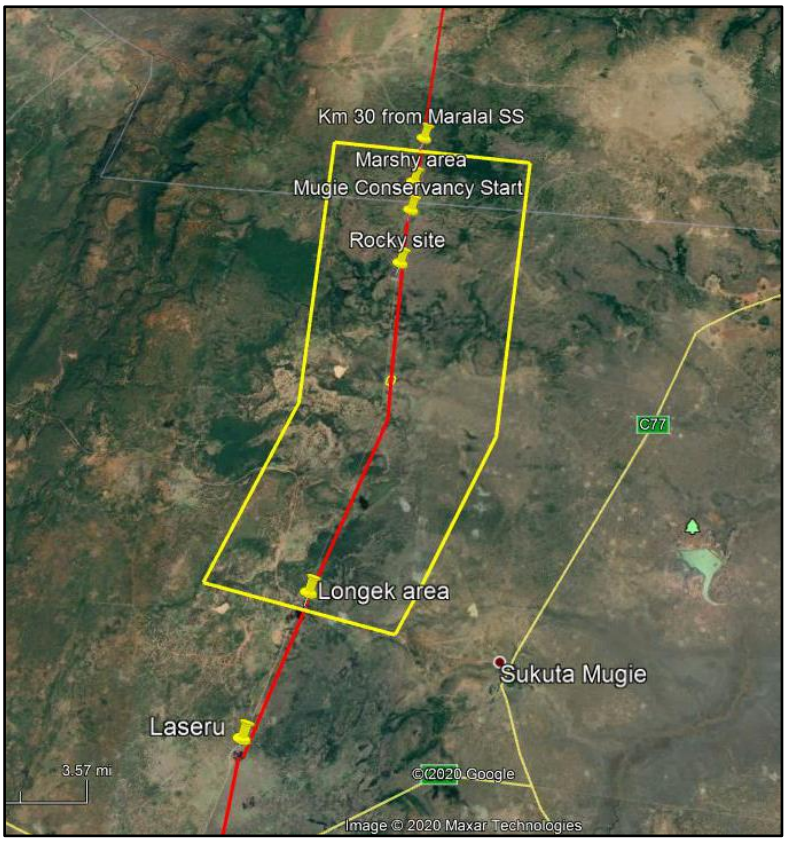


Figure 3.6: ecologically sensitive areas within Mugie Conservancy

This area was already home to most of Kenya's indigenous fauna such as lions, leopards, cheetah, elephant, buffalo and a wide range of antelopes and other mammals including a strong population of the threatened Grevy's Zebra and the Jackson's Hartebeest. The creation of the Conservancy saw the translocation of 20 endangered black rhino to Mugie as part of a national effort to protect and enhance the black rhino population in Kenya.

Mugie Conservancy provides a haven for animals, birds, and plant life. Grevy's zebra, Jackson's hartebeest, (which are endemic to the area), big cats, buffalo, elephants, reticulated giraffe, storks, and birds of prey, and forests.

Just north of Mugie is a riparian area consisting of *Ipomoea hildebrandtii*, and *Themeda triandra*, Other species of importance are *Olea africana*, *Carissa edulis*, *Vangueria madagascariensis*, *Euclea divinorum*, *Senna didymobotrya Akocanthera schimperi* and *Acacia gerrardii*.

Plate 3.29: End of northern side of Mugie conservancy

Plate 3.30: Mugie conservancy landscape (left of fence)

Plate 3.31: Olea africana at Mugie

Plate 3.32: Dam with Acacia xanthofloea

Plate 3.33: Vegetation at Mugie area

Plate 3.34: Mugie landscape– riparian zone

Mugie-Longewan Border to Loosuk

This area from N 00º 49.998" and E 036º 33.799" to N 01º 01.406" and E 036º 33.948" This section starts just at end of north side of Mugie to an area just South East of Loosuk. Just north of Mugie is a riparian area consisting of *Ipomoa hildebrandtii, Themeda triandra*, Other species of importance are *Olea africana, Carissa edulis, Vangueria madagascariensis, Euclea divinorum, Senna didymobotrya Akocanthera schimperi* and *Acacia gerrardii* and consists mainly of Acacia thickets. This section of the TL has three ecologically sensitive sites, mainly a riparian area, River crossing and forested site (see Figure 3.6). The area at the start of the section has brown clay soils and a layer of short canopy trees with a layer of shrubs and grasses

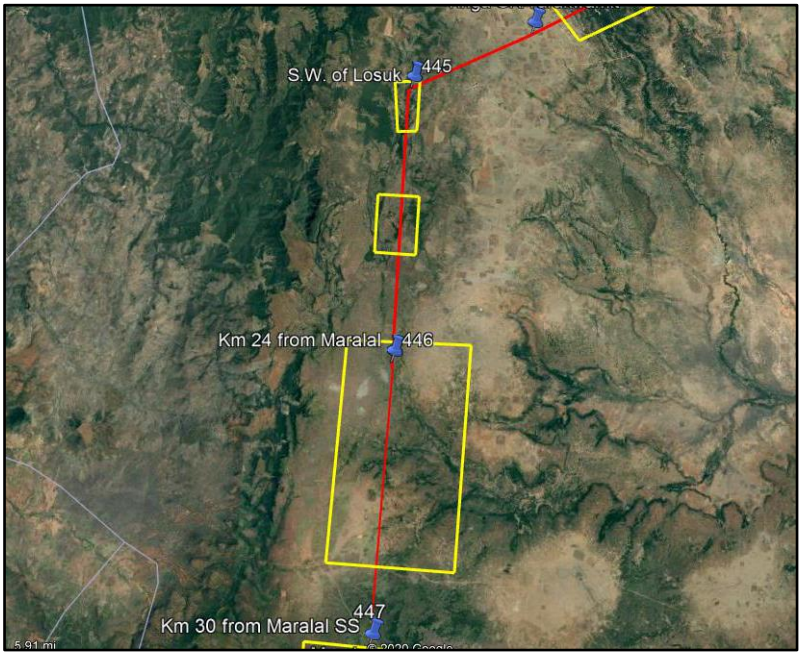


Figure 3.7: Ecologically sensitive sites; Mugie to Loosuk

Plate 3.35: Euphobia candelubrum

Plate 3.36: Mugie to Longewan landscape

Plate 3.37: Olea africana (Endangered species)

Plate 3.38: Agave sisalana

Loosuk to Maralal

This section starts at junction 2 where the proposed line will start going parallel to Loyangalani line. The start of this section, N 01º 01.406" and E 036º 33.948", runs through a series of two

seasonal streams before a grassland area of Tinga Group Ranch. Towards Maralal the section passes through what is considered to be "dry forest" in that it is associated with a sub-humid climate. However, most of the sections except the riverine ones have been modified, as evidenced by remnants of large *Juniperus procera* trees and regenerating vegetation of the same species underneath (Figure 3.7). The section ends at the proposed Maralal substation located at N 01º 05.11', E036º 40.197' at 1970 metres asl.

Some main species found in this section of the proposed line include regenerating *Juniperus procera, Akocanthera schimperi, Croton dichogamus*. Shrubs such as *Solanum incanum, Plectranthus barbatus, Psiadia punctulata. Enteropogon microstachyus* and *Cenhrus cilliaris* are the main grasses. Further south west towards around Sirata area is a grassland and mixed farmland interspersed with small rivers lined up with riverine forests. Several seasonal rivers, such River Nkengu Emuny and streams and riverine forests occur in some areas as shown in Figure 3.7. After the River there are again patches of *Juniperus procera* interspersed with shrubs and grasses up to Losuk area and up to Junction South West of Loosuk. The local inhabitants reported this as a wildlife free range area with Elephants, Zebra, Baboons, Leopards and Porcupine as common wildlife species.

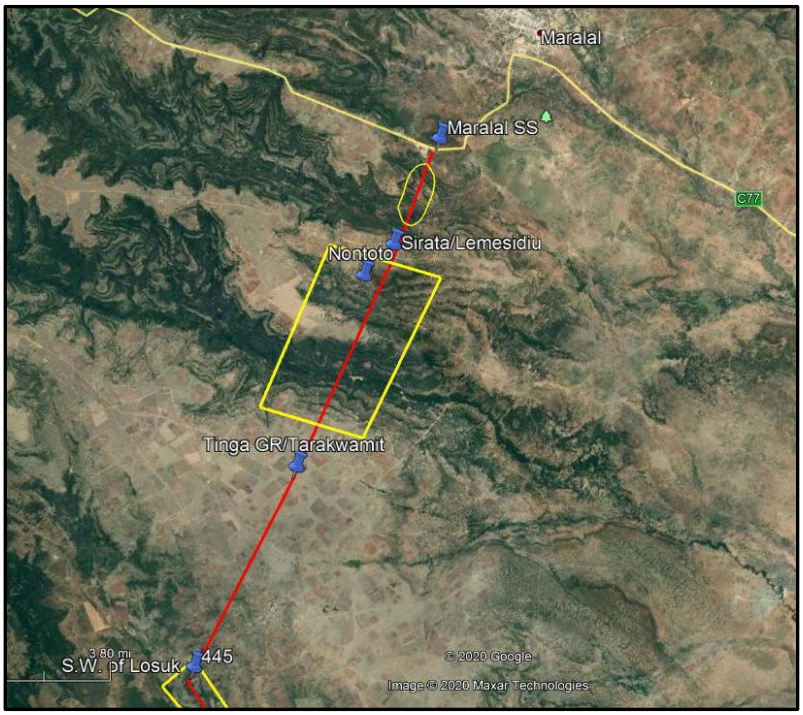


Fig. 3.8; ecologically sensitive areas, Loosuk to Maralal SS

Plate 3.39: Vegetation at Maralal Sub-station

Plate 3.40: Acocanthera schimperi

Plate 3.41: Croton dichogamus, very common across the TL

Plate 3.42: Sporobolus pyramidalis grass at Sirata

Plate 3.43: Themeda triandra grass at Sirata

Plate 3.44: Olea africana

Plate 3.45: Remnants of large Juniperus procera tree

Plate 3.46: Regenerating J. procera in Junction 2 –Maralal section

Plate 3.47: Euclea divinorum

The major forest species in this section include *Juniperus procera* (African cedar), *Dombeya spp*., *Cassipourea spp.* and *Podocarpus milanjianus*. In the lower sections towards the junction, there are found scattered trees of *Euclua, Leleshwa, Euphorbia spp* and *Acacia drepanolobium*. The most common grass here is *Themeda triandra.*

This section is also in close proximity to the Kirisia Forest, an area with abundant birdlife. According to The Peregrine Fund, there exists bird migratory corridors that pass on either side of the mountain ranges, where birds typically do not migrate over the top of these areas, but pass around their base. This section lies in an east-west direction and is 10km from the forest. The area traversed by the TL forms lowland areas surrounding the forest are considered bird

migratory corridors for both Palearctic migrants as well as local migrants, some of which migrate at night.

The Kirisia Forest is also unique in that it contains one of the largest breeding colonies of critically endangered Rüppell's Vultures in Kenya. This east-facing breeding cliff lies on the north-eastern side of the Forest. While the transmission line passes on the western side of the Forest it is important to recognize that these vultures fly on both sides of the Forest when leaving and returning to their colony (The Peregrine Fund). There is, therefore, a need to carry out a more detailed avifauna study in this and other sections of the TL such as Mugie, Parariro Dam, and Ngare Narok forest.

Figure 3.9: Area of concern for migratory birds due to proximity to Kirisia Forest

3.4: Water Resources

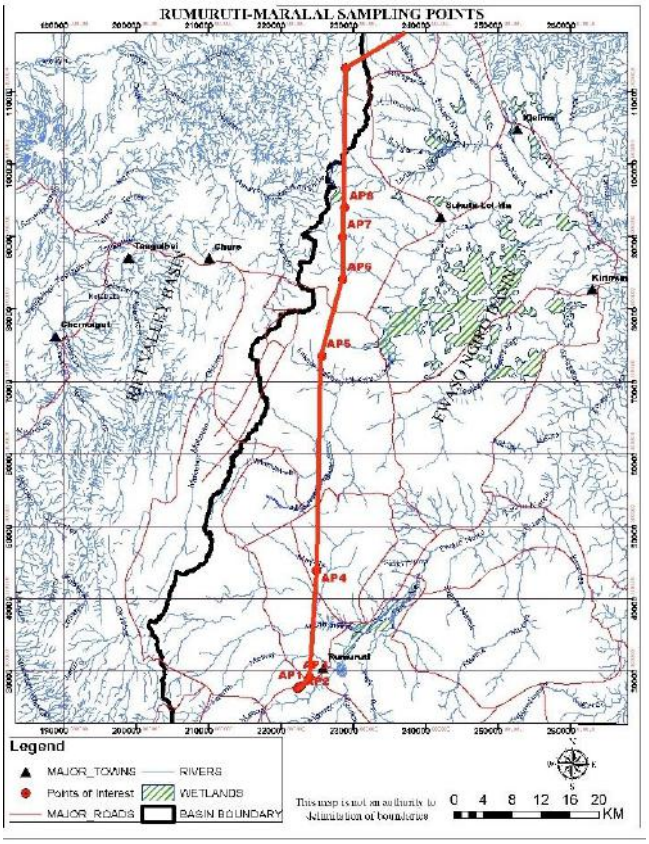


Figure 3.10: Laikipia and Samburu elevation and drainage system

The drainage system within the Laikipia-Samburu ecosystem is centered around the Ewaso-Nyiro river and its tributaries (Figure 3.9). Several rivers are traversed by the proposed transmission line such as Rivers Ayiam, Kandutura, Terienkwe, Ngare Narok Enkungu Emuny, Nontoto and numerous seasonal streams. And several dams as Parario, Nyekundu, and Kajeiria are found within the vicinity of the proposed project.

Location and characteristics of water resources in Rumuruti-Maralal TL

The table below gives a summary of the water bodies, their GPS coordinates, and observations made during the water resources assessment exercise.

Table 3.1: Water resources baseline data

Water Resource	Location	GPS Coordinates 37N (ARC 1960)		Observations	Recommendations (as per the Water Resources Management Rules 2007)
		X	Y		
Lerosion stream	L'partuk	240242	120088	✓ River channel with of approximately 1m wide ✓ Seasonal stream ✓ Slightly turbid water ✓ Water used for domestic purposes and livestock ✓ Recommended riparian land extend 10m	✓ **NO** works should be done at a minimum distance of 10 metres from the top edge of the river bank
River Nontoto	L'partuk	239209	119449	✓ River channel with low flows of approximately 2m wide ✓ Slightly turbid water ✓ River channel 6m wide ✓ Domestic and livestock use ✓ River dammed d/s at Nomotio village to give Nomotio dam used for livestock and domestic purposes	✓ **NO** works should be done at a minimum distance of 10 metres from the top edge of the river bank

Water Resource	Location	GPS Coordinates 37N (ARC 1960)		Observations	Recommendations (as per the Water Resources Management Rules 2007)
		X	Y		
				✓ Recommended riparian land extent 10m	
River Enkungu Emuny	Tinga	235923	117504	✓ Evidence of recent flash floods ✓ Water pools along the river channel ✓ River channel 10m wide ✓ Recommended riparian land extent 15m	✓ **NO** works should be done at a minimum distance of 15 metres from the top edge of the river bank
River Ngare Narok	Sirata Oirobi	237453	0118421	✓ Highly turbid water ✓ River channel with low flows of approximately 2.5m wide ✓ River channel 15m wide ✓ Recommended riparian land extent 30m ✓ Water used for domestic purposes and livestock	✓ **NO** works should be done at a minimum distance of 30 metres from the top edge of the river bank
River Terienkwe	Longewan	228878	98590	✓ Slightly turbid water ✓ Water used for domestic use and livestock ✓ Width of river is approximately 1.5m ✓ Recommended riparian land extent 10m	✓ **NO** works should be done at a minimum distance of 10 metres from the top edge of the river bank
Longdai Stream	Luoniek	225659	71645	✓ River channel of approximately 2m wide ✓ Rocky river bed ✓ Slightly turbid water ✓ Water used for domestic and livestock purposes	✓ **NO** works should be done at a minimum distance of 10 metres from the top edge of the river bank
Kajeiria Dam	Ol Moran	225233	58753	✓ Width of about 100m ✓ Dam used for agricultural, domestic and livestock purposes ✓ Recommended riparian extent 30 m from edge of dam ✓ Farmlands observed around the dam with crops such as peas, maize, beans and vegetables.	✓ **NO** works should be done at a minimum distance of 30 metres from the top edge of the river bank
Ol Moran Stream	Ol Moran	225339	58322	✓ Seasonal stream with a channel of about 7m ✓ Highly turbid water ✓ Mainly used for livestock and irrigation purposes.	✓ **NO** works should be done at a minimum distance of 30 metres from the top edge of the river bank
Ol Motonyi Stream	Ol Motonyi	225227	0055926	✓ Seasonal stream with patches of water during sample collection ✓ River channel of about 3m ✓ Water used for mainly livestock purposes	✓ **NO** works should be done at a minimum distance of 15 metres from the top edge of the river bank
Stream btw Tower 560 & 559 of	Namochong	225000	45211	✓ River channel of about 6m ✓ Slightly turbid water ✓ Water used for livestock, domestic and irrigation purposes	✓ **NO** works should be done at a minimum distance of 15 metres from the top edge of the river bank

Water Resource	Location	GPS Coordinates 37N (ARC 1960)		Observations	Recommendations (as per the Water Resources Management Rules 2007)
		X	Y		
Loyangalani -Suswa				✓ Recommended riparian reserve 10m	
Dam Nyekundu Dam	Dam Nyekundu	225157	0049792	✓ Width of about 120m ✓ Slightly turbid water ✓ Water used for domestic and livestock purposes ✓ Various bird species observed in and around the dam ✓ Recommended riparian reserve to be 30m from edge of dam	✓ **NO** works should be done at a minimum distance of 30 metres from the top edge of the river bank
Southern Ayiam	Ngare Mare	224387	36529	✓ River channel of about 8m ✓ Rocky riverbank observed ✓ Livestock and domestic water use ✓ Slightly turbid water	✓ **NO** works should be done at a minimum distance of 15 metres from the top edge of the river bank
Northern Ayiam	Ngare Mare	224661	40848	✓ Seasonal river with pools of water during the sampling exercise ✓ Water resource approximately 1.1Km d/s of the proposed high voltage line ✓ River channel of 15m width ✓ Riparian land for the river is 30m	✓ Works should be done at a minimum distance of 30 metres from the top edge of the river bank
River Kandutura	Rumuruti/Bobongi	224184	32274	✓ River channel of about 3m ✓ River observed to have low water volume during dry season and high water volume during rainy season ✓ Recommended riparian reserved 15m	✓ **NO** works should be done at a minimum distance of 15 metres from the top edge of the river bank

The map below show the location of the water resource points for the Rumuruti-Maralal Transmission Line.

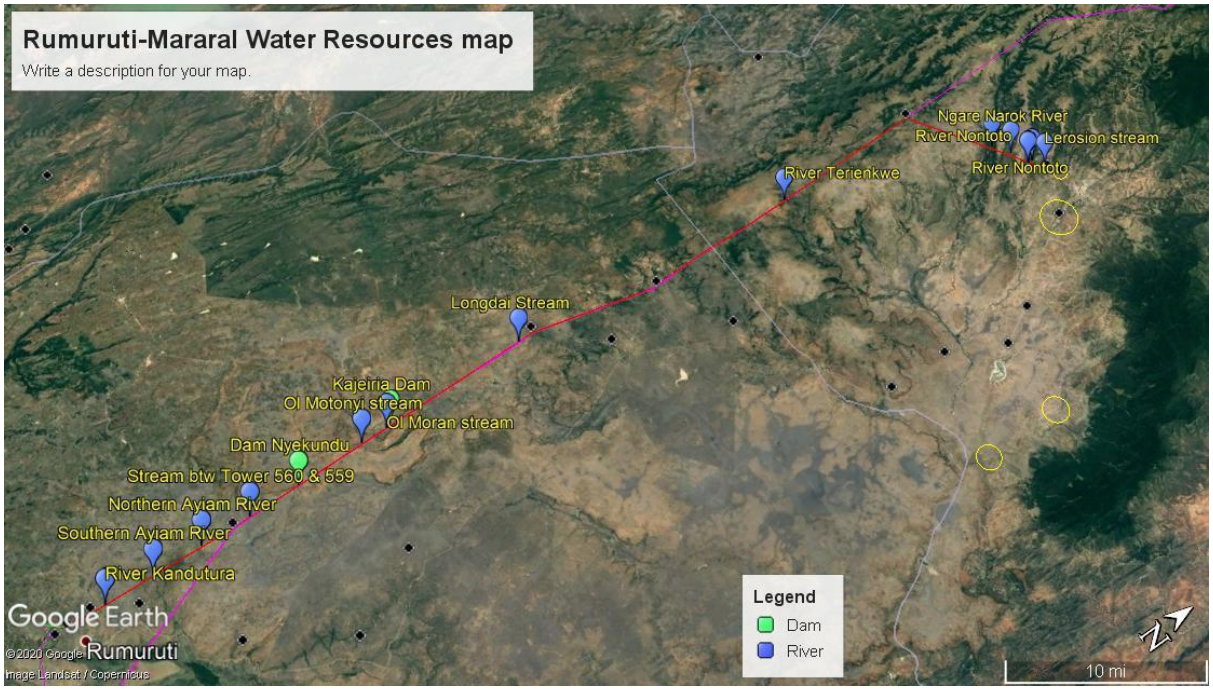


Figure 3.11: location of water resources

Summary of Laboratory Analysis Results

Water samples were collected from all the water resource points and taken to the laboratory for water quality analysis. The following table gives a summary of the lab results

Table 3.2; Results of the water quality analysis

Parameter	Guide value (max allowable) (mg/L)	Lerosion stream	River Nontoto	River Enkungu Emuny	River Ngare Narok	River Terienkwe	Longdai stream	Kajeiria Dam	Ol Moran Stream	Ol Motonyi Stream	Stream btw Tower 560 & 559 of Loyangalani-Suswa	Dam Nyekundu Dam	Southern Ayiam River	Northern Ayiam River	River Kandutura
pH	6.5 - 8.5	8.0	7.4	7.1	6.5	6.8	7.9	7.3	7.3	6.8	6.8	6.8	7.9	7.1	7.3
Suspended solids	30	30	10	15	60	160	100	10	100	280	2340	80	326	60	220
Total Dissolved Solids	1200	476	117	110	64	300	622	94	200	127	50	72	218	135	149
Nitrate-NO_3	10	2.0	ND	1.0	ND	0.1	ND	8	98	0.4	ND	3.0	ND	4.0	2.0
Nitrite –NO_2	3	ND	0.02	ND	ND	ND	0.02	0.02	0.07	0.08	ND	ND	ND	0.02	ND
Ammonia–NH_3	0.5	ND	0.5	0.5	ND	ND	ND	0.6	0.7	0.4	0.5	0.7	0.6	0.5	1.6
(E.coli)	0 - 100	100	100	40	100	200	100	100	100	100	98	200	100	200	2000
Fluoride	1.5	0.5	0.3	0.3	0.2	0.2	2.6	0.5	1.6	1.4	0.3	0.5	0.6	0.7	1.2
Arsenic	0.01	9	8	3	10	8	4	6	5	4	3	2	2	6	7
Cadmium	0.01	0.007	0.005	0.021	0.003	0.006	0.005	0.098	0.016	0.007	NIL	0.014	0.002	0.015	0.007
Lead	0.05	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

Copper	0.05	NIL	NIL	0.003	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.431
Zinc	1.5	NIL	NIL	0.091	NIL	NIL	NIL	NIL	0.278	0.005	NIL	0.211	0.013	0.022	0.118
Permanganate value	1.0	4.7	5.5	4.7	5.5	6.3	7.9	6.3	6.3	5.5	7.1	4.7	8.7	5.5	5.5

Interpretation of the Results

The results discussed in the following section are for water samples collected from water resources in their natural state and present the physical-chemical and micro-biological status of the water resources at the time the water samples were collected.

Interpretation of Physical-Chemical Parameters

- pH levels were within the NEMA guideline values of 6.5-8.5 for all the samples
- River Ngare Narok (60mg/L), Northern Ayiam River (60mg/L), Dam Nyekundu (80mg/L), Ol Moran Stream (100mg/L), Longdai stream (100mg/L), River Terienkwe (160mg/L), River Kandutura (220mg/L), Ol Motonyi Stream (280mg/L), Southern Ayiam River (326mg/L) and Stream between Tower 560 & 559 (2,340mg/L) had high levels of suspended solids compared to NEMA standard of 30 (mg/L). Generally suspended solids in a body of water are as a result of organic materials such as decayed plants and leaves, and inorganic materials such as silt due to erosion or surface runoff. The high levels of suspended solids in River Terienkwe, River Kandutura, Ol Motonyi stream, and stream between towers 560 & 559 can be attributed to loading of the rivers with high quantities of silt and decayed organic matter (plants materials) as a result of soil erosion during to the heavy rains from the upper catchment areas of the rivers.

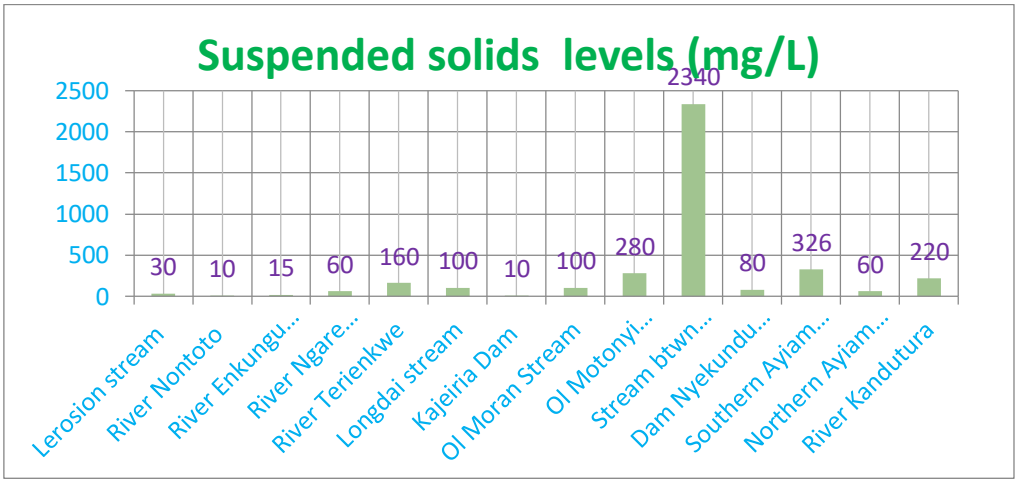


Figure 3.12.1: Suspended Solid Levels

- All the samples had Total Dissolved Solids levels within the NEMA standard of 1,200mg/L

- All the samples had Nitrate–NO_3 levels within NEMA standard of 10mg/L except Ol Moran Stream which recorded a value of 98mg/L. This can be attributed to animal wastes finding way into the river.
- All the samples had Nitrite–NO_2 levels within NEMA standard of 3mg/L
- River Kandutura had high levels of ammonia-NH_3 at 1.6mg/L whereas the rest of the samples had Ammonia-NH_3 levels within acceptable limits or slightly above the NEMA standard of 0.5mg/L.
- All the samples had Fluoride levels within NEMA standard of 1.5mg/L except Ol Moran Stream which had slightly high level of Fluoride at 1.6mg/L
- Arsenic is highly toxic in its inorganic form and contaminated water used for drinking, food preparation and irrigation of food crops poses the greatest threat to public health from arsenic. Long-term exposure to arsenic from drinking-water can cause cancer and skin lesions. Arsenic has also been associated with cardiovascular disease and diabetes, and in utero and early childhood exposure has been linked to negative impacts on cognitive development and increased deaths in young adults. All the collected samples tested for high levels of Arsenic, ranging from 2mg/L to 10mg/L against NEMA standard of 0.01mg/L. The high levels of Arsenic in all the water samples collected indicate that the rocks and soils in the area where the proposed transmission line traverses have high Arsenic content since Arsenic as an element occurs naturally in rocks and soil.

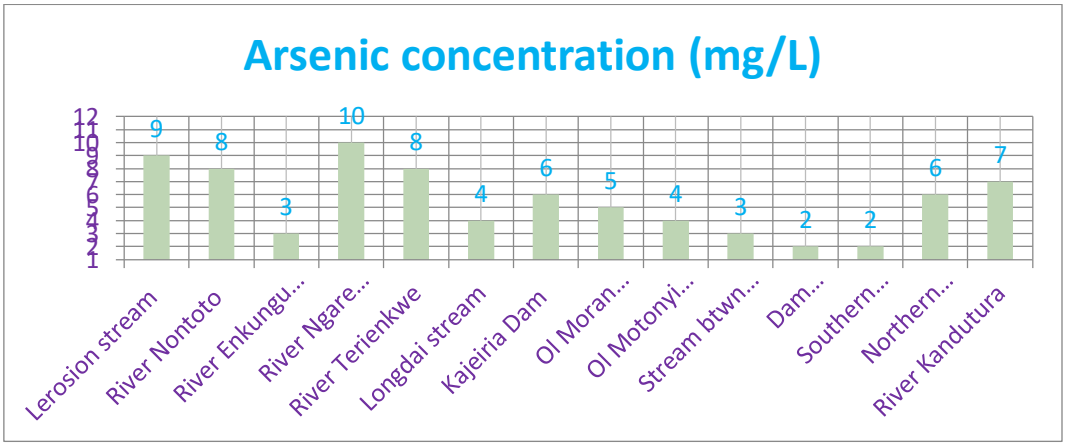


Figure *3.12.2: Arsenic concentration*

- All the samples had 20-min Permanganate values ranging from 4.7g/L to 7.9mg/L against NEMA standard of 1.0mg/L an indication of enough oxygen levels to oxidize both organic and inorganic matter in the water resources.

Interpretation of Microbiological Analysis Results

Most strains of E. coli are not harmful but are part of the healthful bacterial flora in the human gut, however, some types can cause illness in humans, including diarrhoea, abdominal pain,

fever, and sometimes vomiting. All samples collected tested positive to E.coli, indicating contamination of the water resources with human waste. Majority of the water resources recorded very high levels (>100/100ml), with River Kandutura recording the highest levels of contamination at 2000/100ml. The extremely high levels of E. coli at River Kandutura can be attributed to discharge of human waste into the river through seepage from latrines as the river is downstream of a semi-urban settlement.

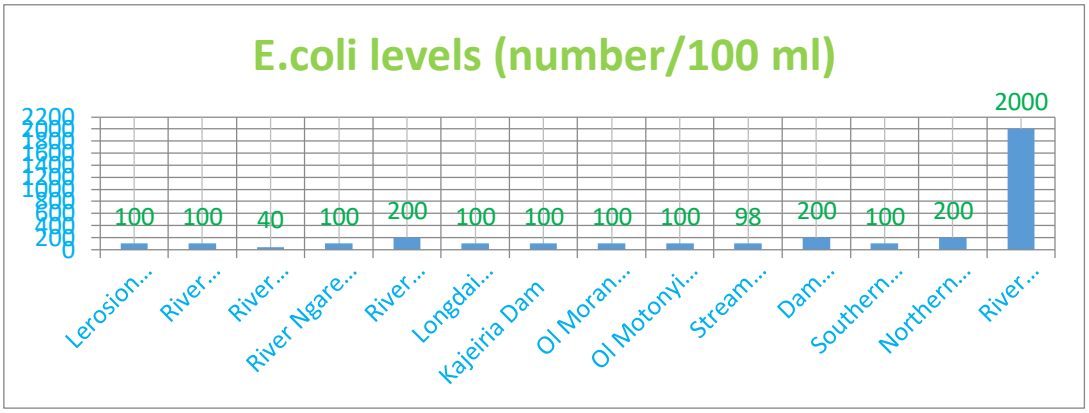


Figure 3.12.3: E-Coli Levels

Interpretation of the Results for Heavy Metal Analysis

- Kajeiria Dam had very high levels of Cadmium (Cd) at 0.098mg/L, while River Enkungu Emuny (0.021mg/L), Ol Moran Stream (0.016mg/L), Dam Nyekundu Dam (0.014mg/L) and Northern Ayiam River (0.015mg/L) had Cadmium levels slightly above NEMA standard of 0.01mg/L. Cadmium (Cd) has the chronic potential to cause kidney, liver, bone and blood damage from long-term exposure at levels above the Maximum Contaminant Level (MCL). The high level of Cadmium in Kajeira Dam can be attributed to leaching of certain fertilizers into the dam since the area is agricultural.

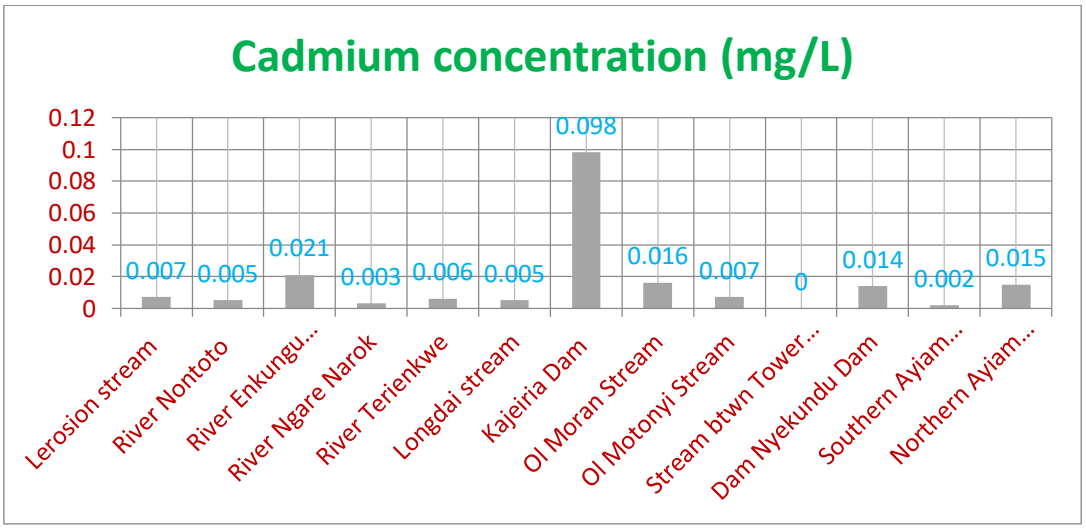


Figure *3.12.4: Cadmium Concentration*

- All the water samples tested NIL for Lead (Pb)

- River Kandutura had 9.06 times the permissible levels of Copper (CU) at 0.453mg/L against NEMA guideline of 0.05mg/L. All the other water resources tested within the permissible standards. Long-term exposure to copper can cause irritation of the nose, mouth and eyes and it causes headaches, stomachaches, dizziness, vomiting and diarrhea. Intentionally high uptakes of copper may cause liver and kidney damage and even death.
- All the water samples tested within the NEMA permissible standard of 1.5mg/L for Zinc (Zn).

Recommendations

Riparian conservation and protection of the river resources from pollution to be done by ensuring that NO works are carried out within the distances mentioned in Table 2 for every water resource. However if the contractor finds it unavoidable, then an approval to carry out such activities or works shall be sought from Water Resources Authority as required by Water Act 2016 and Water Resources Management Rules 2007.

It is recommended that, KETRACO, during the construction period, conduct bi-annual water quality analysis for these water bodies to monitor environmental performance of the proposed project and based on the above baseline, observation of significantly higher values would indicate pollution which could be as a result of the project implementation. Corrective actions, if established pollution is highly likely to be by project implementation, must be taken. Corrective actions may include soil erosion prevention measures, solid waste management, provision of mobile toilets, containment of used oils from machines and vehicles, protection of the riverine ecosystems, among others.

Appendix IV gives the full Surface Water Resources Survey Report

3.5: Social Economic Status

Sources and Distribution of Income

The project area, being composite of rural and urban areas, records diverse sources of income. In Laikipia West, the locals mainly engage in farming, livestock rearing and in business.

In Rumuruti, Bobongi area – where the TL will pass, most of the inhabitants engage in farming and livestock rearing. Most farmers, who mostly are from the Kikuyu ethnic community, grow food crops such as maize, beans and wheat. The area also has companies that engage in horticulture and floriculture, with the aim of exporting the produce. The pastoralists living in

the area engage in livestock keeping as their source of income. They keep large herds of cattle and camels, and flocks of sheep and goats. The pastoralists earn from the sale of the animals and its products. The area is served by a market where on Tuesdays the locals go sell their livestock. Rumuruti, being a semi-urban centre, and the proposed location for the county administration's headquarters, is a trading centre that has business activities in the retail and wholesale sectors. The area also has a robust service industry such as banking facilities, accommodation services and transport services. A considerably high percentage of the population of Rumuruti earn their income from engaging in the above activities.

The inhabitants of the rural parts of Laikipia West mostly engage in farming and livestock rearing too. The largest part of the project area is inhabited by pastoralists who earn from the sale of their livestock. They are served by two markets, the one in Rumuruti and another one in Posta. Farming in the project area is mostly concentrated in Ol- Moran where the inhabitants have considerably larger tracts of land. The presence of large water pans in the area has contributed greatly to the activities where they farm tomatoes for sale in the nearby towns of Rumuruti, and Maralal.

In Samburu, most of the inhabitants engage in livestock rearing as their source of livelihood. The area's market is in Maralal and Suguta Marmar, where the county has livestock sale markets and abattoirs. Maralal town, where the line terminates, is an urban centre and the county headquarters for Samburu County. Being a town, some of the locals engage in businesses such as wholesale and retail shops, ICT, food and accommodation, entertainment, transport, livestock sale, etc. Other sources of income include formal employment and casual labour.

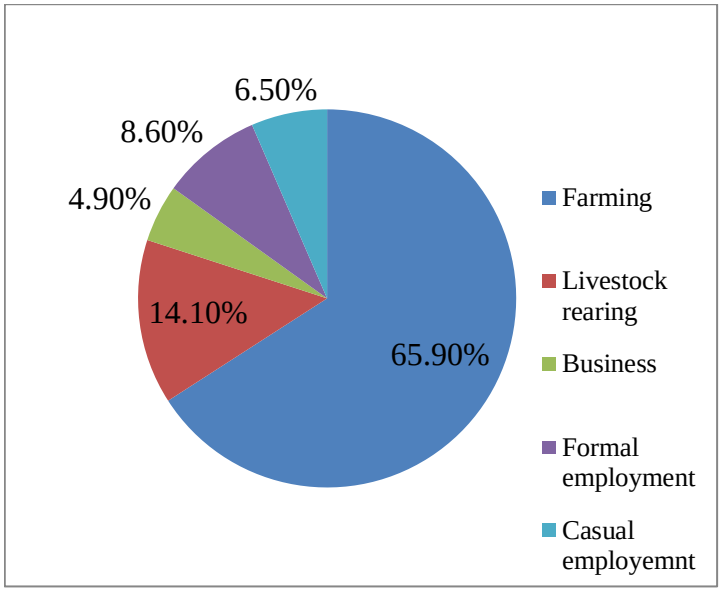


Figure 3.13.1: Sources of income. Source-data from socio-economic study for Rumuruti-Maralal TL

Figure 3.12.1 is a pie chart depicting the sources of income in the project area.

The proposed line will greatly impact these activities and to a larger extent improve production. Areas such as Rumuruti and Maralal will see an increase in the number of businesses reliant on electricity opening up due to stable and adequate supply.

Economic Impact

The proposed project intends to improve the supply and connectivity in the area. The economic impacts of the project can be analysed in the following phases;

Construction and decommissioning phases - the proposed project will see an improvement in the economy of the project area, first and foremost, through employment of the locals in the project areas. The income earned from the project will improve the lives and the economic standing of the individuals and that of the households at large. The local businesses too will benefit from an increase in the number of expenders in the area working on the construction site. The workers' disposable income will be chasing the few goods that exist in the area which will lead to an increase in demand, and thus local businesses will benefit from the high demand. The influx will increase the demand for accommodation, food, and services. This will lead to improvement in the economy of the area. Other businesses that deal with the supply of construction material could also benefit from the project as contractors could use their materials on site.

On the other hand, the locals stand to lose a season's worth of produce during construction which would inadvertently mean loss of income for a period of time, thereby straining the economic growth of the affected areas and persons.

Implementation phase- The project is inadvertently going to improve the economic lives of the locals in the long run. The goal of improving supply and increasing connectivity will benefit the two sub counties by creating stable supply. Since, incidentally, the take off and the terminus are both county headquarters, they stand to benefit the most economically from the

power to be supplied. The two towns will see an emergence of new and many economic activities and an upsurge in the investments into the areas as a result of improvement in ease of doing business occasioned by improved connectivity. This will definitely lead to economic growth in the area.

The power supply will improve the economic standing of individuals and households, through the establishment of businesses especially those reliant on electricity. This will translate to improvement of the area's economy.

Socio-cultural Impact

The line in traversing the two counties passes through areas inhabited by people from different communities and they each are organised differently. In Laikipia especially, the ethnic communities composite of the population is diverse, therefore their cultures are different as well. The socio-cultural aspects in Laikipia are not deep or entrenched and most practices are informed by government or neighbourliness.

The socio-cultural processes that may be affected by the project are: -

Religion- most people in the project area are Christians but Islam is also practiced. The area is served by many denominations notable among them being the Roman Catholic church, the Anglican Church of Kenya and the Full Gospel Churches of Kenya. Cases of people who subscribe to traditional religions are very few.

Rituals - Most of the communities are immigrants and do not have defined rituals as a group. However, in Samburu, the area has more defined rituals that the local community engages in that could affect the projects progress.

i. Birth Rituals- they are normally performed at home and the ceremony is performed by women. Men are barred from attending. The father of the new born would later host a celebration of the new born where all persons are welcome.

ii. Initiation- this is the major ritual of the community that would to a large extent be affected by the project construction phase. Initiation involves circumcision of boys to signify transition to adulthood. The initiates are secluded in a *Lorora* where they get care and teachings as they heal. The *Lorora* doesn't allow any guests from

outside. This is the aspect of the entire ritual that could be affected during construction as it would lead to dire consequences for the intruder.

iii. Interment – this is the last rite. For the cultures here, burial rites are more influenced by religion than anything else. Christians take a few days to prepare the burial but Muslims bury their dead the same day. No common cemetery was identified but a few graves were spotted none of which was on the way-leave.

Social Organisation- the communities in the area are organised from the smallest unit of the society, the family which is headed by the father. The other aspects of the social organisation depend on the location. In Samburu the society is more organised as after circumcision the age-set is headed by two leaders. The community is led by elders, amongst whom is a *Laiguan*i, the official leader and the *Laibon*, the seer.

In Laikipia, the locals being immigrants lack social order that stems from culture. However, in Luoniek, members of the Pokot and Turkana communities have organised community leadership and they largely conduct the cultural practices on behalf of the community. The community leaders cooperate with the local administration to ensure that order is kept and together they solve any issues that arise.

Law - the communities in the project area have different norms and morals that guide coexistence especially amongst the communities living in the project area. These norms and mores could be a source of conflict if not adhered to and could lead to violence which may affect the project.

Cultural Impacts

The project could have an impact on the culture of the local communities living in the project area. The various aspects of culture that stand the project's impact are:

1. **Material Culture**-The residents have varying degrees of attachment to different material things, depending on source of livelihood. The pastoralist communities in the area, Maasai, Samburu, Turkana, Borana, Somali, and the Pokot, are attached to livestock mainly due to its significance in their culture. Livestock to these communities is a source of livelihood, holds a lot of sentimental value and is used to perform most rituals in these communities. The farming communities, the kikuyu and the Kalenjin, are attached to their land as it is their source of livelihood and place of abode. The

project will definitely have an impact on the material culture in the project area since it will be traversing farmlands and grazing lands. The company should therefore ensure that the effects' adversity is monitored and reduced. Certain trees especially the huge ones, the *Kokua* for the Pokot community, and *mugiet* (a tree on which the sticks that were used in roasting meat during circumcision and other traditional ceremonies) for Maasai, and Samburu are also held with esteem.

2. **Collectivism**- The project area is quite diverse and the inhabitants display varied degrees of collectivism. In Laikipia collectivism is not founded as much as the area is inhabited by people from various communities with no uniform culture. The residents are mostly immigrants from other regions so they also lack attachment to the project area, since there are no ancestral ties to the project area. The numerous incidences of conflict between the ethnic communities in the area have also served in dissuading any collectivism in the area. In Samburu however, their sense of collective attachment is present because of the ancestral heritage that the area has. The social organisation there too is indicative of collectivism as most residents live in nuclear families, and participate in the social affairs and rituals of the society. In Samburu's case therefore, there is need to ensure that the aspect is considered especially when detaching PDPs from their ancestral land.
3. **Conformity** - Laikipia sees low levels of cultural conformity due to the diversity of the communities in the project area. However, there are several issues that are agreeable across all cultures as the proper ethos to engage in. Most of these practices have been imposed by the similarities in culture and law. In Samburu however, the degree is higher as the community in the area has culturally imposed norms, beliefs and rules. The subscribers have conformed to the practices due to their upbringing. The project workers should take note of the areas of cultural sensitivity to avoid clashes that would strain the implementation of the proposed projects. The client should also train both the communities and the workers on cultural relativism to ensure coexistence.
4. **Civilization** - This are issues such as education, health and inclusion. On matters education, the area has seen relative improvement in the enrolment of students into school and improving levels of literacy but the pastoralist communities are yet to fully embrace education yet where some children and morans opt to herd at the expense of learning. The root could be attributed to the cultural importance of herding. On health, the area has made progress too. However, cases of traditional remedies to illnesses and especially home deliveries for pregnant mothers are rampant. Inclusion in the society is far from being achieved as women and persons with disability have not been included in financial, social and political activities and are still side-lined. Notably however, Samburu West constituency is represented by a female member of

the national assembly. The project could further compound truancy during its construction so the contractor should only engage adults who are not in school.

Family and Community

At the core of a society's existence is the unit known as the family. It is the single most basic unit and the society's source of life. As such it is esteemed and it is expected that every member of the society becomes part of one as a product and later as the founder.

The project area records different types of families. In Laikipia, the most common type of family is the nuclear family where the unit is headed by the father. This can be attributed to the residents being immigrants into the area thus have no kin in the project area. The project is likely to affect the unit during compensation as the father being the head could unilaterally make unpopular decisions.

The community that lives in Rumuruti are characterised by coexistence and shallow cooperation. As one moves further along the line in Laikipia, the cooperation becomes deeper, but not to a strong degree.

In Samburu, families are organised differently from those in Laikipia. Most of them exist as an extended unit living in group ranches that are currently in the process of demarcation. These units are headed by the father and women are the home makers. The line would affect the existence of this unit during compensation as well where the father being the head makes the decisions unilaterally which could face backlash from the other members of the family.

The families make up the communities in Samburu under whose umbrella the single units coexist and cooperate in their societal activities. The line is likely to impact the community in the following two ways:

1. Influx of workers from other places into the area during construction will affect the normal interaction and community life. The workers as well may not easily adapt to the communal way of living leaving them isolated in the area.
2. Displacement by the proposed project may deprive the community of its members and also deprive the affected person of communal relations.

Gender Relations Impact

The diversity in the communities in the project area means different cultural definitions and roles for different genders. The baseline however is that there is uniformity in the manner in which the roles for different sexes is constructed.

The process of engendering the roles starts quite early during childhood and the different sexes are exposed to different roles. Young boys are taught how to look after livestock and tender for animals while young girls are taught how to help in house chores such as fetching water and firewood. At this stage relations with adults of any gender is not restricted but premised on respect. As the children grow into puberty, they are secluded during initiation and are taught of the different expectations of their sexes as they grow up. They are taught roles different sexes play in the family and the society. They are also taught on how to relate with persons of the opposite sex and especially on how to keep their relations to minimum interaction. On marriage the man becomes the head of the house and the woman the home maker. In pastoralist communities, the woman is charged with the responsibility of building the family's abode. When it comes to leadership, women are not involved in community decisions, they only follow and implement instructions.

The line could potentially impact these relations in the project area in the following ways:

1. Women are often guarded and under the protection of their husbands if married and fathers if not married. Any inappropriate advances made to the women by the visiting workers are highly likely to end up in violence.
2. Due to the role of women in the construction of houses in pastoralist communities, the family and the society could be thrown into chaos in the event that a woman is compensated for the house despite their position in the household and society, as second to the man.

Potential Project Affected Persons (PAPs)

The transmission line traverses peoples farmlands and therefore will inadvertently affect people's property. The impact is variant depending on the level to which households and individuals are affected and also relatively to the current standard of living of the affected person. As a mitigation measure the client needs to conduct a full resettlement action plan study to determine the actual number of affected persons so as to ensure that their lives are not dramatically affected by the proposed project. From the field assessment, it was noted that several homesteads and land parcels will be affected.

For the Rumuruti-Maralal line, the affected persons engage in various forms of economic activity. From take-off to the terminus, the proposed line traverses residential areas, farms, conservancies, and grazing lands. The economic activity of the project affected persons is largely livestock rearing and farming. There are sections, however, where there are private conservancies.

The assets that will be affected are land, trees and crops, and structures and the line has particularly a considerable number of squatters (a few of whom have structure on the TL corridor while many others graze their livestock) therefore the persons affected could be more than the parcels of land to be affected. The area is also characterized by absentee land owners whose land is either lying fallow or has been squatted on. The project area also records a number of registered group ranches.

The line will affect more than 200 persons and thus necessitating carrying out of a full RAP to ensure that the affected persons are adequately and timely compensated to relocate away from the corridor.

People, Community and Structures

For the Rumuruti- Maralal transmission line, it traverses stretches of land inhabited by people of different ethnic communities. The Laikipia section has been inhabited by different ethnic communities while the Samburu side has been inhabited by predominately by the Samburu community. In Laikipia west, the dominant tribes are the Pokot, Samburu, Kikuyu and the Maasai. These make up the majority of the population that live along the line. The communities in Laikipia are a mostly pastoralists with sections of the populations engaging in crop farming especially in areas inhabited by the Kikuyu. The inhabitant generally co-exists peacefully but there arise conflicts from time to time mainly due to lack of pasture leading the pastoralist grazing on people's farms. The area also experiences cases of human wildlife conflicts due to the close proximity of conservancies to the community.

The residents of Laikipia mostly live in as nuclear families consisting of father, mother and children. The size of households in Laikipia is not that big as they live individually and not as extended families.

The Samburu county side of the line being inhabited by the Samburu community is entirely inhabited by settled pastoralists. In Samburu, families are largely polygamous and big in nature .The communities who live along the line are members of group Ranches and therefore own large tracts as a family and live on the piece of land together. This therefore implies that most of them live together as extended families. The leadership structure on the Laikipia side is undefined due to the absence of cultural homogeneity and largely relies on political administration. The Samburu side however has an existent leadership structure, especially because of communal ownership of land.

These areas will suffer significant cultural impact especially during the construction phase. Due to an influx of construction workers from other parts of the country and possibly from other races, cultural exchange and culture shock are anticipated. Cases of intermarriages with the locals cannot be ruled out as well and this could be an issue which would require norms be followed in the process of formalizing such a union.

Population Density and Distribution

The total population of Laikipia West, according to the 2019 Kenya Housing and Population Census, was 129,263 with 50.41% of the population being male and 49.59% females. 49.4% of the enumerated population was under the age 18 years and the youth made up 37.7% of the population of Laikipia West. The labour force age, 15-64, in the sub-county made up 52.7% of the population and 5.2% of the population was above the age of 65. The population density of Laikipia West as was 38 persons per square km. The population of the major urban center in the project area in Laikipia West, Rumuruti, was 13,056 with 51.3% of the population being female.

In Laikipia West, according to the latest census, the number of households in the sub-county is 33,025 with the average household size being 3.9 persons. The dependency ratio for Laikipia West stood at 89.59 as according to the 2019 census.

The line traverses Samburu West sub-county which has a population of 164,942 people, 50.7% being male and 49.3% female. 56.3% of the population as of 2019 was made up of children under the age of 18 years. The youth made 28.2% of the population in Samburu West. The labour force in Samburu West stood at 48.8% of the total. 2.8% of the population was aged 65 years and above. The dependency level in Samburu West stood at 104.95. The sub county is the most densely populated in the county with a density of 45 persons per square kilometer. The population of Maralal town was 31,350 with 49.5% of the population being male and 50.5% being female.

The number of households in the sub-county as of the last census was 34,202 with an average household size of 4.8 persons.

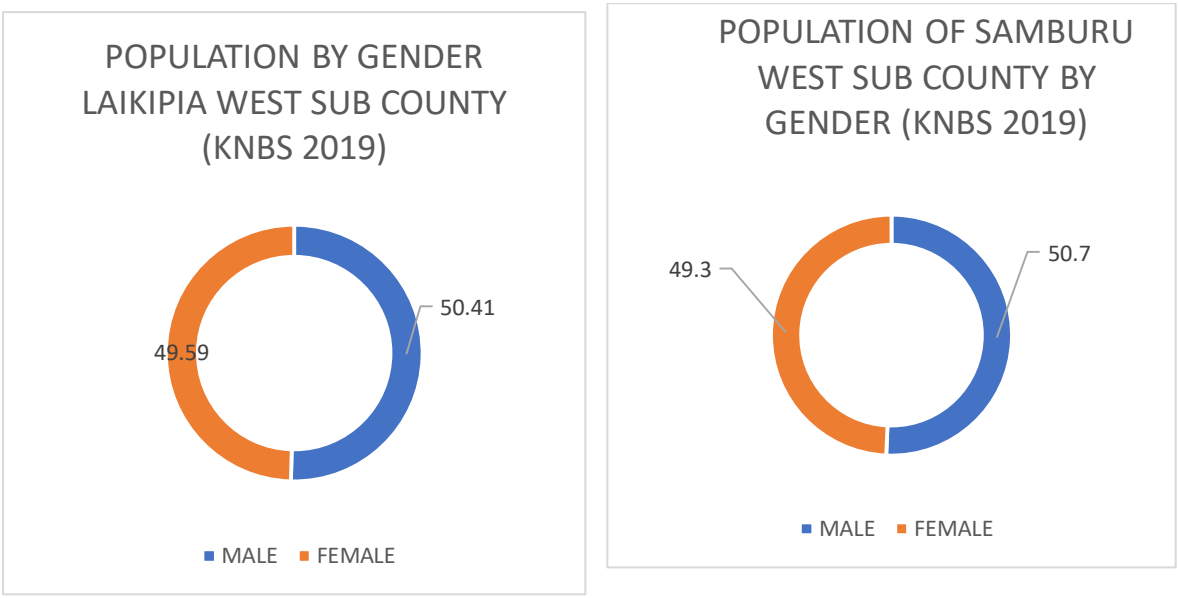


Figure 3.13.2: Population by Gender; 2019 Housing and Population Census by KNSB.

The section between Rumuruti-Maralal is sparsely populated with settlements being far apart from each other.

The anticipated effects of the proposed projects on population include influx of people during the construction phase, some of whom may decide to settle permanently in the project area. This would increase the number of migrants into the area and the population by extent. In addition to that, on completion of the project, the towns being served by the substations will register a population increase because of more investment in the towns occasioning growth of the town, all these will be as a result of reliability of power. The people in the project area are expected to migrate to towns in search of job and business opportunities, thus increasing the rate of rural-urban migration.

Health Profile

For the Rumuruti- Maralal line, the locals receive medical attention from health facilities in their respective counties. In Laikipia West the population is served by dispensaries mostly in Survey, Maundu ni meri, Luoniek and Ol-Moran. The referral facilities in the sub-county are Rumuruti District Hospital and the Nyahururu level 5 hospitals. The prevalent diseases in Laikipia West sub-county are respiratory tract infection (RTIs), skin diseases, rheumatism, joint pains, diarrhea and hypertension.

The HIV prevalence rate in the county stood at 5.2%. The doctor patient ratio stands at 1:4,432 while the nurse/patient is 1:1,157.

In Samburu, the population is served by one level four hospital in Maralal. The population in Samburu West is served by dispensaries in Longewan, Sirata-Oirobi, Loosuk, and L'partuk. The County, according to CIDP, has 11 community health units distributed across the sub-county. The county engages community health volunteers in an effort to deliver services to residents. The prevalent diseases are RTIs, pneumonia, skin disease and diarrhea. The doctor patient ratio in the county stand at 1:10,000 and for the nurse/patient stands at 1:1,099.

Construction of the transmission lines will have some health implication on the locals and the construction workers. Most of these implications will be suffered during the construction phase. As can be seen from the analysis of prevalent diseases, respiratory tract infections could increase during the construction phase because of dust from the construction site. In addition, due to an influx of construction workers in the project area, unprotected sexual activity between themselves or with the locals could lead into cases of contracting STDs and or HIV/AIDS.

Education Profile

In Laikipia, according to the CIDP, there are 286 public primary schools and 87 private primary schools. The total number of students enrolled at the primary level in 2017 was 91,508. The enrolment rate in the county stood at 93.4%. 90% of the pupils in the county live within a 4.9km of the school. The teacher pupil's ratio in the county stand at 1:52.

The county has 99 secondary schools, both public and private with an enrolment of 24,711 students. The enrollment rate in the county is slightly above average with an enrollment of 61.05%. The teacher/pupil ratio in the county stood at 1:26.

Only 3.4% of the population had attained tertiary education. 79.1 % of the population in the county can read and write.

In Samburu, the number of primary schools in the county is 164 with a total population of 49,897 pupils. Of the pupils, 53.10% are boys and 46.90% were girls. The teacher /pupil ratio stood at 1:41 as of 2017.

There are 30 secondary schools in the county with an enrolment of 8,014 students 59.15% being males. The teacher/ pupil ratio stands at 1:23. This low enrolment can be attributed to low transition rates.

According to the 2019 Kenya Housing and Population census most of the people in the project area have completed primary school education. They form 56.44% of the residents of Laikipia West and 52.78% of Samburu Central's residents. 25.67% of Laikipia West's inhabitants and 20.24% of Samburu Central's inhabitants had completed secondary school education. Only 4.18% of Laikipia West's residents and 5.34% of those in Samburu West had completed technical and vocational training. University graduates made up 1.78% of Laikipia West's residents and 2.95% of Samburu Central's residents.

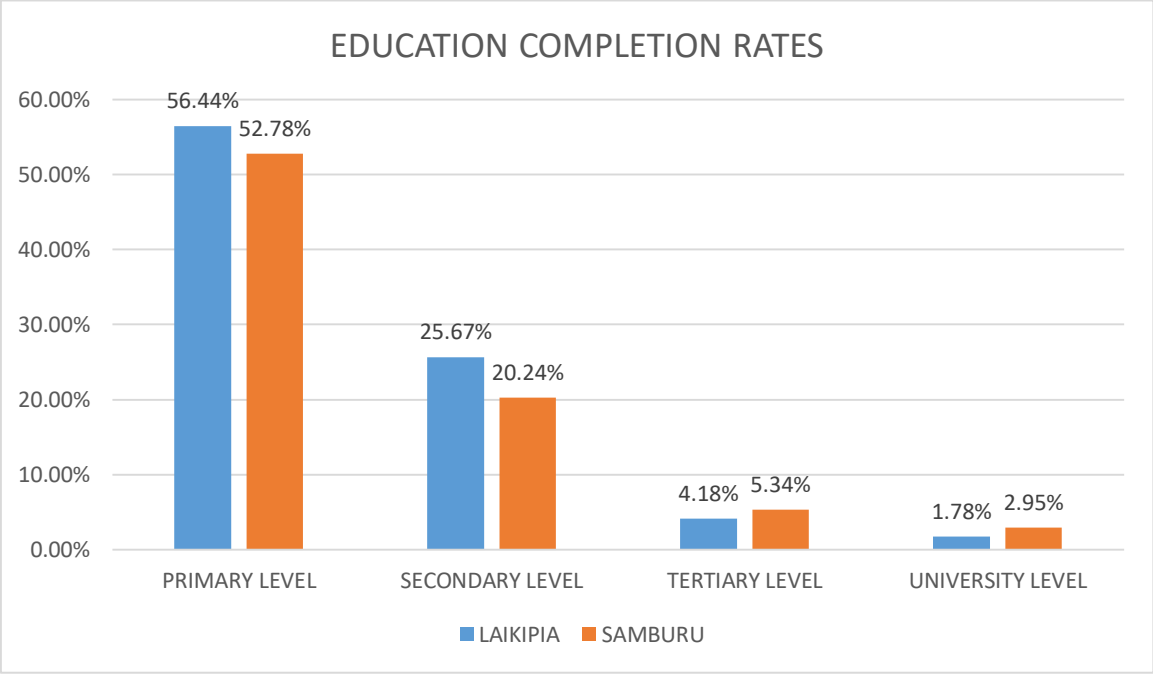


Figure 3.13.3: School Enrolment in Laikipia and Samburu County; 2019 Housing and Population Census by KNSB.

The impact that the project could have on the project areas' education trends include, but is not limited to, truancy in the area as the students opt to work in construction sites and an increase in dropout rate. It is also expected that, on completion, more schools and villages will be energized and students will have more study time which may translate to better school performance.

To develop skills among its youth, Laikipia County in 2017 had 3 Technical Training Institutes, a talents academy, 94 Adult and Continuing Education Centres offering adult and continuing

education at primary and secondary level, and 10 Public Vocational Training Centers with trainee enrolment of 617. Samburu County on the other hand has a public youth polytechnic in Maralal town with a total enrolment of 51. The County also has 67 Adult Literacy Centers and a privately owned Vocational Training Center.

These institutions have created various skill sets including, electrical, mechanical, masonry, carpentry, driving, welding, social work, information technology among others.

Housing

According to the 2019 Kenya Housing and Population Census, Laikipia West Sub County had a total of 24,232 shelters of which, 93.9% had been built by the owner. In Samburu Central, 96.9% of the 27,041 houses were built by individuals. 80.3% of the houses in Laikipia West are roofed with iron sheets, with 40.5% of them being mud walled and 64.1% of the houses have earthen floors. In Samburu Central, 40.5% of the houses are roofed with iron sheets, with 25.9% of them having muddy roofs. 59.6% of the houses are mud walled with 66% of them having earthen floors.

Land Use and Land Tenure

The Rumuruti-Maralal line, in Laikipia County traverses individually owned parcels. However, in Rumuruti ward, there are several parcels of land owned by the government. The line in Samburu County traverses registered and unregistered community land. The registered Community Group Ranches include Longewan, Lolmolok, Loosuk, Tinga, and Sirata Oirobi, while L'partuk is an unregistered Community Group Ranch. Most of the land is fallow but under conservation for grazing. The communally owned land is the community's source of livelihood.

Land use will definitely be affected adversely as the traversing of the line will limit land use. However, on the positive side, the value of land around the project area will increase as a result of improved power supply.

Employment Profile

Most residents are farmers and herders. In Laikipia West, majority of the residents are farmers who grow a myriad of food crops and cash crops. Other residents in the area are livestock keepers with most of them being settled pastoralists. According to the Laikipia county CIDP, 32% of the residents are either crop farmers or pastoralists. The CIDP also states that 24.4% of the workforce is formally employed while 42.8% of the population is self-employed.

In Samburu West, majority of the residents are settled pastoralists with some few engaging in mixed farming. According to Samburu County's CIDP, only 4.1% of the population is formally employed and 2.95% are self-employed.

The levels of unemployment in the two counties as reported by the respective CIDPs are, 10.8% for Laikipia County and 93% for Samburu County.

The transmission lines will have the greatest social impact on employment and labour. During construction activities, the line will provide many casual jobs for the locals in unskilled labour and for the qualified skilled workers. On completion of the project, the steady and improved supply will see more factories and spur business opportunities in sectors which heavily rely on electricity. This will lead in an increase in casual employment and self-employment.

Water and electricity

According to the 2019 Kenya Housing and Population Census, most of the residents in the project area rely on water from streams and rivers. 25.1% of the residents in Laikipia West rely on streams and rivers whereas in Samburu West 33.1% of the residents rely on the same. The rest mainly rely on boreholes and wells. Only 13.9% of the residents in Laikipia West and 8.7% for Samburu West are connected to piped water.

Fuel for lighting in the area according to the 2019 census findings indicated that a majority of the residents in the project area do not use electricity for lighting. In Laikipia West, only 18.8% of the residents used electricity for lighting. Most of the residents, 36.1% of the population, rely on solar power for lighting. In Samburu Central, 20.7% of the residents rely on electricity for lighting while most of the residents in the area, standing at 30.9%, relied on wood for lighting. Power infrastructure available include 11 and 33kV distribution lines connecting major markets, a 132kV transmission line from Rumuruti to Nanyuki which is yet to be completed, a 400kV TL from Loyangalani to Suswa that does not serve the project area, a 132/33kV substation at Rumuruti that is yet to be commissioned, and a 40MW Rumuruti Solar Power Station.

Commerce and trade

Samburu County has a huge potential for establishing industry and commerce. However, currently there is no established manufacturing industry. The honey refinery in Maralal run by Samburu beekeeper's cooperative society is the only resemblance of a processing plant. The County government through the department of livestock has established markets at Maralal, Lekuru, Poro, Suguta, Loibor-Ngare, Tangar and Lolkuniyani where livestocks trading are

undertaken. In addition, the government has made efforts to improve the existing markets by constructing stalls for green groceries in Maralal, Suguta, and Loosuk markets. Within the County there are small-scale, medium-scale, and large-scale traders (retail shops, wholesale, supermarkets, kiosks/canteens, mobile transporters, hawkers etc). The county has numerous tourist attraction sites and conservancies that has promoted the growth of the hospitality industry.

Laikipia County has a robust hospitality industry. Its close proximity to Mt. Kenya, Meru, Aberdares, and Samburu game parks have greatly boosted tourism within the county through provision of hospitality services to the tourists. There are 36 registered hotels and lodges with a total bed capacity of 1,064. Of these only 7 are classified in the range of 1-5 stars. The county is also characterized by markets for both commodities and livestock. The main commodity markets in the county are in Nanyuki and Nyahururu whereas main livestock markets are at Rumuruti, Doldol and Kimanjo. Other market centers include Olmoran, Sipili, Wiyumiririe, Lamuria and Debatas. There are numerous Micro, Small and Medium Enterprises in various sectors including in agriculture and forestry, whole sale trade, retail trade, repair of motor vehicles, repair of motor cycles, accommodation and food services, construction, information and communication, arts and music, professional and technical services.

3.6: Archaeological Baseline Survey

Introduction.

The Archaeological Baseline Survey identified locations to target, in the identification of archaeological resources. These areas coincided with sections where river action and road grading/construction (riverbanks and road cuttings) have exposed sediment profiles in the otherwise plain landscape. Below is a list of the specific points along the TL route where stops were made and ground surface observation made to identify and record any archaeological resources.

Table 3.3; Locations surveyed for archaeological resources

Location	GPS Coordinates UTM 37N (ARC 1960)	Observation
Rumuruti Substation	222393, 27274	In wheat plantation southwest of existing Rumuruti sub-station. This area appears to have relatively thick sediment cover as seen from the nearby road cutting. Due to the grass and the recently harvested wheat stocks cover, it was not possible to observe the sediments or surface soils for any archaeology.

Location	GPS Coordinates UTM 37N (ARC 1960)	Observation
Rumuruti-Sipili Road	222800, 28015	Located in Kahuho Village in a plain with sparse to moderate vegetation cover and with very thin sediment cover. The area has modern settlements and no archaeology was observed.
Kandutura/Kanyamyong River	224184, 32274	The location is a seasonal river with gravels and has no soils sediment profile to observe for archaeology
Rumuruti-Ngare Mare Road	224235, 34054	This is a small road to the north west of Rumuruti town. This road cutting is in shallow sediments covered in grasses and shrubs. No archaeology was observed.
Southern Ayiam River	224387, 36529	A stream with small pebbles and no soil sediment and with no archaeology.
Northern Ayiam River	224661, 40848	This location is a riverbed with cobbles and shallow sediments profile with no soils on the flood plain. No archaeology was recorded.
Stream next to Tower 560 of Loyangalani-Suswa TL	225000, 45211	In a grassy area with shrubs after the angle point where the TL starts to parallel the existing Loyangalani-Suswa TL. No archaeology.
Ol Motonyi Stream	225227, 55926	Very shallow sediments with bedrock slabs. One obsidian fragment observed, but no archaeology was recorded.
Ol Moran Stream	225339, 58322	Swampy plain area with thick grass and shrub cover with relatively thick sediment in the gully with pebbles at the base but no archaeology was recorded.
Survey – Ol Moran	225550, 65645	Road cutting in an area with thick shrub cover on laterite deposit with no archaeology observed
Long'dai stream	225659, 71645	Riverbed with boulders and no soil profile or flood plain. Very shallow sediments in most places, but no archaeology recorded.
Mugie-Baringo Road	227361, 79750	This is at the intersection of the road with the TL, viewed from a water cut trench along the road. The cutting shows deep deposits including approximately 30cm thick top soil overlying laterite deposit that is as deep as 50 – 100cm in some parts. No archaeology was observed.
Mugie-Longewan Road	228563, 90748	This area has shallow sediment overlying laterite with no rock and is covered in thick bush. The road cutting has no archaeology.
Longewan-Suguta Marmar Road	228838, 95355	Very thin sediments overlying laterite with no archaeology.
River Terienkwe	228929, 96393	Steep riverbank with boulders and bedrock. No sediment for archaeology.

Location	GPS Coordinates UTM 37N (ARC 1960)	Observation
Longewan-Lolmolok Road	228916, 102985	Newly graded road with shallow sediment profile up to about 50cm in some places with grass and bush cover. No archaeology was recorded.
Dry riverbed in Lolmolok	229011, 107030	Dry riverbed with boulders and a thin sediment profile on the banks and a small flood plain. No archaeology was recorded.
River Lolmolok	229056, 109690	A flattish riverbed and flood plain without much sediment profile. Clay alluvium with rocky bed (boulders). No archaeology.
River Enkungu Emuny	235923, 117504	There is thin sediments away from the crossing, low fold plain relative to the crossing and adjacent lands. Rock boulders and pebbles are rampant, but there are no archaeological finds.
River Ngare Narok	237554, 118129	This is the river downslope of Sirata Village. It has a steep walk to valley end in a cliff with very shallow sediments across the river channel. No archaeology.
River Nontoto	239282, 119164	Tropical rainforest of Ngare Narok forest. Surface covered in boulders, pebbles and screen on the riverbed. No archaeology was recorded.
Lerosion Stream	240242, 120088	No archaeology bearing sediments observed
Proposed substation (Maralal)	240705, 120059	Located along the Maralal – Baragoi road, the area has compact sediments with grass and bush cover. No archaeology was recorded.

Discussion

This area does not have significant archaeological resources, based on the survey carried out along the project footprint area. The scarcity of archaeological resources in the region may also be a factor of a paucity of early archaeological research and limited survey sampling method during the current exercise. To safeguard any archaeological resources that though not document in the report may be present in the project area, the following recommendations are proposed:

- A Chance Finds Procedure (CFP) should be developed and provided to field crews during the project implementation phase. The CFP is a project specific document that aims to minimize damage to objects accidentally uncovered during the construction phase. Caution must be taken to ensure that archaeological resources are not destroyed or negatively impacted by project activities.
- Construction crew including machine operators, HSE personnel, site engineers and surveyors must undergo an induction and regular training on the significance of

archaeological heritage resources, how to identify such sites and features and how to report the occurrence of suspected archaeological material.

- In the event of exposing human remains during construction, the matter will fall into the domain of National Museums of Kenya and will require a professional bio-archaeologist to undertake mitigation and rescue. Such work will also be at the cost of the developer.

Appendix V gives the full Archaeological Survey Report.

3.7: Baseline Noise Levels

Noise level assessment was carried out to determine ambient noise levels within the project area to be used as a baseline in assessing noise exposure levels during project implementation. The locations sampled coincided with water sampling points as these were identified to be the locations with higher concentration of wildlife and birds as they served as water drinking points and to also make it easy for KETRACO monitoring team. Noise for this project was identified to impact more on workers, wildlife, and birds as opposed to local residents.

A summary of the ambient noise level measurements (using Mastech Digital Sound Level Meter-MS6700 Series) at the selected sites is presented in the table below.

Table 3.4; Noise levels at selected locations of the TL

Area	GPS Coordinates UTM 37N (ARC 1960)		Minimum readings (dBA)	Maximum readings (dBA)
	X	Y		
River Nontoto-Lpartuk	239188	119458	34.2	45.10
R. Ngare Narok- Sirata Oirobi	23716	115710	43.1	57.4
Longewan	228921	102958	30.2	43.3
Lolmolok	228662	92584	31.4	37.1
Mugie Conservancy-Louniek	226375	76404	34.0	38.5
Magadi	226611	70762	29.8	36.5
Survey	225434	6577	33.2	35.7
Namochong – Ngare Mare	225971	42889	31.3	38.1
Northern Ayiam River	226025	9942905	34.7	40.0

Conclusion

The recommended noise limits to reduce hearing loss (occupational deafness) by International Labour Organization (ILO) and World Health Organization and The Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations 2009 are:

- 90dB (A) for 8 hours daily as the occupational exposure level (OEL), which most workers can continually be exposed to noise without developing occupational hearing loss in industries.
- For workshops and plant areas where occasional communication is required, the recommended limit is 65 - 85 dB (A).

Based on the results presented in the table above, the measured noise levels are within the permissible limits for construction sites as well as residential areas as provided for in EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009.

It is recommended that, KETRACO, conduct bi-annual Noise level assessment to monitor noise levels generated by the proposed project and based on the above baseline, identify areas that need corrective action.

3.8 Environmental and social threats

Human activities in Laikipia and Samburu Counties are the main threat to the environment. For example encroachment of riparian zones such Ewaso Narok swamp by farmers is a threat to the wetlands within the county. There has also been increased extraction of forest products especially charcoal burning and firewood collection from Rumuruti, Ngare Mare, Luoniek, Loosuk, Sirata Oirobi, and L'partuk areas leading to loss of biodiversity and wildlife habitats. In addition, farming in water catchment areas, sand harvesting and other quarrying activities have intensified the process of land degradation. Climate change and its associated effects such as droughts, floods and emergence of invasive species are also a serious threat to the environment in the area. The current sub-division of community group ranches may exacerbate vegetation clearing for agriculture leading to loss of biodiversity and wildlife habitats. On social threats, insecurity has been a persistent concern in Laikipia and Samburu Counties. For a long time the counties have been prone to banditry and cattle rustling from within and from the neighboring counties of Isiolo, Baringo, and Turkana. This has triggered inter-ethnic tensions leading to frequent tribal clashes which eventually lead to displacements, loss of life and property.

3.9: Land Use

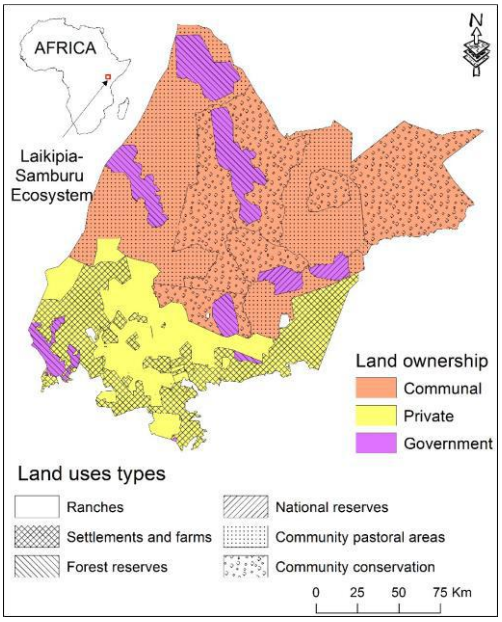


Figure 3.14: major land use types within the Laikipia-Samburu ecosystem

There are about six major land use types within the Laikipia-Samburu ecosystem: community conservancies, private ranches, communal pastoral areas, state-protected forest reserves, settlements mainly under sedentary subsistence production, and the national reserves (Figure 3.9).

The private, government, and community lands comprise 30%, 11% and 59% of the landscape, respectively. The area of land under each different land use type ranges from 533 km^2 to 11,457 km^2. Non-conserved communal land is occupied by nomadic pastoral communities, and inhabited by both livestock and wildlife. There are also communities that actively manage their land for wildlife protection (i.e., community conservancies). The government land comprises national reserves managed for wildlife conservation, and forest reserves, which are national heritage sites but with no active management for wildlife. The forest reserves are managed by the national government, and they often coincide with mountain ranges. Unlike the national reserves, the communities living around forests have uncontrolled access to them. They use the forests as additional grazing land. The southern limit of the Laikipia-Samburu ecosystem is primarily private land (i.e., settlements and ranches). In the settlements, the land is highly subdivided into plots of less than ten hectares. Over 50 private ranch properties, ranging from approximately 10 hectares to 35,000 hectares, are managed for commercial cattle production, with owners generally allowing wildlife access on their properties. Some of the ranches have tourism establishments and activities.

Land users include farmers, pastoralists, settlement, conservancy owners, and squatters.

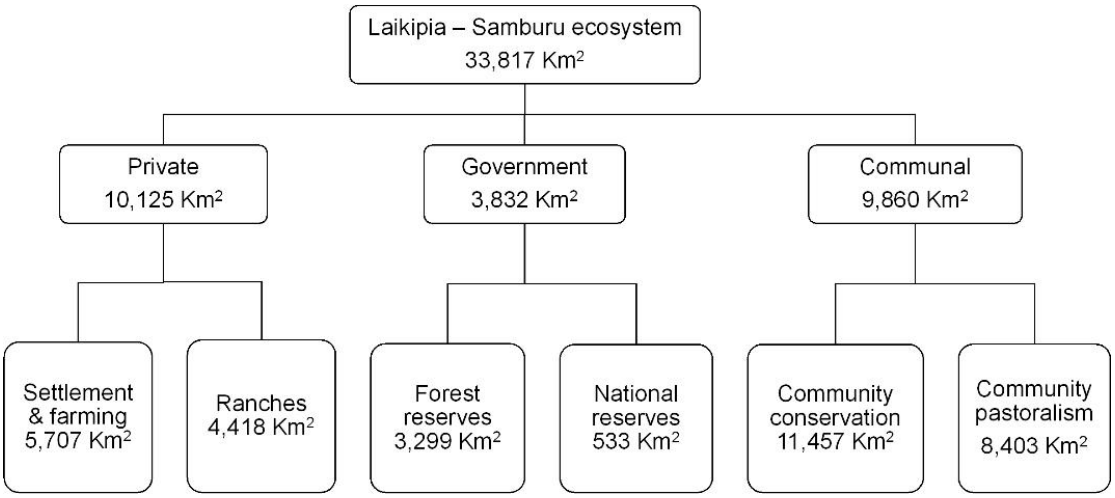


Figure 3.15: Land ownership in Laikipia and Samburu

CHAPTER 4: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

4.1: Introduction

Environmental impact assessment is a tool for environmental conservation and has been identified as a key component in new project implementation. According to section 58 of the Environmental Management and Coordination Act (EMCA) Cap 387, second schedule 9 (I), and Environmental (Impact Assessment and Audit) Regulation, 2003, both new and old projects must undergo Environmental Impact assessment and Audits. The report of the same must be submitted to National Environmental Management Authority (NEMA) for approval and issuance of the relevant certificates.

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

4.2: Environmental and Social policy

This ESIA has been prepared to fully comply with environmental and social safeguard policies and procedures as outlined in World Bank Operational Policy 4.01 and as per various regulations by National Environment Management Authority, in Kenya.

4.3: Relevant Kenya Policies, Plans and Strategies

The policies that are relevant to the proposed development project include the following:

4.3.1; Vision 2030

The Kenya Vision 2030 aims to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment. The blue print is based on three “pillars”; the economic, the social and the political. The adoption of Vision 2030 came after the successful implementation of the Economic Recovery Strategy for Wealth and Employment Creation (ERS) which has seen the country’s economy back on the path to rapid growth since 2002 when Gross Domestic Product (GDP) grew from a low of 0.6% and rising gradually to 6.1% in 2006, one of the foundations for Vision 2030 is infrastructure. The Vision aspires for a country firmly interconnected through

a network of roads, power lines, railways, ports, airports, water and sanitation facilities, and telecommunications. In this Vision to ensure that the main projects under the economic pillar are implemented, investment in the nation's energy sector is given the highest priority. The proposed development project will promote the economic growth of the locality and transport sector during construction and operation phases and help propel Kenya to a middle-income country as envisioned in the Vision 2030 development plan by developing the energy sector, one of the key target sectors in the plan.

4.3.2; The Big 4 Agenda

The Big 4 Agenda is a presidential directive on areas of key development to focus on for the period 2018 to 2022. The areas of focus and the agendas are as follows:

- Enhance manufacturing in the country from 9.2% to 20% of GDP by 2022
- Food security and nutrition through 100% food and nutrition security commitment
- Universal health coverage by scaling up NHIF uptake to 100%
- Affordable housing by implementing 500,000 new affordable homes

Access to affordable and reliable energy is a major contributor towards achieving the Big Four Agenda.

4.3.3; Policy Paper on Environmental and Development (Sessional Paper No. 6 of 1999)

This policy was formulated on the basis of the National Environment Action Plan (NEAP) process of 1994. The policy's major objective is to harmonize environmental and developmental concerns to ensure sustainability. Furthermore, this policy ensures that environmental issues are taken into consideration before the commencement of development policies, programmes, plans and projects. The proposed project is therefore consistent with the Sessional Paper No. 6 of 1999.

4.3.4; The National Energy Policy, 2018

The overall objective of the energy and petroleum policy is to ensure affordable, competitive, sustainable and reliable supply of energy to meet national and county development needs at least cost, while protecting and conserving the environment.

The policy address issues relating to;

- Petroleum and Coal,
- Renewable Energy,
- Electricity,
- Energy Efficiency and Conservation,
- Land, Environment, Health and Safety,

- Devolution and Provision of Energy Services, and
- Energy Financing, Pricing and Socio-Economic Issues;

The policy observes that, the Government will Support the development by KETRACO of new transmission lines, comprising of about 5,000 km in the short term and 16,000 km by 2031 to enhance security, reliability and affordability of electricity supply. The proponent will therefore, be guided by this policy.

4.3.5; The Kenya National Climate Change Response Strategy

The purpose of this strategy is to put in place robust measures needed to address most of the challenges posed by climate variability and change through impact assessments and monitoring of various projects. According to Climate Change Projections, in this country we are likely to experience hotter drier sunny seasons, warmer wetter rainy seasons, rise in sea levels and an increase in extreme weather events. These climactic changes will impact on our daily lives and the buildings that we work and live in must be adapted to cope with such changes. With time both existing buildings and the construction of new buildings will have to adapt to cope with the conditions climate change may produce. A range of new ways to design, construct, upgrade and occupy buildings so that they are more energy efficient as well as resilient to threats such as flooding and drought is proposed.

In the construction sector, priority inclusion areas should include energy efficient innovations and technologies, and utilization of low-carbon appliances and tools; the utilization of eco-friendly energy resources such as wind, solar, biogas, small hydros, etc; as well as possible utilization of biofuels.

4.3.6; The National Poverty Eradication Plan (NPEP) of 1999

The National Poverty Eradication Plan (NPEP) was formulated with an objective of reducing the high levels of poverty in Kenya by 50 percent by the year 2015, as well as to strengthen the capabilities of the poor and vulnerable groups to earn income. The plan also aimed at reducing gender and geographical disparities in order to create a healthy, better-educated and more productive population. The formulation of the plan was guided by the goals and commitments agreed during the World Summit for Sustainable Development (WSSD) of 1995. The plan therefore focuses on the delivery of four WSSD themes of poverty eradication; reduction of unemployment; social integration of the disadvantaged people and creation of an enabling economic, political, and cultural environment through development of transport and communication sector. The plan is implemented by the Poverty Eradication Commission (PEC) that was established in collaboration with various Government Ministries, bilateral and

multilateral donors, the private sector, Community Based Organizations (CBOs) and Non-Governmental Organizations (NGOs). The NPEP is relevant since the proposed project will create an enabling environment that will contribute immensely in the enhancement of economic growth in Kenya. The proposed project would also impact businesses, agricultural and tourism related activities that have great relevancy to poverty eradication in the country.

4.3.7; Environment and Development (Sessional Paper No. 6 of 1999)

The Kenya's policy paper on the Environment and Development was formulated in 1999. The policy defined approaches that will be pursued by the Government in mainstreaming environment into development. The policy harmonized environmental and developmental objectives with the broad goal of achieving sustainable development. The policy paper also provided guidelines and strategies for government action regarding environment and development. With regard to wildlife, the policy reemphasized government's commitment towards involving local communities and other stakeholders in wildlife conservation and management, as well as developing mechanisms that allow them to benefit from the natural resources occurring in their areas. The policy also advocated for the establishment of zones that allow for the multiple use and management of wildlife. This policy is relevant to the proposed development project in view of the potential impacts on the environment and involvement of the public in project planning.

4.3.8; The National Biodiversity Strategy of 2000

The National Biodiversity Strategy and Action Plan (NBSAP) was formulated in order to enable Kenya address national and international commitments defined in Article 6 of the Convention on Biological Diversity (CBD). The strategy is a national framework of action for ensuring that the present rate of biodiversity loss is reversed and present levels of biological resources are maintained at sustainable levels for posterity. The general objectives of the strategy are to conserve Kenya's biodiversity; to sustainably use its components; to fairly and equitably share the benefits arising from the utilization of biological resources among the stakeholders; and to enhance technical and scientific cooperation nationally and internationally, including the exchange of information in support of biological conservation. The proposed project will need to comply with the requirements of this strategy since the project may lead to loss of biodiversity in some sections along the proposed route.

4.3.9; The Land Policy (2007)

The Land Policy in Kenya is guided by the environmental management principles which are aimed at restoring the environmental integrity through introduction of incentives and encouragement of use of technology and scientific methods for soil conservation, among

others. The policy further requires fragile ecosystems to be managed and protected by developing a comprehensive land use policy bearing in mind the needs of the surrounding communities. The policy also requires zoning of catchment areas to protect them from degradation and establishment of participatory mechanisms for sustainable management of fragile ecosystems. The policy also called for development of procedures for co-management and rehabilitation of forest resources while recognizing traditional management systems and sharing of benefits with contiguous communities and individuals. Lastly, all national parks, game reserves, islands, front row beaches and all areas hosting fragile biodiversity are declared as fragile ecosystems under the policy.

The policy recognizes that sustainable management of land based natural resources depends largely on the governance system that defines the relationships between people, and between people and resources. To achieve an integrated approach to management of land-based natural resources, all policies, regulations and laws dealing with these resources need to be harmonized with the framework established by the Environmental Management and Coordination Act (EMCA) 1999.

The policy also addresses land management particularly in Section 3.4.3.2 on ecosystem protection (including wetlands). Measures for protection are required for fragile ecosystems. The policy also calls for the protection of watersheds, lakes, drainage basins and wetlands. The policy prohibits settlement and agricultural activities in water catchment areas and calls for identification, delineation and gazettement of all water courses and wetlands.

4.3.10; Wildlife Policy of 2011

The wildlife policy is aimed at promoting protection and conservation of wildlife in Kenya, both in protected and non-protected areas. The policy is implemented by the Kenya Wildlife Service (KWS). The proposed project will need to be consistent with this policy. Where wild animals will be disturbed during the construction and operation of the transmission line, appropriate mitigation measures must be implemented to minimize disturbance to wildlife.

4.3.11; Wetlands Policy of 2013

The wetlands policy is intended to promote protection of wetlands in Kenya. The policy sets out strategic measures for the protection of existing wetlands in Kenya. The proposed project has crossed some critical water bodies such as the Kandutura, Ayiam, Terienkwe, Nontoto, Nkengu Emuny, and Engare Narok Rivers, and Dams Nyeusi, Kaijeria, and Parariro . It would be important to undertake appropriate mitigation measures in order to minimize or avoid degradation of wetlands.

4.3.12; Physical Planning Policy

The current policy governs the development and approval of all building plans as provided for in the Physical Planning Act (Cap 286). The proposed project will be subjected to the provisions of this policy and legislation.

4.3.13; Public Health Policy of 2014

The public health policy calls upon the project proponents to ensure that buildings are adequately provided with utilities so that they are fit for human habitation. The workers camps must be provided with all amenities/utilities that are essential for safeguarding public health for all people using the facilities.

4.3.14; HIV/ AIDS Strategic Plan 2014/15-2018/19

The Kenya AIDS Strategic Framework 2014/15-2018/19, is the Strategic guide for the country's response to HIV at both national and county levels. The framework addresses the drivers of the HIV epidemic and builds on achievements of the previous country strategic plans to achieve its goal of contributing to the country's Vision 2030 through universal access to comprehensive HIV prevention, treatment and care. The vision of this strategic plan is to have A Kenya free of HIV infections, stigma and AIDS related deaths. The goal of the plan is to Contribute to achieving Vision 2030 through universal access to comprehensive HIV prevention, treatment and care. The objectives of the plan are: 1. Reduce new HIV infections by 75% 2. Reduce AIDS related mortality by 25% 3. Reduce HIV related stigma and discrimination by 50% 4. Increase domestic financing of the HIV response to 50%. The proponent must ensure that the project aligns itself towards the objectives of this plan.

4.3.15 Gender Policy of 2011

The purpose of the Gender Policy is to institutionalize The Kenya National Policy on Gender and Development (NPGD), within Gender, Children and Social Development. It articulates the policy approach of gender mainstreaming and empowerment of women at the ministry level. The policy seeks to have a society where women, men, children and persons with disabilities enjoy equal rights, opportunities and a high quality of life. This report has in depth addressed matters to do with gender and development.

4.4: KETRACO's Internal Policies and Guidelines

4.4.1; KETRACO Policy Frameworks

KETRACO with the assistance of the World Bank has developed a number of policy frameworks to guide the implementation of the Kenya Electricity System Improvement Project (KESIP). These policy frameworks have briefly been highlighted in the following chapters.

Environmental and Social Management Framework (ESMF)

The Environmental and Social Management Framework (ESMF) addresses the environmental and social impacts of the portion of the KESIP, that KETRACO will implement.

The ESMF sets out the principles, rules, guidelines, and procedures to assess the environmental and social impacts of KESIP subprojects. The main purpose of the ESMF is to:

- Establish clear procedures and methodologies for the environmental and social assessment, review, approval and implementation of investments to be financed under the project;
- Specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to project investments;
- Determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF; and
- Provide practical information resources for implementing the ESMF

Resettlement Policy Framework (RPF)

The development of the Resettlement Policy Framework (RPF) followed the World Bank's safeguard policy on Involuntary Resettlement (OP 4.12). OP 4.12 become applicable if projects involve physical displacement through acquisition of land for project activities, economic displacement, or restricted access to natural resources and assets that lead to loss of income sources or means of livelihood.

The RPF provides project stakeholders with the procedures to address the risks that may arise if successful implementation of a subproject requires economic or physical displacement of populations. It provides guidelines on how the projects will avoid, manage or mitigate all project related displacement risks.

The objective of the RPF is to establish the principles, procedures, entitlements and eligibility criteria, organizational arrangements, and provisions for monitoring and evaluation (M&E), the

framework for stakeholder and PAPs participation, as well as the mechanisms for addressing grievances which will be applied to all KETRACO KESIP transmission subprojects.

Vulnerable and Marginalized Groups Framework (VMGF)

The VMGF describes the policy requirements and planning procedures that KESIP will follow during the preparation and implementation of its subprojects, especially those identified as occurring in areas where IPs/VMGs are present. It outlines the specific means of ensuring that the IPs/VMGs are given fair, prior and informed consultation before, during and after the project implementation.

The objective of the VMGF is to ensure that the management of issues related to IPs/VMGs is integrated into the KESIP transmission subprojects to ensure effective mitigation of potential adverse impacts while enhancing accrual of benefits for IPs/VMGs. The Framework provides information on:

- The types of investments likely to be proposed for financing under the project;
- The potential positive and adverse effects of such investments on IPs/VMGs;
- A plan for carrying out the SA for such investments;
- The process for preparing VMGPs;
- A framework for ensuring the Free Prior Informed Consent with the affected IPs/VMGs is obtained at each stage of project preparation and implementation;
- Institutional arrangements, including capacity building where necessary, for screening project-supported investments, evaluating their effects on IPs/VMGs, preparing VMGPs, and addressing any grievances;
- Monitoring and reporting arrangements, including mechanisms and benchmarks appropriate for the project; and
- Disclosure arrangements for VMGPs.

4.4.2; KETRACO Safety, Health and Environment (SHE) Policy

KETRACO has prepared a SHE Management System with the specific aim of complying with Occupational Safety and Health Act (OSHA), 2007; Environmental Management & Coordination Act, 1999; Energy Regulatory Board's Environment, Health and Safety Policy Framework for the Electric Power sub-sector, 2005; its internal SHE Policy and donor requirements.

4.4.3; KETRACO Route Selection Criteria

A. Criteria for Route Selection:

The route of a transmission line is decided from the following main considerations:

- Shortest length, hence least capital cost.
- Ease during construction and ease in maintenance of the line (route near roads for easy approach & accessibility).
- Requirement of future loads (substations) near the proposed route so that the line can be easily connected.
- Required separation distance from parallel communication lines (Communication, Railways, etc.) for meeting the conditions of induced voltage.
- Avoiding of forest areas as well as wild life sanctuaries.
- Cost of securing and clearing right of way (ROW).
- Maintaining statutory distances from Airports, Airstrips and Helipads.

The following areas are to be avoided as far as possible while selecting the route of the line:

- Tough inaccessible areas where approach is difficult.
- Towns and villages, leaving sufficient margin for their growth.
- Areas subject to floods, gushing streams during rainy seasons, tanks, ponds, lakes, etc. and natural hazards.
- Wooded areas with high trees or fruit bearing trees involving payment of heavy compensations for cutting of the trees.
- Swamps and shallow lands subject to flood, marshy areas, low lying lands, river beds, and earth slip zones, etc. involving risk to stability to foundations.
- High hillocks/hilly areas/sand dunes and areas involving abrupt changes in levels and requiring too many long spans.
- Series of irrigation wells.
- Rifle shooting areas and other protected areas such as army/defense installations and ammunition depots.
- Areas which involve risk to human life, damage to public & private properties, religious places, cremation grounds, quarry sites and underground mines, gardens, orchards and plantations.
- Areas which will create problems of right of way and way leaves.
- Buildings/Storage areas for explosives or inflammable materials, bulk oil storage tanks, oil or gas pipelines, etc.

Other points to consider include:

- The route of the transmission line shall, as far as possible, be the shortest length between the pre-determined sub stations.
- The route of the transmission line is to be so located that, as far as possible, it is protected from high winds and falling trees & branches. In hilly tracks, the line is to be

routed, as far as possible, along the side of the hills or through valleys rather than over high points. However, a route of the line very close to steep slopes of hills be avoided as far as possible as there may be difficulty in obtaining lateral (side) clearance to ground for conductors. Also, there may be overhanging/loose boulders which may roll down and damage the line.

- It is desirable to take the line as near the paths and roads as practicable without unduly increasing the length of the line so as to facilitate transportation of material during construction and the patrolling/maintenance of the line. Where the line cannot be routed near paths/roads economically, care shall be taken to see that easy access is possible at every 5 to 8 km. It shall be ensured that all angle/tension points are approachable to facilitate easy transportation of stringing equipment during construction and for maintenance/breakdowns.
- In hilly / mountainous type of terrain or in thickly populated areas, it is generally not advisable to attempt a direct route or try to locate towers in long spans. Small angles of a few degrees cost a little more and add little to the length of the line. Suspension towers (A - type) can be provided for line angles of up to 2 degrees and small angle towers (B - type) can be provided for angles up to 10 degrees.
- In general, large angles in the line are to be avoided wherever possible. The magnitude of the angle should be small as far as possible and should never be more than 60 degrees.
- The line shall be aligned suitably so that it can be diverted/Looped In Looped Out (LILO) to cater for possible future loads/sub stations along the route.

B. Telecommunication, Electricity Distribution Lines, and Electric Fences:

The line route shall be so selected that the voltage induced in parallel running telephone/ communication/power lines/electric fences/signaling lines/circuits of the Communication does not exceed the prescribed permissible values under fault conditions. The Stakeholders approval should be obtained before energizing the line.

C. Approval of The Aviation Authorities:

The line route shall be at a sufficient distance from aerodromes/airports so that clearance from the KCAA is not required or, otherwise, can be obtained easily.

D. Crossing of Rivers/Roads:

- Crossing of rivers is preferably done at points where the bed is of the smallest width and the banks on both sides of the rivers are high. The crossing is done at points of

the river path where it is unlikely to cut the banks when it is flowing. Towers must be spanned as far back from the riparian as is possible.

- The route is selected such that multiple crossings of the same road are avoided.
- Crossing of roads at very small angles is to be avoided.
- Approval of the Roads' Authority must be sought.

E. Crossing of Power Lines:

- When crossing existing higher voltage power lines, the new line shall normally be below such existing lines except in extremely limiting circumstances.
- When crossing existing lower voltage power lines, the new line shall normally be above such existing lines except in circumstances where it is not possible.
- When crossing existing power lines of the same voltage, the new line may be above or below such existing lines as per site conditions.

F. Approval of Forest Services:

- Forest area is to be avoided as far as possible.
- If forest area cannot be avoided, or if the line route is uneconomical in case forest area is avoided, then the approval of the Forest Department is required.

4.5: The National Legal Framework

4.5.1; The Constitution of Kenya

The Constitution of Kenya has taken on board various issues that are related to environmental management. Article 42 of the Bill of Rights contained in the Constitution provides that 'every Kenyan has the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures'. Chapter 5 of the Constitution is dedicated to land and the environment. The constitution requires that land be used and managed in a manner that is equitable, efficient, productive and sustainable. Part 2 of Chapter 5 of the constitution is dedicated to Environment and Natural Resources. Article 69 in Part 2 provides that the state shall encourage efforts towards sustainability of natural resources, increasing of the national forest cover, public participation in the management, protection and conservation of the environment, protection of genetic resources and biodiversity, Environmental Impact Assessment, Environmental Audit and Monitoring of the environment, etc.

4.5.2; Other Relevant National Environmental Legislations

Table 4.1; Kenyan environmental laws and regulations relevant to the Project.

No.	Legislation	Relevance	Trigger	Compliance
1.	The Environment Management and Co-ordination (EMCA), Cap 387	✓ The legislation advocates for environmental protection during project implementation and restoration of impacted environment. ✓ Section 58, subsection 1 – Requires that before a project is executed, an ESIA Report must be prepared and submitted to the Authority (NEMA) in a prescribed form. ▪ Subsection (7); ESIA shall be conducted in accordance with the ESIA regulations, guidelines and procedures issued under the EMCA. ▪ EMCA Part V Section 50 - The Authority shall, in consultation with the relevant lead agencies (including Ministry of Wildlife & Tourism KWS) prescribe measures necessary to ensure the conservation of biological diversity in Kenya. ✓ EMCA, Section 72, 74,75, and 76 deals with water pollution, and prohibition and license to discharge effluent ✓ EMCA, Section 91 and 94 deals with the classification of wastes, handling and their management ✓ EMCA, Section 107 provides standards for the control of noxious smell ✓ EMCA, Part XIII, Section 142 (1) says that any Person who – ▪ Discharges any dangerous materials, substances, oil, oil mixtures into land, water, air or aquatic environment; ▪ Pollutes the environment; ▪ Discharges any pollutant into the environment Commits an offence and shall on conviction, be liable to a fine not less than two million shillings.	✓ Project has the potential to affect the physical and biological environment including soil, water, air, flora and fauna during construction.	✓ The execution of an ESIA Study in compliance with regulations has been commissioned. ✓ The ESIA Report has provided an Environmental and Social Management Plan (ESMP) that will be followed by the contractor to mitigate identified project impacts and implement monitoring activities.

No.	Legislation	Relevance	Trigger	Compliance
2.	The Environment (Impact Assessment and Audit) Regulations, 2003 (Rev. 2019)	✓ The Regulation provides the guidelines that have been established to govern the conduct of environmental assessments and environmental audits in Kenya. ✓ The legislation provides guidance on project impact categorization into low, medium and high risks and implementation of appropriate environmental and social impact assessments. ✓ Section 4 (1) says no proponent shall implement a project that (a) is likely to have a negative environmental impact; or (b) for which an environmental impact assessment is required under the Act or these Regulations unless an environmental impact assessment has been concluded and approved in accordance with these Regulations, ✓ Part III describes the ESIA Study Process, Part IV describes the contents of an ESIA Study Report and Part V elaborates on environmental audit and monitoring. ✓ The regulations provide guidelines on preparation of ESIA Project Report ✓ The EMCA, Cap 387 requires that during the ESIA 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 public meetings with the affected parties and communities.	✓ Being a high voltage transmission line, the proposed project is anticipated to have significant environmental, social, economic and cultural impacts. The proposed project must therefore be subjected to a full ESIA study.	✓ This Study is aimed at ensuring compliance of these regulations. The study has collected information on project design, the relevant baseline data, conducted an elaborate public consultation process and created an Environmental and Social Management Plan(ESMP) and a monitoring plan (ESMoP) that if implemented will ensure conservation and protection of environment and improved livelihoods. ✓ The proponent will be required not to start the project until an ESIA License has been issued. ✓ The study envisage annual environmental audits by the proponent.
3.	Environmental Management and Co-ordination (Water Quality) Regulations, 2006	✓ The Regulations observe that, every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of the Act. It further observes that, no person shall throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any such substance in or near it, as to cause pollution. It goes on to state that, no person shall: 1. Discharge, any effluent from sewage treatment works, industry or other point sources into the aquatic environment without a valid effluent discharge license issued in accordance with the provisions of the Act. 2. Abstract ground water or carry out any activity near any lakes, rivers, streams, springs and wells that is likely to have any adverse impact on the quantity and quality of the water, without an Environmental Impact Assessment	✓ The proposed project will have potential to contaminate water resources that it will traverse. Water resources along the TL corridor include; 1. River Kandutura, 2. River Southern Ayiam 3. River Northern Ayiam 4. Dam Nyeusi 5. A stream next to tower 560 of Loyangalani-Suswa TL 6. Dam Nyekundu 7. Stream between Ol Mutonyi and Ol Moran 8. Ol Moran- seasonal streams 9. Parariro Dam, 10. Kajeria Dam,	✓ KETRACO shall ensure tower foundations are not located near or next to the afore-mentioned water resources and definitely not on their riparian zones. ✓ The contractor will not be allowed to abstract water from water resources in the project area without approval of the community and relevant authorities. ✓ The contractor shall avoid motor vehicles crossing rivers and streams from undesignated points to only use existing bridges or designated crossing points. ✓ The contractor shall put measures to prevent siltation of water resources ✓ The contractor shall provide mobile toilets to avoid Leachates from open defecation by project workers contaminating the water resources

No.	Legislation	Relevance	Trigger	Compliance
		license issued in accordance with the provisions of the Act; or 3. Cultivate or undertake any development activity within a minimum of six meters and a maximum of thirty meters from the highest ever recorded flood level, on either side of a river or stream, and as may be determined by the Authority from time to time.	11. Airewa stream 12. River Long'dai 13. Wetland within Mugie Conservancy 14. Luoniek- Lera Dam 15. Ntimnariko water pan and Borehole 16. River Terienkwe 17. River Lolmolok 18. River Loosuk 19. River Ngare Narok 20. River Nkengu Emuny, 21. River Nontoto, 22. Lerosion stream	✓ The contractor shall enact solid waste management to reduce or completely stop contamination of water systems by solid waste ✓ Baseline water quality of these water resources have been identified and KETRACO should, during construction phase, periodically monitor it to ensure they are not contaminated.
4.	Environmental Management and Co-ordination (Waste management) Regulations, 2006	✓ This Regulation define rules for the management of waste in general and for the management of solid waste, industrial waste, hazardous waste, pesticides and toxic substances, biomedical waste and radioactive substances in particular. ✓ The regulation observes that; 1. No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle. 2. Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed of such waste in the manner provided for under these Regulations. 3. Without prejudice to the foregoing, any person whose activities generates waste has an obligation to ensure that such waste is transferred to a person who is licensed to transport and dispose off such waste in a designated waste disposal facility. 4. Any person whose activities generate waste, shall segregate such waste by separating hazardous waste from non-hazardous waste and shall dispose of such wastes in such facility as is provided for by the relevant Local Authority. 5. Any person who owns or controls a facility or premises which generates waste shall minimize the waste generated by adopting the cleaner production principles.	✓ Implementation of the proposed transmission line project will result in generation of various forms of waste including wood, cement bags, paper, metals, plastic, dredged materials, coarse and fine aggregates, etc.	✓ The contractor shall; ✓ Provide waste receptacles for collecting waste and shall ensure waste is segregated. ✓ Contract a NEMA registered waste handler to collect and dispose of waste at designated sites ✓ Ensure updated waste tracking sheets are maintained for collected waste. ✓ Implement sustainable waste management principles of reduction, reuse and recycling. ✓ Provide mobile toilets for construction workers to manage human waste. ✓ Sensitize construction workers on best waste management practices
5.	Environmental Management and Co-	✓ The regulations observe that, except as otherwise provided in the Regulations, no person shall make or	✓ Construction equipment, vehicles and other	KETRACO will ensure the contractor;

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	ordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009	cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. ✓ In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered: ▪ Time of the day; ▪ Proximity to residential area; ▪ Whether the noise is recurrent, intermittent or constant; ▪ The level and intensity of the noise; ▪ Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and, ▪ Whether the noise is subject to be controlled without unreasonable effort or expense to the person making the noise. ✓ These regulations also relate noise to its vibration effects and seek to ensure that the level of noise causes no harmful vibrations. Any person(s) intending to undertake activities in which noise is suspected to be injurious or endangers the comfort, repose, health or safety of others and the environment, must make an application to NEMA and acquire a license	construction activities have potential to cause noise pollution and excessive vibrations.	✓ Provides ear protection (earmuffs and ear plug) to employees working in areas with high noise levels. ✓ Ensure machines and equipment are dully serviced and inspected to reduce noise emission ✓ Restrict construction work to day time hours only ✓ Sensitizes drivers against unnecessary hooting and vehicle idling. ✓ Baseline noise levels of various points within the transmission line have been given and KETRACO should, during construction phase, periodically monitor it to ensure they are not exceeded.
6.	Environmental Management and Co-ordination (Air Quality) Regulations, 2014	✓ The objective of these Regulations is to provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air. The regulations observe that; 1. No person shall- a. Act in a way that directly or indirectly causes, or is likely to cause immediate or subsequent air pollution; or b. Emit any liquid, solid or gaseous substance or deposit any such substance in levels exceeding those set out in the First Schedule. c. No person shall cause emission of the priority air pollutants prescribed in the Second Schedule to exceed the ambient air quality limits prescribed in the First Schedule. 2. No person shall cause emission of the priority air pollutants prescribed in the Second Schedule to exceed	✓ Operation of construction equipment, movement of vehicles, excavation, and use of cement may result in dust and exhaust emissions during construction phase of the project	KETRACO will ensure the contractor; ✓ Restricts burning of waste on site ✓ Regularly services vehicles and machines to reduce gaseous emissions ✓ Regularly sprinkle water in dusty sections to suppress dust emission ✓ Provides dust masks for workers working in dust prone sections

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		the ambient air quality limits prescribed in the First Schedule. 3. No person shall cause the Ambient Air Quality levels specified in the First Schedule of these Regulations to be exceeded. 4. No person shall cause or allow particulate emissions into the atmosphere from any facility listed under the Fourth Schedule to these Regulations in excess of those limits stipulated under the Third Schedule. 5. Any person, being an owner of premises, who causes or allows the generation, from any source, of any odour which unreasonably interferes, or is likely to unreasonably interfere, with any other person's lawful use or enjoyment of his property shall use recognized good practices and procedures to reduce such odours to a level determined by the odour panel, including any guidelines published by the Authority for reducing odours.		
7.	Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources, and Benefit Sharing) Regulations, 2006.	✓ The regulations observe that; 1. A person shall not engage in any activity that may- a. have an adverse impact on any ecosystem; b. lead to the introduction of any exotic species; c. lead to unsustainable use of natural resources, ✓ Without an Environmental Impact Assessment License issued by NEMA.	✓ The project travels areas of ecological importance such as, woodlands, riparian zones, wildlife dispersal areas, Mugie Conservancies and Engare Narok forest resource.	✓ KETRACO has commissioned an ESIA study for the proposed project that has identified the baseline conditions of the ecosystems and formulated a plan for their protection and conservation.
8.	The Occupational Safety and Health Act, No. 15 of 2007	✓ This is an Act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes. Of importance to the proposed project are: ➢ Registration of workplaces ➢ Health General Provisions (including cleanliness, overcrowding, ventilation, lighting, drainage of floors, and sanitary conveniences) ➢ Safety General Provisions (including ladders, ergonomics at the workplace, Fire prevention, safety provisions in case of fire, evacuation procedures)	✓ The construction sites for the proposed project will be places of work with construction workers. The workplaces will have occupational hazards and risks that could result to injuries to workers.	KETRACO will ensure that; ✓ The site (s) are dully registered as workplaces ✓ Health and safety committees are constituted and dully trained ✓ Statutory inspection of all equipment is done ✓ Statutory trainings are conducted ✓ All workers/visitors are provided with appropriate PPE ✓ Workers are covered by an insurance in case of work-related injuries/illness ✓ Fully equipped first aid kit and trained first aider are available on site always ✓ Firefighting equipment have been provided

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		➢ Welfare General Provisions (including supply of drinking water, washing facilities, accommodation for clothing, facilities for sitting, and first-aid) ➢ Prevents employment of children in workplaces where their safety and health is at risk. ➢ Encourages entrepreneurs to set achievable safety targets for their enterprises. ➢ Promotes reporting of work-place accidents, dangerous occurrences and ill health with a view to finding out their causes and preventing of similar occurrences in future. ➢ Promotes creation of a safety culture at workplaces through education and training in occupational safety and health. ➢ Provision of safety gear (PPE) where hazards are anticipated.		✓ Material Safety Data Sheets are maintained on site ✓ Accidents, incidents and near misses are documented ✓ Accident investigations are conducted
9.	The Work Injury Benefits Act, 2007	✓ This Act provides for compensation to employees for work related injuries and disease contracted in the course of their employment and for connected purposes. Key sections of the Act include the obligations of employers; right to compensation; reporting of accidents; compensation; occupational diseases; medical aid etc.	✓ Construction activities will have potential to cause injuries/ health hazards to construction workers.	KETRACO and the Contractor will ensure that; ✓ Workers are covered by an insurance policy for work related injuries ✓ Accidents, incidents and near misses are documented ✓ Accident investigations are conducted ✓ Workers undergo induction before employment and medical examination
10	Energy Act 2019	✓ This is an Act of Parliament to consolidate the laws relating to energy, to provide for National and County Government functions in relation to energy, to provide for the establishment, powers and functions of the energy sector entities; promotion of renewable energy; exploration, recovery and commercial utilization of geothermal energy; regulation of midstream and downstream petroleum and coal activities; regulation, production, supply and use of electricity and other energy forms; and for connected purposes. ✓ Section 7-8 of this Act states that it the obligation of the government to provide energy in all areas of the country and promote energy investments. ✓ Section 117 states “any person who wishes to carry out generation, exportation, importation, transmission, distribution and retail supply of electricity, must apply for a license from the Authority”	✓ The proposed project is an energy investment project that aims to make electricity accessible to people in the proposed project area and its environs. ✓ KETRACO is a player in the energy sector and regulated by EPRA	✓ KETRACO has applied for and obtained a high voltage power transmission license from EPRA. ✓ The proponent has commissioned an ESIA study for the proposed project ✓ The proponent will be required to implement the ESMP and ESMoP developed and any other conditions that may be issued by NEMA.

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		✓ The Act, also established the Energy and Petroleum Regulatory Authority (EPRC) whose mandate is to regulate all functions and players in the Energy sector. One of the duties of the EPRC is to ensure compliance with Environmental, Health and Safety Standards in the Energy Sector, as empowered by Section 98 of the Energy Act, 2006. In this respect, the following environmental issues will be considered before approval is granted: ▪ The need to protect and manage the environment, and conserve natural resources; ▪ The ability to operate in a manner designated to protect the health and safety of the project employees; the local and other potentially affected communities. ✓ Section 27 and 28 under this Act requires that an application be made before the transmission and supply of bulk energy. Licensing and authorization to generate and transmit electrical power must be supported by an Environmental and Social Impact Assessment (ESIA) Report approved by NEMA. ✓ Article 177 gives obligation to the transmission licensee to make compensation to the owner or occupier of any land or the agents, workmen or servants of the owner or occupier of any land which is the subject of the provisions of the Act, for damage or loss caused by the exercise or use of any power or authority conferred by this Act or by any irregularity, trespass or other wrongful proceeding in the execution of this Act or by the loss or damage or breaking of any energy infrastructure or by reason of any defect in such infrastructure. ✓ Article 179, gives the Cabinet Secretary for Energy Authority for compulsory acquisition of land for purposes of constructing, modifying or operating any energy infrastructure or for incidental purposes where reasonable attempts to acquire the land had failed		
11	The Wildlife Conservation and Management Act No. 47 of 2013 (Revised 2014)	✓ This is an Act of Parliament to provide for the protection, conservation, sustainable use and management of wildlife in Kenya. Section 19 elaborates on the functions of the County Wildlife Conservation and Compensation Committees that includes undertaking education, extension services and public awareness. Section 26(1)	✓ The proposed project will traverse wildlife habitats including; Mugie Conservancy, Engare Narok Forest, Ngare Mare, Magadi, Louniek, Longewan,	The contractor shall; ✓ Prohibit his workers from poaching/hunting of wildlife and shall charge violators in a court of law. ✓ Ensure no invasive species is introduced into the wildlife habitats

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		stipulates that the provisions of this Act with respect to conservation, protection and management of the environment shall be in conformity with the provisions of the Environmental Management and Coordination Act, CAP 387. Section 28 says that Water Act shall apply without exception. Section 29 emphasizes requirement for Sustainable use of land. Section 30 prohibits any activity which is likely to have adverse effects on the environment, including the seepage of toxic waste into streams, rivers, lakes and wetlands. Section 31 provides for declaration of protected areas by the Cabinet Secretary. Section 46 provides for Protection of endangered and threatened ecosystems. Section 47provides for listing of endangered and threatened species and amendment of the list from time to time. Section 89 provides offences relating to pollution of designated wildlife areas and section 92 provides offences relating to endangered and threatened species. ✓ Subject to section 45 (1) No person shall mine or quarry in a national park without the approval and consent of Kenya Wildlife Service (KWS). Where this is approved an ESIA license shall be mandatory. Section 89 (1) provides that any person who: - ➢ discharges any hazardous substances or waste or oil into a designated wildlife area contrary to the provisions of this Act and any other written law; ➢ pollutes wildlife habitats and ecosystems; ➢ discharges any pollutant detrimental to wildlife into a designated wildlife conservation area contrary to the provisions of this Act or any other written law, commits an offence and shall be liable upon conviction to a fine of not less than two million shillings or to imprisonment of not less than five years or to both such fine and imprisonment. ✓ Section 93 stipulates that any person who: - ➢ knowingly introduces an invasive species into a wildlife conservation area; or ➢ Fails to comply with the measures prescribed by the Cabinet Secretary set out under this Act, commits an offence and shall be liable upon conviction to a fine of not less than three hundred thousand shillings or to	Lolmolok, Loosuk, Tinga, Sirata Oirobi, and L'partuk wildlife habitats	✓ Avoid discharging any waste, oil, or any other pollutant into the wildlife habitats ✓ Schedule construction activities to avoid breeding and nesting seasons for any critically endangered or endangered wildlife species. ✓ Apply selective vegetation clearing to minimize loss of fodder for wildlife and natural habitats. ✓ Impose speed limits in the wild areas and on highways where wildlife concentration is high ✓ Liaise with KWS while working in wildlife habitats.

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		imprisonment of not less than one year or to both such fine and imprisonment.		
12	National Museums and Heritage Act No. 6 of 2006, Revised 2012	✓ This law provides for the establishment, control, management and development of national museums and the identification, protection and conservation of cultural and natural heritage of Kenya. ✓ Section 30 states "Where a person discovers a monument or object of archaeological or paleontological interest, the person shall, within seven days, give notice thereof, indicating the precise site and circumstances of the discovery, to the National Museums, and in the case of an object, shall deliver the object to the National Museums or to the District Commissioner to keep it for any particular purpose or for any particular period. ✓ According to section 43 (1) A monument which is for the time being owned by the National Museums, or under the guardianship of the National Museums, shall be properly maintained by the National Museums, except so far as its maintenance is, by such guardianship or agreement the responsibility of the owner of the monument or of any other person. (3) When any such monument or any part thereof is used periodically for religious observances, the National Museums shall make due provision for the protection of the monument from pollution or desecration (a) by prohibiting entry therein, except in accordance with by-laws made with the concurrence of the persons in religious charge of the monument or part thereof, of any person not entitled so to enter by the religious usage of the sect or community by which the monument or part thereof is used; or (b) by taking such other action the National Museums deems necessary. ✓ As per section 57 (1), the Minister may by notice in the *Gazette* appoint persons recommended by the National Museums to be heritage wardens for the purpose of enforcing this Act. A heritage warden appointed under subsection (1) may, with leave of the Attorney-General be appointed prosecutor for purposes of prosecuting offences committed under this Act	✓ Though no archaeology was identified, the proposed transmission line may traverse areas of cultural or national l heritage with objects of archaeological or paleontological interest.	✓ KETRACO shall liaise with National Museums of Kenya to determine presence of archeological or paleontological sites along the line route. ✓ In case of a chance find, the contractor/KETRACO stop the works in that location and notify the National Museums of Kenya for further directions

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13	Forest Conservation and Management Act No. 34 of 2016	✓ An Act of Parliament to give effect to Article 69 of the Constitution with regard to forest resources; to provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socioeconomic development of the country and for connected purposes. The Act applies to all forests on public, community and private lands. ✓ According to section 3, the Act shall apply to all forests on public, community and private lands. ✓ Section 4 give the principles of this Act as: ➢ good governance in accordance with Article 10 of the Constitution; ➢ public participation and community involvement in the management of forests; ➢ consultation and co-operation between the national and county governments; ✓ Section 21 outlines the forestry functions of County Governments. Each County Government: ➢ shall manage all forests on public land defined under Article 62(2) of the Constitution; ➢ shall promote afforestation activities in the county; ➢ shall advice and assist communities and individuals in the management of community forests or private forests; ➢ may enter into joint management agreements with communities or individuals for the management of community forests or private forests. ✓ As per section 42 all indigenous forests and woodlands shall be managed on a sustainable basis for purposes of: ➢ conservation of water, soil and biodiversity; ➢ riparian and shoreline protection; ➢ cultural use and heritage; ✓ Section 44 avers that ➢ Where the Service is satisfied that utilization of a public forest can be done through the granting of a concession, the Service shall grant the concession subject to the provisions of the Constitution, this Act and any other relevant written law. ➢ The Service shall not recommend any such proposal unless: the proposal has been subjected to an independent environmental impact assessment;	✓ The transmission line will pass through wooded areas in Ngare Mare, Magadi, Louniek, Mugie Conservancy, Longewan, Lolmolok, Loosuk, Tinga, Sirata Oirobi, Engare Narok Forest, and L'partuk areas.	✓ ESIA Study has already been Commissioned ✓ KETRACO will liaise with KFS while working in forest and bushy areas ✓ Cutting of trees will only be done where necessary and compensation of cut trees will be done according to KFS rates. ✓ KETRACO will ensure measures are taken to rehabilitate disturbed sites by replacing trees and natural vegetation where appropriate. ✓ KETRACO in consultation with KFS will assist the communities engage in tree planting drives especially in schools ✓ KETRACO to comply with ESIA recommendations on protection of Sacred and Cultural sites and protected/threatened flora species.

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		andpublic consultation in accordance with the Second Schedule has been undertaken and completed. ✓ According to section 64 (1), except under a license or permit or a management agreement issued or entered into under this Act, no person shall, in a publicor provisional forest fell, cut, take, burn, injure or remove any forest produce. ✓ Section 75. No. 9 of 1999 to apply (1) where a provision of this Act requires a person to conserve or protect the environment, the relevant provisions of the Environmental Management and Co-ordination Act, 1999, shall also apply with respect to the manner in which the conservation or protection shall proceed. (3) A user or other related right shall not be granted under this Act where the requirement for a strategic environmental, cultural, economic and social impact assessment licence under the Environmental Management and Co-ordination Act, Cap 387, has not been complied with.		
14	National Land Commission Act, 2012	✓ An Act of Parliament to make further provision as to the functions and powers of the National Land Commission, qualifications and procedures for appointments to the Commission; to give effect to the objects and principles of devolved government in land management and administration, and for connected purposes. Sections 5 outlines the functions of the Commission while section 6 gives the powers of the commission. ✓ The Commission can initiate investigations into present or historical land injustices, recommend appropriate redress, monitor and have oversight responsibilities over land use planning throughout the country.	✓ The Commission will be key in wayleave acquisition for the project.	✓ KETRACO will ensure land acquisition and way leave acquisition is done according to the provisions of this act. ✓ KETARCO will liaise with National Land Commission to determine land owners whose land is affected by the project and for compensation procedures.
15	Land Registration Act No. 3 of 2012	✓ This is an Act of Parliament to revise, consolidate and rationalize the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes. ✓ Section 34 states that “A person who requires an official search in respect of any parcel, shall be entitled to receive particulars of the subsisting entries in the register, certified copies of any document, the cadastral map, or plan filed in the registry upon payment of the prescribed fee” ✓ Section 98 gives conditions for creation of an easement, while sections 99 and 100 talk about cancellation,	✓ The proposed TL will traverse private land. People whose land is traversed by the project will need to be verified, compensated, and an easement registered in their title deeds.	✓ A RAP study has been commissioned. ✓ KETRACO will conduct land searches with County Land Registrar for all affected land parcels to determine the land owners before compensating them. ✓ KETRACO will register easement on title deeds of all PAPs.

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		extinguishment, and enjoyment of easements and analogous rights ✓ The act requires that proper marking and maintenance of boundaries. With regard to the maintenance of boundaries, the Act requires every proprietor of land to maintain in good order the fences, hedges, stones, pillars, beacons, walls and other features that demarcate the boundaries, pursuant to the requirements of any written law.		
16	Community Land Act No. 27 of 2016	✓ This is an ACT of Parliament to give effect to Article 63 (5) of the Constitution; to provide for the recognition, protection and registration of community land rights; management and administration of community land; to provide for the role of county governments in relation to unregistered community land and for connected purposes. Section 4 observes that, subject to Article 40 (3) of the Constitution and the Land Act, no interest in, or right over community land may be compulsorily acquired by the State except in accordance with the law, for a public purpose, and upon prompt payment of just compensation to the person or persons, in full or by negotiated settlement. Section 6. Gives the role of County Governments - the respective county government shall hold in trust for a community any monies payable as compensation for compulsory acquisition of any unregistered community land. According to section 36, an agreement relating to investment in community land shall be made after a free, open, and consultative process and must contain; an ESIA; stakeholder consultations; continuous monitoring and evaluation of the impacts; payment of compensation and royalties; requirement to re-habilitate the land upon completion or abandonment of the project. Part 2 and 3 observes that, an agreement relating to investment in community land shall only be made between the investor and the community with approval from at least two thirds of adult members of the community. Section 39 provides dispute resolution mechanism for disputes in community land which include local community dispute resolution channel, mediation, arbitration and judicial process as a last resort.	✓ The proposed transmission will traverse areas that have community land including Longewan, Lolmolok, Loosuk, Tinga, Sirata Oirobi, and L'partuk community ranches.	✓ Any wayleave acquisition within community land must follow the law and only after payment of a just compensation ✓ KETRACO has commissioned an ESIA study for the proposed project to determine environmental, social and cultural impacts of the project and propose mitigation measures for adverse impacts. ✓ KETRACO should continue stakeholder consultation started during the ESIA process and ensure concurrence of at least two thirds of the adult members. ✓ In case of disputes in community land affected by the project, KETRACO shall apply the stipulated dispute resolution mechanisms which include local community systems, mediation, arbitration and finally judicial process.

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17	Land Act 2012	✓ An Act of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources, and for connected purposes ✓ 19. (1) The Commission shall make rules and regulations for the sustainable conservation of land based natural resources. ✓ Section 107 (7) Says for the purposes of sections 110 to 143, interested, persons shall include any person whose interests appear in the land registry and the spouse or spouses of any such person, as well as any person actually occupying the land and the spouse or spouses of such person. ✓ Section 110. (1) Says that land may be acquired compulsorily under this part if the Commission certifies, in writing, that the land is required for public purposes or in the public interest as related to and necessary for fulfillment of the stated public purpose. ✓ Section 126. Says if the Commission is satisfied that any land of which the occupation or use has been secured under this Part is needed solely as a means of access to other land, then— (b) the compensation to be paid under section 120 shall be limited to the damage done to trees, plants, growing crops and permanent improvements on the land, together with a periodical sum for diminution in the profits of the land and of adjoining land by reason of that use. ✓ Section 146, Says the Commission (National Land Commission) may, create a right of way which shall be known as public right of way. ✓ Section 148 (1) Subject to the provisions of this section, compensation shall be payable to any person for the use of land, of which the person is in lawful or actual occupation, as a communal right of way and, with respect to a wayleave, in addition to any compensation for the use of land for any damage suffered in respect of trees crops and buildings as shall, in cases of private land, be based on the value of the land as determined by a qualified valuer.	✓ Restriction of use of land taken up by the transmission line (30m wide for a distance of 100km). The project will reduce the use of the land occupied by the TL.	✓ KETRACO has commissioned a RAP to determine affected land, crops and structures and their value. ✓ KETRACO will ensure all project affected persons are compensated for wayleave acquired as well as crops and structures affected by the project. ✓ KETRACO will ensure way leave acquisition is done according to the provisions of this act.

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18	Land Value Index Act (Amendment) Act, 2018	This Act states that valuation of land for purposes of compensation shall be based on the Land Value Index which is an analytical representation showing the spatial distribution of land values in a given geographical area at a specific time. This is to be developed jointly by the National Government and County Government. The Act also clearly stipulates that compensation relating to compulsory acquisition shall not be paid to a public body unless there is a demonstrable inference that the land was purchased and developed by that public body. Apart from monetary compensation, the following new forms of compensation have been introduced under the Act: ✓ Allocation of an alternative parcel of land of equivalent value and comparable geographical location and land use to the land compulsorily acquired; ✓ Issuance of government bond; ✓ Grant or transfer of development rights as may be prescribed; ✓ Equity shares in a government-owned entity; and ✓ Any other lawful compensation. The owner whose land has been compulsorily acquired shall elect the form of compensation. The Act establishes the Land Acquisition Tribunal which shall hear disputes related to the compulsory land acquisition process and in determining such disputes, confirm, vary or quash the decision of the NLC. Previously, disputes were referred to the Environment and Land Court (ELC). However, following the passing of this Act, the Tribunal has first instance jurisdiction to hear such disputes with the ELC exercising appellate jurisdiction. Provision is made for Compensation for occupants in good faith of acquired land who may not hold titles having met certain criteria such as they must have occupied the land twelve years prior to publication of notice. An occupant in good Faith does not include a person unlawfully occupying land.	✓ The proposed project involves valuation of land for purposes of compensation.	✓ KETRACO will ensure the land valuation is done according to the provisions of this Act. ✓ KETRACO will also ensure that the compensation process align with the Land Value Index Act, 2018
19	Kenya Roads Act 2007	✓ An Act of Parliament to provide for the establishment of the Kenya National Highways Authority, the Kenya Urban Roads Authority and the Kenya Rural Roads Authority, to	✓ The proposed transmission line will pass over roads including; Rumuruti –Sipili Road; Rumuruti- Bobongi	✓ KETRACO will consult the relevant Road Authorities (KeNHA, KeRRA and KURA) to seek approval before passing the

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		provide for the powers and functions of the authorities and for connected purposes. ✓ Section 49 (1) prohibits erection, construction of any structure on or over or below the surface of a road reserve without approval from the relevant Road Authority.	Road; Ngare Mare-Rumuruti Road; Rumuruti-Ol Motonyi Road; Ol Moran-Survey Road; Louniek-Posta Road; Mugie-Baringo Road; Mugie-Longewan Road; Longewan-Suguta MarMar Road; Longewan-Lolmolok Road; ✓ Loosuk-Poro-Baragoi Road; Tinga-Baragoi Road; Sirata Oirobi-Maralal Road.	transmission line over roads and road reserves.
20	Public Roads and Roads of Access Act Cap. 399 (Revised Edition 2010)	✓ The legislation provides for appropriate governance on development and use of public roads and roads of access. ✓ The Act advocates for: Notification and seeking permission for construction of Roads of Access from land owners; ✓ Section 10 requires that notice is served on land owners affected by the road project. ✓ Section 11 elaborates on granting of leave to construct road of access subject to such conditions and to payment of such compensation in respect of any growing crops or permanent improvements damaged or destroyed by the construction of such road of access	✓ The Construction and Operation activities of the Transmission project will require access roads within the project area. The access roads will pass through private property	✓ KETRACO to ensure contractor acquire land for access roads as per this regulations and apply proposed mitigation measures provided in this ESIA Study Report to minimize impact and inconvenience to project area community
21	Water Act No. 43 of 2016	✓ An Act of Parliament to provide for the regulation, management and development of water resources, water and sewerage service; and for other connected purposes. This Act provides for the regulation, management and development of water resources and water and sewerage services in line with the Constitution. Authorities shall, in administering or applying this Act, be guided by the principles and values set out in Articles 10, 43, 60, and 232 of the Constitution. It establishes the Water Resources Authority ("Authority"), the National Water Harvesting and Storage Authority, the Water Services Regulatory Board, the Water Sector Trust Fund and the Water Tribunal. Section 36 provides that a permit is required for any of the following purposes; ➢ Any use of water from a water resource, except as provided by section 37; ➢ The drainage of any swamp or other land; ➢ The discharge of a pollutant into any water resource; and	✓ Construction phase of the project will have potential to affect underground and surface water resources.	✓ The contractor shall be prohibited to abstract water from water resources without a permit. ✓ Contractor shall be restricted to discharge any form of pollutant into water resources. ✓ Contractor shall create awareness among workers on water resource conservation.

No.	Legislation	Relevance	Trigger	Compliance
		➢ Any other purpose, to be carried out in or in relation to a water resource, which is prescribed by Regulations made under this Act. ✓ Section 143. A person shall not, without authority conferred under this Act (a) willfully obstruct, interfere with, divert or obstruct water from any watercourse or any water resource, or negligently allow any such obstruction, interference, diversion or abstraction; or (b) throw, convey, cause or permit to be thrown or conveyed, any rubbish, dirt, refuse, effluent, trade waste or other offensive matter or thing into or near to any water resource in such manner as to cause, or be likely to cause, pollution of the water resource. ✓ Section 144. (1) Without prejudice to any other remedy or course of action, if a person contravenes any provision under this Act, then, the Authority, the Regulatory Board, the county government executive concerned or the licensee concerned may, by order served on the person concerned, require that person within a reasonable time specified in the order to remedy the contravention and in particular (a) to clean up any pollution or make good any other harm identified in the order which was caused to any water resource by reason of the contravention		
22	The Physical Planning Act No.6 of 1996 Revised 2012	✓ An Act of Parliament to provide for the preparation and implementation of physical development plans and for connected purposes. The Act provides for implementation of regulated development through preparation of physical development plans while taking into account potential environmental impacts. Section 30 states that any person who carries out development without development permission will be required to restore the land to its original condition. Section 31 states,"(1) Any person requiring a development permission shall make an application in the form prescribed in the Fourth Schedule, to the clerk of the local authority responsible for the area in which the land concerned is situated". Section 36 states "If in connection with a development application a local authority is of the opinion that proposals for industrial location, dumping sites, sewerage treatment, quarries or any other development activity will have injurious impact on the environment, the applicant shall be required to	✓ The proposed project has potential to interfere with Physical planning designs of the areas it traverses. ✓	✓ KETRACO shall apply for development permission and share project designs and line routes with relevant physical planning departments (Samburu County and Laikipia County) to ensure it does not affect physical planning designs in the proposed project areas. ✓ KETRACO has commissioned this Environmental Social Impact Assessment Study to determine potential environmental impacts of the project and provide mitigation measures.

No.	Legislation	Relevance	Trigger	Compliance
		submit together with the application an environmental impact assessment report".		
23	Employment Act No 11 of 2007 Revised 2017	✓ An Act of Parliament to repeal the Employment Act, declare and define the fundamental rights of employees, to provide basic conditions of employment of employees, to regulate employment of children, and to provide for matters connected with the foregoing. ✓ ✓ 4(1) No person shall use or assist any other person in recruiting, trafficking or using forced labour. ✓ ✓ 5(3) No employer shall discriminate directly or indirectly, against an employee or prospective employee or harass an employee or prospective employee— (a) on grounds of race, colour, sex, language, religion, political or other opinion, nationality, ethnic or social origin, disability, pregnancy, mental status or HIV status; (b) in respect of recruitment, training, promotion, terms and conditions of employment, termination of employment or other matters arising out of the employment. ✓ ✓ Section 6 of the act prohibits any form of sexual harassment at the workplace. ✓ ✓ 53 (1) Notwithstanding any provision of any written law, no person shall employ a child in any activity which constitutes worst form of child labour.	✓ There will be employment opportunities for skilled, unskilled and semiskilled people during construction and operation phases of the proposed project. ✓ ✓	✓ The contractor will be prohibited from using forced labour during project implementation. ✓ The contractor shall ensure there is no form of discrimination against any worker during construction phase of the project. ✓ Sexual harassment will be strongly prohibited and will be chargeable in a court of law. ✓ The contractor shall not use child labour (workers below 18 years).
24	✓ HIV and AIDS Prevention and Control Act No. 14 of 2006 Revised in 2012	✓ The Act provides for measures for the prevention, management and control of HIV and AIDS, to provide for the protection and promotion of public health and for the appropriate treatment, counseling, support and care of persons infected or at risk of HIV and AIDS infection. ✓ 7 (1) The Government shall ensure the provision of basic information and instruction on HIV and AIDS prevention and control to— (a) employees of all Government Ministries, Departments, authorities and other agencies; and (b) employees of private and informal sectors. ✓ 31 (1) Subject to subsection (2), no person shall be— (a) denied access to any employment for which he is qualified; or (b) transferred, denied promotion or have his employment terminated, on the grounds only of his actual, perceived or suspected HIV status.	✓ Risk of spread of HIV/AIDS and other STIs will be high during construction of the proposed project as a result of an influx of people from different areas.	✓ KETRACO is advised to ensure that the contractor conducts HIV/AIDS awareness campaigns and provides condoms for workers. ✓ The contractor shall be directed not to discriminate any worker at the workplace based on their HIV status.

No.	Legislation	Relevance	Trigger	Compliance
25	Public Health Act, Cap 242	✓ This Act aims to protect public health in Kenya and outlines guidelines in regards to food hygiene and protection of foodstuffs, animal keeping, public water supply, prevention and destruction of mosquitos, and the abatement of nuisances including nuisances arising from sewerage ✓ ✓ Section 115 states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health	✓ The proposed project has potential to cause health nuisances especially during construction phases through generation of waste, human waste, garbage etc.	✓ The contractor shall provide waste receptacles for collecting waste ✓ The contractor shall contract a NEMA licensed waste handler to collect and dispose of waste. ✓ The contractor shall ensure construction activities are conducted between 6 am-6 pm. ✓ The contractor shall provide mobile toilets for workers. ✓ The contractor shall not discharge any form of pollutant into water resources.
26	Climate Change Act, 2016	✓ This is an Act to provide for a regulatory framework for enhanced response to climate change; to provide for mechanism and measures to achieve low carbon climate development. Section 3 stipulates in part, that the national and county governments shall promote low carbon technologies, improve efficiency and reduce emissions intensity by facilitating approaches and uptake of technologies that support low carbon, and climate resilient development. According to section 15 of the Act, each state department and national government public entity shall among others; integrate the climate change action plan into sectoral strategies, action plans and other implementation projections for the assigned legislative and policy functions and report on sectoral greenhouse gas emissions for the national inventory.	✓ Operation of equipment, vehicles and use of certain materials during construction and operation phases of the project has potential to emit greenhouse gases that contribute towards climate change. ✓ Burning of waste on site may contribute towards greenhouse gas emission. ✓ logging or cutting down of trees will reducing the existing carbon sink	✓ The contractor shall; ✓ Service machines and equipment to reduce emission of gases ✓ Create awareness on reducing idling of vehicles and equipment. ✓ Avoid burning of materials on site. ✓ Ensure selective vegetation clearing
27	✓ Civil Aviation Act, 2013	✓ This is an Act of Parliament to provide for the control, regulation and orderly development of civil aviation in Kenya; and for connected purposes and Safety of aircraft and persons on board. Under this Act, the Kenya Civil Aviation Authority (KCAA) has to authorize and approve the height of the mast for the purpose of ensuring the safety of flying aircraft over the proposed project area. Section 56 of Civil Aviation Act (Restriction of building in declared areas) observes that, the Cabinet Secretary may, where he considers it to be necessary in the interests of the safety of air navigation, by order published in the Gazette, prohibit the erection within a declared area of any building or structure above a height specified in the order. A “declared area” in this case means any area adjacent to or in the vicinity of an aerodrome which the Cabinet	✓ The height of transmission line and towers has a potential to interfere with flight paths and aviation safety in general. There are also the following airstrips: ▪ Naibor airstrip (6km) ▪ Mugie airstrip (4km) ▪ Amaya airstrip (9km) ▪ Lesiolo airstrip (11km) ▪ Maralal Boma airstrip (5km)	✓ KETRACO will be required to acquire a KCAA license for this transmission line. ✓ Where it is likely that the power line is hazardous to aviation safety because of its height or location, spherical markers will be used to identify overhead power lines or KETRACO will consider reducing the size of its towers in such sections.

No.	Legislation	Relevance	Trigger	Compliance
		Secretary may by notice in the Gazette declare to be a declared area. Section 57 (Control of structures, etc., on or near aerodromes), observes that, the KCAA Director General may consider provisions for civil aviation safety and security or efficiency of air navigation ought to be made; ▪ whether by lighting or otherwise for giving aircraft warning of the presence of any building, structure, tree or natural growth or formation on or in the vicinity of an aerodrome; or ▪ by the removal or reduction in height of any such obstruction or surface,		
28	Work Injury Benefits Act, 2007;	✓ The Work Injury Compensation Benefit Act 2007 provides guidelines for compensating employees on work-related injuries and diseases contacted in the course of employment; and provision of compulsory insurance for all employees;	✓ The project will be high risk to workers due to its inherent nature of implementation	✓ The proponent will have ensure that both its internal staff and contractors' staff and workers are catered for as provided in this Act. ✓ Contractor and subcontractors must take insurance for all workers
29	National Gender and Equality Commission Act, 2011	✓ An Act of Parliament to establish the National Gender and Equality Commission as a successor to the Kenya National Human Rights and Equality Commission pursuant to Article 59(4) of the Constitution; to provide for the membership, powers and functions of the Commission, and for connected purposes. Key to this act is the affirmative action, popularly known as the Two-thirds gender rule, which requires not more than two-thirds of people who hold public office be from the same gender.	✓ The contractor will need to employ people of different gender.	✓ KETRACO will implore the contractor to give more opportunities to women and to strive to achieve the Two-thirds gender rule.
30	The Valuers Act cap 532	✓ The Act Cap makes provisions for the relevant charges and conducts of valuers in relation to valuation of assets. ✓ The Act also provides the relevant regulations and guidelines in the undertaking of the valuation works.	✓ The project requires land valuation for due compensation to project effected persons	✓ Valuation will be carried out to meet the actual compensation measures and the market rates and reduce any acts of malice in the exercise.
31	Building Code, 2000;	✓ This law recognizes the county governments as the leading planning agencies mandating the potential developers to submit development applications for approval. ✓ The county governments are hence empowered to approve or disapprove plans if they do or don't comply with the law, respectively.	Construction of the transmission line triggers the codes	✓ The proponent has to submit the designs and building plans for approval
32	County Government Act No. 17 of 2012 Revised 2017	✓ The County Government Act is intended to provide powers, functions and responsibilities to deliver services to the Counties under the devolved government.	✓ The project will traverse Laikipia and Samburu Counties	✓ Project plans will be taken to county governments for approval. ✓ Project design will conform to local zonal physical planning requirements

No.	Legislation	Relevance	Trigger	Compliance
		✓ As per section 3 the object and purpose of this Act is to (h) prescribe mechanisms to protect minorities within counties pursuant to Article 197 of the Constitution; ✓ Section 34 says that, the county executive committee shall exercise the executive authority (e) while ensuring the protection and promotion of the interests and rights of minorities and marginalized communities; ✓ Section 94 observes that, a County government shall use the media to (c) undertake advocacy on core development issues such as agriculture, education, health, security, economics, sustainable environment among others; ✓ Section 104 (2) avers that, the county planning framework shall integrate economic, physical, social, environmental and spatial planning. ✓ As per section 110. (2), the spatial plan, which shall be spatial development framework for the county, shall (c) contain strategies and policies regarding the manner in which the strategies and policies shall (vi) contain a strategic assessment of the environmental impact of the spatial development framework; ✓ Section 115. (1) observes that, Public participation in the county planning processes shall be mandatory and be facilitated through (b) provision to the public of clear and unambiguous information on any matter under consideration in the planning process, including— ➢ clear strategic environmental assessments; ➢ clear environmental impact assessment reports;		✓ ESIA Study which is in progress will carry out an all-inclusive Public Participation process through consultations, sensitization meetings and Public Consultation Meetings. ✓ A site-specific Social Assessment, and a VMGP have been developed. The VMGP has outlined appropriate measures to ensure VMGs have equal access to social and economic benefits and opportunities that are also culturally appropriate. ✓ Further, the proponent will implement project structured interventions to ensure vulnerable individuals and households (present among VMGs and non-VMGs) effectively participate in, and benefit from the project.
33	Agriculture and Food Authority Act, No. 13 of 2013 Revised 2015	✓ The Act provides for governance on land classification, land use and preservation. ✓ Section 21. Land Development Guidelines (1) The Cabinet Secretary shall, on the advice of the Authority, and in consultation with the National Land Commission, provide general guidelines, in this Act referred to as land development guidelines, applicable in respect of any category of agricultural land to the owners or the occupiers thereof. ✓ Section 23. Land preservation guidelines ✓ (1) The Cabinet Secretary, on the advice of the Authority, and in consultation with the National Land Commission, for the purposes of the conservation of the soil, or the prevention of the adverse effects of soil erosion on, any land, may, prescribe national guidelines for any or all of	✓ The proposed transmission line crosses over agricultural land where farmers grow crops such maize, beans, potatoes, kales, cabbages, mangos, avocados, and bananas.	✓ Project proponent undertakes to abide by the requirements of the developed guidelines touching on type of development, prevention of adverse effects and following preservation orders issued by County Government.

No.	Legislation	Relevance	Trigger	Compliance
		the following matters: (a) prohibiting, regulating or controlling the undertaking of any agricultural activity including the firing, clearing or destruction of vegetation when such prohibiting, regulating or controlling is deemed by the Cabinet Secretary to be necessary for the protection of land against degradation, the protection of water catchment areas or otherwise, for the preservation of the soil and its fertility; (b) requiring, regulating or controlling: ➢ the afforestation or re-afforestation of land; ➢ the drainage of land, including the construction, maintenance or repair of drains, gullies, contour banks, terraces and diversion ditches; ➢ salination, acidification and saltification of soil; (c) requiring the uprooting or destruction, without payment of any compensation therefore, of any vegetation which has been planted in contravention of a land preservation order; ✓ Section 32. Land preservation orders A county government may make a land preservation order against the owner or occupier of land, or against both the owner and occupier either at the same time or at different times.		
34	The Sexual Offences Act, 2006 and its amendment 2012	✓ The Act of Parliament makes provision about sexual offences, their definition, prevention and the protection of all persons from harm from unlawful sexual acts, and for connected purposes. ✓ The Act gives prominence on observing a standard work ethic to ensure all genders are not subjected to sexual offences. ✓ The Act lists a number of sexual offences for compliance	✓ The Contractor and subcontractors will have a workforce that need to observe this Act	✓ The contractor to have in place a sexual harassment policy ✓ All workers to comply to this Act.
35	Protection of Traditional Knowledge and Cultural Expressions Act, 2016;	✓ The Act of parliament provides a guideline for the protection and promotion of traditional knowledge and cultural expressions	✓ The project is to be implemented within an area regarded to have cultural importance and attachment to their indigenous knowledge	✓ The client will be required to conduct a Vulnerable and Marginalised Group Plan which will address this issue.
36	✓ Laikipia County By-Laws	✓**Laikipia Couny Water Services Bill 2018**: This bill provides the legal and institutional framework for management of water resources, water harvesting, and provision of water and sewerage services in the County and for connected purposes.	✓ Construction activities may interfere with underground water pipes. The contractor campsite will require provision of water and sewer disposal services	✓ The contractor will liaise with relevant water and sewerage services providers for provision of water and sewer services. The contractor will also consult relevant water companies before scheduling excavation works.

No.	Legislation	Relevance	Trigger	Compliance
		✓Laikipia County Health Services Act, 2014 promotes access of quality healthcare. ✓Laikipia County Covid-19 regulations are aimed at suppressing the spread of the Covid-19 virus in the county. ✓**The Laikipia County Public Participation Act 2020** requires that the public is involved before implementation of any government project or process and provides guidelines on how to conduct public participation.	✓ Construction workers may get injuries caused by occupational accidents or develop occupational health problems requiring medical care ✓ The construction phase of the project will involve workers from different parts of the country causing a labour induced population influx in the project area. ✓ The proposed project is a government project and will be implemented in Laikipia County hence public participation is required.	✓The contractor will hire a qualified first aider or nurse to be stationed at the construction site to attend to occupational injuries and diseases. The contractor will liaise with County approved hospitals in the project area for referral of serious injuries and health issues. ✓The contractor will ensure water and soap is proved at all points of entry of the construction sites to curb the spread of Covid-19 virus. The contractor will also ensure that all workers on site have face masks and special waste bins are provided for used masks. ✓Public participation for the proposed project will be conducted according to the guidelines of EIA/EA Regulations 2019 and Laikipia County Public Participation Act 2014.
37	✓ Samburu County By Laws	✓ **The Samburu County Conservancies' Act, 2019** promotes conservation of wildlife in Samburu County and promotes tourism activities. ✓ **The Samburu County Spatial Planning Act, 2018** is an Act of the County Assembly of Samburu to provide for the preparation of the County Spatial Plan and related physical development plans and for connected purposes. ✓ **The Sanburu County Emergency and Disaster Management Act, 2015** provides effective organization of the mitigation of, preparedness for, response to and recovery from emergencies and disasters.	✓ The proposed project will traverse areas with wildlife and Mugie Conservancy which is home to various endangered species. ✓ The proposed TL is a physical development project and will require approval from the physical planning department Samburu County. ✓ Disasters and emergencies eg fire, electrocution, accidents may arise during project implementation.	✓The contactor shall implement all mitigation measures provided in the ESMP to prevent or reduce impacts on wildlife and natural habitats. ✓The contractor will work with KWS, Mugie Conservancy and other wildlife stakeholders to schedule construction activities in areas with wildlife. ✓KETRACO will consult the Department of Physical Planning, Samburu County for guidance and approval. ✓The contractor will implement measures provided in the ESMP to reduce the risk of a disaster and will collaborate with the County Government of Samburu in case of emergencies or disasters.

4.6: World Bank Safeguard policies

4.6.1; World Bank policy OP 4.01 Environmental Assessment

The objective of this policy is to ensure that Bank financed projects are environmentally sound and sustainable, and that decision making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is applicable if a project is likely to have potential (adverse) environmental risks and impacts on its area of influence. OP 4.01 covers impacts on the natural environment (air, water and land); human health and safety; physical cultural resources; and transboundary and global environment concerns. Projects are screened and assigned categories (A, B, C or FI) depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

The operational principles of the policy require the environmental assessment process to;

- Evaluate a project potential environmental risks and impacts in its area of influence
- Examines project alternatives
- Identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts
- Include the process of mitigating and managing adverse environmental impacts throughout project implementation
- Evaluate adequacy of existing legal and institution framework including applicable international environmental agreements. This policy aims to ensure that projects contravening the agreements are not financed.
- Undertake meaningful stakeholder consultation before and during project implementation
- Engage service of independent experts to undertake the environmental assessment
- Provide measures to link the environmental process and findings with studies of economics, financial, institutional, social and technical analysis of the proposed project.

This Project falls under clause 3 subsection 10 (e) of the second schedule of the Environment (Impact Assessment and Audit) (Amendment) Regulations, 2019 and is designated as a high risk project. The project also aligns to category A under OP 4.01. It therefore, require a full Environmental Assessment (EA) since the project is associated with significant impacts.

The Proponent has commissioned an Environmental and Social Impact Assessment study in compliance with the policy. The ESIA study was conducted by independent ESIA experts and underwent an elaborate public participation process and encourages more public consultation and participation during construction, implementation, and decommissioning phases of the

project; examined project alternatives; identified potential negative impacts of the project and formulated mitigation measures for all the identified impacts; and is written in a format suggested by the policy.

4.6.2; World Bank policy OP 4.04 Natural Habitats

This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The World 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.

To meet the requirements of this policy, the ESIA team with the guidance of a qualified and experienced Ecologist collected baseline information on natural habitats and used the information to predict potential project impacts on the ecosystems and formulated measures to eliminate or minimize the impacts. The consulting team also engaged several stakeholders during project impact evaluation and those consulted included NEMA, WRA, KWS, KFS, The *Peregrine Fund, Nature Kenya, Mugie Conservancy, Community Group Ranches (Longewan, Lolmolok, Loosuk, Tinga, Sirata Oirobi, and L'partuk), and County Government Officials among others.*

4.6.3; World Bank policy OP 4.10 Indigenous Peoples

The objective of this policy is to ensure that;

- The development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples;
- Adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and
- Indigenous peoples receive culturally appropriate and gender and intergenerationally inclusive social and economic benefits.

This policy is applicable since Samburu, Maasai, Turkana, Somali, Pokot, Ogiek (assimilated into the Samburu culture), and Borana, communities included among people who meet the OP 4.10 requirements, and to whom this policy would apply are present in the project area.

4.6.4; World Bank policy OP 4.11 Physical Cultural Resources

This policy addresses physical cultural resources, which are defined as movable or immovable objects, sites, structures, groups of structures, and 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 or below ground, or under water. Their cultural interest may be at the local, provincial or national level, or within the international community

Though no Physical Cultural Resources were identified in the project area during the ESIA process, the Contractor/KETRACO shall be required to comply with chance find procedures which should include stopping the works in that location and notifying the National Museums of Kenya (NMK) for further directions.

4.6.5; World Bank Operational Policy 4:12 Involuntary Resettlement

The World Bank safeguard policy on involuntary resettlement, Operational Policy (OP 4.12) establishes guidelines for land acquisition and compensation of people affected by a World Bank sponsored project. Key principles and policy objectives of OP 4:12 can be summarized as to:

- Avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs;
- Assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them;
- Encourage community participation in planning and implementing resettlement; and
- Provide assistance to affected people regardless of the legality of land tenure.

The proponent already has a Resettlement Policy Framework. For this project, the ESIA study recommends a detailed RAP and the proponent to ensure that the RAP is implemented in accordance with the RPF.

4.6.6; World Bank Operational Policy 4:36 Forests

The objective of this policy is to assist borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests. The policy aims to ensure that Forests are managed in a sustainable manner, significant areas of forest are not encroached upon and the rights of communities to use their traditional forest areas in a sustainable manner are not compromised.

While no gazetted/protected forest were observed during the ESIA process, the project will pass through bushland, wooded areas, and privately owned forest areas. Project activities have the potential to affect the health and quality of these resources and the rights and welfare of local resident's dependent on the resources. The ESMP has formulated mitigation measures to ensure conservation of these forested areas.

Table 4.2: World Bank Safeguard Policies Applicable to TL Project

Policy	Applicable	Explanation
Environmental Assessment OP 4.01	Yes	This Project falls under clause 3 subsection 10 (e) of the second schedule of the Environment (Impact Assessment and Audit) (Amendment) Regulations, 2019 and is designated as a high risk project. The project also aligns to category A under OP 4.01. Therefore, this policy is applicable. To address the requirements of this policy, the client has commissioned full Environmental Assessment (EA). The ESIA study was conducted by independent ESIA experts and underwent an elaborate public participation process and encourages more public consultation and participation during construction, implementation, and decommissioning phases of the project; examined project alternatives; identified potential negative impacts of the project and formulated mitigation measures and a monitoring plan for all the identified impacts; and is written in a format suggested by the policy. This policy is applicable under this project.
Natural Habitats OP 4.04	Yes	The project will pass through natural habitats with unique biodiversity. To meet the requirements of this policy, the ESIA team with the guidance of a qualified and experienced Ecologist collected baseline information on natural habitats and used the information to predict potential project impacts on the ecosystems and formulated measures to eliminate or minimize the impacts. The consulting team also engaged several stakeholders during project impact evaluation and those consulted included NEMA, WRA, KWS, KFS, Mugie Conservancy, Community Group Ranches (Longewan, Lolmolok, Loosuk, Tinga, Sirata Oirobi, and L'partuk), and County Government Officials among others. This policy is applicable under this project.
Forests OP 4.36	Yes	While no gazetted/protected forest were observed during the ESIA process, the project will pass through bushland, wooded areas, conservancies, and community forest areas. Forests are classified as critical habitats since they are described as being pristine and harbouring high biodiversity. Project activities have the potential to affect the health and quality of these resources and the rights and welfare of local resident's dependent on the resources. Therefore the policy is applicable. The ESMP has formulated mitigation

		measures to ensure preservation and conservation of these forested areas. This policy is applicable under this project.
Pest Management OP 4.09	No	The project will not involve the use of pesticides for pest management. This policy is not applicable under this project.
Physical Cultural Resources OP 4.11	Yes	Though no Physical Cultural Resources were identified in the project area during the ESIA process, the project will involve excavation activities which may lead to excavation and impacts on PCRs. In case of a Chance Find, the client will be required to comply with chance find procedures which include stopping the works in that location and notifying the National Museums of Kenya (NMK) for further directions. This policy is applicable under this project.
Indigenous Peoples OP 4.10	Yes	The project area is inhabited by Vulnerable and Marginalized Groups (VMGs). The Samburu, Turkana, Borana, Pokot, Somali, Maasai and Ogiek (assimilated into the Samburu culture). These communities meet the World Bank OP 4.10 requirements. Further, since the Ogiek, a minority VMG community is present in the project area and sharing project benefits and opportunities with majority VMGs and other communities, the proponent has undertaken a Social Assessment study which subsequently informed the preparation of a VMGP. The VMGP has outlined appropriate mitigation measures including the application of the Free Prior Informed Consent (FPIC) process. The FPIC process will ensure VMGs understand the full extent of project risks and impacts that may affect them, and the proponent will obtain and document the Free Prior Informed Consent. The VMGP will also ensure VMGs have equal access to social and economic benefits and opportunities that are also culturally appropriate. Further, the proponent will implement project structured interventions to ensure vulnerable individuals and households (present among VMGs and non-VMGs) effectively participate in, and benefit from the project.
Involuntary Resettlement OP 4.12	Yes	The project will affect more than 200 PAPs. This make OP4.12 to be applicable. The client will be required to undertake a full RAP. The RAP should seek ways to avoid or minimize resettlement and should ensure that affected individuals and households and displaced communities are meaningfully engaged and consulted and are timely, adequately, and fairly compensated. This policy is applicable under this project.
Safety of Dams OP 4.37	No	Other than water pans for pastoralist communities, the project will not construct any dams. This policy is not applicable under this project.
Projects on International Waterways OP 7.50	No	The project will not have any activity in catchment areas of international waterways. This policy is not applicable under this project.

Projects in Disputed Areas OP 7.60	No	The project will not implement activities in disputed areas. This policy is not applicable under this project.

4.7 Comparison between World Bank Operation Policies and Kenya Legal Framework

A comparison between the Laws of Kenya and The World Bank Operation Policies are contained in Table 4.3. Table 4.4 gives the Severity of impact of land taking and recommended compensation options as per OP .4.12.

Table 4.3: A Comparative Analysis between World Bank Operation Policies and Kenyan Laws

World Bank Operation Policies	Applicable Kenyan Legal Framework	Comparison/Comment	The law to be applied
OP 4.12 recognizes a) Those who have formal legal rights to land (including customary and traditional rights recognized under the laws of the country); b) Those who do not have formal legal rights to land at the time the census begins but have a claim to such land or assets provided that such claims are recognized under the laws of the country or become recognized through a process identified in the resettlement plan c) Those who have no recognizable legal right or claim to the land they are occupying.	The Land Act 2012, the Community Land Act, 2016, and the Environment and Land Court Act, 2011 recognize those with formal rights to land including customary. The Land Value (Amendment) Act, 2019 observes that, compensation may be made to occupants in good faith of land compulsorily acquired who may not hold title to the land they occupy. The Act therefore, recognizes occupants in good faith of land who include squatters.	No gap	Implement both Kenyan legislation and World Bank Policy.
Compensation levels should be sufficient to replace the lost land and other assets at full replacement cost in local markets.	The Land Value (Amendment) Act, 2019 defines the criteria for valuation of land for purposes of determining the just compensation to be awarded. The Act also observes that, compensation to be awarded should be just, prompt and in full. The Valuers Act (Cap 532), establishes the Valuers Registration Board, which regulates the activities and practice of registered valuers. Registered valuers must be trained on valuation methods one of which is the Gross Replacement Value Method which OP 4.12	No gap	Implement both Kenyan legislation and World Bank Policy.

World Bank Operation Policies	Applicable Kenyan Legal Framework	Comparison/Comment	The law to be applied
	recognizes as the Full Replacement Cost.		
Taking of land and related assets may take place only after compensation has been paid and, where applicable, resettlement sites and moving allowances have been provided to the displaced persons.	The Land Value (Amendment) Act, 2019 observes that, compensation for compulsorily acquired land should be prompt i.e., within a reasonable time of, and in any case not more than one year after, the taking of possession of the land by the Commission and in full including payment of reasonable expenses to be determined by the Commission.	No gap	Implement both Kenyan legislation and World Bank Policy.
Information related to quantification and costing of land, structures and other assets, entitlements, and amounts of compensation and financial assistance are to be disclosed in full to the affected persons. Displaced persons and their communities are provided timely and relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementation and monitoring of resettlement.	Access to Information Act, 2016 observes that, every citizen has the right of access to information held by the State. The proponent is therefore, obligated to disclose all relevant project information to the PAPs in culturally appropriate languages and formats, using feasible techniques such as FGDs, public barazas in easily accessible locations, and a timeframe that enables meaningful consultations.	No gap	Implement both Kenyan legislation and World Bank Policy.
A draft resettlement plan that conforms to OP 4.12 is a condition of appraisal, however, where impacts on the entire population are minor (impacts are considered “minor” if the affected people are not physically displaced and less than 10% of their productive assets are lost), or fewer than 200 people are displaced, an abbreviated resettlement plan may be agreed with the borrower.	Though the Land Act, 2012 is silent on this, most sectoral policies address this issue. KESIP RPF avers that, an Abbreviated Resettlement Action Plan (ARAP) will be prepared for subproject that are likely to affect fewer than 200 people or more than 200 people but with minor land acquisition of land (10% or less) and no physical relocation. Where PAPs include IPs/VMGs or the context is otherwise unusually complex, a RAP will be prepared.	No gap	World Bank OP 4.12 policy
Where there are adverse indirect social or economic impacts, it is good practice for the borrower to undertake a social assessment and implement measures to minimize and mitigate adverse economic and social impacts,	Environmental Management and Coordination Act (EMCA), Cap 387 and the Environmental (Impact Assessment and Audit) Regulations (2003) guides on preparation of environmental and social impact assessment	No gap	Implement both Kenyan legislation and World Bank Policy.

World Bank Operation Policies	Applicable Kenyan Legal Framework	Comparison/Comment	The law to be applied
particularly upon poor and vulnerable groups.			
OP 4.12 requires, the resettlement plan (RP) provides prompt and effective compensation at full replacement cost for losses of assets attributable directly to the project. For households with land-based livelihoods that lose a significant portion of their holdings, Bank policy gives preference to land-based strategies. Payment of cash compensation may be appropriate where (a) livelihoods are land based but the land taken for the project is a small fraction of the affected asset and the residual is economically viable; (b) active markets for land, housing, and labor exist, displaced persons use such markets, and there is sufficient supply of land and housing; or (c) livelihoods are not land-based. Cash compensation levels should be sufficient to replace the lost land and other assets at full replacement cost in local markets.	The Land Value (Amendment) Act, 2019 observes that, compensation for compulsorily acquired land may take any one or more of the following forms; a) allocation of alternative parcel of land of equivalent value and comparable geographical location and land use to the land compulsorily acquired; b) monetary payment either in lump sum or in instalments spread over a period of not more than one year; c) issuance of government bond; d) grant or transfer of development rights as may be prescribed; e) equity shares in a government owned entity; or f) any other lawful compensation.	No gap	Implement both Kenyan legislation and World Bank Policy.
To restore people's income-earning opportunities after land acquisition and resettlement, OP 4.12 specifies that "displaced persons are provided with development assistance in addition to compensation measures such as land preparation, credit facilities, training, or job opportunities".	Kenyan laws are silent on development assistance on top of compensation measures.	KESIP RPF advocates for provision of Rehabilitation Assistance needed to enable PAPs and Displaced Persons to improve their living standards, income earning capacity and production levels or at least maintain them at pre- project levels.	WB's OP 4.12
Resettlement programs to be sustainable, with meaningful consultation with affected parties.	The Land Act, 2012 Act provides steps for sensitizing the affected population. Gives provisions and guidance on consultation on implications and grievance procedures.	Same as the World Bank	WB's OP 4.12
Involuntary resettlement should be avoided where feasible, or	As per the Prevention, Protection and Assistance to Internally	Same as the World Bank	WB's OP 4.12

World Bank Operation Policies	Applicable Kenyan Legal Framework	Comparison/Comment	The law to be applied
minimized, exploring all alternatives. Particular attention should be given to vulnerable groups. Affected persons should be assisted to improve their livelihoods and standards of living or at least to restore them to pre- project levels.	Displaced Persons and Affected Communities Act, 2012, the government shall prevent displacement of persons who have been forced to leave their homes or places of habitual residence as a result of large-scale development projects except in situations justified by overriding public interests. Environmental Management and Coordination Act (EMCA), Cap 387 guides on identification of project impacts including resettlement and preparation of mitigation measures.		
Displaced persons should be assisted in improving livelihoods etc. or at least restoring them to pre-project levels.	The Land Act 2012 guarantees the right to fair and just compensation in case of relocation.	Just and fair compensation as outlined in the Land Act 2012 is not clear and can only be determined by NLC. It gives provisions about improving livelihood or restoring them to pre-project status.	World Bank OP 4.12 policy
PAP Consultation: Displaced persons should be meaningfully consulted and should be given equal opportunities to participate in planning and implementing resettlement programs	The Land Act outlines procedures for consultation with affected population by the NLC and grievance management procedures.	Similar to the World Bank's	Implement both Kenyan legislation and World Bank Procedures.
Grievance Redress Mechanism: A culturally appropriate and accessible grievances redress mechanism will be established and applied to the entire RAP implementation process, including physical and economic resettlement.	The National Land Commission Act, 2012 encourages the application of traditional dispute resolution mechanisms in land conflicts. The Land Act, 2012 establishes the Land Arbitration Tribunal where any dispute arising under the Act are referred to, while the Environment and Land Court Act, 2011 has created a court with powers to deal with disputes relating to land administration and management.	Similar to the World Bank's	Implement both Kenyan legislation and World Bank Policy.

Table 4.4 Severity of impact of land taking and recommended compensation options as per OP .4.12

#	Severity of impact (OP 4.12)	Recommended compensation options
1	If more than 20% of holdings are acquired.	*Option 1:* Replacement land for that taken. *Option 2:* Prorated cash compensation and rehabilitation package.
2	Displaced Persons losing more than 20 percent of their total agricultural land.	Those affected are entitled to a land-replacement option.
3	If less than 20% of holdings are acquired.	Prorated cash compensation is vailed to those affected.
3	If more than 80% of holdings are acquired.	*Option1:* Replacement land for that taken is availed to those affected. *Option 2:* Prorated cash compensation, rehabilitation package, and option to sell residual land.
4	Residual holdings no longer economically viable.	*Option 1*: Replacement land for that taken. *Option 2*: Prorated cash compensation, rehabilitation package, and option to sell residual land.

Source; Involuntary Resettlement Sourcebook; Planning and Implementation in Development Projects by World Bank

4.8: International Conventions

4.8.1; The Rio Declaration and Agenda 2

The action plan for the 21st century are two non-legally binding instruments adopted by the 1992 United Nations Conference on the Environment and Development (UNCED). While the Rio Declaration contains general principles and objectives, Agenda 21 contains detailed guidance on their practical implementation. Principle 4 of the Rio Declaration provides that in order to achieve sustainable development environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it. Principle 25 accentuates this by stating that peace, development and environmental protection are interdependent and indivisible.

4.8.2; The United Nations Convention on Biological Diversity (UNCBD), 2000

The Convention on Biological Diversity (CBD) is an agreement between countries based on natural and biological resources. The CBD has three main goals: to protect biodiversity; to use biodiversity without destroying it; and, to share any benefits from genetic diversity equally.

Article 6 of the convention provides that parties shall develop national strategies, plans or programs for the conservation and sustainable use of biological diversity and endeavour to integrate the conservation and sustainable use of biological diversity into relevant sectorial or cross sectorial plans, programs and policies.

Article 7 of the Convention requires parties to identify components of biodiversity important for conservation and sustainable use and to monitor the components so identified, paying particular attention to those requiring urgent conservation measures and those with potential for sustainable use. Parties are required to identify and monitor processes and activities which may have significant adverse impacts on conservation and sustainable use of biodiversity.

Article 8 requires parties to put in place in situ conservation measures including: -

a. The establishment of a system of protected areas;
b. The promotion of the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;
c. Promotion of environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering the protection of these areas;
d. The rehabilitation and restoration of degraded ecosystems and the recovery of threatened species and
e. Prevention, control and eradication of alien invasive species.

The proponent will put in place measures to ensure that biodiversity is conserved. Where possible clearing of vegetation should be minimized as much as possible, especially as regards to associated transmission line passing through a forest

4.8.3; The United Nations Framework Convention on Climate Change (UNFCCC), 1992

The United Nations Framework Convention on Climate Change provides the basis for concerted international action to mitigate climate change and to adapt to its impacts. Its provisions are far-sighted, innovative and firmly embedded in the concept of sustainable development. With 189 Parties, the Convention has nearly a universal membership.

According to Article 2, the Convention's ultimate objective is "to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic [originating in human activity] interference with the climate system". This objective is qualified in that it "should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner". In stating this objective, the Convention reflects concerns that the earth's climate system is threatened by a rise in atmospheric greenhouse gas (GHG) concentrations, which is caused by increased anthropogenic GHG emissions. The Convention does not state a limit for total anthropogenic GHG emissions which would have to be respected

to reach the objective. Nor does it indicate the level of total GHG concentrations beyond which "dangerous anthropogenic interference with the climate system" would occur. Estimates of where these levels lie evolve continually with scientific advances and are complicated by the political need to take into account the changing ability of societies to adapt to climate change. Another important factor is that stabilizing atmospheric concentrations of GHGs to near current levels would actually require a steep reduction of current emissions. This is because, once emitted, GHGs remain in the atmosphere for a considerable length of time: carbon dioxide, for instance, stays in the climate system, on average, for a century or more.

According to Article 4(1), the convention provides that all parties make general commitments regarding;

a. The establishment of national inventories of greenhouse emissions and sinks;
b. The promotion of scientific and technical cooperation;
c. The sustainable management of forests, oceans and ecosystems and
d. The integration of climate change considerations in national social, economic and environmental policies.

Bush clearing on the way-leave trace, extra efficiency (30% of energy is lost while transmitting power on 33 and 66kV lines as opposed to high voltage lines), and communities adopting use of electricity as opposed to fossil and wood fuels will invoke this treaty. The Proponent will ensure that the contractor adopts measures to reduce greenhouse gas emission during the construction and operation phase of the project as outlined in the ESMP.

4.8.4; United Nations Convention to Combat Desertification (UNCCD)

The UNCCD was adopted on 17th June 1994 in Paris and came into force on 26th December 1996. Kenya ratified the Convention in 24th June 1997. The purpose of the Convention is to address the problem of the degradation of land by desertification and the impact of drought particularly in arid and dry semi-humid areas. The strategic objectives of the convention are to;

1. Improve the condition of affected ecosystems, combat desertification/land degradation, promote sustainable land management and contribute to land degradation neutrality
2. Improve the living conditions of affected populations
3. Mitigate, adapt to, and manage the effects of drought in order to enhance resilience of vulnerable populations and ecosystems
4. Generate global environmental benefits through effective implementation of the UNCCD

5. Mobilize substantial and additional financial and non-financial resources to support the implementation of the Convention by building effective partnerships at global and national level

The project is located in an arid area and KETRACO shall put into place mitigation measures proposed in the ESMP that reverse land degradation including selective clearance of vegetation, tree planting, and preventing soil erosion among other measures.

4.8.5; African Convention on the Conservation of Nature and Natural Resources

It was held on 15 September, 1968 in Algiers. The convention sought to awaken the continent on the need to preserve natural ecosystems and employ sustainable use of natural resources of economic importance, particularly the soil, water, flora and fauna.

KETRACO shall encourage the planting of indigenous trees to try to restore a balance within the ecosystem in areas that will be disturbed.

4.8.6; The convention on the Conservation of Migratory Species of Wild Animals (CMS)

The convention on the Conservation of Migratory Species of Wild Animals (CMS), in force since 1983, is the only global convention focused on the conservation of migratory species, their habitats and their migration routes. Kenya ratified the CMS and thus has an obligation to promote protection of endangered migratory species.

The proposed project traverses in areas where there are wild animals. KETRACO in collaboration with KWS will implement measures to avoid interfering with migratory paths and habitats of wild animals and birds that may be traversed by the project.

4.8.7; Paris Agreement

The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC), dealing with greenhouse gas emissions mitigations, adaptation and finance. The long term goal of this agreement is to keep the increase in global average temperature to well below 2^0 C above pre-industrial levels; and to limit the increase to 1.5^0 C, since this would substantially reduce the risks and effects of climate change.

To promote the goals of the Paris Agreement, KETRACO and the contractor will ensure that greenhouse gas emission reduction measures recommended in the ESMP and Monitoring Plan are adhered to.

4.8.8; Convention on International Trade in Endangered Species

This Convention was adopted on 3rd March 1973 and came into force on 1st July 1975. The purpose of the Convention is to regulate the international trade in wild plants and animals that are at risk of extinction as a result of trade. The Convention seeks to control trade not only in live species but also in dead specimen and their derivatives. The Kenya Government ratified CITES on 13th December 1978. The lead agency for the CITES in Kenya is the Kenya Wildlife Service (KWS).

The proponent and the Consultant with the support of KWS, community, and Mugie Conservancy will strictly ensure that, no worker engage in hunting/poaching of wildlife

4.9: Institutional Framework

4.9.1; Environmental Institutional Framework

This section presents the institutions important to the environmental implementation of the project.

National Environmental Management Authority (NEMA)

The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. A Director-General appointed by the president heads NEMA. The Authority shall:

- Co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plan, programmes and projects with a view to ensuring the proper management and rational utilization of the environmental resources on a sustainable yield basis for the improvement of the quality of human life in Kenya.
- Take stock of the natural resources in Kenya and their utilization and conservation, with the relevant lead agencies.
- Examine land use patterns to determine their impact on the quality and quantity of the natural resources.
- Carry out surveys, which will assist in the proper management and conservation of the environment.
- Advise the government on legislative and other measures for the management of the environment or the implementation of relevant international conservation treaties and agreements in the field of environment as the case may be.

- Advise the government on regional and international environmental convention treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements where Kenya is a party.
- Undertake and co-ordinate research, investigation and surveys in the field of environment and collect and disseminate information about the findings of such research, investigation or survey.
- Mobilize and monitor the use of financial and human resources for environmental management.
- Identify projects and programmes or types of projects and programmes, plans and policies for which environmental audit or environmental monitoring must be conducted under EMCA.
- Initiate and evolve procedures and safeguards for the prevention of accidents, which may cause environmental degradation and evolve remedial measures where accidents occur.
- Monitor and assess activities, including activities being carried out by relevant lead agencies in order to ensure that the environment is not degraded by such activities, environmental management objectives are adhered to and adequate early warning on impeding environmental emergencies is given.
- Undertake, in co-operation with relevant lead agencies programmes intended to enhance environmental education and public awareness about the need for sound environmental management as well as for enlisting public support and encouraging the effort made by other entities in that regard.
- Publish and disseminate manuals, codes or guidelines relating to environmental management and prevention or abatement of environmental degradation.
- Render advice and technical support, where possible to entities engaged in natural resources management and environmental protection so as to enable them to carry out their responsibilities satisfactorily.
- Prepare and issue an annual report on the state of the environment in Kenya and in this regard may direct any lead agency to prepare and submit to it a report on the state of the sector of the environment under the administration of that lead agency and,
- Perform such other functions as government may assign to the Authority or as are incidental or conducive to the exercise by the authority of any or all of the functions provided under EMCA.

National Environmental Complaints Committee (NECC)

The Committee performs the following functions:

- Investigate any allegations or complaints against any person or against the authority in relation to the condition of the environment in Kenya and on its own motion, any suspected case of environmental degradation and to make a report of its findings together with its recommendations thereon to the Council.
- Prepare and submit to the Council periodic reports of its activities which shall form part of the annual report on the state of the environment under section 9 (3) and
- To perform such other functions and excise such powers as may be assigned to it by the council.

National Environmental Tribunal (NET)

This tribunal guides the handling of cases related to environmental offences in the Republic of Kenya. If disputes to this project arise, they are supposed to be presented here for hearing and legal direction.

4.9.2; Ministerial Institutional Framework

There are several institutions that have been set up to operate under the Ministry of Energy and Petroleum (MOE&P) to provide services in the energy sector particularly generation, transmission and distribution of electricity. They include Energy and Petroleum Regulatory Authority (EPRA), Kenya Electricity Generating Company (KenGen), The Kenya Power and Lighting Company (KPLC), The Rural Electrification Authority (REA), Kenya Electricity Transmission Company (KETRACO), Geothermal Development Company (GDC), Energy Tribunal, Kenya Nuclear Electricity Board (KNEB), and Independent Power Producers (IPPs).

The roles and functions of these institutions have been categorized into generation, transmission, distribution, oversight, policy and regulation. The functions are elaborated in Table 4.2 below

Table 4.5: Roles of Organizations involved in Electricity Generation & Distribution

No.	Category	Institution	Role/Function
1	Policy	Ministry of Energy and Petroleum (MOE&P)	MOE&P is in charge of making and articulating energy policies to create an enabling environment for efficient operation and growth of the sector.
3	Arbitration	Energy Tribunal	Energy Tribunal is an independent legal entity which was set up to arbitrate disputes in the sector.

No.	Category	Institution	Role/Function
4	Regulation	Energy Regulatory Commission (ERC)	Energy Regulatory Commission (ERC) is responsible for regulation of the energy sector. Functions include tariff setting and oversight, coordination of the development of Indicative Energy Plans, and monitoring and enforcement of sector regulations.
5	Generation	Kenya Electricity Generating Company (KenGen)	KenGen carries out generation of electricity from hydropower, thermal, geothermal and wind.
		Geothermal Development Company (GDC)	GDC undertakes surface exploration of geothermal fields, exploratory appraisal and production drilling, and management of steam fields as well as entering into steam sales agreements with investors.
		Independent Power Producers (IPPs)	IPPs are private investors that are involved in generation either on a large scale or for the development of renewable energy under the Feed-in-tariff Policy. Some of the IPPs include IberAfrica Power, Rabai Power, Tsavo Power, or Power, Mumias Sugar Company etc
6	Transmission	Kenya Electricity Transmission Company (KETRACO)	KETRACO Plans, designs, constructs, owns, operates and maintains new high voltage (132kV and above) electricity transmission infrastructure.
7	Distribution	Kenya Power and Lighting Company commonly known as Kenya Power	KPLC is the off-taker in the power market buying power from all power generators on the basis of negotiated Power Purchase Agreements (PPAs) for onward transmission, distribution and supply to consumers.
		Rural Electrification and Renewable Energy Corporation (REREC).	Rural Electrification and Renewable Energy Corporation (REREC) has a mandate of implementing rural electrification projects with an additional mandate of spearheading Kenya's green energy drive.

4.9.3 The World Bank

The World Bank plays a critical role in implementation of the ESIA since it has laid globally accepted operational policies to which all actors are to comply with. The WB will provide supervisory roles in the implementation of the ESIA and the project through monitoring of use of funds and the Environmental Social Performance of the project against the laid procedures in the Operational Policies, the ESMF and the ESMP.

4.10 Grievance Redress Mechanism for Workers and Community Members.

KETRACO at the beginning of RAP implementation process will set up a Community Resettlement Committee (CRC) whose role, among others, will be resolution of disputes as soon as they arise, through an agreed socio-cultural approach. The CRC shall comprise of diverse stakeholder groups including at the lowest tier, at which most grievances and disputes should be resolved, PAPs, community elders, local administration, intergenerationally inclusive community members who are conversant with socio-cultural GRM process, and community level organization representatives. In its composition, KETRACO should consider all groups including women, youth, and Persons with Disability.

Grievances may be received by village elders, local leaders (including religious leaders), politicians, members of CRC, local administrators (chiefs and ward reps), or KETRACO staff and can be through any mean including oral, letter, email, or telephone.

The procedure for addressing grievances at the community level will start with registration of the grievances with KETRACO's Community Liaison Officer (CLO) on site or with the CRC. The CLO will, within a week, convene a meeting with CRC, invite the aggrieved party to the meeting and present the grievance to the committee for hearing. The committee will resolve the complaint if possible, if not, the CLO will escalate the unresolved complaints to the PIU.

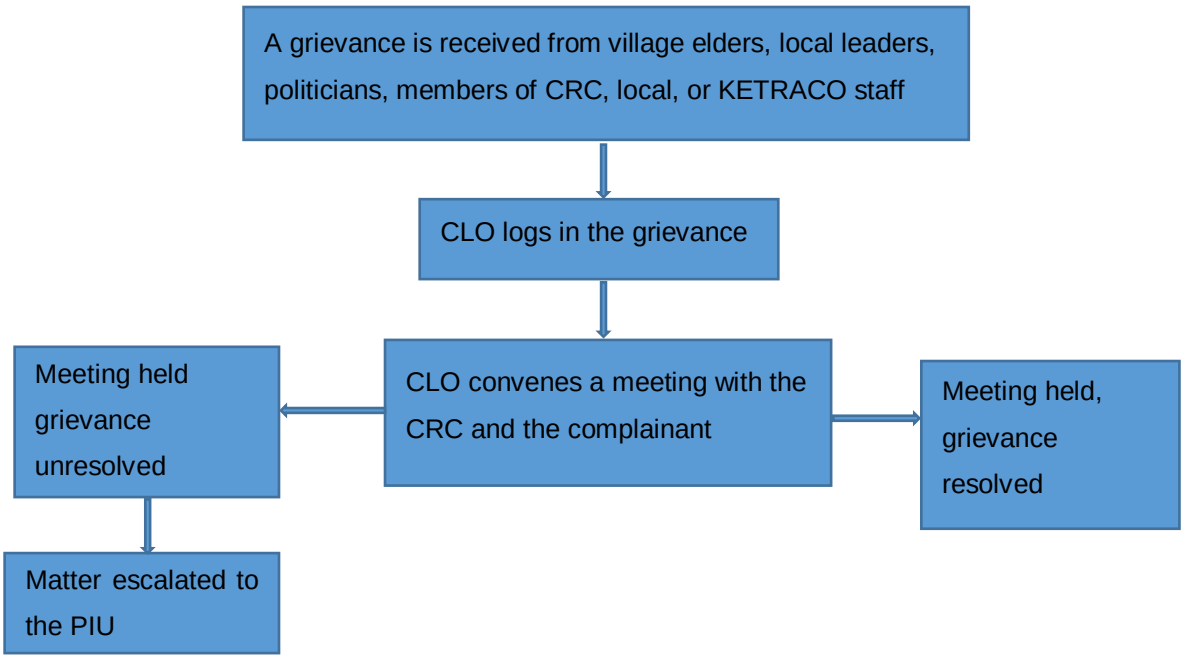

Figure 4.1: Community Level Grievance redress procedure

The second level grievance redress will be at the Company level, whereby, grievances will be received by KETRACO through email, letters, verbal, suggestion box or from the CLO. Once grievances are received, they will be logged into the grievance log in the office. Some grievances may be resolved immediately, if not, they will be escalated to KETRACO's PIU. KETRACO will acknowledge receipt of complaints within two weeks and will strive to resolve each complaint within two months. In the two levels, and where necessarily, the GRM process should ensure anonymity in reporting complaints.

The PIU will convene a meeting with the aggrieved party and seek to resolve the grievance. However, if the PIU is unable to resolve it, depending on the nature of the grievance, the PIU, through the General Manager Technical Services (GMTS) or the Company Secretary (CS), will escalate the grievance to the Ministry of Energy and Petroleum, the National Land Commission (NLC), or the National Environmental Complaints Committee (NECC) for arbitration. MoEP, NLC, or NECC will resolve it but if unable to, the aggrieved party will have an option to go to court in which case the court judgement will be final as well as access the World Bank GRS. It is worth noting here that, while aggrieved parties shall be free to pursue legal redress according to the laws of the land, cases that are referred to the legal redress system shall no longer be within the control of the project.

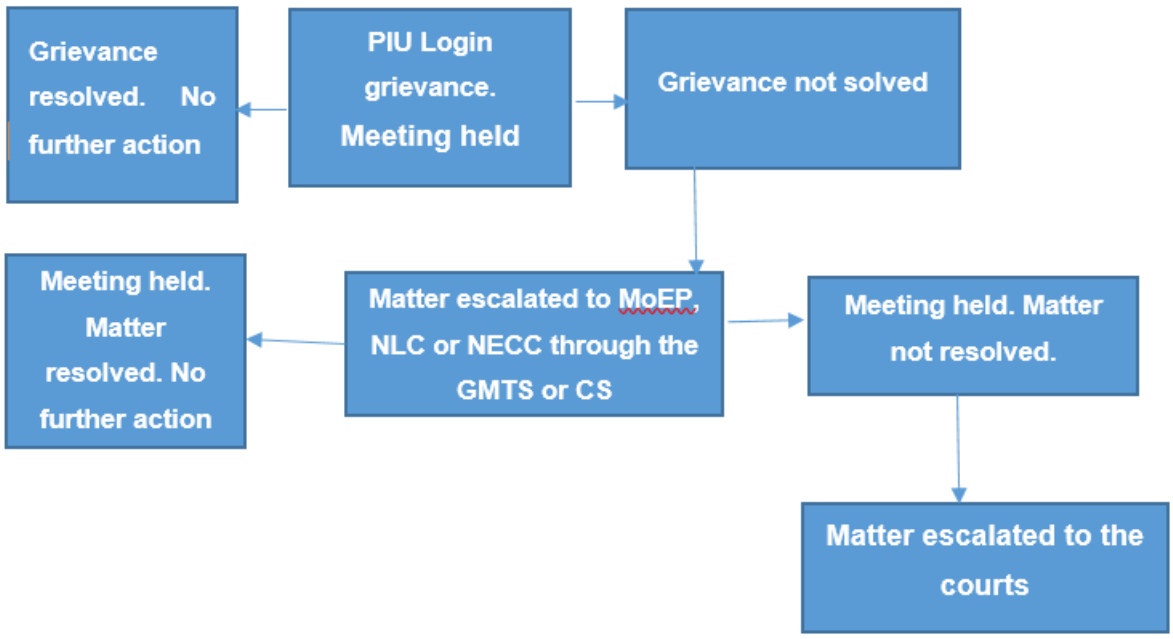

Figure 4.2: PIU level Grievance Redress Procedures

The World Bank Grievance Redress Service

The World Bank's Grievance Redress Service (GRS) provides an additional, accessible way for individuals and communities to complain directly to the World Bank if they believe that a World Bank financed project had or is likely to have adverse effects on them or their community. The GRS enhances the World Bank's responsiveness and accountability by ensuring that grievances are promptly reviewed and responded to, and problems and solutions are identified by working together.

The GRS accepts complaints in English or the official language of the country of the person submitting the complaint. Submissions to the GRS may be sent by:

Email: grievances@worldbank.org
Fax: +1-202-614-7313
Letter: The World Bank
Grievance Redress Service (GRS)
MSN MC 10-1018
1818 H St NW
Washington, DC 20433, USA
http://pubdocs.worldbank.org/en/440501429013195875/GRS-2015-BrochureDec.pdf

World Bank Inspection Panel

The Inspection Panel is an independent complaints mechanism for people and communities who believe that they have been, or are likely to be, adversely affected by a World Bank-funded project. The Board of Executive Directors created the Inspection Panel in 1993 to ensure that people have access to an independent body to express their concerns and seek recourse. The Panel assesses allegations of harm to people or the environment and reviews whether the Bank followed its operational policies and procedures

The Panel has authority to receive Requests for Inspection, which raise issues of harm as a result of a violation of the Bank's policies and procedures from any group of two or more people in the country where the Bank financed project is located who believe that, as a result of the Bank's violation of its policies and procedures, their rights or interests have been, or are likely to be adversely affected in a direct and material way. They may be:

- an organization, association, society, or other group of individuals;
- A duly appointed local representative acting on explicit instructions as the agent of
- adversely affected people;
- In exceptional cases, a foreign representative acting as the agent of adversely affected
- people;

- An Executive Director of the Bank in special cases of serious alleged violations of the
- Bank's policies and procedures.

The Panel may be contacted by:

Email; ipanel@worldbank.org

Phone +1-202-458-5200

Fax +1 202-522-0916 (Washington, D.C.)

mail at: Inspection Panel, Mail Stop MC 10-1007, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A.

http://ewebapps.worldbank.org/apps/ip/Documents/Guidelines_How%20to%20File_for_web.pdf

CHAPTER 5: STAKEHOLDER CONSULTATION

5.1: Introduction

Stakeholder consultation was undertaken among people living in the environs of the proposed transmission line project as an integral part of the ESIA study. The aim was to ensure that all stakeholder interests were identified and incorporated in project development at planning, implementation and operation phases.

The specific objectives for consultation process were to:

- Create public awareness about the proposed project
- Seek public opinion and concerns relating to the project and more specifically problems they anticipate and ways of overcoming them.
- Obtain professional advice from sector heads including departmental heads and local administration
- Consultatively and in a participatory way identify potential positive and negative impacts of the project and seek remedial measures
- Sell the project to the public for their acceptance and ownership

These meetings enabled interested and affected parties to contribute their concerns (views and opinions on the proposed project) which might have been overlooked during the scoping exercise. Findings of stakeholder analysis were very important in predicting impacts and development of ESMP. Stakeholder consultations for the proposed project followed several steps as described below:

5.2: Stakeholders Mapping and Analysis;

Two major categories of stakeholders were identified;

1. Those who were affected by the project and
2. Interested Parties

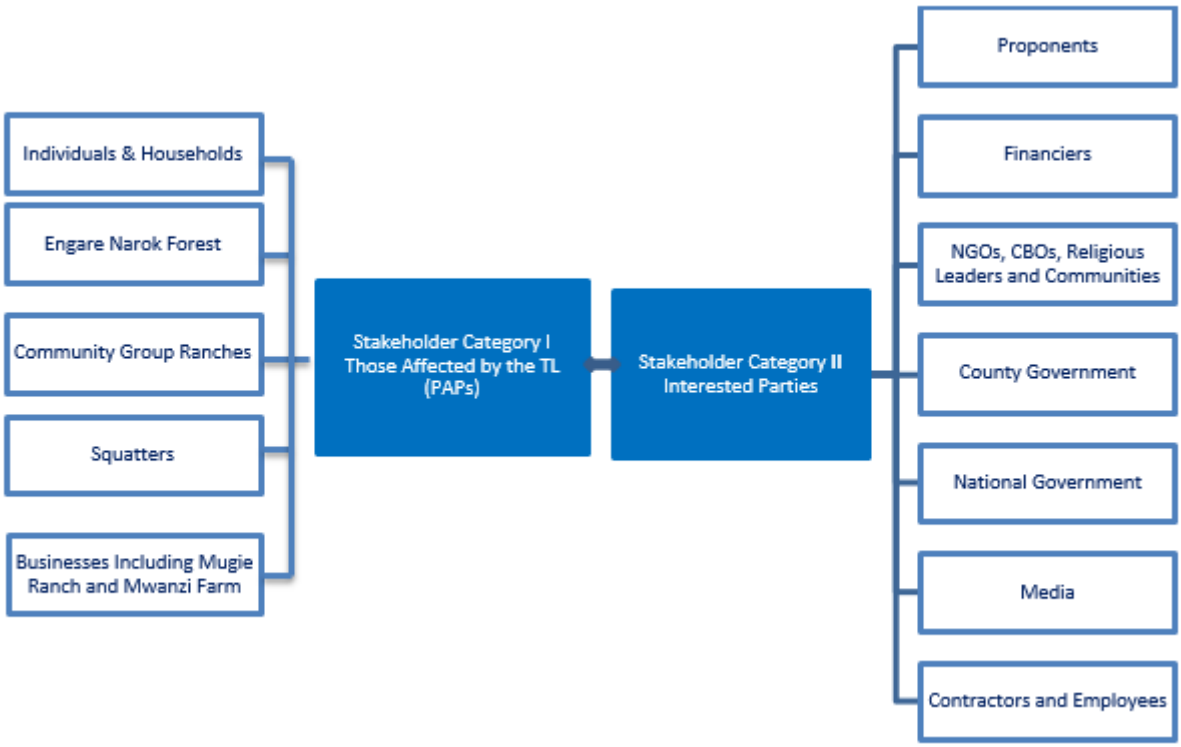

Figure *5.1: Identified key stakeholders*

The proposed project will typically involve construction of a transmission line from Rumuruti to Maralal. Of necessity, land for the location of the transmission line must be acquired. Individuals, households, businesses, and institutions whose land, structures, or trees and crops will be affected by the project are known as Project Affected Persons (PAPs) and were categorized as Stakeholder Category I.

The second category (Interested Parties) comprised of National and County Government officers in charge of diverse sectors which are likely to be impacted by the project. This category was consulted as key informants on sectoral policy and to advise the ESIA study on mitigation measures to be put in place so as to minimize adverse impacts in their respective sectors. This category also included local policy makers and opinion leaders, local administration, NGOs, Religious leaders, media, and other community level stakeholders (persons who lived close to the TL route but whose property was not affected). The proponent, contractors, sub-contractors, and employees were also identified as key stakeholders.

5.3: Approach to Stakeholder Consultations

A detailed stakeholder's consultation for this study was undertaken from 29th July to 31st October, 2019. These consultations were conducted in the form of:

5.3.1; Key Informant oral Interviews:

The following people were consulted:

Laikipia County

1) County Director of Environment, National Environment Management Authority
2) Senior Warden, Kenya Wildlife Service
3) Managing Director, The Mugie Conservancy Ltd.
4) Sub-regional Manager, Water Resources Authority
5) Ag. Director- Ministry of Water
6) Engineer II, Agriculture- Department of Irrigation
7) Director Environment- Department of Environment and Natural Resources
8) Deputy Head of Section- Fisheries Department
9) Head of Livestock Production- Department of Agriculture, Livestock and Fisheries
10) Crops and Livestock Development Officer- Department of Agriculture
11) Sub county Livestock Production Officer, Livestock Production
12) Scheme Manager, Nyahururu Water and Sanitation Company
13) County Occupational Safety and Health Officer- DOSHS Office
14) County Drought Coordinator- National Drought Management Authority
15) Executive Director, Laikipia Wildlife Forum
16) Chief Officer- Infrastructure
17) Deputy Director, Kenya Rural Roads Authority
18) Chief, Magadi
19) Assistant Chief, Magadi
20) Assistant Chief, Luoneik
21) Assistant Chief, Ol Mutonyi
22) Deputy Head Teacher, Ol Mutonyi Primary School
23) Senior Chief, Rumuruti
24) Assistant Chief 1, Rumuruti
25) Assistant Chief 2, Rumuruti
26) Assistant Chief, Sosian Location
27) Pastor, Lemis Evangelist Ministry Rumuruti
28) Chief, Ol Moran
29) Assistant Chief, Ol Moran

Samburu County

1) County Director of Environment, National Environment Management Authority
2) Senior Warden, Kenya Wildlife Service

3) Ecosystem Conservator, Kenya Forest Service
4) Senior Superintendent Water, County Water Directorate
5) Technical Manager, Samburu Water and Sanitation Company Limited
6) County Director of Environment, Natural Resources and Energy
7) Physical Planning Officer, Samburu County Government
8) Public Health Officer, Public Health Department
9) Project Office Assistant, Regional Livelihood Resilience project
10) County Drought Information Officer, National Drought Management Authority
11) District Social Development Officer, Department of Social Development
12) Monitoring and Evaluation Officer, Agricultural Sector Development Support Programme
13) Principal Youth Officer
14) Ward Administrator, Loosuk
15) Chairman and Secretary for Longewan, Lolmolok, Loosuk, Tinga, Sirata Oirobi, and L'patuk Group Ranches
16) Assistant Chief, Lolmolok
17) Chief Loosuk
18) Assistant Chief, Loosuk
19) Assistant Chief, Sirata Oirobi
20) Chief Maralal
21) Assistant Chief, L'partuk

Nairobi County

1. Senior Aerodrome Inspector, Kenya Civil Aviation Authority.
2. Collection Manager and Cultural Heritage Researcher, National Museums of Kenya.
3. Assistant Director of Africa Programs, The Peregrine Fund.
4. Membership Manager, Nature Kenya.
5. The Chief of Defence Forces, Kenya Defence Forces

5.3.2; Key Informant Questionnaires:

Open-ended questionnaires were administered to stakeholders comprised of GoK officers and civil society groups in charge of diverse sectors which are likely to be impacted by the proposed project. Concerns, views and opinions from a total of 34 respondents were received (Appendix VIII).

5.3.3; Community Questionnaires:

Open-ended questionnaires were administered to households, and small business enterprises neighbouring the site. Concerns, views and opinions from a total of 218 respondents (155 male and 63 female) were received (Appendix IX).

5.3.4; Public *Baraza*

Public *barazas* were held in Mutamaiyo, Ngare Mare, Namochong, Ol Mutonyi, Ol Moran, Survey/Magadi, Luoniek, Longewan, Lolmolok, Loosuk and L'partuk villages/towns with the assistance of the local administration and leaders. A public announcement notice in both English and Kiswahili (appendix VI) was given to the chiefs 2 weeks prior to the meeting (appendix VII) to ensure more community members were aware of the meeting and attended. The chiefs were requested to also include in their invitations women, youth, PWDs, and the elite in the society like teachers.

In the *barazas*, the consultant team would introduce themselves, their consultancy, the proponent, and the World Bank; explain to the communities the proposed project; highlight the advantages of the project; inform the participants that, they had been contracted among others to help develop an environmental management plan that would ensure any negative impacts of the project are mitigated and that the participants had been identified as an important stakeholder who would assist in developing the management plan and therefore the reason for the visit.

Representatives from the proponent (KETRACO) consisting of an Environmentalist, Socio-Economist, and a Land-Economist were also present in the public *barazas*.

The environmentalist generally explained that KETRACO was a 100% Government entity under the Ministry of Energy mandated to transmit high voltage power from the generating companies like KENGEN and GDC. The transmitted power would be stepped down at a step-down substation for distribution by Kenya Power. He would explain that, the proposed Rumuruti-Maralal transmission line would be part of a circuit that was in the works to include the Lessos- Kabarnet- Rumuruti, the Nanyuki-Rumuruti, the Isiolo- Nanyuki, and the Isiolo-Maralal transmission lines which were either under construction or had been proposed. The rationale behind the construction was to aid in powering Kenya in accordance with the Big 4 Agenda to facilitate industrialization. The benefits that the communities would accrue from the project include: creation of employment during the construction phase and in the industries that would be set up; supply of clean, reliable, and secure power that had no black-outs; creation of business opportunities such as supply of materials, catering for workers,

refrigeration, and welding; and improvement of security through street lighting. However, the project would have some anticipated negative impacts like felling of trees on the wayleave (which would be compensated for and more planted), dust emission which the contractor would mitigate by sprinkling water on the roads, and noise pollution which would be mitigated by constructing during the day. The contractor would be required to source unskilled labour from the locality. Socially, the project would bring about social vices and conflict arising from cultural differences. The community and the contractor would be educated on co-existence. On waste management, the contractor would be required to handle waste in a rational manner. On matters sanitation the contractor would be required to ensure use of mobile toilets for all staff. The contractor would be required to regularly repair the machinery on concrete ground to avoid oil from seeping into the ground. He would also add that the pylons would be secured with barbed wire and spikes to prevent people from climbing and that workers erecting them would be equipped with safety gear (PPEs) at all times.

The Land-Economist generally explained that there will be compensation for the affected assets. Three types of compensation including Structures, Land, and Trees/Crops were given. For structures, the company would compensate based on valuation and the World Bank's requirement of 'Full Replacement Cost'. The agreed amount would be paid through the owner's bank account. He explained that compensation would be done in two phases, 70% to aid in relocation and 30% on proof of relocation. There would be an additional 15% disturbance allowance. For crops/trees, way leave officers would conduct a census of the affected crop/trees and record the number against which the owner would sign if satisfied including the chief to affirm that indeed the crops belong to the affected person. The rates for these would be dictated by the Kenya Forest Service and the Ministry of Agriculture. Compensation of land would be based on proof of ownership, level and extent of impact. He explained that the company doesn't buy land but instead seeks the right of way hence a maximum of 98% compensation. This implies that the land owner would retain ownership but has limited use on the land (prohibited from planting trees capable of growing beyond 6 feet (1.8m) and erecting structures on the way leave of the transmission line). According to KETRACO, whole land is compensated if the remaining unaffected land is less than 2,000m^2.

In the meetings, the Socio-Economist emphasized on the need to ensure the societies in the project area are not negatively affected but also do not take undue advantage which would increase the project cost and create a big burden to the Government. He gave an example of one of the lines where some people learned of where it would pass through and built structures along the wayleave. KETRACO in this instant rerouted the line and speculators lost a lot of money. He explained to the participants that, the project was aimed at promoting social

economic benefits in the area and that since it was a World Bank funded project, its implementation, would be very keen on environment and social welfare. He informed the participants that, apart from developing the local transmission lines KETRACO also builds interconnectors (between countries) in bid to increase Kenya's power supply and to create a highway for power trade. Such interconnectors included, the Ethiopia-Kenya TL, the Kenya-Uganda TL, and Kenya-Tanzania TL. The lines would boost power pools like Southern Africa and Northern Africa Power Pools. He assured participants that, all affected property would be compensated for and reiterated the benefits of the project to the society including, increasing the supply of power, improving connectivity, supporting industrialization, street lighting and generally improving the quality of life thus transforming the lives of the people within and around the project area.

Table 5.1: Summary of Consultative Meetings

Area	Date	Venue	Time	Attendance		
				Male	Female	Total
Laikipia County						
Magadi/Survey	29/07/2019	Survey Dispensary	10:00am-1:05pm	29	15	44
Luoniek	29/07/2019	Luoniek Chief's camp	2:00pm-3:56pm	71	11	82
Namochong	30/07/2019	Namochong Village	3:00pm-4:01pm	20	0	20
Ol Mutonyi	30/07/2019	Ol Mutonyi Centre	10:00am-1:00pm	36	13	49
Mutamaiyo	31/07/2019	Mutamaiyo Centre	10:00am-1:10pm	38	50	88
Ngare Mare	31/07/2019	Ngare Mare Village	2:30pm-3:40 pm	24	0	24
Ol Moran	01/08/2019	Parariro dam	11:00am-1:10pm	54	18	72
Samburu County						
Longewan	02/08/2019	Longewan Centre	10.00am-11:17am	61	0	61
Lolmolok	02/08/2019	Lolmolok Centre	1:00pm-3:00pm	76	0	76
Loosuk	03/08/2019	Loosuk Chief's Camp	11.00am-1:38pm	79	5	84
L'partuk	03/08/2019	L'partuk Dispensary	2:00pm-3:56pm	39	7	46

Women representation in most location was fair except in four centers where despite the team's insistence on the chief to invite women, none attended since none was available at the location and time of the meeting. Appendices X and XI give the minutes of the meetings and attendance list respectively.

Questions and comments by the participants and responses from KETRACO and the Consultant team are highlighted below;

Table 5.2: Mutamaiyu *Baraza* (31st July, 2019- 10:00 am) Venue: Mutamaiyu Centre

Questions and Comments	Answers
Liaise with the office of the chief for us to get jobs	It is the policy of KETRACO that when a project reaches a particular location, it is the residents of that locality that will be given first priority during consideration of the available jobs (75% of unskilled labour will come from the locals). Skilled jobs will be sourced from all over the country including the project area. Wayleave officers will be sourced from the project area.
Do you have first aiders to attend to accident victims during construction?	KETRACO, contractors and sub-contractors will have safety officers and trained first aiders to attend to accidents at the workplace. There will be toolbox talks, that lay emphasis on health and safety issues, each day before workers commence work. In addition, there will be supervisors to check on safety issues regularly.
If I give my original title deed and it gets lost, what do I do?	There will be an acknowledgment/agreement form that will be signed by both the land owner and KETRACO when submitting original title deeds to KETRACO. If a title deed is lost, KETRACO takes responsibility and will follow up and ensure that the title is delivered to the rightful owner.
If I want my house to be connected to power from the transmission line, what do I do?	Since this is a high voltage power transmission line, it has to reach the intended substation first where it is stepped down and then distributed to the project areas by Kenya Power. The mandate of KETRACO is transmission of high voltage power not power distribution to homes, centres etc.
Are there any impacts during energising of the transmission line that can be prevented?	Each pylon has spikes about 3m high to prevent people from climbing the towers. Furthermore, the towers have warning signs to warn people of electrocution.
What are the impacts of high voltage power transmission on people and the environment?	KETRACO officers gave examples of the negative impacts including noise, dust, vegetation clearance and social vices, but assured the participants that transmission lines are built according to international standards and that all measures had been employed to ensure there would be safety for all. Therefore, the power line would pose no risk to residents and the environment

Questions and Comments	Answers
Some of us do not have title deeds, will we get compensated?	There should be proof of land ownership. This could be a title deed, allotment letter, or agreement between the buyer and seller. Through the office of the local administration, there will be a critical examination of the documents at hand before compensation of the rightful owner is done.
Where is the contractor?	These are still the initial stages of the proposed project. There are still some studies to be done and a number of procedures to be followed (like ESIA, RAP, acquisition of wayleave, and NEMA license) before a contractor is appointed.
If the transmission line affects a small part of my land, will that also be compensated?	Yes; as long as the line passes through a property, the said property will be compensated based on the extent and impact created.
This is a good project. We acknowledge that the transmission line will not pass through everybody's land. We ask for CSR initiatives like powering Bobongi Centre and building classrooms. ***(Comment for onward passing to KETRACO)***	

Plate 5.1: (Left) The chief calling the meeting to order and (Right) A KETRACO staff explaining about the proposed project

Plate 5.2: (left) Some of the Samburu women in attendance and (right) The Assistant Chief giving a vote of thanks

Table 5.3: Ngare Mare *Baraza* (31st July, 2019- 2:00 pm) Venue: Ngare Mare Village

Questions and Comments	**Answers**
Where will the transmission line pass?	The exact transmission line route will be confirmed to the PAPs later when all studies and any necessary re-routing has been done.
How is the project benefiting the region	The main aim of the line is to meet the increasing power demand in Rumuruti and Maralal Counties and to improve the reliability of the supply so as to enable realisation of Vision 2030 and the Big Four Agenda. But also, there will be compensation of PAPs whose livelihood it is hoped will be enhanced.
If my whole plot is taken by the line, how will I be paid?	The extent of the affected area and the impact will be determined. Based on this, adequate compensation will be issued. If whole land is affected, you get paid about 98% (not 100%) so that you can still retain your title deed. According to KETRACO, whole land is compensated if the remaining unaffected land is less than 2,000m^2.
Will we get jobs?	It is the policy of KETRACO that when a project reaches a particular location, it is the residents of that locality that will be given first priority during consideration of the available jobs (75% of unskilled labour will come from the locals). Skilled jobs will be sourced from all over the country. Wayleave officers will be sourced from the locality.


Plate 5.3: (left) A KETRACO staff introducing the proposed project and (right) A local asking a question


Plate 5.4: (left) A KETRACO staff answering questions and (right) A KETRACO staff addressing the baraza

Table 5.4: Namochong *Baraza* (30th July, 2019- 10:00 am) Venue: Namochong Village

Questions	Answers
Who will be paid when the line passes our village; the land owners or the community?	The land owner with proof of ownership will be compensated when the transmission line passes the village. But if there were structures or trees/crops that belong to someone else, then compensation would be paid to the rightful owner of the structures/trees/crops after consulting the chief and village elders
What happens if the transmission line affects crops?	All the crops that will be destroyed during construction will be compensated.
Some people lost their title deeds during some skirmishes. They just have letters. How will they be compensated?	A search will be done through the lands office to know the owners of the lands before compensation is done. With the help of chiefs and village elders there will be a critical examination of the documents at hand before compensation of the rightful owner is done.
The transmission line will pass through different areas. How will community members benefit if it	The proposed project will lead to economic growth of the region. In addition, there will be employment opportunities during the construction phase of the project and the locals will be given first priority when the proposed project reaches their location. There are

does not pass through everyone's farm?	also other cascading benefits that will come as a result of this proposed project. In addition, wayleave officers will be sourced from the locality.
Can we get CSR initiatives like provision of piped water to the community?	KETRACO sticks to its mandate of transmitting power. It does not have a budget for CSR. However, based on what is saved of the project amount, a CSR activity can be done to the community.
How does KETRACO prevent accidents when they create open pits for tower foundation?	When tower foundations are being dug, for example, a hoarding/barbed wire is placed around the open foundations to prevent people and livestock from falling into the pits. However, if an accident occurs, the party concerned will be compensated.
If the transmission line passes near a school, can the school get power?	Since this is a high voltage power, it has to reach the intended substation first before it is stepped down and then distributed to the project areas by Kenya Power.
Is it possible to get power from KETRACO?	Since this is high voltage power, it has to be taken to a substation first to be stepped down before distributed to the project areas by Kenya Power.
If a person stays on a land that is not his/ hers, but the house belongs to him, who will be paid?	The owner of the house (structure) will be compensated for the structure. The owner of the land will be compensated for land and not the structure (owned by someone else).
Will all affected land owners be registered for KETRACO to know who to compensate?	Yes; a RAP will be conducted and details of the PAPs will be captured that will help in the compensation process.
Do you have an office where we will get employed?	Employment will be done through the office of the chief (local administration) after advertisements have been made.
Will you employ community members?	Yes; It is the policy of KETRACO that when a project reaches a particular location, it is the residents of that locality that will be given first priority during consideration of the available jobs (75% of unskilled labour will come from the locals). Skilled jobs will be sourced from all over the country. Wayleave officers would be sourced from the local communities
KETRACO should employ people from the community as per their ability. ***(Comment for onward passing to KETRACO)***	

Plate 5.5: (left) A team member introducing the project and (right) A KETRACO staff addressing the meeting

Plate 5.6: (left) A resident asking a question and (right) The chief putting the meeting to a close

Table 5.5: Ol-Mutonyi *Baraza* (30th July, 2019- 2:00 pm) Venue: Ol Mutonyi Centre

Questions	Answers
How will Ol Mutonyi be connected to the Transmission Line?	The high voltage power cannot be connected directly to the households in Ol Motonyi but would be taken to the substations first for stepping down before Kenya Power can distribute it to individual customers.
How would the local communities benefit and are there CSRs	The communities would now have reliable power with less black-outs. The County would also be able to realise the benefits of the Big 4 Agenda especially on industrialization where more industries would be set up and more people would be employed. The team informed the participants that, though KETRACO does not pay a lot of attention to CSRs as it concentrates on its mandate, they would pass on the recommendation on CSR.
How will locals be hired for jobs during project implementation?	The contractor will liaise with the Chief's office to hire people. Vacancies will be dully advertised.
What is the source of power for the proposed transmission line?	The power will come from a mix of sources including wind, hydro and geothermal.

What is the wayleave distance for the proposed transmission line?	The proposed line is a 132kv line whose standard wayleave is 30m (15m on each side of the line).
When will the proposed project begin?	The project is still in the planning phases and will commence after all approvals and licenses have been acquired.
We welcome the project since it will promote development and economic growth in our areas and country. ***(Comment for onward passing to KETRACO)***	

Plate 5.7: Community members who attended the baraza

Plate 5.8: (left) The ESIA team with the chief and (right) an ESIA team member explaining the proposed project

Table 5.6: Ol-Moran *Baraza* (1st August, 2019- 10:00 am) Venue: Parariro Dam, Ol-Moran

Questions and comments	**Answers**
During the construction of the Loyangalani- Suswa transmission line, some title deeds were taken but have not been returned to date.	KETRACO's Land-Economist told all those whose original Title Deeds had not been returned that he'd look into the matter and revert back to them. He asked them to share the details of the titles with him so that he could follow up with the relevant authorities in KETRACO and the Lands Office

In my land, there are natural and planted trees. Will natural trees be paid?	All trees within the property that will be cut down will be compensated for.
What is the payment period?	Compensation for structures will be immediate. 70% of the agreed amount will be given first to help one relocate and build a new house. 30% of the amount will be given after the structure on the wayleave has been demolished. Compensation of trees and crops would be done when they are destroyed and the wayleave officer in the presence of the owner have enumerated the destroyed tree/crops. Compensation for land will be done after valuation and may take time since the Lands Department is involved
The Loyangalani- Suswa line passed through our land. I do not have title deed of the land and my husband is deceased. How can I be compensated?	Details of the PAP were taken and KETRACO agreed to follow-up.
The transmission line will just pass the village. How do you plan for the people to benefit?	It is the policy of KETRACO that when a project reaches a particular location, it is the residents of that locality that will be given first priority during consideration of the available jobs (75% of unskilled labour will come from the locals). Skilled jobs will be sourced from all over the country. Wayleave officers will be sourced from the locality. With adequate power, the locals can also start small businesses like barbershops, salons, welding activities to boost the economy of the areas.
Can we get power from this project?	Since this is a high voltage power, it has to reach the intended substation first before it is stepped down and then distributed to the project areas by Kenya Power.
Will the compensation that shall be offered be sufficient to make me improve my life?	Compensation will be made based on the extent of the property that is affected and the impact that is realised but also intended to improve PAPs' livelihoods


Plate 5.9: (left) A KETRACO staff addressing the meeting and (right) A KETRACO staff answering a question


Plate 5.10: (left) A KETRACO staff giving the addressing participants and (right) A resident asking a question


Plate 5.11: (left)The chief giving his remarks and (right) The ACC giving some comments on the proposed project

Table 5.7: Magadi/Survey *Baraza* (29th July, 2019- 10:00 am) Venue: Survey Dispensary

Questions and Comments	Answers
Where will the transmission line pass in Magadi? Will it be the same as the existing one?	The Rumuruti-Maralal transmission line will not be the same as the Loyangalani-Suswa line but will run parallel to the it as it comes from Rumuruti Substation. However, at Loosuk, it will make an angular turn as it heads towards Maralal.

Can the power be connected directly to the people?	Since this is a high voltage power, it cannot be connected directly. It has to reach the intended substation first before it is stepped down and then distributed to the people by Kenya Power.
Since the people will not be connected directly what benefit does it have to the community?	The project will boost the power supply in the region and make it more reliable and efficient. This will eliminate blackouts in the region, increase connectivity, enable creation of more industries relevant to the area which would provide a market to people's livestock and crops and also provide employment to the youth. The project will also enable street lighting and reduce insecurity in the area. Other sectors to benefit will include health, education, water and sanitation.
Who was consulted in the existing transmission line?	Since the line has a NEMA license, public consultation must have happened. Also during construction KETRACO will always have elaborate meetings with the PAPs in presence of chiefs and village elders for purposes compensation and wayleave acquisition.
What safety measures does KETRACO employ because the Loyangalani-Suswa project left a lot of waste on site which has been hazardous to both children and livestock. Can KETRACO employ a community officer to ensure that the needs of the community are addressed	KETRACO employs stringent safety measures and it must be an oversight that this happened. It shouldn't be allowed again. The ESIA team will formulate elaborate measure to ensure proper waste management. It is a KETRACO procedure to employ at least two Wayleave Officer from the local communities who would be the link between KETRACO, the contractor and the community and who would assist in wayleave acquisition and solving community issues.
Members of the community should be considered for available jobs. People from elsewhere should not be brought to work in their location as witnessed in the previous transmission line project.	It is the policy of KETRACO that when a project reaches a particular location, it is the residents of that locality that will be given first priority during consideration of the available jobs. 75% of unskilled labour will come from the locals. Skilled jobs will be sourced from all over the country. Wayleave officers will be acquired from the project area.
How will the community benefit in terms of CSR? For example, there is a school	KETRACO lays more emphasis on its mandate of transmitting power. Only in a few cases, is it able to

that is about 500metres from the transmission line, will that school get power?	undertake CSR projects. The team will however forward these proposals to KETRACO.
What is the length of the wayleave?	The wayleave for this proposed transmission line will be 30metres (15m on either side of the centre line).
The community suggested formation of committees to monitor the contractor and construction process, and adherence to the promises made to the community.	Community Resettlement Committees (CRCs) would be formed to resolve the grievances that may arise from the project implementation.
The Loyangalani-Suswa contractors used community resources like water resources and facilities and roads and failed to rehabilitate them to their original status. The community in future must be involved in allowing and making conditions for such usage. ***(Comment for onward passing to KETRACO)***	
The previous contractor failed to put up the necessary ancillary facilities and the situation led to improper human waste disposal by the workers among other sanitation issues. ***(Comment for onward passing to KETRACO)***	
KETRACO to consult the local administration when it comes to employment of community members and wayleave officers. Each section should be involved with local administration and committee liaison officers being consulted. ***(Comment for onward passing to KETRACO)***	
Negative impacts of the project should be adequately addressed. For example, when constructing the Loyangalani-Suswa transmission line, the contractor left many open pits which have caused accidents to people and livestock.	

In addition, used plastic bags were left at the construction sites which were fed on by livestock and caused many would-be prevented deaths. Moreover, usage of water from existing boreholes was not controlled and some boreholes were left broken. ***(Comment for onward passing to KETRACO)***	
There should be adequate compensation for those who will be affected by the project. ***(Comment for onward passing to KETRACO)***	

Plate 5.12: (left) A consultant taking about the proposed project and (right) Residents present during the meeting

Plate 5.13: (left) A community member asking a question and (right) A local raising an issue of concern

Table 5.8: Luoniek *Baraza* (29th July, 2019- 2:00 pm) Venue: Luoniek Chiefs Camp

Questions and Comments	Answers
Is the project the same one as that of Loyangalani-Suswa?	No. This project would be from Rumuruti to Maralal but would run parallel to the Loyangalani-Suwa line. It will be

	a 132kV line (existing one is 400kV) and therefore will have smaller towers.
In the previous KETRACO project, people from elsewhere were employed. What will be the procedure for employment and benefit to community members? Employment should be from members of the locality from one location to another.	It is the policy of KETRACO that when a project reaches a particular location, it is the residents of that locality that will be given first priority during consideration of the available jobs. 75% of unskilled labour will come from the locals. Skilled jobs will be sourced from all over the country.
We have a secondary school with only one classroom. Can KETRACO help us to construct the remaining 3 classrooms as a CSR initiative? In addition, can KETRACO sponsor some less fortunate pupils from the locality who passed their primary school exams and are unable to go to high school?	The consultants will take note of this and present it to the proponent (KETRACO).
Luonek Centre does not have power. If the transmission line passes through it, will the centre be connected to power?	Since this is a high voltage power, it cannot be connected directly to the Luonek Centre. It has to reach the intended substation first before it is stepped down and then distributed to the project areas. The mandate of distribution lies with Kenya Power and not KETRACO.
In the previous KETRACO project of the Loyangalani- Suswa transmission line, we did not get direct benefits. What benefits can the community get from this project?	The proposed project will boost the power supply of the area. This will lead to economic growth of the region as it will enable setting up of heavy industries which will in turn provide a market for people's goods and give employment the youth. In addition, there will be employment opportunities during the construction phase of the project and the locals will be given first priority when the proposed project reaches their location. Other sectors that will benefit include education, health, security, and water and sanitation.
When the project begins, there are some trees that will be cut; how will the affected person benefit?	For trees and crops cleared, the affected person will be compensated according to rates established by the KFS and the Ministry of Agriculture.
When the project begins, there should be a committee to check on the procedures of	

employment of the community members and issues such as late payment and rates of payment. Besides, there should be a liaison officers who act as a link between the community, Contractor, and KETRACO. ***(Comment for onward passing to KETRACO)***	
The project should be implemented as soon as possible as it will benefit the locals	
Contractors have in the past reneged on paying local Morans for offering security against wild animals. This issue should be looked into in future. ***(Comment for onward passing to KETRACO)***	
Women too should be given the chance to work in the construction sites and should also be equally involved in the project. ***(Comment for onward passing to KETRACO)***	
Security should be offered to workers since the area has many wild animals like elephants and hyenas. ***(Comment for onward passing to KETRACO)***	

Plate 5.14: (left) The chief introducing the ESIA team to the residents and (right) A local raising an issue of concern

Plate 5.15: (left) A resident asking a question and (right) Some women present in the meeting

Table 5.9: Longewan *Baraza* (2nd August, 2019- 10:00 am) Venue: Longewan Centre

Questions and comments	Answers
In 2016, some compensation was not paid; How and when will we get our money.	KETRACO staff agreed to follow up on this issue and revert back through the chief.
If I do not have a title deed, will I be paid given that this land is a group ranch?	For structures and crops payment will be done to the owner upon confirmation by the chief and the village elders. For land, upon subdivision, each owner will be given ownership documents which will be used for compensation purposes
Will our village be connected to power	KETRACO mandate is high voltage power transmission and as such did not have the mandate to distributed power to the village which is the work of Kenya Power. On completion of the project, Kenya Power will have enough power to supply to the whole county including Longewan
What benefits will the community get?	One immediate benefit would be employment although it would not be long term. Investors will also be able to set up industries which will be able to employ more people in the community. Other benefits would include lighting of the schools and health care programmes

Plate 5.16: (left) The chief calling the meeting to order and (right) A KETRACO staff introducing the project

Plate 5.17: (left) Longewan residents following the proceedings and (right) A resident asking a question

Plate 5.18: (left) A KETRACO staff responding to questions and (right) The chief putting the meeting to a close

Table 5.10: Lolmolok *Baraza* (2nd August, 2019- 2:00 pm) Venue: Lolmolok Centre

Questions and Comments	Answers
Is this a different transmission line being constructed?	Yes but will run parallel to the existing Loyangalani-Suswa line; it will be a high voltage line from Rumuruti to Maralal that will pass through Lolmolok village to make power supply adequate and reliable in Laikipia and Samburu Counties.
Will there be an agreement with the community before the project proceeds?	Yes; environmental and social impact assessment is just one out of a number of consultations that will be done with the community

	members. KETRACO will still involve PAPs and other community members as the project continues.
Where is the transmission line passing within the group ranches?	It will be parallel to the existing line from Loyangalani but there may be minor re-routing depending on the out-come of on-going studies and other studies that may be done by KETRACO and the contractor.
In the case of group ranches, who will be compensated; individuals or groups?	If the ranches have been subdivided, and in case the line affects such a ranch, then the individual land owners will be compensated. However, if beaconing has not been done to determine the individual land owners, the officials from the ranch will be involved in signing of the relevant documents before compensation is done to the ranch account.
The Loyangalani- Suswa line just passed without any CSR initiatives; will this project help the community?	KETRACO sticks to its mandate of transmitting power. It does not have a budget for CSR. However, based on what is saved of the project budget, a CSR activity can be done to the community.
Some people who worked on clearing the bush during the construction of the Loyangalani-Suswa line were not paid. The contractor ran with their money.	A follow-up with the concerned KETRACO staff will be done and communication will be given through the office of the chief.

Plate 5.19: (left) The chief calling the meeting to order and (right) A KETRACO staff talking about the project

Plate 5.20: (left) A resident giving some comments and (right) A KETRACO staff responding to some questions

Table 5.11: Loosuk *Baraza* (3rd August, 2019- 10:00 am) Venue: Loosuk Centre

Questions and Comments	Answers
Is this project same as Loyangalani-Suswa TL or it is a new project?	The proposed project is a new project different from the existing Loyangalani- Suswa TL. The proposed project will run from Rumuruti to Maralal.
What is the exact TL route?	The exact TL route will be communicated to those who will be affected in subsequent meeting by KETRACO.
It has become a trend to promise community members that they will get employed during project implementation so that they endorse the project.	KETRACO will employ wayleave officers who would be sourced locally. On unskilled labour, contractors will be required contractually to ensure locals are given priority and 75% of unskilled labor is sourced from locals in line with KETRACO's policy on local recruitment.
CSR projects promised during implementation of the Loyanagalani- Suswa TL were not implemented.	A follow up with KETRACO officials who were involved in the Loyangalani-Suswa TL project would be done and feedback given to the community through the chief.
What are the effects of high voltage transmission lines on human health?	Studies have not found any health hazards associated with high voltage transmission lines. There are rumours that high voltage transmission lines cause cancer but this is not true.
In the event that a pylon fall on the house beside it, will there be compensated	The lines are made as per internationals standards and chances of a pylon falling were very slim. But in the rare event it happened, the company would deal with the case.
Compensation rates in Samburu County are lower compared to other areas, why?	For trees and crops, compensation rates are the same for all regions in the country and are determined by the KFS and the Ministry of Agriculture. For land different regions have different

	sale values (price of land in Nairobi is not the same as price of land in Loosuk), hence the disparity in compensation rates. Compensation rates are determined independent by valuers.
High illiteracy levels in Samburu should not be used to discriminate people during compensation. Compensation process should be transparent.	Compensation process will be fair and transparent.
Will PAPs be paid before the project begins?	Yes all compensations will be made before the project begins.
Before compensation is done, the Group Ranch officials should be involved. ***(Comment for onward passing to KETRACO)***	

Plate 5.21: (left) The chief calling the baraza to order and (right) A KETRACO staff explaining about the project

Plate 5.22: (left) A resident asking a question and (right) The Ward Administrator raising issues of concern

Table 5.12: L'partuk *Baraza* (3rd August, 2019- 2:00 pm) Venue: L'partuk Centre

Questions and Comments	Answers
What is the exact TL route?	The exact line route will be communicated later by KETRACO when it has been firmed up.
People in this area do not have title deeds since the land is under Group Ranch scheme. How will compensation be done?	Land compensation will be done through the Group Ranch.
There are rumours that high voltage TL may have a negative impact on fertility. How true is this?	Studies have not found any health hazards associated with high voltage transmission lines. Rumours about TL causing infertility are not true.
If a house is mine but I am staying in a group ranch, who will be paid?	The owner of the house (structure) will be the one compensated for the house and not the group ranch.
What will happen to squatters who have been affected?	Any squatter who will be affected will be given compensation for structures, trees, or crops that he owns. The only payment he/she may not be entitled to is for land
Community needs civic education on compensation process. ***(Comment for onward passing to KETRACO)***	
Members suggested that any agreements between the Group Ranch and KETRACO be made in public meetings so as to ensure transparency and information access. ***(Comment for onward passing to KETRACO)***	


Plate 5.23: (left) A KETRACO staff introducing the TL and (right) A KETRACO staff explaining more on the TL

Plate 5.24: (left) Some members present during the baraza and (right) The chief putting the meeting to a close

5.3.5 Focused Group Discussions (FGD)

Focused Group Discussion (FGD) were held in Rumuruti, Ol Moran, and Loosuk, towns. From each location (Bobongi, Ngare Mare, Namochong, Ol Mutonyi, Ol Moran, Survey, Luoniek, Longewan, Lolmolok, Loosuk, Tinga, Sirata Oirobi, and L'partuk), at least five persons were nominated to represent their communities. The five included village elders and representatives for women, youth, and PWD. The minutes of the meeting and the attendance list are given in appendix XII and XIII respectively.

Table 5.13: Summary of Focus Group Discussion Meetings

Area	Date	Venue	Time	Attendance		
				Male	Female	Total
Rumuruti and Ngare Mare	14/01/2020	Rumuruti Chief's Camp	11:00am-4.00pm	6	1	7
Ol Mutonyi, Ol Moran, Survey, and Luoniek	15/01/2020	Red Cross Conference Hall, Ol Moran	11:00am-2:30pm	14	3	17
Longewan, Lolmolok, Loosuk, Tinga, Sirata Oirobi, and L'partuk	16/01/2020	Samburu Girls Foundation Center in Loosuk	10:00pm-4:01pm	15	6	21

5.4: Outcome of the Stakeholder Consultations:

5.4.1; Information Provided by Key Informant

In summary, the following issues of concern were raised by the key informants in Laikipia and Samburu counties:

- Community wildlife areas within or around the proposed project area were identified to be; Ol Maiso, Lentile, Mugie Ranches, Litugai Conservancy, Loisaba, Laikipia Nature Conservancy (Ol Ari Nyiro), , Kirimon National Reserve, and Samburu Game Sanctuary

- Common wildlife species in the project area include; Buffalos, Dikdik, Duiker, Elephants, Giraffes, Hyenas, Impalas, Jackals, Lions, Leopards, Steenboks, Thompson gazelles, Warthogs, and Zebras
- Common bird species include; Herons, Sacred ibis, Vultures, Goshawks, Bustards, Plovers, Curlews, Martial eagle, Tawny eagle, Augur buzzard, Harriers, Ostriches, Crowned Crane, and Weaver birds
- Threatened/rare/endangered species include; Elephants, Grevey Zebras, Reticulated Giraffes, Rhinoceros, Wild dogs, Cedar, Podo, Sandalwood
- Sensitive/unique habitats, include; constructed water dams, Elephant moving between LNC and Iltungai Conservancy, Amaya Triangle (boarders 3 counties- Baringo, Laikipia and Samburu- limited resource in terms of water and pasture for pastoralists), Suguta Marmar Swamp, Wildlife around Mugie Ranch and Ol Moran areas, and breeding sites for elephants, hyenas, and birds
- Identified project Impacts include;
    - ✓ Poaching by employees.
    - ✓ Lowered power supply lines can kill giraffes.
    - ✓ Vegetation clearance.
    - ✓ Destruction of important habitats
    - ✓ Disruption of wildlife during construction
    - ✓ Avifauna mortality due to collision with conductors
    - ✓ Destruction of very old hardwood trees (+/- 500years) including Wild Olive and Red Cedar
    - ✓ Visual and aesthetics
    - ✓ Littering/Waste disposal
    - ✓ Destruction of private roads during construction
    - ✓ Language barrier due to foreign citizens
    - ✓ Construction of masts/towers might interfere with catchment areas.
    - ✓ Project may interfere with wildlife routes and pasture areas.
    - ✓ Displacement
    - ✓ Electromagnetic radiations from transmission line may have negative health impacts
    - ✓ Culture shock- people of different cultures will come together
    - ✓ Occupational accidents which may occur during construction.
    - ✓ Wildlife like baboons climb the pylons to seek refuge. This is a safety concern since they may be electrocuted.
    - ✓ Issues such as social vices/culture shock will emerge
    - ✓ The proposed lines may cross our road networks
    - ✓ Vandalism of infrastructure by ignorant residents

- ✓ Noise pollution
- ✓ May lead to prostitution
- ✓ May result to hatred between beneficiaries and non-beneficiaries
- ✓ Children may fall or get injured climbing the towers
- ✓ Land degradation as a result of cutting of trees.
- ✓ Conflicts within communities during compensation
- ✓ Gate givers may relay wrong information.
- ✓ Human-wildlife conflict
- ✓ Temporary marriages with different communities that may lead to family breakages

➢ Suggested Mitigation Measures.

- ✓ All workers should be sensitized to avoid poaching of wildlife, and respect culture of the local communities. Further, avoid leaving trenches behind to avoid wildlife falling into the ditches.
- ✓ Put ball markers on the conductors to reduce bird mortality
- ✓ Avoid water resource points
- ✓ Not to install the masts along riparian land
- ✓ Raise masts where there is a river crossing.
- ✓ Avoid dumping excavated materials near water sources and riparian land.
- ✓ The community within the project area should be involved adequately
- ✓ While implementing the project local community should be employed by KETRACO
- ✓ Ensure removal of vegetation is confined to project site.
- ✓ Area cleared must be compensated through tree planting and maintenance to ensure forest/ tree cover is maintained (grow trees equivalent to the number removed). Replant native vegetation
- ✓ Landscape project affected areas
- ✓ Compensate PAPs timely, fairly, and adequately
- ✓ Awareness creation in the project area. Communities should be sensitised on the upcoming project through public participation and their views should be taken serious and included in the project cycle.
- ✓ Ensure maximum safety of the lines so that pastoral communities stay safe
- ✓ Ensure minimal disturbance to natural water sources
- ✓ Assessment of underground water pipelines before the works commence
- ✓ Conduct regular inspections/checks along the lines to correct any dangers that is likely to come up
- ✓ Ensure solid wastes are gathered and safely disposed to appropriate places.

- ✓ Plastics, emissions into atmosphere, and dust are kept to minimum.
- ✓ The contractor is supposed to register the site with DOSHS to comply with Section 44 of the OSHA
- ✓ Employ locals to undertake unskilled/manual works
- ✓ The works to be done during the day to avoid noise pollution
- ✓ Young girls/youth to be sensitized about the dangers of prostitution that could lead to HIV/AIDS. Community to be sensitized about the project to understand that not everybody will be a beneficiary (paid compensation) in the project
- ✓ KETRACO should ensure there is no importation of manual labourers
- ✓ Relocate endangered wildlife from current site to other areas.
- ✓ Put soil and water conservation structures in fragile ecosystems.
- ✓ Engage Kenya Wildlife Service on wildlife corridors within the project area
- ✓ Insurance cover for workers
- ✓ Avoid highly settled areas
- ✓ Avoid areas with schools and water points especially Lemisigiyo area and areas around Sirata-Oirobi.
- ✓ Take cognizance of KDF land at L'partuk.
- ✓ Seek approval from KCAA.
- ✓ Consider the design of Maralal- Baragoi highway from KeNHA.
- ✓ Consider the subdivision of Loosuk, Longewan and Tinga A group ranches in your design.
- ✓ Those that will be affected especially the women and the vulnerable groups should be compensated adequately

- ➢ Issues of concern as raised by community members;
  - ✓ The project owners, KETRACO should give back to the community through CSR e.g., by improving schools infrastructure, water, health or sporting activities.

5.4.2; Information Provided by Community Informants

In summary, the following information was provided by the members of the community in Laikipia and Samburu counties:

- ➢ Impacts as identified by community members;
  - ✓ Displacement of residents living along the line. Relocation of homes and Jobs
  - ✓ Effects on grazing fields
  - ✓ Electrocution of human and livestock
  - ✓ People and animals can fall into open pits
  - ✓ Cutting down of trees. Destruction of forests

- ✓ Wild animals may attack workers
- ✓ Destruction of homes and other structures
- ✓ Loss of soil fertility due to erosion
- ✓ Loss of land
- ✓ Compensation may not be adequate/fair and may be delayed
- ✓ Might pose health risks to those who live near the transmission line
- ✓ It can promote corruption in processes like employment and compensation
- ✓ If explosives are used during tower foundation, people might mistake it to gun fight and thus create tension among the people.
- ✓ Project may take advantage of ignorance (low education levels) among the community
- ✓ Project may create Project Displaced Persons (PDPs)
- ✓ Noise pollution
- ✓ Dust pollution
- ✓ It may cause school going children to drop out of school due to employment
- ✓ May increase the problem of misuse of alcohol
- ✓ Reduce agricultural production
- ✓ Erosion of local cultures
- ✓ If the conductors snap/break, it may cause injury to people near it
- ✓ Disturbance of wildlife
- ✓ Accidents during construction
- ✓ Poor systems of employment
- ✓ Many herders are children who may not be aware that the transmission line is powered

- Mitigation measures as suggested by the community members;
  - ✓ Community to be engaged in employment in a fair and transparent manner. Each ethnic group to be included. Unskilled labour not to be imported
  - ✓ Sensitize public on safety to avoid incidents and accidents
  - ✓ Public must be fully consulted
  - ✓ Workers should receive adequate pay commensurate with the work they do
  - ✓ Ensure safety of workers and community
  - ✓ Compensation to be fair and prior to construction
  - ✓ Transmission line to avoid areas with high population density
  - ✓ Compensation to be done to individuals and not Community Ranch
  - ✓ Employ security guards from the community to guard against attack by wildlife
  - ✓ Educate the people to understand the project
  - ✓ Individual or community complaints to be listened to and solved

- ✓ Workers and community to be compensated in case of accident
- ✓ Care should be taken when dealing with community land as leaders may misappropriate funds and that not every member may benefit from the compensation given

➢ Issues of concern as raised by community members;

- ✓ KETRACO to undertake CSR for community in sectors like water, health, education, and energy (power connectivity).

5.5: Overall Picture from the Stakeholder Consultations.

The overall picture emergent from the stakeholder consultations is that their attitude towards the project is positive and desirous. In addition, the project is seen as being strategic to stabilizing power supply which is crucial to sustained economic growth. In order to sustain this overwhelming public support, the project development should proceed simultaneously with resolution of stakeholder concerns.

5.6 Stakeholder Engagement and Grievance Redress during Construction, Operations, and Decommissioning Phases

Prior to the start of the project, the proponent will develop a stakeholder engagement plan to be used in each of the project phases (pre-construction, construction, operations, and decommissioning). Stakeholders will be provided with information in a timely manner and the information will relate to planned and unplanned activities in every phase of project implementation. This could include information on safety measures in the vicinity of the construction site, traffic management, employment opportunities, opportunities for service provision (for example, banking, eateries, tailoring and cleaning services, etc.) and any other emerging issue or identified during the development of the ESIA. Stakeholder engagement will be done through a range of methods, including:

i. Face to face meetings (unless otherwise not possible due to unforeseen events such as disease outbreak like a spike in COVID-19). Most of the time these engagements will be facilitated by the Community Liaison Officers.
ii. Written updates that will be posted in public spaces including markets and shopping centres, worship centres, chief's camp and in public institutions such as learning institutions.
iii. Public barazas, seminars, workshops, and Focus Group Discussion
iv. Quarterly monitoring reports and annual project progress reports, including compliance on environmental and social impacts requirements, health and safety performance, and implementation of the grievance redress mechanism, among others.

The grievance redress mechanism developed at the start of the project shall continue to exist during the construction, operations, and decommissioning phases of the project (it may be necessary to change the name of the RAP committee). The GRM committee will convene meetings on a regular, predefined basis to solve any reported grievance. The proponent, depending on the seriousness of a reported grievance may request the committee to convene an impromptu meeting. Anyone, including community members, project employees, social organizations, and governmental units will be eligible to submit a grievance to the project if any activity of the project is deemed to cause adverse impact on the community, the environment, or on their quality of life.

5.7 Public Disclosure

It is a World Bank procedural requirement that, an ESIA for a World Bank funded project, be publicly disclosed (for category A projects, this period of disclosure is 120 days). This allows the public and other stakeholders to comment on the possible environmental and social impacts of the project. Towards this end, summaries of ESIAs and all project frameworks/plans will be disclosed to PAPs in culturally appropriate languages and formats, using feasible techniques such as FGDs, public *barazas* in easily accessible locations, and a timeframe that enables meaningful consultations. Among others, the following are suggested disclosure method;

1. Hard copies and summaries (in culturally appropriate languages) will be made available at the following offices;
    a. KETRACO Offices in Nairobi
    b. NEMA Offices in Nairobi, Nanyuki, and Maralal
    c. County Commissioners' Offices at Nanyuki and Maralal
    d. Chiefs' Offices at Rumuruti, Sosian, Ol Mutonyi, Ol Moran, Survey, Luoniek, Longewan, Lolmolok, Loosuk, Sirata Oirobi, and L'partuk.

2. Soft Copies will be made available at the following sites
    a. KETRACO's webpage at www.ketraco.co.ke
    b. NEMA's website at www.nema.co.ke
    c. World Bank's external website.

3. Through subsequent consultation fora by KETRACO.

CHAPTER 6: POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROPOSED PROJECT

6.1: Introduction

A summary of the main potential impacts and mitigation measures of the proposed project based on stakeholders' views, assessment of the project area, evaluation of project processes, literature materials, and consultants' previous experience in undertaking ESIAs is discussed below.

6.2: Positive Impacts

Broadly, the identified positive impacts associated with the proposed transmission line project include;

6.2.1; Reliable and Secure Electricity Power Supply

The project will enhance the adequacy, reliability, and security of electricity power supply in Laikipia and Samburu Counties. This will help meet the increasing demand for power supply, increase connectivity, minimize if not eliminate power outages (blackouts), and stabilize power supply by eradicating over and under voltages.

6.2.2; Achievement of the Big Four Agenda

The Big Four Agenda has focused a lot on manufacturing. For this to be achieved, adequate, reliable and secure power supply is of necessity. The project therefore, will create an enabling environment for the investors to set up big industries in areas like tanning of skins and hides, milk cooling and processing, and abattoirs. The other objectives of the Big 4 Agenda including Housing, Food Supply, and Health Care require power supply and this project will come in handy.

6.2.3; Contribute towards reduction in Greenhouse Gas emission and global warming

Current electricity power transmission mode in Laikipia and Samburu counties is mainly through 33kV distribution lines. Studies show that, the 33kV distribution lines lose up to 30 per cent of the power they transmit. High voltage transmission lines on the other hand are efficient and hardly lose any power they are transmitting. The project therefore, will contribute towards saving power loses which translates to reduced generation of excess power (lost during transmission). A significant amount of power produced in Kenya (33.4%), is from thermal sources (fossil fuels). With less need of power generation, the diesel power generators can be rested. This will ultimately result in a reduction in the generation of greenhouse gasses. The

project will further reduce the need for diesel operated (factory and business) equipment and household dependence on kerosene and fire wood. This will again help reduce emission of greenhouse gasses and global warming.

6.2.4; Contribute towards lowering the cost of electricity

The project as stated above will help reduce transmission loses by almost 30 percent. This will translates into reduced power production costs and as a consequence the final power tariffs per kilowatt hour charged to Kenya Power customers.

6.2.5; Employment Opportunities

The construction, implementation, and decommissioning phases of the proposed project will create employment opportunities for both skilled and unskilled personnel. These opportunities will include

- Way-Leave Officers (at least 2 who shall be KETRACO staff).
- Bush clearing personnel (by contractor/proponent).
- Tower foundation, erection, and stringing technicians (by contractor).
- Drivers (by contractor/proponent).
- Security personnel (by contractor/proponent).
- Casual Workers (by contractor).
- Operation and maintenance technicians (by proponent).
- Cleaners (by proponent) and
- Decommissioning staff (by contractor).

The project can employ an approximated 50 permanent staff and 150 casual workers. The proponent has committed to ensure that priority is given to the local communities.

6.2.6; Contribution towards reduction of environmental pollution

Studies show that, the dominant energy source in the two counties is fuel-wood (charcoal and fire wood). The project will provide alternative energy source and thus reduce reliance on fuel-wood thereby contributing towards among others, the national goal of meeting the minimum forest cover (charcoal burning is a key contributor in reduced forest cover) and emissions from burning of fuel-wood (reducing household air pollution).

6.2.7; Gains in the Local and National Economy

Expected gains in the local and national economy from the construction and operation of the proposed project will be in the form of consumption of locally available materials. Local economy will benefit from the sale of;-

1. Fuel and lubricants from the main petrol stations at Rumuruti and Maralal for project vehicles and machinery and from the small retail shops at Namochong, Survey, Ol Mutonyi, Ol Moran, Luoniek, Longewan, Lolmolok and Loosuk for motorbikes that may be used to ferry workers.
2. Cement, glass, metal, paint, and timber from hardware stores at Rumuruti, Posta, Suguta Marmar, and Maralal for construction of project materials camps, workers' camps, and to some extent tower foundation.
3. Loose aggregates from local traders in Rumuruti, Suguta Marmar, Ol Moran, and Maralal for construction of project materials camps, workers' camps, and to some extent tower foundation.
4. Building stones and coarse aggregates from quarries and traders in Rumuruti, Posta, Suguta Marmar, and Maralal for construction of project materials camps, workers' camps, and to some extent tower foundation.
5. Electrical equipment and services in Rumuruti and Maralal for new electrical installations in buildings.

The national economy will benefit from taxes levied from the contractors and their employees and income from business associated with the project.

6.2.8; Informal Sector Benefits

The project will require supply of large quantities of building materials most of which will be transported by local traders. Project workers will need to go to their designated places of work which will boost the local transport industry especially *matatus* and *boda bodas.* Project vehicles and machinery will require regular maintenance which can be sourced from local garages and spare part shops in Rumuruti, Ol Moran, Suguta Marmar, and Maralal. The Project will also spur the growth of small business enterprises including those that provide accommodation, food items, health services, entertainment, clothing, and enhancement of beauty among others in all the urban centers of the project area.

6.2.9; Development of Other Sectors

Increase in reliability and security of power supply in the region will enhance efficiency and productivity of other sectors including;-

1. Improved grades for school going children due to added study time,
2. Better performance of health facilities in Rumuruti, Ol Moran, Suguta Marmar, and Maralal as they can now have reliable power to run power operated treatment equipment and refrigeration

3. Increased livestock production due to an increase in availability of market as a result of more abattoirs with refrigeration facilities and milk processing industries in the main urban centers. The livestock industry will also benefit from refrigeration of drugs and increase in Artificial Insemination (AI).
4. Increased efficiency in water supply due to power operated water pumping equipment.
5. Improved agricultural production in Rumuruti, Ol Moran, and Survey due to an increase in power driven irrigation equipment.

6.2.10; Security

Increased availability of power will trigger more street lighting in Rumuruti, Ol Moran, Survey, Luoniek, Suguta Marmar, Longewan, Lolmolok, Loosuk, and Maralal. Increased power connectivity in the villages within the project area will lead to more security lights in households. This will contribute towards enhancement of security in the project area.

6.3: Negative Impacts

Social Impacts

6.3.1; Acquisition of Wayleaves and Land for Sub-stations, Contractor Facilities and Workers Camps

The proposed project will require a wayleave corridor of 30m width. Within the 30m corridor, no structures or trees with a capability of growing taller than 6ft (1.8m) shall be allowed. The Bobongi area in Rumuruti town will have an approximated 10 parcels of land to be affected. The parcels average 5 acres, but most of them are being subdivided into parcels of an eighth of an acre each (because of the closeness to Rumuruti town). Project Displaced Persons (PDP) in this area are likely but only a few structures will be affected. The area is predominantly agricultural and crops like wheat, maize, avocados, beans, and vegetables may be affected. The stretch between Bobongi and Ol Moran, which include Bhola farm, Ngare Mare, Namochong, and Ol Mutonyi, is wilderness used by the locals as grazing fields. Here, the biggest impact will be vegetation (trees) clearance but a few structures and crops will also be affected. Ol Moran is a farming village and relatively has more settlement as compared to the other sections of the TL. Hence loss of structures, trees and crops is highly likely. The TL will pass through Mugie Conservancy for a distance of about 18km. Land, trees, and a few structures belonging to Mugie Conservancy will be affected. The TL will then enter Samburu County and traverse Longewan, Lolmolok, Loosuk, Tinga, Sirata Oirobi, and L'partuk Community Group Ranches. All of the community group ranches in exception of L'partuk are registered and each possess a group title. Therefore, compensation monies, for Longewan, Lolmolok, Loosuk, Tinga, and Sirata Oirobi will be paid directly to the community group ranches (each group ranch management will transact on behalf of its members and as agreed

between the ranch management and ranch members). For L'partuk, which is an unregistered group ranch, compensation monies shall be given to the County Government of Samburu to hold in trust for the community group ranch members as described in the Community Land Act of 2016 (further elaboration is done in the mitigation measures below). In total, the transmission line will affect 705 acres of land represented by over 500 parcels owned privately and 6 Community Group Ranches.

Land will also be required for ancillary facilities, which may include, project campsite, materials holding and storage facilities, temporal worker camps, quarries, etc.

There will also be a need for substation land in Maralal. For this project, the substation in Maralal will most likely (not yet fully determined) be located in L'Partuk Community Group Ranch. The Ranch is unregistered. As per the Community Land Act 2016, 'County Governments shall hold in trust all unregistered community land on behalf of the communities for which it is held. (2) The respective county government shall hold in trust for a community any monies payable as compensation for compulsory acquisition of any unregistered community land. (3) Upon registration of community land, the respective county government shall promptly release to the community all such monies payable for compulsory acquisition. (4) Any such monies shall be deposited in a special interest earning account by the county government. The respective county government shall transfer the amount and the interests earned to the communities as may be prescribed. (6) Any transaction in relation to unregistered community land within the county shall be in accordance with the provisions of the Act and any other applicable law. (7) Upon the registration of any unregistered community land in accordance with this Act, the respective registered community shall, assume the management and administrative functions provided in this Act and the trustee role of the respective county government in relation to the land shall cease. (8) A county government shall not sell, dispose, transfer, convert for private purposes or in any other way dispose of any unregistered community land that it is holding in trust on behalf of the communities for which it is held'.

Due to uncertainty of the exact location of the proposed substation at the time of the study, this ESIA did not focus on the environmental and social impacts of the sub-station. It is therefore, recommended that, a site specific ESIA study for the sub-station be undertaken once the location is identified.

Way-leave acquisition will have effects on family set-up due to unexpected large income from compensation including domestic violence/wife battering, drunkenness, marrying more wives,

running to far urban Centers to seek worldly pleasures, getting conned, misuse of money, and gambling.

Proposed Mitigation measure

To properly resettle and fairly compensate affected people and communities, the proponent should;

- Conduct an elaborate Resettlement Action Plan (RAP)
- Compensate PAPs fairly (at full replacement cost) and promptly
- Give PAPs adequate time to relocate
- Form Resettlement Action Plan Committees to resolve potential conflicts
- Salvaged materials from structures, crops, and trees to belong to PAPs
- Formulate and implement a Livelihood Restoration Plan to cushion economic displacement and loss of livelihoods. This should include Mwanzi farm (horticulture), Mugie Conservancy, ranching, and any other businesses or livelihood sources affected by the project.
- Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases and ensure participation of women in decision making and sharing of project benefits.
- Develop a Stakeholder Engagement Plan to guide stakeholder engagement during all phases of the project.
- Before and after the compensation process, conduct focused groups sensitization fora and counselling sessions to discuss social vices associated with receiving an unexpected (large) income.
- To manage community expectations, the proponent to discuss and agree with the affected communities compensation modes for being disturbed. The compensation should either be in-kind or cash compensation.
- Land for ancillary facilities will be acquired by the contractor on a willing seller willing buyer basis, while ensuring that the full replacement cost principles of OP 4.12 are adhered to. If land for ancillary facilities is to be acquired in Community Group Ranches, the contractor will be required to strictly follow the Community Land Act 2016.
- The substation land to be completely purchased from a vendor/community. For this project, the substation in Maralal will most likely be located in L'Partuk Community Group Ranch. The Ranch is an 'Unregistered Community Land'. KETRACO shall abide by the provisions of the Community Land Act of 2016 to compensate for the Community Land. For unregistered community land held in trust by County Governments, KETRACO will undertake free, prior and informed consultations with the affected communities, including VMGs, both to make them aware of the need for their land and

to secure their broad support for the project. In addition, they will be sensitized on the provisions of the Community Land Act, 2016, which states that cash compensation for unregistered community land will be placed in an interest earning account held on behalf of the community by the County Government until the community has registered the land. After sensitization and consultation with county governments, the community will be provided with the opportunity to choose between in-kind compensation or the escrow account held for them by the County Government until they register their land.

- Land and trees compensation for the registered Community Group Ranches (Longewan, Lolmolok, Loosuk, Tinga, and Sirata Oirobi) should be made to the account of the group ranches while for the unregistered group ranch (L'Partuk), compensation should be given to the County Government of Samburu to hold in trust for the community members in the same manner as described above for the substation. Structures shall be paid to individual owners.

6.3.2; Project Induced Labour Influx

The Rumuruti – Maralal Transmission line will involve construction of civil works for which the required labour force and associated goods and services cannot be fully supplied locally for a number of reasons, among them worker unavailability and lack of technical skills and capacity. In this case, a majority of the labour force will need to be brought in from outside the project area. This influx may be compounded by an influx of other people who follow the incoming workforce with the aim of selling them goods and services, or in pursuit of job or business opportunities. This labour influx may have some impacts on the local communities including:

- Social conflict between the local community and the construction workers due to religious, cultural or ethnic differences or competition for labour opportunities or local resources. This impact may be felt more in Ngare Mare, Namochong, Ol Moran, and Luoniek areas which have previously had social conflicts.
- Increase in illicit behavior and crime including theft, physical assaults, substance abuse, and prostitution which will be felt more in urban centers like Rumuruti, Ol Moran, Suguta Marmar, and Maralal where the workers will seek accommodation.
- Increased burden on and competition for public service provision including water, energy, medical services, transport, and education in urban centers of Rumuruti, Ol Moran, Suguta Marmar, and Maralal where the workers will seek accommodation.
- Spread of diseases such as HIV/AIDS, STDs and other communicable diseases.
- Gender Based Violence such as sexual harassment of women and girls, exploitative sexual relations, and illicit sexual relations with minors.
- Child labor and school dropout

- Local inflation of prices due to increase in demand for goods and services in urban centers of Rumuruti, Ol Moran, Suguta Marmar, and Maralal where the workers will seek accommodation.
- Disregard of important cultural norms.

Proposed Mitigation measure

To reduce the impacts of labour influx, the proponent and the contractor should;

- Develop and implement a Local Recruitment Plan that will ensure employment of as many locals as is possible. Local laws require 30% of labour force to come from the locals.
- Formulate and implement a Labor Influx Management Plan that will ensure harmony between non-local workers and the locals and minimize effects of labour influx.
- Conduct sensitization fora for employees on ethics, morals, general good behaviour, GBV-SEA/SH, and the need for the project to co-exist with the neighbours. The fora should be guided by the Stakeholder Engagement Plan.
- Provide guidance and counselling on drug abuse, HIV/AIDS, and other STDs to employees.
- Sensitize local community on communicable diseases (STDs and HIV/AIDS) and GBV-SEA/SH.
- Provide female and male condoms to workers.
- Cooperation with local law enforcement and introduction of sanctions (e.g., dismissal) for workers involved in criminal activities.
- Provision of water supply source to workers and prohibition of use from other community sources or ensure the project and community agree on the right to access water from community sources.
- Create and implement a GBV Management Action Plan to mitigate and respond to Sexual Exploitation and Abuse (SEA) and workplace Sexual Harassment (SH) due to labor influx. The management action plan should take cognizance of 1. sensitivity of GBV, and 2. the need to ensure confidential reporting and responding to GBV cases reported.
- Mandatory and regular training for workers on required lawful conduct in relation to GBV in host community in addition to social and cultural inductions to workers. The project should support survivors who choose the legal redress route by referring them to the legal redress referral pathway – which could include legal entities (NGOs, lawyers, police stations etc.).
- Provision of opportunities for workers to regularly return to their families;

- Provision of opportunities for workers to take advantage of entertainment opportunities away from rural host communities.
- Ensure that children and minors are not employed directly or indirectly on the project.
- Sensitize construction site manager and project manager on how to handle criminal cases.
- Maintain an updated employee database on site.
- Issue construction workers with identification cards to access construction site.
- All criminal cases involving workers to be reported to the relevant authorities through appropriate channels.

6.3.3; Impacts on Culture, Heritage, and Norms

The project site host various communities including the Samburu, Maasai, O'giek, Turkana, Borana, Somali, and Pokot. These communities have certain distinct cultural practices that they hold dear and that act as an important ingredient to their unity. Incoming workers from other regions may affect these cultural practices by interference with cultural sites such as initiation grounds, burial sites, sacred trees, shrines etc., having sexual relations with local communities, cutting down culturally sacred trees, and eroding local cultures as a result of introduction of new ways of life.

Proposed Mitigation measure

To ensure the project has minimal impacts on culture, heritage, and the norms, the proponent should ensure that:

- The contractor engages a local liaison (cultural ambassador) to guide and advice the project on all issues regarding culture, heritage, and society norms.
- While working in areas that contain Vulnerable and Marginalized Groups (VMG), the contractor employs a local person (cultural ambassador) in each location he is working on to guide on issues culture and heritage.
- Graves should never be excavated. Should they accidentally be excavated, certain traditional rituals must be performed with KETRACO bearing the cost of the rituals. The cultural ambassador to advice on required rituals. Contractor to design the towers so as to avoid marked graves.
- During the traditional ceremony of Rite of Passage (circumcision), the "morans' live in 'manyattas'. With the assistant of the cultural ambassador, the proponent, should consult local elders and ensure such 'manyattas' are not put up on the wayleave. Should they be on the wayleave, works in the location must be skipped until the occasion ends which can take up to 3 months.

- Workers from other cultures especially women are not allowed anywhere near the manyattas.
- Certain sacred trees, like the *Kokua* for the Pokot community, and *mugiet (*a tree on which the sticks that were used in roasting meat during circumcision and other traditional ceremonies) for Maasai, Samburu, and Ogiek cannot be felled until elders perform the necessary rituals. All sacred trees and cultural sites along the route should be identified and listed.
- Workers should avoid sexual relationships with locals. Sexual relations with local married women is considered to be a taboo and could lead to conflict or violence.
- Contractor to prohibit workers from wearing clothes that are too revealing.
- The contractor shall sensitize workers to respect the culture of the local community and not to impose their culture on the community.

6.3.4; Effects on Livestock farming

The project area is predominantly arid and semi-arid and the main socio-economic activity carried out in the area is livestock rearing. The communities here regard livestock with high esteem and see them as a measure of one's wealth. Community conflicts based on livestock are known to happen here. Any activity that affect livestock production is therefore, most unwelcome. The transmission line project may affect livestock production sector in the following ways:

- Animals may fall into the excavated pits for tower foundation
- Vegetation clearance may reduce animal fodder
- Construction of a substation in Maralal may lead to a reduction in pasture zones
- Abstraction of water for construction from local water reserves may reduce availability of water to animal
- Wayleave corridor may be used as an access road and exacerbate livestock theft
- Livestock death from falling objects during tower erection; being hoisted up during conductor stringing; and traffic accidents
- Noise, movement of equipment and staff, and general construction works may be a nuisance to the grazing animals

Proposed Mitigation measure

To ensure minimal effects to pastoralist, the proponent should ensure:

- Excavated foundation pits are well secured to avoid animals from falling into them. Foundation pits thought to take long must be secured by barbed or mesh wire.
- Excavated pits are backfilled as soon as possible

- Contractor to conduct selective vegetation clearance by only clearing what is necessary to ensure animals have enough fodder
- The substation land to be completely purchased from a vendor/community. Compensation for loss of communal pasture zones to be managed in accordance to the provisions in the project's RPF.
- The substation land to be completely purchased from a vendor/community. Compensation for loss of communal pasture zones to be managed in accordance to the provisions in the project's RPF. For this project, the substation in Maralal will most likely be located in L'Partuk Community Group Ranch. The Ranch is an 'Unregistered Community Land'. KETRACO shall abide by the provisions of the Community Land Act of 2016 to compensate for the Community Land. For unregistered community land held in trust by County Governments, KETRACO will undertake free, prior and informed consultations with the affected communities, including VMGs, both to make them aware of the need for their land and to secure their broad support for the project. In addition, they will be sensitized on the provisions of the Community Land Act, 2016, which states that cash compensation for unregistered community land will be placed in an interest earning account held on behalf of the community by the County Government until the community has registered. After sensitization and consultation with county governments, the community will be provided with the opportunity to choose between in-kind compensation or the escrow account held for them by the County Government until they register their land.
- Contractor develops water pans at strategic points where water can collect during wet seasons for his construction activities and for livestock. Candidate areas for water pans include Bobongi, Ngare Mare, Namochong, Ol Mutonyi, Luoniek, Longewan, Lolmolok, Loosuk, Tinga, Sirata Oirobi, and L'partuk.
- During dry seasons no water is extracted from the local water resources. The contractor to use water-bowsers with water from water companies in Rumuruti and Maralal
- Communities are facilitated to conduct vigilance and to create barriers within the wayleave corridor to stop or control access by motorable equipment including cars and motorbikes to reduce livestock theft.
- During conductor stringing one person is posted on each tower with red and green flags and whistle so that he can give a signal, which is relayed to the pulling end by other similarly placed persons, to stop the paying out operation if any incident of animal hoisting is encountered.
- Set speed limits in sections where there is high concentration of animals

6.3.5; Women Inclusion and Empowerment

During stakeholder consultation, it was identified that, women attendance in project meetings was very low. This could partly be attributed to the patriarchal nature of some communities in the project area where women are not allowed to head households, make community decisions, or attend public meetings when adult males are present. Furthermore, the many household and field chores that women have to take care of, leave them with little if any time to attend meetings.

Proposed Mitigation measure

To enhance inclusion of women in project meetings and other decision making fora and to empower them, the following measures are proposed;

- Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases and ensure participation of women in decision making and sharing of project benefits.
- For the employment of project staff, the proponent and contractor to give more preference to women applicants and to encourage women to apply.
- In developing a Stakeholder Engagement Plan, the proponent and contractor to ensure women are identified as an important focus group and the plan's implementation to be sensitive to women's availability to attend meetings.
- For any community meetings held, the announcement to encourage women to attend and the organizers to design initiatives that reach out to more women to attend the meetings.
- The proponent to ensure all women PAPs are compensated and in a fair and timely manner. Where possible create joint accounts between spouses for disbursement of compensation funds.
- Inclusion of women representatives in the Grievances Redress Mechanism.
- Conduct sensitization fora about the importance of women participation in the project.
- Identify and address women employee security issues, including their safety while traveling to and from work and on project-related business.
- Proactively recruit and appoint women workers to senior, managerial, and executive positions and give them opportunities to lead on important assignments and task forces.
- Offer flexible work options for women workers, accord them their leave days, and where possible support their access to child and dependent care.
- Eliminate all forms of Gender Based Violence such as Sexual Exploitation and Abuse (SEA) and workplace Sexual Harassment (SH of women and girls, exploitative sexual relations, and illicit sexual relations with minors.

Environmental Impacts

6.3.6; Community Health and Safety

During the construction, implementation, and decommissioning phases of the project, a number of project process namely tower foundation, erection of towers, the conductor stringing and TL energization, may have some negative impacts to the surrounding communities including the following:

- Children may fall into excavated tower foundations.
- Children may drown in water filled excavated tower foundations.
- Children may try to climb erected towers and risk falling or electrocution.
- People may accidentally be hoisted up by conductors during stringing.
- Traffic accidents.

For transmission lines in the range above 400kV, noise in the form of buzzing or humming can often be heard producing corona. Ozone, a colorless gas with a pungent odour, may also be produced. Buzzing/humming is also heard from substations. In quiet rural areas this can even be heard up to 300m or more, depending on topography, vegetation etc. Neither the noise nor ozone produced by power distribution lines or 132kV transmission lines carries any known health risks.

Proposed Mitigation measure

To ensure the safety of children and other community members, the proponent should ensure that:

- Excavated foundation pits are well secured to avoid children from falling into them. Foundation pits thought to take long must be secured by barbed or mesh wire and any water in the pit drained every morning.
- Excavated pits are to be backfilled as soon as possible
- The proponent conduct sensitization fora on the dangers posed by the transmission line (especially on children) and ways of staying safe.
- Safety features including danger warning sign and perimeter barbed wire surrounding each tower are put in place.
- Contractor facilitates the community to keep vigil or employ security guards to ensure no kids climb the towers.
- During conductor stringing one person to be posted on each tower with red and green flags and whistle so that he can give a signal, which is relayed to the pulling end by

other similarly placed persons, to stop the paying out operation if any incident of a child hoisting is encountered.

- Within settled areas, speed limits are imposed and people, especially children, are given the right of way.
- To reduce the corana effect the overhead line insulator sets should be provided with grading rings at the bottom of insulator string (corona rings).
- To reduce effects of the noise from corona effect on population, final detailed design should avoid densely populated areas.
- The substations shall be 132/33kV substations and the buzzing/harming sound is not predicted but should this be the case, the proponent should consider creating noise shields. Creating a tree canopy (along the safe sections of the perimeter fence) can also help in shielding the noise.

6.3.7; Destruction of Existing Vegetation and Habitats

The project will require a way-leave of 30 meters width for the 100km. Within the way-leave, selective clearing of vegetation will be necessary to (1) remove any tall trees that pose a risk to the transmission line, (2) give way for the construction of the towers; and (3) give room for workers to do survey work and stringing of the transmission line. It is estimated that, over 10,000 trees of various age, height, width, and species may be affected by the project. Vulnerable tree species including Wild Olive and the East African pencil cedar (in Mugie and areas around Sirata Oirobi) may also be affected by the project. A number of important medicinal plants for human and livestock, and dry season fodder species such as *Acacia tortilis* (In the dryland section between Rumuruti and Mugie) may also be affected.

The impact will be more felt in areas with high vegetation density including Ngare Mare, Luoniek, Mugie, Longewan, Lolmolok, Engare Narok Forest, and L'partuk. It will be long-term, as it would persist as long as the facility is in operation. However, the overall intensity of this impact is rated as medium, as more than 70% of the line follow an existing transmission line (Loyangalani – Suswa) and that, the impact is not likely to be of wider significance given the paucity of species of conservation concern in the area, the overwhelmingly intact nature of the surrounding landscape as well as the fact that average tree/shrub height in the transmission line corridor is less than 6ft (1.8m) and may require no clearing.

Operational phase that includes maintenance of the RoW will not incur major ecological impacts as there will be no new towers to be erected. Maintenance works will be very small in scale and infrequent, and will involve few changes to the existing situation. The practice of allowing some re-growth of vegetation along the RoW will also have ecological benefits as it

will allow plants and animals to re-colonize. Because the forest canopy is now open in these areas the species will be different from those that were originally present, which may be seen as a further gain as this will increase the diversity of habitats. However, it will be important to prevent colonization of cleared sites by aggressive colonizers as *Prosopis spp.*

Proposed Mitigation measure

To minimize destruction of existing vegetation and habitats, KETRACO should ensure that;

- The Contractor to conduct selective vegetation clearance by only clearing what is necessary
- Trees that have no ability to grow beyond 6 ft (1.8m) tall e.g., *Rhus natalensis, Acacia drepanolobium, Carissa edulis, Croton dichogamus,* etc., are not cut except if within the tower plinth area.
- Vegetation that needs to be reduced in height is cut to an acceptable height, and not to ground level except where necessary. This shall be especially true for vulnerable or endangered species like Wild Olive – *Olea africana* (Mutamayo) and East African pencil cedar - *Juniperus procera*
- Where possible avoid important medicinal plants for human and livestock, and dry season fodder species such as Acacia tortilis.
- Bush clearing shall be to no more than absolutely necessary extent; At completion of construction work, areas not needed anymore should be replanted/reforested as far as the line security is not impeded;
- Collection or harvesting of any plants or fuel wood is strictly forbidden as it can exacerbate more clearing
- As far as possible, bush clearing be manual as opposed to mechanical or chemical methods
- Map all water catchment areas especially springs and river sources and ensure contractor does not interfere with them.
- Construction equipment is properly cleaned to avoid accidental spreading of invasive species.
- Undertake regular monitoring to ensure that alien and potentially invasive plant species (like *Lantana camara, Solanum mauritianum, Prosopis juliflora, Ipomoea spp* and others) are not increasing as a result of the disturbance that has taken place.
- Fair compensation (full replacement cost) to the affected PAPs with the cut trees remaining the property of the PAPs
- With the assistant of KFS and KWS, KETRACO to facilitate community to initiate tree planting drives.
- As far as is possible, avoid disruption and alteration of habitat during RoW maintenance

6.3.8; Disturbance of Faunal Species

The potential impacts associated with vegetation loss are closely linked to potential impacts on fauna, since a key determinant of faunal disturbance is generally habitat quality. Fauna such as small mammals are likely to occur at various habitats throughout the site. This is likely to occur in area between and including Mugie conservancy and Loosuk area. This section has abundant wildlife as described in Appendix III. In the drier areas after Mugie, there are free ranging wildlife, mainly in areas that have gallery forests and rivers/streams.

Construction phase activities that will impact on animal life in the area include:

- Poaching/Hunting of game by project staff especially in the wildlife free ranging areas outside protected conservancies.
- Loss of habitats, breeding, and feeding grounds for some animal species
- Increased noise pollution during construction may affect the tranquility of the wild animals
- Fragmentation of woodlands and introduction of strange structures to the animals (towers) may hinder shy mammals from accessing the other side of the habitat
- Fragmentation is likely to make interior forest/woodland species more vulnerable to predators and competition from edge and colonizing species
- Traffic accidents

Proposed Mitigation measure

To minimize effects on faunal species;

- The contractor to strictly prohibit staff from poaching/hunting game and monitor the same.
- Plan the transmission line to follow already disturbed habitats e.g., the existing Loyangalani – Suswa TL.
- Avoiding creating tower bases on breeding and nesting areas.
- Consult KWS to scheduling activities to avoid breeding and nesting seasons for any vulnerable or critically endangered wildlife species.
- Animals will have right of way.
- Any fauna directly threatened by the construction activities will be removed to a safe location by KWS or other qualified personnel.
- Hand-clearing vegetation to minimize noise pollution.
- Limit construction to as short a time as possible.
- Impose speed limits in the wild areas and on highways where wildlife concentration is high.

6.3.9; Avifauna Mortalities

During the assessment, various types of avifauna were recorded (appendix III gives their conservation status and locations). The transmission line therefore, is quite likely to have impacts on the birds and bats. The impacts will be as a result of destruction of habitats for birds and bats including their breeding areas, noise pollution, or collision of birds and bats with transmission line cables.

Avifauna mortality by transmission lines can either be due to electrocution or strikes by the conductors. The separation between the conductors of the transmission line (132kV) shall be a minimum of 3m and therefore, electrocution will be highly unlikely (electrocution can only occur if the bird and bats touches at least two conductors). Bird and bats strike by the conductors is however, likely and in a few circumstances may lead to mortality.

Bird mortality from collisions with power lines is well documented (Bevanger, 1994, Lehman *et al.* 2007; Jenkins *et al.* 2010). Collisions occur most often where transmission lines intercept them in areas where birds concentrate, such as migratory flyways, feeding areas, and nesting/roosting sites (Savereno et al., 1996). In addition, collisions are more likely to occur during periods of high winds or low visibility such as on rainy days. Although some avian collisions with power lines occur during migration, most collisions take place during flights within a daily use area. This is likely to be significant in the Loosuk-L'patuk section, due to proximity to Kirisia forest, Mugie, Louniek, Longewan, and Parariro dam areas of the proposed TL.

The Kirisia Forest is also unique in that it contains one of the largest breeding colonies of critically endangered Rüppell's Vultures in Kenya. This east-facing breeding cliff lies on the north-eastern side of the Forest. While the transmission line passes on the western side of the Forest it is important to recognize that these vultures fly on both sides of the Forest when leaving and returning to their colony (The Peregrine Fund)

Proposed Mitigation measure

To minimize effects on bird and bats habitats and collisions leading to their mortality;

- In consultation with KFS, KWS, Nature Kenya, and any other organization that deals with bird conservation, map important bird migration corridors. These should include the wooded areas in Ngare mare, Mugie Conservancy, and the Engare Narok Forest.
- In the identified corridors, use bird flight diverters placed 7.5 m apart along the shield wire. The shield wire is the most dangerous section of line for flying birds and bats and

it's usually much thinner and difficult to see. Many birds do not see well in front of them during flight. It is important that the flight diverters are reflective as well as contrasting, as many birds migrate at night. These areas may include areas around Parariro dam, Dam Nyeusi, Mugie, and Endonyo Narok forest and in other areas where large birds are common.

- To avoid electrocution in the identified migration corridors, provide sufficient separation between energized phase conductors to accommodate at least the wrist-to-wrist or head-to-foot distance of a bird (approximately 1.8m) or insulate the conductors.
- Provide artificial bird safe perches and nesting platforms which are placed at a safe distance from the energised parts.
- Use perch management techniques i.e, cross-arms, insulators and other parts of the power lines can be constructed so that there is no space for birds to perch where they can be proximate to energised wires.
- Avoid wooded areas which act as bird breeding areas or areas with high concentration of birds including areas around Ngare mare, Pararito Dam, Northern section of Mugie Longewan, Lolmolok, and areas between Sirata Oirobi and L'partuk.
- Limit noise pollution in bird and bats habitats especially in aquatic and wooded areas such as Parariro dam and Dam Nyeusi, Mugie, and Engare Narok Forest
- Any avifauna mortality due to collision should be recorded, including the species affected and the date. If repeated collisions occur, then further mitigation and avoidance measures may need to be implemented.

6.3.10; Effects on Community Water Reserves

The project site has a number of water resources that the communities depend on for their daily use. The water resources traversed or close to the transmission line include:

- River Kandutura
- River Southern Ayiam
- River Northern Ayiam
- Dam Nyeusi
- A stream next to tower 560 of Loyangalani-Suswa TL
- Dam Nyekundu
- Ol Mutonyi stream
- Ol Moran- seasonal streams
- Kajeria Dam,
- Airewa stream
- River Long'dai
- Wetland within Mugie Conservancy
- River Terienkwe
- River Lolmolok
- River Loosuk
- River Ngare Narok
- River Nkengu Emuny,
- River Nontoto,
- Lerosion stream

Project impacts on these water resources may including:

- Encroachment of river riparian zone.
- Destruction of riverine herbaceous plant cover.
- Abstraction of water by the contractor.
- Silt deposit in surface water reserves during tower foundation.
- Contamination of water by project workers when crossing, washing, or drawing water for drinking.
- Motor equipment crossing these rivers may result in some shoreline erosion or disturbance to banks and river bottoms.
- Leachates from open defecation by project workers.
- Oil contamination from motor equipment.
- Solid waste pollution.
- Effects on existing water pipelines.

Proposed Mitigation measure

To minimize effects on community water reserves;

- Avoid locating towers within the riparian zones
- Locate towers far enough back from river banks to prevent erosion related to the tower foundation and destruction of riverine herbaceous plant cover.
- Contractor should not be allowed to abstract water from the community water resources. The contractor to use water-bowsers with water from water companies in Rumuruti and Maralal
- Contractor to develop and implement an oil spill minimization and cleanup plan to avoid contamination of the rivers by oil
- Avoid motor vehicles crossing rivers and streams from undesignated points to only use existing bridges or designated crossing points
- Contractor to provide mobile toilets
- Contractor to enact solid waste management to reduce or completely stop contamination of water systems by solid waste
- Avoid interfering with existing water infrastructure.

6.3.11; Effects on Mugie Conservancy and Engare Narok Forest

Among the sensitive ecosystem identified in the project area are the Mugie Conservancy and the Engare Narok Forest Community Forest. Mugie Conservancy encompasses 194 km^2 and is home to over 70 mammal species, 280 bird species, and sensitive/unique habitats that include olive tree forests. The Engare Narok Forest on the other hand is community forest with a dense tree cover and a habitat for wildlife including elephants.

Identified project impacts to these sensitive ecosystems including:

- Clearing of vulnerable tree species including the Wild Olive and Red Cedar (some are over 500 years old)
- Poaching/Hunting of game by project staff
- Destruction of habitats
- Disruption of wildlife
- Induced voltage on the Conservancy electric fence may cause minor shocks to those working on the fence
- Clearing the 30m wayleave may reduce water retention capacity of the conservancy
- Littering
- Destruction of private roads
- Language barrier if foreign workers cannot speak English
- Security issues
- Impacts on Visual and Aesthetics
- Disrespect of private properties by Government Contractors
- Impact on tourism, and therefore revenue

Proposed Mitigation measure

To mitigate against the negative effects on Mugie Conservancy and Engare Narok Forest:

- At the start of the project, KETRACO, Contractor, and Mugie to have a joint meeting to chart the Terms of Engagement. During the meeting, Mugie to furnish KETRACO and the Contractor with its manual on Dos and Don'ts while in the Conservancy.
- KETRACO, Mugie, and the Engare Narok Forest Community to map out all vulnerable/endangered/very old tree species (including Wild Olive and Red-Cedar) on the wayleave for protection. If the trees pose a danger to the TL, then they should be reduced in height by cutting them to acceptable height, and not to ground level.
- The contractor to strictly prohibit staff from poaching/hunting game and monitor the same.
- Vegetation clearances to follow the mitigation measures identified in the section on 'Destruction of existing vegetation and habitat' of this ESMP.
- Wildlife management to follow the mitigation measures identified in the section on 'Disturbance to Wildlife' of this ESMP.
- Mugie to provide security guards to the contractor with KETRACO footing the bills. The guards to protect the staff from wildlife and wildlife from the staff.
- All staff to only use designated entry/exit points and to be provided with identification tags.

- Contractor to only use designated routes within the conservancy and to periodically repair damaged sections and at the end of the construction reinstate all roads to their original state.
- Contractor to assist Mugie Conservancy to effectively ground its fence to avoid effects of induced voltage.
- Any waste generated must be disposed of as per methods identified in the section 'Waste handling, storage and disposal' of this ESMP.
- Within the conservancy, widen the span length to reduce the number of towers.
- Foreign workers who cannot communicate in English to be reduced to the bare minimum and team managers to ensure employees respect the conservancy workers and the locals.
- A redress mechanism be created to address any disagreements.

6.3.12; Impacts on Workers' Health and Safety

Workers in the project area may be exposed to various risks and hazards. The most serious hazards in the construction of transmission lines include:

1. Falling objects i.e. from high levels of towers and excavations.
2. Collapsing of excavations.
3. Poor hygiene as the contractor may find it difficult to provide sanitary welfare in the bushes.
4. Attack by wild animals in areas like Survey, Luoniek, Mugie Conservancy, Longewan, Tinga and L'partuk.
5. Road accidents.

Other hazards may include; slips and trips, electrical shocks, electrocution, dust, noise and vibrations, fire, bruises and cuts, etc. This impact will be felt in construction, implementation, and the decommissioning phases of the project.

Proposed Mitigation measure

The proponent will implement all necessary measures to ensure health and safety of the project workers and the general public during construction, operation and decommissioning of the proposed project as stipulated in the Occupational Safety and Health Act, 2007 including General Provisions (ensure the workplace is dully registered as a workplace, has a safety and health policy, has a safety and health committee, is always clean, have enough lighting and ventilation, sanitary conveniences are provided and are always clean, and provide clean drinking water to the workers), Machinery safety (ensure all machines requiring inspection are dully inspected by a DOSHS approved inspector and that inspections records are maintained

on site, only approved/licensed workers operate machines such as cranes, excavators, graders, rollers, vehicles etc., machines and equipment are dully serviced as per manufacturers' manual and that service records are maintained on site), Chemical safety Material Safety (maintain a Material Safety Data Sheet for all chemicals at the site, provide appropriate personal protective equipment to workers handling chemicals, ensure all chemicals are labeled and appropriate warning signs are put in place).

Other measures will include but not limited to;

- Employing an Environmental, Health and Safety Officer.
- Formulate and implement a Labor Management Plan that will ensure among others child and forced labor is not engaged.
- Ensure the construction site is dully registered as a workplace.
- Establish a health and safety committee as per Factories and other places of Work (Safety and Health Committee Rules) requirements.
- Conduct job safety analysis for high risk activities and document safe work procedures.
- Identify all hazards before undertaking a process.
- Conduct and continually review a risk assessment.
- Hold daily morning toolkit talks where safety is the key issue.
- Train workers on health and safety.
- Ensure first aid kits and trained first aiders are available on site.
- Identify and train fire marshals and provide them with firefighting equipment.
- Ensure only qualified personnel operate construction equipment and vehicles.
- Ensure each worker is covered under an insurance policy as per WIBA.
- Ensure construction equipment and vehicles are regularly inspected by approved inspectors and inspection records maintained.
- Where there are risks of attack by wild animals, ensure workers are accompanied by armed guards.
- Collect daily security briefs and avoid insecure places.
- Place warning signs where necessary including excavation sites, tower erection sites, conductor stringing sites, material loading zones, etc.
- Provide all necessary PPEs including helmets, ear muff/plug, hand gloves, dust/respiratory mask, reflective jacket, goggles, safety boots, double hook safety harness, etc.
- Only allow trained and certified workers to conduct repair and maintenance of the TL.

6.3.13; Working at Height (Transmission Line Towers)

Though this falls under health and safety, in this ESMP, it is treated separately as it can lead to fatalities, as has indeed happened in some of the KETRACO lines. This, it is assumed, will lay enough emphasize to the contractor and the proponent of its importance and therefore, help achieve a 100% fall protection advised by the World Bank. It is probably one of the riskiest/most dangerous process in construction of transmission lines.

Proposed Mitigation measure

To ensure no injury or fatality is encountered due to falls from towers;

- The client/consultant must implement a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among other measures;
- Only qualified and experienced personnel should be allowed to climb the towers.
- Every morning before beginning the works, there should be a tool box talk emphasizing on safety at heights.
- Structures must be tested for integrity prior to undertaking work.
- No personnel should be allowed to climb the towers while drunk or under the influence of drugs
- There should be a ground supervisor constantly observing and conversing with the workers atop the towers. The officer should ensure workers observe safety precautions at all the times and should have emergency telephone contacts.
- Use approved tool bag for raising or lowering tools and materials to workers atop the towers.
- Workers climbing the towers must be provided with non-slip footwear, gloves, helmet, and double hook safety harness and should be compelled to use them all the time. The PPEs should constantly be inspected, maintained, and replaced where necessary.
- Safety belts should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident.

6.3.14; Solid and Liquid Waste Generation

It is expected that solid waste will be generated in all phases of the project.

During construction, generated waste will include; excavated soil and rocks, residual loose and fine aggregates, cement bags, reject PPEs, wooden boxes used to deliver tower parts,

conductors, steel, metal, plastic, glass, paper, organic, paints, adhesives, sealants, fasteners, wastewater, sewage etc.

Cement will be used in large quantities during the construction period. This will in essence mean production of a quite substantial amount of cement bags. If not properly disposed, the bags litter the area, pollute the environment, are an eyesore, and become the most noticeable thing (poor environmental management by the proponent) by the community. This therefore, calls for the contractor and the proponent to ensure collection of all used cement bags and their proper disposal. PPE provided to the workers, including masks, reflective jackets, boots, helmets, etc., get worn-out after some time. A waste disposal plan for worn-out PPEs, that include collection and proper disposal, should be developed and implemented.

Experience from the already built transmission lines in Kenya show that, many contractors fail to collect (effectively) the remnants of the coarse aggregates (locally known as *kokoto*) and concreted waste from the tower bases. This creates a small patch that is not ecologically productive and can be seen many years after construction. Nothing can grow on this patch. Assuming that, this transmission line will have an approximated 300 towers and that each patch (of waste aggregate/*kokoto*) is about a meter square, the transmission line will create a desert equivalent to 300 square meters which is about 0.07 of an acre. Not big but a significant figure.

Proposed Mitigation measure

To avoid waste generation or to minimize the amount of waste generated, the following measures are recommended;

- Provide mobile toilets for construction workers to manage human waste.
- Provide well labeled waste collection bins at designated points on site to handle solid waste. Ensure segregation of waste.
- Implement sustainable waste management principles of reduction, reuse and recycling.
- Contract a NEMA licensed waste handler to collect and dispose waste. Ensure updated waste tracking sheets are maintained for collected waste.
- Ensure collection and proper disposal of all used cement bags.
- Develop and implement a waste disposal plan for reject PPEs.
- Sensitize construction workers on best waste management practices.
- Accurately estimate the dimensions and quantities of materials required especially fine and loose aggregates for tower bases.
- Reduce material and energy consumption

- Ensuring that, all remnants of loose gravel and concrete are effectively collected from the tower bases and re-used or disposed of in an environmentally friendly manner.
- Construction waste shall not be left in stockpiles along the wayleave, but removed and reused or disposed of on a regular basis.

6.3.15; Noise and vibrations

The construction and decommissioning works of the project will most likely be noisy due to the moving machines (concrete mixers, tippers, drilling etc) and incoming vehicles to deliver construction materials to site or take away debris. Except for areas like Bobongi, Ol Moran, Tinga, and parts of L'partuk, which have settlements close to the TL, this impact will be localized and only felt in the construction sites only. It can lead to; hearing problems, disruption of animal behaviors, and psychological and physical stress among workers which can reduced their productivity.

Machines like tippers, concrete mixtures, and drills produce continuous high levels of noise over a long period of time every day. Operators of these machines are therefore exposed to high levels of noise over long period which is continuous. This as a stand alone can be rated as high but overall noise impact for this project is however rated moderate to low.

For transmission lines in the range above 400kV, noise in the form of buzzing or humming can often be heard producing corona. Ozone, a colorless gas with a pungent odour, may also be produced. Buzzing/humming is also heard from substations. In quiet rural areas this can even be heard up to 300m or more, depending on topography, vegetation etc. Neither the noise nor ozone produced by power distribution lines or 132kV transmission lines carries any known health risks.

Proposed Mitigation measure

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 site and nearby communities. This can be achieved by regular maintenance and servicing of machine and vehicles, reducing idling of vehicles and equipment, sensitizing drivers against unnecessary hooting, blasting only when very necessary, among other measures. No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day. In addition no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dBC. Employees working in continuous loud noise should be provided with the necessary PPEs and impelled to use them.

Exposure to hand-arm vibration from equipment such as hand and power tools or whole-body vibrations from surfaces on which the worker stands or sits shall be controlled through selection of equipment and limitation of time of exposure. The limits for vibration and action values, i.e. the level of exposure at which remediation should be initiated, should not exceed a daily exposure limit value standardized to an 8-hours reference period of 5 meters per square second (m/s2) for hard-arm and 1.15m/s2 for whole-body.

The contractor will adhere to the EMCA Noise and Excessive Vibration Pollution Control Regulation, 2009 and will be required to implement noise control measures amongst exposed work force and community. This will include provision of hearing protective devices such as ear plugs and ear muffs; avoiding construction or demolition activities during the night, education and awareness programmes and creation of a buffer to propagate against noise pollution among other noise control measures. Where there will be need to work at night or where noise levels may be breached, the contractor will have to seek approval from NEMA.

Rock blasting for this project may not be necessary as no serious rock outcrops were identified but should the contractor encounter underground hard rocks, blasting may become necessary. Blasting will be guided by the Explosives Act, 2012 which requires one to have a permit to acquire or use blasting materials and to follow rules under section 30 – referred to as Explosives (Blasting Explosives) Rules, 1962. The rules include; licensing and permits, packaging, transportation, dealing with, usage, storage, sale, record keeping, and accidents (reporting and enquiry). Blasting may also require a variation of the NEMA License.

If the hum/buzz from substations exceeds the minimum standards set by NEMA or the IFC, then, corrective measures, which may include relocation (or slight changes in the location) of the substations, or relocation of nearby residents, should be undertaken.

6.3.16; Air Pollution

Exhaust emissions are likely to be generated by the motored equipment during the construction and decommissioning phase of the proposed project. Ozone may be produced due to corona discharge, but it is likely not to be a significant amount and would be easily dispersed. Motor vehicles that will be used to ferry construction materials, take away debris during decommissioning phase or those used for general operation activities (operation phase) will also have impacts on air quality. Diesel operated power back-ups (Generators) if used may also produce exhaust emission.

The construction phase of transmission line projects require use of large amounts of cement. Workers, especially, those who work on the concrete mixers will therefore be exposed to cement dust. Dust emission is also likely to occur during site clearance, excavation of foundation for steel towers, vehicles moving on dirt roads, and by uncovered trucks delivering loose aggregates to the site. Dust emissions are also likely to occur during the decommissioning phase.

Exhaust and dust emissions will mainly affect workers and community members. Workers will be affected in the entire line while effects on community will be more pronounced in areas like Bobongi, Ol Moran, Tinga, and parts of L'partuk where some settlements are close to the TL.

Proposed Mitigation measure

To mitigate against exhaust emissions, the proponent is advised to sensitize truck drivers and machine operators to switch off engines when not in use; regularly service engines and machine parts to increase their efficiency and reduce generation of exhaust emission; and where feasible use alternative non-fuel construction equipment.

The proponent will endeavour to minimize the effect of dust on the surrounding environment resulting from use of cement, site clearance, excavation, demolition works, and temporary access roads to ensure protection of health and safety of workers and communities. Control measures will include, use of PPE; regular sprinkling of water on dusty areas and temporary access roads; and observing set speed limits among other measures.

6.3.17; Soil Erosion

Certain sensitive areas prone to impacts of soil erosion, were identified. These included hilly areas and areas with rivers, streams, and water pans (given in section 3.5). In these areas, if not checked, soil erosion from the loose excavated soil, may lead to; land degradation, loss of soil fertility, and siltation of water resources which affects water quality and productivity in aquatic ecosystems.

Proposed Mitigation measure

To reduce soil erosion, the following mitigation measures are important:

- Soils excavated for the tower foundations should be used for refilling and should not be left exposed to wind or water for long periods.
- Apply soil erosion control measures such as levelling of the tower sites to reduce run-off velocity and increase infiltration of storm water into the soil.
- Ensure that construction vehicles are restricted to use existing graded roads.

- Contractors should avoid steep terrain during the transportation of construction material by using alternative routes or use light vehicles where appropriate.
- Riverine vegetation should be minimally disturbed during the construction phase to reduce soil erosion and safeguard riverbank. This may include realigning the transmission line route and redesigning the tower placement to avoid the riverine vegetation.
- Re-plant degraded areas with local species common in the area to complement natural vegetation regeneration to improve ground cover.

6.3.18; Archeological and Historical sites

Though not identified during the ESIA assessment, the transmission line may traverse through cultural heritage areas. Further, during excavations for the tower bases, workers may come across Archaeological finds. Project effects on archeological and historical sites may include:

- Damage or interference with archeological and historic sites.
- Chance encounter of archaeological material during construction phase.
- Destruction of buried archaeological materials by heavy machinery, earthworks and excavation during the construction phase.
- Unearthing of unexpected/unmarked/unidentified graves.

Proposed Mitigation measure

To reduce impacts on Archeological and Historical sites;

- Train KETRACO and construction staff on identification of archeological objects.
- If there is a chance encounter of archaeological material during construction, employ Chance Find Procedures. Chance Find Procedures include stopping construction works at the site, confining the site using tapes or local materials, and informing relevant authorities including local administration officers and the National Museums of Kenya (NMK) for further direction.

6.3.19; Aircraft Navigation Safety

The Kenya Civil Aviation Authority (KCAA) regulations, establish standards for determining obstructions in navigable airspace. Issues such as size and height of tower/poles, right-of-way needs, maintenance access, and impacts to the approach zone, clear zone, or safety zone has to be evaluated and approved by KCAA to utilize property near airports and airstrips.

The consultant in consultation with KCAA identified the following airstrips and their relative distance from the TL;

- Naibor airstrip (6km)

- Mugie airstrip (4km)
- Amaya airstrip (9km)
- Lesiolo airstrip (11km)
- Maralal Boma airstrip (5km)

To ensure the safety of aircrafts within these sections, KETRACO will be required to acquire a KCAA license for this transmission line. This may involve overflying the transmission line with KCAA officials. Where it is likely that the power line is hazardous to aviation safety because of its height or location, spherical markers will be used to identify overhead power lines or KETRACO will consider reducing the size of its towers in such sections.

6.3.20; Traffic disruption on road crossings during stringing

The transmission line will cross a number of roads including; Rumuruti-Sipili, Rumuruti-Bobongi, Rumuruti-Ngare Mare, Rumuruti-Ol Motonyi, Ol Motonyi-Ol Moran, Survey-Ol Moran Posta-Luoniek, Mugie-Baringo, Mugie-Longewan, Longewan-Suguta MarMar, Longewan-Maralal, and Loosuk-Poro – Baragoi. GPS coordinate of these roads are given in section 2.2. Effect of the transmission line on the roads will include; encroachment of road reserve, and disruption of traffic flow during conductor stringing.

To avoid encroachment of road reserve and reduce traffic disruption on road crossings during tower erection and stringing:

- Seek necessary approvals from the roads' authorities.
- Inform community on the time and dates prior to disruptions of traffic.
- Involve local traffic police and/or administration.
- Put up clear signs and provide traffic marshals to guide motorists during conductor stringing.

6.3.21; Visual and Aesthetic Impacts

The physical presence and profile of the proposed transmission line will alter the visual and aesthetic effects of the surrounding area. The project terrain in most section is rather flat and concealing the tall pylons of the TL will be a difficult challenge.

Contractor's materials' yard/camp sites and any temporary structures (e.g., toilets) built/placed on the way-leave by the contractor will also impact on visual and aesthetic nature of the surrounding areas.

Proposed Mitigation measure

To reduce impacts on visual and aesthetic values of the area, the project proponent will;

- Undertake extensive public consultation during the planning of the project.
- Design structures (in the camping site, material storage site, site offices, and any other temporary structure built by the contractor) in such a way as to improve the beauty of the surroundings.
- Restore site areas through backfilling, landscaping and planting of trees, shrubs and grass on the unused areas to re-introduce visual barriers.
- Design and implement an appropriate landscaping programme for the substations.

6.3.22; Perceived Danger of Electrostatic and Magnetic Force

Electric power 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 and the lateral distance from the power lines 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 (over 30m high) and there should be no potential health risks for people living outside of 30m corridor (information obtained from KETRACO Engineers).

Proposed Mitigation measure

The proponent will take the precautionary principle approach and ensure that a safe distance is maintained between residential units and the TL and conduct education and awareness campaigns to dispel fear among communities on the effects of electrostatic and magnetic forces.

6.3.23; Fire outbreak

Fire outbreak due to electrical faults in the TL and flammable substances is a possible effect of the proposed TL. If underlying growth is left unchecked, or slash from routine maintenance is left to accumulate within the way-leave, sufficient fuel can accumulate that may promote fires. Fire outbreak from electrical faults is highly unlikely given that, modern technology, allows for a split second circuit break in case of an electrical fault but use of match boxes and lit cigarettes by workers can indeed cause fire.

Proposed Mitigation measure

To reduce the risk of fires in the project area, the following mitigation measures are proposed;

- Conduct fire risk assessment and prepare Fire Response Plan. The fire risk assessment should identify possible sources of fire/hazards, people or property at risk, the probability a fire will occur, how fast it can spread, preparedness to manage a fire, among others. Part aim is to avoid forest fires and fires that can extend into or emanate from the substations.
- Advise workers not to smoke in forested areas.
- Ensure compliance with fire safety regulations and ensure availability of all necessary fire safety equipment.
- Conduct regular training and fire drills for employees
- Regularly monitor the way-leave and ensure there is no accumulation of flammable substances.
- Create fire-breaks (ploughed strips) on strategic areas of the TL
- Build capacity for workers and community on fire related issues including sources, fighting, and vigilance.

6.3.24; COVID-19

Since the emergency of Coronavirus (COVID-19) pandemic in the country in March, 2020, the number of infections continue to raise. For this project, due to interactions between consultant staff, KETRACO staff, and community members, the spread of COVID-19 among workers, KETRACO staff, and community members is highly propbale. Impacts COVID-19 may have for this project include;

- Increased high expectations on the project e.g., higher demand for jobs, CSR activities, compensation monies, salaries/wages etc.
- Psychological effects of Covid-19 and social isolation may lead to increased cases of GBV including, GBV-SEA, workplace Sexual harassment, as well as other forms of GBV at the community or family level attributable to the project.

- Due to COVID-19 effects the burden of taking care of the household might fall disproportionately on women, therefore making it difficult for them to take part in e.g., including consultation fora, decision making etc.
- External sourcing of labour may be impeded by, (a) cessation of movement; and (b) unwillingness of some workers to live in unfamiliar locations during a pandemic (fear of contracting the virus), and especially in locations with a high number of infections/pandemic epicenters.
- Stigma and social discrimination of outsiders who might be viewed by locals as spreaders of COVID-19. This might lead to social divisions in the project area between

the locals and outsiders who will be working on the project such that the relations will be strained.

Proposed Mitigation measure

To reduce the risk and effects of COVID-19, the following mitigation measures are proposed;
All staff and community members should;

- Regularly and thoroughly clean their hands using soap and running water or with an alcohol-based hand rub.
- Maintain at least 1 metre distance between themselves and others.
- When coughing or sneezing, cover mouth and nose with flexed elbow or use disposable tissue and discard after use.
- Avoid touching eyes, nose and mouth.
- Always wear a mask in public and safely dispose used masks.
- Greet people with a wave, a nod, or a bow instead of shaking their hands.
- Avoid going to crowded places.
- If they have a fever, cough, difficulty breathing, or any other COVID-19 symptom, they should seek medical attention.

The proponent must;

- Every morning monitor staff health for symptoms such as fever, cough, or difficulty in breathing.
- Make sure workplaces and equipment are clean and hygienic and are regularly disinfected.
- Put sanitizing hand rub dispensers in project vehicles.
- Develop a response plan in case someone becomes ill with symptoms of COVID-19.
- Give additional support to those disadvantaged and vulnerable groups who have been further disenfranchised due to negative social and economic impacts of Covid-19.
- Manage increased high expectations on the project e.g., higher demand for jobs, CSR activities, compensation monies, salaries/wages etc. through training and information dissemination.
- Assist people to cope with stress and psychological effects during the COVID outbreak.
- Develop and implement a Gender Mainstreaming Plan with COVID-19 effects in mind to reduce the risk of gender inequality and biases.
- In sourcing external labour (adverts and interviews), ensure people know measures employed to protect them from contracting COVID-19.
- Organize with the MoH on how project workers can be tested for COVID-19 from time to time.

6.4 Potential threats to the Transmission Line

Threats to transmission lines include Vandalism, Natural Disasters, Local Conflicts, Terrorist Attacks, and Manufacture or Installation Defects.

Vandalism involves destruction or damage of transmission line components by thieves or hateful/deliberate persons. Vandalism mainly happen in remote areas with no settlement and very low human activity. The most affected parts include tower angle bars, nuts, barb wire, warning plates, stay, and earth wire. This may lead to weakening of the tower and possible collapse. The collapse of one tower on the network leads to uneven stress on the two adjacent towers leading to a possibility of a domino effect which may lead to power outage.

Natural disasters like earthquake, landslides, lightening, and torrential rains can also affect the integrity of the transmission line components that may lead to the collapse of towers and subsequent power outages.

The project area has been known to host a number of conflict which mainly revolve around cattle rustling. These conflict most times involve gun fights and sometime leads to evacuation of many project staff from the area. If the TL staff are evacuated due to such conflicts, the power system will be left un-attended and may lead to power outages.

Terrorists may aim to sabotage the power system. This may include physical assault of towers and their components, substation equipment, or project staff.

Manufacture or Installation Defects are as a result of use of sub-standard and defective equipment, installation of the TL by unqualified contractors who were never keen on details, week foundation bases for the towers, siting of towers on riparian zones or weak grounds, failure to strictly adhere to set standards, weak supervision of construction activities among other reasons.

To counter these threats, the following measures are proposed;-

- Use of anti-theft bolt and fasteners and an anti-climbing spike system.
- Use of lightening arrestors at strategic areas of the TL.
- Locate towers away from the highest recorded flood level of any water-way and in soils that can effectively support the towers.
- Supervision of project construction should be of the highest standard.
- Regular surveillance of the TL and advocate and support community surveillance mechanisms.

- Creation of a department that will be responsible of monitoring the integrity of the TL equipment and responding to any threat to the transmission line. Empower this department with all required staff and resources so as to be able to quickly respond to emergencies to avoid long duration of power outages.
- Develop and implement a Security Management Plan to deal with these situations.
- With time ensure more inter-connected systems e.g., creation of other TL in this area, to reduce over-reliance on this particular TL.

6.5: Impacts Characteristic Table

Table 6.1: Impacts Characteristic Table

Impacts	Nature	Magnitude	Timing (phase)	Duration	Extent	Reversible Irreversible	Likelihood	Significance
Reliable and secure electricity power	+ve	High	Operations	Long term	Large	Reversible	Certain	Regional
Big Four Agenda	+ve	High	Operations	Long term	Medium	Reversible	Certain	Regional
Reduced greenhouse gas emissions	+ve	Low	Operations	Long term	Large	Reversible	Probable	Regional
Low cost of electricity	+ve	High	Operations	Long term	Large	Reversible	Highly probable	Regional
Employment	+ve	Medium	All phases	Short term	Medium	Reversible	Certain	National
Reduced pollution	+ve	Low	Operations	Long term	Small	Reversible	Certain	Regional
Economic growth	+ve	High	All phases	Long term	Large	Reversible	Highly probable	National Regional
Informal Sector Benefits	+ve	Low	All phases	Long term	Small	Reversible	Probable	Regional
Development of other Sectors	+ve	Medium	Operations	Long term	Small	Reversible	Probable	Regional
Improved security	+ve	Low	Operations	Long term	Small	Reversible	Probable	Regional
Acquisition of wayleaves and land for substation, contractor facilities, and workers camps	-ve	High	Prior to construction	Long term	Large	Irreversible	Certain	Local
Livelihood restoration	-ve	Low	Prior to construction	Short term	Small	Reversible	Probable	Local
Gender biases	-ve	Low	All phases	Short term	Small	Reversible	Probable	Local
Inadequate stakeholder engagement and grievances management etc.	-ve	Low	All phases	Short term	Small	Reversible	Probable	Local
Inability for all community segments to access project benefits and opportunities including employment, local sourcing, capacity building etc.	-ve	Low	Preconstruction Construction and Decommissioning	Short term	Small	Reversible	Probable	Local
COVID-19	-ve	High	All phases	Short term	Large	Irreversible	Probable	Local
Project Induced Labour Influx	-ve	Low	Preconstruction, construction, operations, and decommissioning	Short term	Small	Reversible	Certain	Local
Culture, Heritage, and Norms	-ve	Low	Construction	Short term	Small	Reversible	Probable	Local
Livestock farming	-ve	Low	Construction	Short term	Medium	Reversible	Certain	Local
Community health and safety	-ve	High	All Phases	Long term	Medium	Reversible	Probable	Local
Destruction of existing vegetation and habitat	-ve	High	Construction	Short term	Large	Irreversible	Certain	Local
Disturbance of wildlife	-ve	High	Construction Decommissioning	Short term	Medium	Reversible	Probable	Local

Impacts	Nature	Magnitude	Timing (phase)	Duration	Extent	Reversible Irreversible	Likelihood	Significance
Avifauna disturbance and mortality	-ve	High	Construction Operations	Short term	Large	Irreversible	Probable	Local
Water pollution	-ve	High	Construction	Long term	Large	Reversible	Probable	Regional
Mugie and Engare Narok Forest	-ve	High	Construction Decommissioning	Long term	Large	Irreversible	Probable	Local
Worker health and safety	-ve	High	Construction, Operations, and Decommissioning	Long term	Large	Irreversible	Probable	Local
Working at height	-ve	High	Construction Decommissioning	Long term	Large	Irreversible	Probable	Local
Waste handling, storage and disposal	-ve	Medium	Construction, Operations, and Decommissioning	Long term	Small	Reversible	Certain	Local
Noise and vibrations	-ve	High	Construction, Operations, and Decommissioning	Long term	Small	Irreversible	Certain	Local
Air pollution	-ve	Medium	Construction, Operations, and Decommissioning	Short term	Large	Irreversible	Certain	Local
Soil erosion	-ve	Low	Construction	Short term	Small	Reversible	Probable	Local
Archaeological and historic sites	-ve	Low	Construction	Short term	Small	Irreversible	Unlikely	Local
Air craft navigation safety	-ve	High	Operations	Long term	Large	Irreversible	Unlikely	Local
Traffic disruptions	-ve	Medium	Construction	Short term	Small	Reversible	Probable	Local
Visual and aesthetic impacts	-ve	Low	Construction, Operations, and Decommissioning	Long term	Small	Irreversible	Certain	Local
Perceived Danger of EMF	-ve	Low	Operations	Long term	Small	Irreversible	Probable	Local
Fire outbreaks	-ve	Low	Construction, Operations, and Decommissioning	Short term	Small	Irreversible	Probable	Local

CHAPTER 7: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

7.1: ESMP for the Pre-construction Phase

Table 7.1: ESMP for the pre-construction phase of the proposed project

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
Social Impacts				
Acquisition of wayleaves and land for substation, contractor facilities and workers camps	✓ Loss of land, structures, crops and trees ✓ Loss/Disruption of livelihoods/income ✓ Effects on family set-up due to unexpected large income from compensation including domestic violence/Wife battering, drunkenness, marrying more wives, running to far urban Centers to seek worldly pleasures, misuse of money, and gambling. ✓ Delay in compensation for PAPs due to land disputes and lack of land ownership documents. ✓ Gender inequality, e.g., lack or inadequate participation of women in project meetings and other activities and unequal access to compensation for women etc. ✓ Denied physical access to social facilities e.g., health centers, schools, water points, etc.	✓ Develop and implement a Resettlement Action Plan (RAP) and a Livelihoods Restoration Plan (LRP) and ensure that all community segments including vulnerable individuals and households are fairly and promptly compensated, and their livelihoods improved or restored to pre-project levels. ✓ Implement the VMGP to ensure VMGs effectively participate in the project and access social and economic benefits that are also culturally appropriate. ✓ Compensate PAPs fairly (full replacement cost) and promptly ✓ Give PAPs adequate time to relocate ✓ Salvaged materials from structures, crops, and trees will be accessible to PAPs. ✓ Develop and implement a Livelihood Restoration Plan to cushion economic displacement and loss of livelihoods. This should include Mwanzi farm (horticulture), Mugie Conservancy, ranching, and any other businesses or livelihood sources affected by the project. ✓ Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases and ensure participation of women in decision making and sharing of project benefits including compensation. ✓ Develop a Stakeholder Engagement Plan and Grievances Redress Mechanism to guide stakeholder engagement and grievances management during all phases of the project. ✓ Before and after the compensation process, conduct focused groups sensitization fora and counselling sessions to discuss social vices associated with receiving an unexpected (large) income. ✓ Constitute Resettlement Committees comprising of representation from all community segments to manage all aspects related to land acquisition and compensation. ✓ To manage community expectations, the proponent to discuss and agree with the affected communities on their preferred compensation modes whether cash, land, or in-kind. ✓ For delayed compensation, KETRACO to deposit compensation monies on an interest earning escrow account until such cases are resolved. The proponent to ensure that information regarding the escrow account is timely disseminated to all PAPs in subsequent consultation fora.	Total budget for wayleaves acquisition as per the RAP is KES 481, 800, 367 Budgets for acquiring land for substation, contractor facilities and workers camps will be determined once specific sites for the said facilities have been established and a cost analysis/valuation undertaken.	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Land for ancillary facilities (including contractor facilities, and workers camps) will be acquired by the contractor on a willing seller willing buyer basis. If land for ancillary facilities is to be acquired in Community Group Ranches, the contractor will be required to strictly adhere to the provisions of the Community Land Act 2016. ✓ For this project, the substation in Maralal will most likely be located in L'Partuk unregistered Community Group Ranch held in trust by the county government. KETRACO shall abide by the provisions of the Community Land Act of 2016 to compensate for the Community Land. KETRACO will undertake free, prior and informed consultations with the affected communities, including VMGs, both to make them aware of the need for their land and to secure their broad support for the project. In addition, they will be sensitized on the provisions of the Community Land Act, 2016, which states that cash compensation for unregistered community land will be placed in an interest earning account held on behalf of the community by the County Government until the community and the land are registered. ✓ After sensitization (including the disclosure of all forms of compensation) and consultation with communities and county government, the community will choose their preferred form of compensation (whether, land, in-kind, or cash compensation). The community will be made aware of the fact that, under cash compensation, compensation monies will be held on an interest- earning escrow account held for them by the County Government, and upon registration of the land and the community, all monies and accrued interest will be released to the community. ✓ Compensation for land and other assets for the registered Community Group Ranches (Longewan, Lolmolok, Loosuk, Tinga, and Sirata Oirobi), each holding a group title will be paid to the group ranches (management) and as agreed with ranch members. While, for the unregistered group ranch (L'Partuk), compensation will be given to the County Government of Maralal to hold in trust for the community members in the same manner as described above for the substation. Compensation for private structures shall be paid to individual owners. ✓ Ensure compensation takes into consideration temporary loss of use of land (some households will only be affected during construction) as well as permanent loss of use of land (the affected portion of land will remain unutilized for the entire period of existence of the transmission line) of the RoW. ✓ Proponent to ascertain property ownership through land searches, local administration, village elders, and local leaders before compensation.		

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Where land documents are missing, proponent to give adequate time and any other necessary support to PAPs to get the ownership documents. ✓ Proponent to use available and culturally appropriate dispute resolution mechanisms. ✓ In case of an unresolved dispute, delay in securing land documents etc. proponent to deposit compensation money in an escrow account to be paid to PAPs upon resolution of the dispute etc. ✓ Ensure resettled PAPs enjoy or get access to social facilities like schools, health centres and water points to enable them to resettle with minimal distress.		
Livelihood restoration	✓ Effects on farming and livestock rearing ✓ Impact on conservancy-based tourism ✓ Loss of businesses ✓ Loss of formal and/or informal employment ✓ Extra burden to vulnerable PAPs who include household headed (HH) by an elderly person, HH by a child, HH by a single parent, HH by a chronically ill person, or HH by a PWD as they may require to hire other people to support them in the resettlement process since they may not have the time, energy/strength, education, various abilities (have disability), ability to comprehend the process, ability to negotiate etc.	✓ Develop and implement a livelihoods restoration plan. ✓ The PAPs will to the extent possible be allowed to harvest seasonal crops (maize, beans etc.) nearing maturity as well as transfer fruit trees, where feasible. ✓ For fruit trees, compensation should be based on the value of the harvests lost until the replacement trees come into full production. In the case of immature trees, it is proposed to directly supply seedlings as a replacement and provide compensation for the resulting delay in reaching fruit-bearing capacity. ✓ Identification of local institutions where farmers can go for training on good farming techniques and animal husbandry. ✓ Facilitation of farmers and pastoralist to obtain inputs like seeds, fertilizer, animal feeds, veterinary services, etc. and markets for farm and livestock products. ✓ Training of farmers and pastoralists on proper ways of handling and storage of farm and animal produce to avoid wastage and losses. ✓ Buy an insurance cover for animals that may be involved in any accident (e.g., traffic, falling on open pits, or being hoisted during conductor stringing). ✓ Develop water pans at strategic points where water can collect during the wet season for use by livestock during the dry seasons. ✓ Repairing any damaged sections of the perimeter electric fence and roads within Mugie conservancy. ✓ Effectively ground the electric fence for Mugie Conservancy to avoid effects of induced voltage. ✓ Provide compensation for lost businesses and any other livelihood sources. ✓ Ensure PAPs are relocated near their current dwelling sites to avoid affecting their current formal or informal sources of livelihood ✓ Ensure resettled PAPs enjoy or get access to social facilities like schools, health centres and water points to enable them resettle with minimal distress. ✓ Provision of additional assistance to vulnerable PAPs and VMGs (particularly minority VMGs) to cushion them from the	✓ Farmer and pastoralist Training and facilitation @ 500,000 ✓ Insurance @ 200,000 ✓ Damaged and grounding electric fence @ 200,000, ✓ Lost business @ 1,000,000 ✓ Assistance to vulnerable PAPs @ 2,000,000	KETRACO

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		impacts of resettlement and loss of livelihoods.		
Project Induced Labour Influx related impacts e.g., GBV-SEA/SH	✓ Spread of diseases such as HIV/AIDS, STDs and other communicable diseases. ✓ Gender Based Violence such as sexual exploitation and abuse of community members by project workers (SEA) and workplace sexual harassment (SH), and exploitative sexual relations and illicit sexual relations with minors. ✓ Gender mainstreaming issues including the two-thirds gender rule, gender inequality, gender equity, women participation in project meetings and activities etc. ✓ Child labour (employment of minors) and school dropout. ✓ Disregard of important cultural norms.	✓ Develop and implement a Local Recruitment Plan that will ensure employment of as many locals as is possible. Local laws require 30% of labour force to come from the locals. ✓ Develop and implement a Labor Influx Management Plan that will ensure harmony between non-local workers and the locals and minimize effects of labour influx ✓ Conduct sensitization fora for employees on ethics, morals, general good behaviour, GBV-SEA/SH, and the need for the project to co-exist with the neighbours. The fora should be guided by the Stakeholder Engagement Plan. ✓ Provide guidance and counselling on drug abuse, HIV/AIDS, and other STDs to employees. ✓ Sensitize local community on communicable diseases (STDs and HIV/AIDS) and GBV-SEA/SH. ✓ Provide female and male condoms to construction workers. ✓ Cooperation with local law enforcement and introduction of sanctions (e.g., dismissal) for workers involved in criminal activities. ✓ Develop and implement the GBV Management Plan (Cognizant of 1. sensitivity of GBV, and 2. the need to ensure confidential reporting and responding to GBV cases reported); including plans for prevention, response and Grievance Redress Mechanism, and ensure that the project does not trigger or exacerbate other forms of GBV at the community level. Further, ensure codes of conduct are signed by all with physical presence on project site. ✓ Mandatory and regular training for workers on required lawful conduct in relation to GBV in host community in addition to social and cultural inductions to workers. The project should support survivors who choose the legal redress route by referring them to the legal redress referral pathway – which could include legal entities (NGOs, lawyers, police stations etc.). ✓ Commitment to cooperate with law enforcement agencies investigating perpetrators of gender-based violence. However, survivors or guardians of survivors (in the case of minors) can choose to involve the police or not. The project, therefore, can support survivors who choose the legal redress route by referring them to the legal redress referral pathways mapped by the project-which could include legal entities (NGOs, lawyers, police stations, etc.) in the project area working in the GBV space, but the decision to follow this route must be made by the survivor or their guardian. Further, the survivor will be facilitated to understand that they may be required to cooperate with law enforcement. ✓ Ensure that children and minors are not employed directly or indirectly on the project.	Sensitization fora @ 500,000 Condoms @ 200,000 Training on GBV @ 200,000	✓ KETRACO

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		To ensure minors or children are not employed directly or indirectly in the project, the proponent/contractor will monitor the employment register; in addition to ensuring that all workers hold valid national identification cards. ✓ All criminal cases to be reported to the relevant authorities through appropriate channels. ✓ Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases.		
Gender biases	✓ Gender mainstreaming issues including the two-thirds gender rule, gender inequality, gender equity etc. ✓ Inability of women to attend project meetings and other decision-making fora. ✓ Unfavorable employment conditions for women including salary, maternity leave, working hours, security, periodic time off to afford them access to child and dependent care, etc.	✓ Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases and ensure participation of women in decision making and sharing of project benefits. The plan should also ensure gender is mainstreamed in all aspects of the project. ✓ For the employment of a wayleaves officer, Community Liaison Officer, drivers, and any other staff working in the project, KETRACO to give more preference to women applicants and to encourage women to apply. ✓ In developing a Stakeholder Engagement Plan, the proponent to ensure women are identified as an important focus group and the plan's implementation to be sensitive to women's availability to attend meetings. ✓ For any community meetings held, the announcement to encourage women to attend and the organizers to design initiatives that reach out to more women to attend the meetings. ✓ The proponent to ensure all women PAPs are compensated and in a fair and timely manner. Where possible create joint bank accounts between spouses for disbursement of compensation funds, and ensure both spouses consent to joint bank accounts. ✓ Inclusion of women representatives on Grievances Redress Committees. ✓ Conduct sensitization fora with all community segments about the importance of women participation in the project. ✓ Identify and address women employee security issues, including their safety while traveling to and from work and on project-related business. ✓ Proactively recruit and appoint women workers to decision making positions. ✓ Offer flexible work options for women workers, accord them their leave days, and where possible support their access to child and dependent care.	Sensitization fora @ 200,000	KETRACO
Stakeholder engagement and grievances management.	✓ Stakeholder engagement is not aligned with the Stakeholders Engagement Plan. ✓ Inadequate or partial stakeholder identification. ✓ Lack of or inadequate stakeholder engagement. ✓ Untimely disclosure of relevant project information	✓ Develop and implement a Grievances Redress Mechanism (GRM) to manage all grievances in a timely manner and ensure the grievances management process is aligned with the GRM. ✓ Periodic review of the SEP and GRM ✓ Continual improvement of the SEP and GRM ✓ Ensure that all stakeholders are identified and are included in the SEP, and engaged	✓ Develop and implement ation of SEP @ 5,080,000 ✓ Develop and implement ation of	KETRACO

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
	✓ Inadequate or partial disclosure of relevant project information. ✓ Grievances are not managed and resolved in a timely manner ✓ Process of grievances management is not aligned with the Grievances Redress Mechanism, leading to escalation into legal claims. ✓ Exclusion of vulnerable individuals and households from the engagement process.	meaningfully, including vulnerable individuals and households. ✓ Conduct Free Prior Informed Consultations to ensure affected VMGs are engaged meaningfully and access culturally appropriate social and economic benefits. ✓ Implement project structured interventions to ensure vulnerable individuals and households effectively participate in, and benefit from the project. ✓ Implement the SEP and ensure all stakeholder engagement is aligned to the SEP. ✓ Ensure timely disclosure of relevant project information, e.g., project instruments, project risk management plans, positive and negative impacts, full rights and entitlements of project-affected persons, project benefits, and project opportunities.	GRM @ 3,000,000	
Project benefits and opportunities including employment, local sourcing, capacity building etc.	✓ Failure by contractor and the proponent to prioritize locals for jobs. ✓ Perception by the locals that labour is imported from outside the project area. ✓ Project benefits and opportunities (e.g., employment, project-structured interventions for disadvantaged groups, etc.) are inaccessible to project-affected persons, including vulnerable individuals and households (elderly, PWD, etc.) and VMGs.	✓ Develop and implement a Local Recruitment Plan that will ensure employment of as many locals as is possible and manage all aspects related to local employment. Local laws require 30% of labour force to come from the locals. ✓ Manage negative public perception through community sensitization and training ✓ All job advertisements to be made available to the local population /placed in locations accessible to locals. ✓ Develop and implement a Corporate Social Responsibility (CSR) Plan in consultation with all community segments. ✓ Implement the VMGP to ensure VMGs effectively participate in the project and access social and economic benefits that are also culturally appropriate. ✓ Implement project structured interventions to ensure vulnerable individuals and households effectively participate in, and benefit from the project	✓ Sensitization and training @ 500,000 ✓ CSR at 3,000,000	KETRACO
COVID-19	Spread of the disease due to; ✓ Interaction of KETRACO staff and community members during RAP implementation, disclosure of ESIA findings, engagement on CSR implementation, and sensitization sessions on HIV/AIDs, GBV-SEA/SH etc. ✓ RAP team seeking accommodation within project areas. Increased high expectations on the project e.g., higher demand for jobs, CSR activities, compensation monies, salaries/wages etc Psychological effects of Covid-19 e.g., due to negative socio-economic effects, social	All staff, visitors, and community members should adhere to the government's covid-19 regulations, including; ✓ Regularly and thoroughly clean their hands using soap and running water or with an alcohol-based hand rub. ✓ Maintain at least 1 metre distance between themselves and others. ✓ When coughing or sneezing, cover mouth and nose with flexed elbow or use disposable tissue and discard after use. ✓ Avoid touching eyes, nose and mouth. ✓ Always wear a mask in public and safely dispose used masks. ✓ Greet people with a wave, a nod, or a bow instead of shaking their hands. ✓ Avoid going to crowded places. ✓ If they have a fever, cough, difficulty breathing, or any other COVID-19 symptom, they should seek medical attention. The proponent must; ✓ Every morning monitor staff health for symptoms such as fever, cough, or difficulty in breathing.	Thermometers@ 6,000 each. Face masks@ 500 a pack and transparent plastic protective face shield@ 300 each. Disinfecting workplaces @5,000 a month. Alcohol based sanitizers, soaps and disposable tissue@ 5,000 a month.	✓ KETRACO

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
	isolation may lead to increased cases of GBV including, GBV-SEA, workplace Sexual harassment, as well as other forms of GBV at the community or family level attributable to the project. Due to COVID-19 effects the burden of taking care of the household might fall disproportionately on women, therefore making it difficult for them to take part in e.g., including consultation fora, decision making etc. External sourcing of labour may be impeded by, (a) cessation of movement; and (b) unwillingness of some workers to live in unfamiliar locations during a pandemic (fear of contracting the virus), and especially in locations with a high number of infections/pandemic epicenters.	✓ Make sure workplaces and equipment are clean and hygienic and are regularly disinfected. ✓ Put sanitizing hand rub dispensers in project vehicles. ✓ Develop a response plan in case someone becomes ill with symptoms of COVID-19. ✓ Give additional support to disadvantaged and vulnerable groups/locals who have been further disenfranchised due to negative social and economic impacts of Covid-19. ✓ Manage high expectations on the project e.g., higher demand for jobs, CSR activities, compensation monies, salaries/wages etc. through training and information dissemination. ✓ Assist people to cope with stress and psychological effects during the COVID outbreak. ✓ Develop and implement a Gender Mainstreaming Plan with COVID-19 effects in mind to reduce the risk of gender inequality and biases. ✓ In sourcing external labour (adverts and interviews), ensure people know measures employed to protect them from contracting COVID-19.		

7.2: ESMP for the Construction Phase

Table 7.2: ESMP for the construction phase of the proposed project

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
Social Impacts				
Project Induced Labour Influx related impacts e.g., GBV-SEA/SH	✓ Social conflict between the local community and the construction workers due to religious, cultural or ethnic differences or competition for local resources. ✓ Increase in illicit behavior and crime including theft, physical assaults, substance abuse, and prostitution. ✓ Increased burden on and competition for public service provision including water, energy, medical services, transport, and education. ✓ Spread of diseases such as HIV/AIDS, STDs and other communicable diseases. ✓ Gender Based Violence such as sexual exploitation and abuse of community members by project workers (SEA) and workplace sexual harassment (SH), and	✓ Develop and implement a Local Recruitment Plan that will ensure employment of as many locals as is possible. Local laws require 30% of labour force to come from the locals. ✓ Develop and implement a Labor Influx Management Plan that will ensure harmony between non-local workers and the locals and minimize effects of labour influx ✓ Conduct sensitization fora for employees on ethics, morals, general good behaviour, GBV-SEA/SH, and the need for the project to co-exist with the neighbours. The fora should be guided by the Stakeholder Engagement Plan. ✓ Provide guidance and counselling on drug abuse, HIV/AIDS, and other STDs to employees. ✓ Sensitize local community on communicable diseases (STDs and HIV/AIDS) and GBV-SEA/SH. ✓ Provide female and male condoms to construction workers. ✓ Cooperation with local law enforcement and introduction of sanctions (e.g., dismissal) for workers involved in criminal activities. ✓ Provision of water supply source to workers and prohibition of use from other community sources or ensure the project and community agree on the right to access water from community sources.	Sensitization fora @ 1,000,000 Condoms @ 200,000 Training on GBV @ 200,000	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
	exploitative sexual relations and illicit sexual relations with minors. ✓ Gender mainstreaming issues including the two-thirds gender rule, gender inequality, gender equity, women participation in project meetings and activities etc. ✓ Child labour (employment of minors) and school dropout. ✓ Local inflation of prices due to increase in demand for goods and services ✓ Disregard of important cultural norms.	✓ Develop and implement the GBV Management Plan (Cognizant of 1. sensitivity of GBV, and 2. the need to ensure confidential reporting and responding to GBV cases reported); including plans for prevention, response and Grievance Redress Mechanism, and ensure that the project does not trigger or exacerbate other forms of GBV at the community level. Further, ensure codes of conduct are signed by all with physical presence on project site. ✓ Mandatory and regular training for workers on required lawful conduct in relation to GBV in host community in addition to social and cultural inductions to workers. The project should support survivors who choose the legal redress route by referring them to the legal redress referral pathway – which could include legal entities (NGOs, lawyers, police stations etc.). ✓ Commitment to cooperate with law enforcement agencies investigating perpetrators of gender-based violence. However, survivors or guardians of survivors (in the case of minors) can choose to involve the police or not. The project, therefore, can support survivors who choose the legal redress route by referring them to the legal redress referral pathways mapped by the project-which could include legal entities (NGOs, lawyers, police stations, etc.) in the project area working in the GBV space, but the decision to follow this route must be made by the survivor or their guardian. Further, the survivor will be facilitated to understand that they may be required to cooperate with law enforcement. ✓ Provision of opportunities for workers to regularly return to their families. ✓ Provision of opportunities for workers to take advantage of entertainment opportunities away from rural host communities. ✓ Ensure that children and minors are not employed directly or indirectly on the project. To ensure minors or children are not employed directly or indirectly in the project, the proponent/contractor will monitor the employment register; in addition to ensuring that workers have valid national identification cards. ✓ Maintain an updated employee database on site. ✓ Issue construction workers with identification cards to access construction site. ✓ All criminal cases to be reported to the relevant authorities through appropriate channels. ✓ Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases.		
Culture, Heritage, and Norms	✓ Interference with (damage to, relocation of, or limited access to) cultural sites such as initiation grounds, burial sites, sacred trees, shrines etc. ✓ Sexual relations with local communities. ✓ Cultural erosion as a result of introduction of new ways of life.	✓ The contractor to engage a local liaison (cultural ambassador) to guide and advice the project on all issues regarding culture, heritage, and norms. ✓ Workers from other cultures especially women are not allowed anywhere near the *manyattas*. ✓ Workers should avoid sexual relationships with locals. Sexual relations with local married women are considered to be a taboo and could lead to conflict or violence. ✓ Contractor to prohibit workers from wearing clothes that are too revealing.	Remuneration for the Cultural Ambassador @ 20,000 a month Settling disputes for interfering with cultural sites	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ The contractor shall sensitize workers to respect the culture of the local community and not to impose their culture on the community. ✓ Implement the VMGP to ensure VMGs effectively participate in the project and access social and economic benefits that are also culturally appropriate. ✓ Graves should never be excavated. Should they accidentally be excavated, certain traditional rituals must be performed with KETRACO bearing the cost of the rituals. The cultural ambassador to advice on required rituals. Contractor to design the towers so as to avoid marked graves. ✓ During the traditional ceremony of Rite of Passage (circumcision), the "morans' live in '*manyattas'*. With the assistant of the cultural ambassador, the proponent, should consult local elders and ensure such '*manyattas'* are not put up on the wayleave. Should they be on the wayleave, works in the location must be skipped until the occasion ends which can take up to 3 months. ✓ Certain sacred trees, like the *Kokua* for the Pokot community, and *mugiet (*a tree on which the sticks that were used in roasting meat during circumcision and other traditional ceremonies) for Maasai, Samburu, and Ogiek cannot be felled until elders perform the necessary rituals. All sacred trees and cultural sites along the route should be identified and listed.	including cleansing rituals @ 70,000 per case	
Livestock farming	✓ Animals may fall into the excavated pits for tower foundation ✓ Vegetation clearance may reduce animal fodder ✓ Construction of a substation in Maralal may lead to a reduction in pasture zones ✓ Abstraction of water for construction from local water reserves may reduce availability of water to animals ✓ Wayleave corridor may be used as an access road and exacerbate livestock theft ✓ Livestock death from falling objects during tower erection; being hoisted up during conductor stringing; and traffic accidents ✓ Noise, movement of equipment and staff, and general construction works may be a nuisance to the grazing animals	✓ Excavated foundation pits to be well secured to avoid animals from falling into them. Foundation pits thought to take long must be secured by barbed or mesh wire. ✓ Excavated pits to be backfilled as soon as possible ✓ Selective vegetation clearance by only clearing what is necessary to ensure animals have enough fodder. ✓ For this project, the substation in Maralal will most likely be located in the unregistered L'Partuk Community Group Ranch. Compensation for loss of communal pasture zones will be managed in accordance to the provisions in the project's RPF. ✓ Contractor to develop water pans at strategic points where water can collect during wet seasons for his construction activities and for livestock. ✓ During dry seasons no water to be extracted from the local water resources. The contractor to use water-bowsers with water from water companies in Rumuruti and Maralal ✓ Community to be facilitated to conduct vigilance and to create barriers within the wayleave corridor to stop or control access by motorable equipment including cars and motorbikes to reduce livestock theft. ✓ During conductor stringing one person be posted on each tower with red and green flags and whistle so that he can give a signal, which is relayed to the pulling end by other similarly placed persons, to stop the paying out operation if any incident of animal hoisting is encountered. ✓ Speed limits to be enforced by all project vehicles, and in all areas within the project area of influence.	Water pans @ 500,000	✓ KETRACO ✓ Contractor
Gender biases	✓ Gender mainstreaming issues including the two-thirds gender rule, gender	✓ Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases and ensure participation of women in	Sensitization fora @ 200,000	✓ Contractor ✓ KETRACO

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
	inequality, gender equity etc. ✓ Inability of women to attend project meetings and other decision-making fora. ✓ Unfavorable employment conditions for women including salary, maternity leave, working hours, security, periodic time off to afford them access to child and dependent care, etc.	decision making and sharing of project benefits. The plan should also ensure gender is mainstreamed in all aspects of the project. ✓ During the employment of project staff, the Contractor to give more preference to women applicants and to encourage women to apply. ✓ In implementing the Stakeholder Engagement Plan, the proponent to be sensitive to women's availability to attend meetings. ✓ For any community meetings held, the announcement to encourage women to attend and the organizers to design initiatives that reach out to more women to attend the meetings. ✓ Inclusion of women representatives on Grievances Redress Committees. ✓ Conduct sensitization fora with all community segments about the importance of women participation in the project. ✓ Identify and address women employee security issues, including their safety while traveling to and from work and on project-related business. ✓ The contractor to proactively recruit and appoint women workers to decision-making positions. ✓ Offer flexible work options for women workers, accord them their leave days, and where possible support their access to child and dependent care.		
Stakeholder engagement and grievances management.	✓ Stakeholder engagement is not aligned with the Stakeholders Engagement Plan. ✓ Inadequate or partial stakeholder identification. ✓ Lack of or inadequate stakeholder engagement. ✓ Untimely disclosure of relevant project information ✓ Inadequate or partial disclosure of relevant project information. ✓ Grievances are not managed and resolved in a timely manner ✓ Process of grievances management is not aligned with the Grievances Redress Mechanism, leading to escalation into legal claims. ✓ Exclusion of vulnerable individuals and households from the engagement process.	✓ Develop and implement a Grievances Redress Mechanism (GRM) to manage all grievances in a timely manner and ensure the grievances management process is aligned with the GRM. ✓ Periodic review of the SEP and GRM ✓ Continual improvement of the SEP and GRM ✓ Ensure that all stakeholders are identified and are included in the SEP, and engaged meaningfully, including VMGs and vulnerable individuals and households. ✓ Implement the VMGP to ensure VMGs effectively participate in the project and access social and economic benefits that are also culturally appropriate. ✓ Implement project structured interventions to ensure vulnerable individuals and households effectively participate in, and benefit from the project. ✓ Implement the SEP and ensure all stakeholder engagement is aligned to the SEP. ✓ Ensure timely disclosure of relevant project information, e.g., project instruments, project risk management plans, positive and negative impacts, full rights and entitlements of project-affected persons, project benefits, and project opportunities.	✓ Development and implementation of SEP @ 2,000,000 a year ✓ Development and implementation of GRM @ 1,000,000 a year.	✓ KETRACO ✓ Contractor
Project benefits and opportunities including employment, local sourcing, capacity building etc.	✓ Failure by contractor and the proponent to prioritize locals for jobs. ✓ Perception by the locals that labour is imported from outside the project area. ✓ Project benefits and opportunities (e.g., employment, project-structured interventions for disadvantaged groups, etc.) are inaccessible to project-affected persons, including	✓ Develop and implement a Local Recruitment Plan that will ensure employment of as many locals as is possible and manage all aspects related to local employment. Local laws require 30% of labour force to come from the locals. ✓ Manage negative public perception through community sensitization and training ✓ All job advertisements to be made available to the local population /placed in locations accessible to locals. ✓ Develop and implement a Corporate Social Responsibility (CSR) Plan in consultation with all community segments.	✓ Sensitization and training @ 500,000 a year ✓ CSR @ 3,000,000	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
	vulnerable individuals and households (elderly, PWD, etc.) and VMGs.	✓ Implement the VMGP to ensure VMGs effectively participate in the project and access social and economic benefits that are also culturally appropriate. ✓ Implement project structured interventions to ensure vulnerable individuals and households effectively participate in, and benefit from the project.		
COVID-19	Spread of the disease due to; ✓ Workers seeking accommodation within project areas. ✓ Contractor/KETRACO engaging local workforce. ✓ Contractor and KETRACO involving communities in project monitoring. ✓ CSR implementation. ✓ Sensitization sessions on HIV/AIDs, GBV-SEA/SH etc. Increased high expectations on the project e.g., higher demand for jobs, CSR activities, salaries/wages etc. There will be a risk of engaging children/minors to work in the project or engage in business activities to supply goods and services to the project, in order to supplement dwindling household income sources due to effects of COVID-19 Psychological effects of Covid-19 e.g., due to negative socio-economic effects, social isolation may lead to increased cases of GBV including, GBV-SEA, workplace Sexual harassment, as well as other forms of GBV at the community or family level attributable to the project. Due to COVID-19 effects the burden of taking care of the household might fall disproportionately on women, therefore making it difficult for them to take part in e.g., including consultation fora, decision making etc. External sourcing of labour may be impeded by, (a) cessation of movement; and (b) unwillingness of some workers to live in unfamiliar locations during a pandemic (fear of contracting the virus),	All staff, visitors, and community members should adhere to the government's covid-19 regulations, including; ✓ Regularly and thoroughly clean their hands using soap and running water or with an alcohol-based hand rub. ✓ Maintain at least 1 metre distance between themselves and others. ✓ When coughing or sneezing, cover mouth and nose with flexed elbow or use disposable tissue and discard after use. ✓ Avoid touching eyes, nose and mouth. ✓ Always wear a mask in public and safely dispose used masks. ✓ Greet people with a wave, a nod, or a bow instead of shaking their hands. ✓ Avoid going to crowded places. ✓ If they have a fever, cough, difficulty breathing, or any other COVID-19 symptom, they should seek medical attention. The proponent and contractor must. ✓ Monitor everyone's health for symptoms such as fever, cough, or difficulty in breathing. ✓ Ensure workers who have returned from an area where COVID-19 is spreading monitor themselves for symptoms for 14 days and take their temperature twice a day. ✓ Make sure workplaces are clean and hygienic and are regularly disinfected. ✓ Put sanitizing hand rub dispensers in prominent places around the workplace and ensure that workers and visitors have access to places where they can wash their hands with soap and running water. ✓ Display posters and use other communication measures such as toolbox talks, briefings at meetings, and internet to promote handwashing, respiratory hygiene, keeping social distance and other measures of combating COVID-19. ✓ Develop a response plan in case someone becomes ill with symptoms of COVID-19. ✓ Give additional support to disadvantaged and vulnerable groups/locals who have been further disenfranchised due to negative social and economic impacts of Covid-19. ✓ Manage high expectations on the project e.g., higher demand for jobs, CSR activities, salaries/wages etc. through training and information dissemination. ✓ Ensure that children and minors are not employed directly or indirectly on the project. ✓ Assist people to cope with stress and psychological effects during the COVID outbreak. ✓ Develop and implement a Gender Mainstreaming Plan with COVID-19 effects in mind to reduce the risk of gender inequality and biases.	Thermometers@6,000 each. Face masks@500 a pack and transparent plastic protective face shield@ 300 each. Disinfecting workplaces @5,000 a month. Alcohol based sanitizers, soaps and disposable tissue@ 20,000 a month. Hand washing systems@ 5,000 each. Posters@ 500 each.	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
	and especially in locations with a high number of infections/pandemic epicenters.	✓ In sourcing external labour (adverts and interviews), ensure people know measures employed to protect them from contracting COVID-19.		
Environmental Impacts				
Community health and safety	✓ Children may fall into excavated tower foundations ✓ Children may drown in water filled excavated tower foundations ✓ Children may try to climb erected towers and risk falling ✓ People may accidentally be hoisted up by conductors during stringing ✓ Traffic accidents ✓ If blasting is used as a method of tower foundation, people may accidentally get injured or may mistake it for gun fighting hence create tension ✓ Open defecation is a community health hazard which can cause spread of diseases. ✓ Noise from corona discharge and buzzing/humming sound from substations.	✓ Excavated foundation pits to be well secured to avoid children from falling into them. Foundation pits thought to take long must be secured by barbed or mesh wire and any water in the pit drained every morning. ✓ Excavated pits to be backfilled as soon as possible ✓ Conduct sensitization fora on the dangers posed by the transmission line (especially on children) and ways of staying safe. ✓ Safety features including danger warning sign and perimeter barbed wire surrounding each tower must be put in place. ✓ Contractor to facilitate the community to keep vigil or employ security guards to ensure no kids climb the towers. ✓ During conductor stringing one person be posted on each tower with red and green flags and whistle so that he can give a signal, which is relayed to the pulling end by other similarly placed persons, to stop the paying out operation if any incident of a child hoisting is encountered. ✓ Within settled areas, impose speed limits and ensure people, especially children, have the right of way. ✓ Should blasting be used, give prior warning to the surrounding communities and ensure no one is near the site of blasting ✓ Contractor to provide mobile toilets ✓ To reduce the corana effect the overhead line insulator sets should be provided with grading rings at the bottom of insulator string (corona rings). ✓ To reduce effects of the noise from corona effect on population, final detailed design should avoid densely populated areas. ✓ The substations shall be 132/33kV substations and the buzzing/harming sound is not predicted but should this be the case, the proponent should consider creating noise shields. Creating a tree canopy (along the safe sections of the perimeter fence) can also help in shielding the noise.	Sensitization fora on dangers of transmission lines@ 500,000 Support for community to keep vigil to ensure people especially kids do not climb towers or fall into open pits 7,000 per month Provision of mobile toilets @ 70,000 each	✓ KETRACO ✓ Contractor
Destruction of existing vegetation and habitat	✓ Trees and Shrubs estimated to be over 10,000 of various age, height, width, and species may be affected by the project ✓ Clearing of vulnerable tree species including the Wild Olive and Red Cedar ✓ Interference with water catchment areas ✓ Forest fragmentation ✓ Fragmentation is likely to make interior forest species more vulnerable to predators and competition from edge and colonizing species ✓ Introduction of invasive species	✓ Selective vegetation clearance by only clearing what is necessary ✓ Trees that have no ability to grow beyond 6 ft (1.8m) tall should not be cut except if within the tower plinth area. ✓ Vegetation that needs to be reduced in height will be cut to an acceptable height, and not to ground level except where necessary. This shall be especially true for vulnerable or endangered species like Wild Olive – *Olea Africana* (Mutamayo) and East African pencil cedar – *Juniperus procera* ✓ Where possible avoid important medicinal plants for human and livestock, and dry season fodder species such as *Acacia tortilis*. ✓ Bush clearing shall be to no more than absolutely necessary extent; At completion of construction work, areas not needed anymore should be replanted/ reforested as far as the line security is not impeded;	Tree planting drives @ 800,000 Mapping water catchment areas @ 150,000	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Collection or harvesting of any plants or fuel wood is to be strictly forbidden as it can exacerbate more clearing ✓ As far as possible, bush clearing be manual as opposed to mechanical or chemical methods ✓ Map all water catchment areas especially springs and river sources and ensure contractor does not interfere with them. ✓ Ensure that construction equipment is properly cleaned to avoid accidental spreading of invasive species. ✓ Undertake regular monitoring to ensure that alien and potentially invasive plant species (*Lantana camara, Solanum mauritianum, Prosopis juliflora, Ipomoea spp* and others) are not increasing as a result of the disturbance that has taken place. ✓ Fair compensation (full replacement cost) to the affected PAPs with the cut trees remaining the property of the PAPs ✓ With the assistant of KFS and KWS, KETRACO to facilitate community to initiate tree planting drives.		
Disturbance to Wildlife	✓ Poaching/Hunting of game by project staff ✓ Loss of habitats, breeding, and feeding grounds for some animal species ✓ Increased noise pollution during construction may affect the tranquility of the wild animals ✓ Fragmentation of woodlands and introduction of strange structures to the animals (towers) may hinder shy mammals from accessing the other side of the habitat ✓ Fragmentation is likely to make interior forest/woodland species more vulnerable to predators and competition from edge and colonizing species ✓ Traffic accidents	✓ The contractor to strictly prohibit staff from poaching/hunting game and monitor the same. ✓ Plan the transmission line to follow already disturbed habitats e.g., the existing Loyangalani – Suswa TL. ✓ Avoiding creating tower bases on breeding and nesting areas. ✓ Consult KWS to scheduling activities to avoid breeding and nesting seasons for any vulnerable or critically endangered wildlife species. ✓ Animals will have right of way. ✓ Any fauna directly threatened by the construction activities will be removed to a safe location by KWS or other qualified personnel. ✓ Hand-clearing vegetation to minimize noise pollution. ✓ Minimize noise levels where there are large concentration of wild animals or birds and in breeding and nesting areas. ✓ Limit construction to as short a time as possible. ✓ Impose speed limits in the wild areas and on highways where wildlife concentration is high.	Costs of relocating threatened wildlife to safe areas@ 50,000 per relocation	✓ KETRACO ✓ Contractor
Avi-fauna disturbance and mortality	✓ Collision of birds with transmission line cables. ✓ Destruction of habitats for birds including breeding areas ✓ Noise pollution	✓ Map important bird migration corridors ✓ In the identified corridors, use bird flight diverters placed 7.5 m apart along the shield wire. The shield wire is the most dangerous section of line for flying birds and it's usually much thinner and difficult to see. Many birds do not see well in front of them during flight. It is important that the flight diverters are reflective as well as contrasting, as many birds migrate at night. These areas may include areas around Parariro dam, Dam Nyeusi, Mugie, and Endonyo Narok forest and in other areas where large birds are common. ✓ To avoid electrocution in the identified migration corridors, provide sufficient separation between energized phase conductors to accommodate at least the wrist-to-wrist or head-to-foot distance of a bird (approximately 1.8m) or insulate the conductors.	Mapping of important bird migration corridors @100,000	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Provide artificial bird safe perches and nesting platforms which are placed at a safe distance from the energised parts. ✓ Use perch management techniques i.e, cross-arms, insulators and other parts of the power lines can be constructed so that there is no space for birds to perch where they can be proximate to energised wires. ✓ Avoid wooded areas which act as bird breeding areas or areas with high concentration of birds ✓ Limit noise pollution in bird habitats especially in aquatic and wooded areas such as Parariro dam and Dam Nyeusi, Mugie, and Engare Narok Forest		
Surface and underground water reserves including Dams, Rivers, Streams, Wetlands, Marsh-areas, Water-pans, lagas, springs, wells, and boreholes.	✓ Encroachment of river riparian zone ✓ Destruction of riverine herbaceous plant cover. ✓ Abstraction of water by the contractor ✓ Silt deposit in surface water reserves during tower foundation ✓ Contamination of water by project workers when crossing, washing, or drawing water for drinking ✓ Motor equipment crossing these rivers may result in some shoreline erosion or disturbance to banks and river bottoms ✓ Leachates from open defecation by project workers ✓ Oil contamination from motor equipment ✓ Solid waste pollution ✓ Effects on existing water pipelines	✓ Avoid locating towers within the riparian zones. ✓ Locate towers far enough back from river banks to prevent erosion related to the tower foundation and destruction of riverine herbaceous plant cover. ✓ Contractor should not be allowed to abstract water from the community water resources. The contractor to use water-bowsers with water from water companies in Rumuruti and Maralal ✓ Contractor to develop and implement an oil spill minimization and cleanup plan to avoid contamination of the rivers by oil ✓ Avoid motor vehicles crossing rivers and streams from undesignated points to only use existing bridges or designated crossing points ✓ Contractor to provide mobile toilets ✓ Contractor to enact solid waste management to reduce or completely stop contamination of water systems by solid waste ✓ Avoid interfering with existing water infrastructure.	Developing and implementing an oil spill plan@ 500,000 Mobile toilets @ 70,000 each Waste management @ 30,000 per month	✓ KETRACO ✓ Contractor
Mugie Conservancy and Engare Narok Forest	✓ Clearing of vulnerable tree species including the Wild Olive and Red Cedar (some are over 500 years old) ✓ Poaching/Hunting of game by project staff ✓ Destruction of habitats ✓ Disruption of wildlife ✓ Induced voltage on the Conservancy electric fence may cause minor shocks to those working on the fence ✓ Clearing the 30m wayleave may reduce water retention capacity of the conservancy ✓ Littering ✓ Destruction of private roads ✓ Language barrier if foreign workers cannot speak English ✓ Security issues ✓ Impacts on Visual and Aesthetics ✓ Disrespect of private properties by Government Contractors.	✓ At the start of the project, KETRACO, Contractor, and Mugie to have a joint meeting to chart the Terms of Engagement. During the meeting, Mugie to furnish KETRACO and the Contractor with its manual on Dos and Don'ts while in the Conservancy. ✓ KETRACO, Mugie, and the Engare Narok Forest Community to map out all vulnerable/endangered/very old tree species (including Wild Olive and Red-Cedar) on the wayleave for protection. If the trees pose a danger to the TL, then they should be reduced in height by cutting them to acceptable height, and not to ground level. ✓ The contractor to strictly prohibit staff from poaching/hunting game and monitor the same. ✓ Vegetation clearances to follow the mitigation measures identified in the section on 'Destruction of existing vegetation and habitat' of this ESMP ✓ Wildlife management to follow the mitigation measures identified in the section on 'Disturbance to Wildlife' of this ESMP ✓ Mugie to provide security guards to the contractor with KETRACO footing the bills. The guards to protect the staff from wildlife and wildlife from the staff.	Facilitation of meeting with Mugie @ 50,000 Mapping out of vulnerable/endangered/old trees species@ 60,000 Provision of security guards @ 20,000 per month. Waste management within Mugie @ 30,000 per month	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
	✓ Impact on tourism and therefore revenue.	✓ All staff to only use designated entry/exit points and to be provided with identification tags. ✓ Contractor to only use designated routes within the conservancy and to periodically repair damaged sections and at the end of the construction reinstate all roads to their original state. ✓ Contractor to assist Mugie Conservancy to effectively ground its fence to avoid effects of induced voltage ✓ Any waste generated must be disposed of as per methods identified in the section 'Waste handling, storage and disposal' of this ESMP. ✓ Within the conservancy, widen the span length to reduce the number of towers ✓ Foreign workers who cannot communicate in English to be reduced to the bare minimum and team managers to ensure employees respect the conservancy workers and the locals ✓ A redress mechanism be created to address any disagreements		
Workers Health and Safety	✓ Falling objects i.e. from high levels of towers and excavations, ✓ collapsing of excavations, ✓ poor hygiene as the contractor may find it difficult to provide sanitary welfare in the bushes ✓ attack by wild animals, ✓ road accidents, ✓ Occupational diseases.	✓ Employing an Environmental, Health and Safety Officer. ✓ Formulate and implement a Labor Management Plan that ensure among others child and forced labor is not engaged. ✓ Ensure the construction site is dully registered as a workplace. ✓ Establish a health and safety committee as per Factories and other places of Work (Safety and Health Committee Rules) requirements. ✓ Conduct job safety analysis for high risk activities and document safe work procedures. ✓ Identify all hazards before undertaking a process ✓ Conduct and continually review a risk assessment ✓ Hold daily morning toolkit talks where safety is the key issue ✓ Train workers on health and safety ✓ Ensure first aid kits and trained first aiders are available on site. ✓ Identify and train fire marshals and provide them with firefighting equipment. ✓ Ensure each worker is covered under an insurance policy as per WIBA ✓ Ensure only qualified personnel operate construction equipment and vehicles. ✓ Ensure construction equipment and vehicles are regularly inspected by approved inspectors and inspection records maintained. ✓ Where there are risks of attack by wild animals, ensure workers are accompanied by armed guards ✓ Collect daily security briefs and avoid insecure places ✓ Place warning signs where necessary ✓ Provide all necessary PPEs including helmets, ear muff/plug, hand gloves, dust/respiratory mask, reflective jacket, goggles, safety boots, double hook safety harness, etc.	EHS officer @70,000 a month Reg. of workplaces @ 3,000 per site, Training workers on health and safety @ 200,000, Provision of insurance policy for workers @ 500,000 a year, PPE: dust mask @ 200 each, earmuff @ 1,000 each, Safety goggles @ 1,000 each, Reflective jacket @ 1,000 each, safety boots @ 5,000 a pair, gloves @ 1,000 a pair, helmet @ 2,000 each, Armed guards @ 4,000 a day	✓ Contractor
Working at Height – transmission line towers	✓ Injury or fatality due to a fall from the tower	✓ The client/consultant must implement a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among other measures.	Safety gear; non –slip footwear @ 5,000 a pair, gloves @ 1,000 a pair, helmet @ 2,000 each,	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Only qualified and experienced personnel should be allowed to climb the towers. ✓ Every morning before beginning the works, there should be a tool box talk emphasizing on safety at heights. ✓ Structures must be tested for integrity prior to undertaking work. ✓ No personnel should be allowed to climb the towers while drunk or under the influence of drugs ✓ There should be a ground supervisor constantly observing and conversing with the workers atop the towers. The officer should ensure workers observe safety precautions at all the times and should have emergency telephone contacts. ✓ Use approved tool bag for raising or lowering tools and materials to workers atop the towers. ✓ Workers climbing the towers must be provided with non-slip footwear, gloves, helmet, and double hook safety harness and should be compelled to use them all the time. The PPEs should constantly be inspected, maintained, and replaced where necessary. ✓ Safety belts should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident.	double hook safety harness @ 20,000 each. Inspecting the harness @ 20,000 every 3 months	
Waste handling, storage and disposal	✓ Public nuisance ✓ Health problems ✓ Contamination of soil and water resources ✓ Eye sore	✓ Provide mobile toilets for construction workers to manage human waste. ✓ Provide well labeled waste collection bins at designated points on site to handle solid waste. Ensure segregation of waste. ✓ Implement sustainable waste management principles of reduction, reuse and recycling. ✓ Contract a NEMA licensed waste handler to collect and dispose waste. Ensure updated waste tracking sheets are maintained for collected waste. ✓ Ensure collection and proper disposal of all used cement bags. ✓ Develop and implement a waste disposal plan for reject PPEs. ✓ Sensitize construction workers on best waste management practices. ✓ Accurately estimate the dimensions and quantities of materials required especially fine and loose aggregates for tower bases; ✓ Ensuring that, all remnants of loose gravel and concrete are effectively collected from the tower bases and re-used or disposed of in an environmentally friendly manner. ✓ Construction waste shall not be left in stockpiles along the wayleave, but removed and reused or disposed of on a regular basis.	Mobile toilets @ 70,000 each Provision of colour coded waste collection bins@ 5,000 each Contracting NEMA licensed waste handler @ 10,000 per month.	✓ KETRACO ✓ Contractor
Noise and vibrations	✓ Hearing problems. ✓ Public nuisance. ✓ Interference with communication on site which could result to accidents/injuries. ✓ Disruption of animal behaviors. ✓ Psychological and physical stress among workers hence reduced productivity.	✓ No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day. In addition no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dBC ✓ Exposure to hand-arm vibration from equipment such as hand and power tools or whole-body vibrations from surfaces on which the worker stands or sits shall be controlled through selection of equipment and limitation of time of exposure. The limits for vibration and action values, i.e. the level of exposure at which remediation should be	Provision of ear plugs @ 500 each and Ear muffs @ 1,000 each	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
	✓ If explosives are used for tower foundation, people might confuse it with gun fight and hence tension. ✓ Noise from corona discharge and buzzing/humming sound from substations.	initiated, should not exceed a daily exposure limit value standardized to an 8-hours reference period of 5 meters per square second (m/s2) for hard-arm and 1.15m/s2 for whole-body. ✓ Limit construction activities to be between 6.00 am to 6.00 pm. Where there will be need to work at night or where noise levels may be breached, the contractor will have to seek approval from NEMA. ✓ Reduce idling of vehicles and construction equipment. ✓ Provide workers in noisy areas with appropriate personal protective equipment (ear muffs/ear plugs). ✓ Drivers to be sensitized against unnecessary hooting. ✓ Ensure construction vehicles and equipment are well maintained and serviced as per manufacturer's guidelines. ✓ Any blasting will be guided by the Explosives Act, 2012 which requires one to have a permit to acquire or use blasting materials and to follow rules under section 30 – referred to as Explosives (Blasting Explosives) Rules, 1962. Blasting may also require a variation of the NEMA License. ✓ Where explosives are used, give prior warning to the surrounding communities. ✓ To reduce the corana effect the overhead line insulator sets should be provided with grading rings at the bottom of insulator string (corona rings). ✓ To reduce effects of the noise from corona effect on population, final detailed design should avoid densely populated areas. ✓ The substations shall be 132/33kV substations and the buzzing/harming sound is not predicted but should this be the case, the proponent should consider creating noise shields. Creating a tree canopy (along the safe sections of the substation perimeter fence) can also help in shielding the noise.		
Air Pollution	✓ Dust Emission ✓ Exhaust emission	✓ Water sprinkling to suppress dust emission. ✓ Impose a maximum speed limit supported by speed limit signs. ✓ Cover vehicles transporting loose materials such as sand, spoil and stone aggregate to prevent escape ✓ Wetting loose materials before, after and when handling loose materials. ✓ Provide workers working in areas likely to have dust emissions with suitable protective equipment (dust masks, eye protection and coveralls) ✓ Reduce idling of vehicles and construction equipment. ✓ Ensure construction vehicles and equipment are well maintained and serviced as per manufacturer's guidelines. ✓ Burning of solid waste on site will be prohibited.	Water sprinkling @ 10,000 per month. Provision of dust masks @ 200 each, eye protection @ 1,000 a pair, and coveralls@ 5,000 each	✓ KETRACO ✓ Contractor
Soil Erosion	✓ Land degradation ✓ Loss of soil fertility ✓ Siltation of water resources	✓ Soils excavated for the tower foundations should be used for refilling and should not be left exposed to wind or water for long periods. ✓ Apply soil erosion control measures such as levelling of the tower sites to reduce run-off velocity and increase infiltration of storm water into the soil. ✓ Ensure that construction vehicles are restricted to use existing graded roads.	Reforestation of degraded areas with native species @ 200,000	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Contractors should avoid steep terrain during the transportation of construction material by using alternative routes or use light vehicles where appropriate. ✓ Riverine vegetation should be minimally disturbed during the construction phase to reduce soil erosion and safeguard riverbank. This may include realigning the transmission line route and redesigning the tower placement to avoid the riverine vegetation. ✓ Re-plant degraded areas with local species common in the area to complement natural vegetation regeneration to improve ground cover.		
Archeological, and historical sites	✓ Damage or interference with cultural, archeological, and historic sites. ✓ Chance encounter of archaeological material during construction phase. ✓ Destruction of buried archaeological materials by heavy machinery, earthworks and excavation during the construction phase ✓ Unearthing of unexpected/unmarked/unidentified graves.	✓ Training of KETRACO and construction staff on identification of archeological objects. ✓ If there is a chance encounter of archaeological material during construction, employ Chance Find Procedures. Chance Find Procedures include stopping construction works at the site, confining the site using tapes or local materials, and informing relevant authorities including local administration officers and the National Museums of Kenya (NMK) for further direction.	Training on identification of archeological objects@ 200,000	✓ KETRACO ✓ Contractor
Aircraft navigation safety	✓ Damage to transmission lines and towers ✓ Damage to aircrafts ✓ Injuries to aircraft operators, construction workers, public and animals.	✓ Ensure necessary approvals are acquired from Kenya Civil Aviation Authority (KCAA) ✓ Take KCAA recommendations on tower height, aerodromes flight paths, and placement of ball markers while designing the transmission towers and lines.	Acquisition of approvals from KCAA@ 500,000 (Assuming KCAA requests to fly the line)	KETRACO
Traffic disruption on road crossings during stringing	✓ Encroachment of the road reserve ✓ Disruption of Traffic flow during conductor stringing	✓ Seek necessary approvals from the roads' authorities ✓ Inform community on the time and dates prior to disruptions of traffic. ✓ Involve local traffic police and/or administration. ✓ Put up clear signs and provide traffic marshals to guide motorists during conductor stringing	Cost of traffic signs and hiring traffic marshals @ 30,000 per month	✓ KETRACO ✓ Contractor
Visual and Aesthetic Impacts	✓ Effect on Visual and Aesthetic	✓ Undertake extensive public consultation during the planning of the project. ✓ Design structures at the site in such a way as to improve the beauty of the surroundings. ✓ Restore site areas through backfilling, landscaping and planting of trees, shrubs and grass on the unused areas to re-introduce visual barriers. ✓ Design and implement an appropriate landscaping programme.	Public consultation @ 200,000 Site restoration @ 1,000,000	✓ KETRACO ✓ Contractor
Fire Outbreaks	✓ Fire Outbreaks	✓ Conduct fire risk assessment and prepare Fire Response Plan. ✓ Advise workers not to smoke on forested areas. ✓ Ensure compliance with fire safety regulations and ensure availability of all necessary fire safety equipment. ✓ Conduct regular training and fire drills for employees. ✓ Regularly monitor the way-leave and ensure there is no accumulation of flammable substances.	Training and fire drills for employees @ 500,000 Building capacity for workers and community on fire related	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Create fire-breaks (ploughed strips) on strategic areas of the TL ✓ Build capacity for workers and community on fire related issues including sources, fighting, and vigilance.	issues @ 500,000	
Total estimated cost for the pre-construction and construction phases (KES) = 13,310,000				

7.3: ESMP for the Operation Phase

Table 7.3: ESMP for the operation phase of the proposed project

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES.)	Responsible party
Social Impacts				
Project Induced Labour Influx related impacts e.g., GBV-SEA/SH	✓ Social conflict between the local community and the transmission line operation and maintenance workers due to religious, cultural, or ethnic differences or competition for local resources. ✓ Increase in illicit behavior and crime including theft, physical assaults, substance abuse, and prostitution. ✓ Spread of diseases such as HIV/AIDS, STDs and other communicable diseases. ✓ Gender Based Violence such as sexual exploitation and abuse (SEA) of community members by project workers and workplace sexual harassment (SH), and exploitative sexual relations and illicit sexual relations with minors. ✓ Disregard of important cultural norms ✓ Gender mainstreaming issues including the two-thirds gender rule, gender inequality, gender equity, women participation in project meetings and activities etc.	✓ Develop and implement a Local Recruitment Plan that will ensure employment of as many locals as is possible. Local laws require 30% of labour force to come from the locals. ✓ Formulate and implement a Labor Influx Management Plan that will ensure harmony between non-local workers and the locals and minimize effects of labour influx ✓ Conduct sensitization fora for employees on ethics, morals, general good behaviour, GBV-SEA/SH, and the need for the project to co-exist with the neighbours. The fora should be guided by the Stakeholder Engagement Plan. ✓ Provide guidance and counselling on drug abuse, HIV/AIDS, and other STDs to employees. ✓ Sensitize local community on communicable diseases (STDs and HIV/AIDS) and GBV-SEA/SH. ✓ Provide female and male condoms to workers. ✓ Cooperation with local law enforcement and introduction of sanctions (e.g., dismissal) for workers involved in criminal activities. ✓ Develop and implement the GBV Management Plan (Cognizant of 1. sensitivity of GBV, and 2. the need to ensure confidential reporting and responding to GBV cases reported); including plans for prevention, response and Grievance Redress Mechanism, and ensure that the project does not trigger or exacerbate other forms of GBV at the community level. Further, ensure codes of conduct are signed by all with physical presence on project site. ✓ Mandatory and regular training for workers on required lawful conduct in relation to GBV in host community in addition to social and cultural inductions to workers. The project should support survivors who choose the legal redress route by referring them to the legal redress referral pathway – which could include legal entities (NGOs, lawyers, police stations etc.). ✓ Provision of opportunities for workers to regularly return to their families. ✓ Provision of opportunities for workers to take advantage of entertainment opportunities away from rural host communities. ✓ Ensure that children and minors are not employed directly or indirectly on the project. To ensure minors or children are not employed directly or indirectly in the project, the proponent/contractor will monitor the employment register; in addition to	Sensitization fora @ 1,000,000 a year Condoms @ 200,000 a year Training on GBV @ 200,000 a year	✓ Contractor ✓ KETRACO

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES.)	Responsible party
		ensuring that workers have valid national identification cards. ✓ All criminal cases to be reported to the relevant authorities through appropriate channels. ✓ Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases.		
Stakeholder engagement and grievances management.	✓ Stakeholder engagement is not aligned with the Stakeholders Engagement Plan. ✓ Inadequate or partial stakeholder identification. ✓ Lack of or inadequate stakeholder engagement. ✓ Untimely disclosure of relevant project information ✓ Inadequate or partial disclosure of relevant project information. ✓ Grievances are not managed and resolved in a timely manner ✓ Process of grievances management is not aligned with the Grievances Redress Mechanism, leading to escalation into legal claims. ✓ Exclusion of vulnerable individuals and households from the engagement process.	✓ Develop and implement a Grievances Redress Mechanism (GRM) to manage all grievances in a timely manner and align the grievances management process to the GRM. ✓ Periodic review of the SEP and GRM ✓ Continual improvement of the SEP and GRM ✓ Ensure that all stakeholders are identified and are included in the SEP, and engaged meaningfully, including VMGs and vulnerable individuals and households. ✓ Implement the VMGP to ensure VMGs effectively participate in the project and access social and economic benefits that are also culturally appropriate. ✓ Implement project structured interventions to ensure vulnerable individuals and households effectively participate in, and benefit from the project. ✓ Implement the SEP and ensure all stakeholder engagement is aligned to the SEP ✓ Ensure timely disclosure of relevant project information, e.g., project instruments, project risk management plans, positive and negative impacts, full rights and entitlements of project-affected persons, project benefits, and project opportunities.	✓ Development and implementation of SEP @ 1,000,000 a year ✓ Development and implementation of GRM @ 500,000 a year	KETRACO
COVID-19	Spread of the disease due to; ✓ KETRACO O&M staff and monitoring consultants seeking accommodation within project areas. ✓ Consultants and KETRACO involving communities in project monitoring. ✓ CSR implementation. ✓ Sensitization sessions on HIV/AIDs, GBV-SEA/SH etc.	All staff, visitors, and community members should adhere to the government's covid-19 regulations, including; ✓ Regularly and thoroughly clean their hands using soap and running water or with an alcohol-based hand rub. ✓ Maintain at least 1 metre distance between themselves and others. ✓ When coughing or sneezing, cover mouth and nose with flexed elbow or use disposable tissue and discard after use. ✓ Avoid touching eyes, nose and mouth. ✓ Always wear a mask in public and safely dispose used masks. ✓ Greet people with a wave, a nod, or a bow instead of shaking their hands. ✓ Avoid going to crowded places. ✓ If they have a fever, cough, difficulty breathing, or any other COVID-19 symptom, they should seek medical attention. The proponent must; ✓ Monitor everyone's health for symptoms such as fever, cough, or difficulty in breathing. ✓ Ensure workers who have returned from an area where COVID-19 is spreading monitor themselves for symptoms for 14 days and take their temperature twice a day. ✓ Make sure workplaces are clean and hygienic and are regularly disinfected.	Thermometers@ 6,000 each. Face masks@ 500 a pack and transparent plastic protective face shield@ 300 each. Disinfecting workplaces @5,000 a month. Alcohol based sanitizers, soaps and disposable tissue@ 5,000 a month. Hand washing systems@ 5,000 each. Posters@ 500 each.	KETRACO

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES.)	Responsible party
		✓ Put sanitizing hand rub dispensers in prominent places around the workplace and ensure that workers and visitors have access to places where they can wash their hands with soap and running water. ✓ Display posters and use other communication measures such as toolbox talks, briefings at meetings, and internet to promote hand-washing, respiratory hygiene, keeping social distance and other measures of combating COVID-19. ✓ Develop a response plan in case someone becomes ill with symptoms of COVID-19. ✓ Assist people to cope with stress and psychological effects during the COVID outbreak. ✓ In sourcing external labour (adverts and interviews), ensure people know measures employed to protect them from contracting COVID-19.		
Environmental Impacts				
Community health and safety	✓ Children may try to climb erected towers and risk falling or electrocution.	✓ Conduct sensitization fora on the dangers posed by the transmission line (especially on children) and ways of staying safe. ✓ Ensure safety features including danger warning sign and perimeter barbed wire surrounding each tower are in place. ✓ proponent to urge the community to keep vigil to ensure no kids climb the towers.	Sensitization fora on dangers of transmission lines@ 200,000 per quarter	KETRACO
Destruction of Existing Vegetation and Habitats	✓ Vegetation clearing during RoW maintenance	✓ As much as is possible avoid disruption and alteration of habitat during RoW maintenance ✓ As far as possible, bush clearing be manual as opposed to mechanical or chemical methods		KETRACO
Avi-fauna mortality	✓ Collision of birds with transmission line cables.	✓ While monitoring or working on the line, avoid interfering with bird safety features on the transmission line and bird habitats ✓ Any avifauna mortality due to collision should be recorded, including the species affected and the date. If repeated collisions occur, then further mitigation and avoidance measures may need to be implemented.	Implementation of further mitigation measures for avi-fauna mortality @300,000 a year	KETRACO
Workers Health and Safety	✓ Falling objects i.e. from high levels of towers. ✓ attack by wild animals, ✓ Occupational diseases. ✓ Electrocution of workers, animals or public.	✓ Ensure the work places is dully registered as a workplace. ✓ Conduct job safety analysis for high risk activities and document safe work procedures. ✓ Identify all hazards before undertaking a process ✓ Conduct and continually review a risk assessment ✓ Hold daily morning toolkit talks where safety is the key issue ✓ Train workers on health and safety ✓ Ensure first aid kits and trained first aiders are available on site. ✓ Ensure each worker is covered under an insurance policy as per WIBA ✓ Where there are risks of attack by wild animals, ensure workers are accompanied by armed guards ✓ Collect daily security briefs and avoid insecure places ✓ Place warning signs where necessary ✓ Provide all necessary PPEs including helmets, ear muff/plug, hand gloves, dust/respiratory mask, reflective jacket, goggles, safety boots, double hook safety harness, etc.	PPE @ 10,000 per staff, Risk assessment @ 100,000 a year, Training @ 200,000 a year, Armed guards @ 4,000 a day.	KETRACO
Working at Height – transmission line towers	✓ Injury or fatality due to a fall from the tower	✓ The client/consultant must implement a fall protection program that includes training in climbing techniques and use of fall protection	Safety gear; non –slip footwear @	KETRACO

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES.)	Responsible party
		measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among other measures. ✓ Only qualified and experienced personnel should be allowed to climb the towers. ✓ Every morning before beginning the works, there should be a tool box talk emphasizing on safety at heights. ✓ Structures must be tested for integrity prior to undertaking work. ✓ No personnel should be allowed to climb the towers while drunk or under the influence of drugs ✓ There should be a ground supervisor constantly observing and conversing with the workers atop the towers. The officer should ensure workers observe safety precautions at all the times and should have emergency telephone contacts. ✓ Use approved tool bag for raising or lowering tools and materials to workers atop the towers. ✓ Workers climbing the towers must be provided with non-slip footwear, gloves, helmet, and double hook safety harness and should be compelled to use them all the time. The PPEs should constantly be inspected, maintained, and replaced where necessary. ✓ Safety belts should be of not less than 16 millimeters (mm) (5/8 inch) two-in-one nylon or material of equivalent strength. Rope safety belts should be replaced before signs of aging or fraying of fibers become evident.	5,000 a pair, gloves @ 1,000 a pair, helmet @ 2,000 each, double hook safety harness @ 20,000 each. Inspecting the harness @ 20,000 every 3 months	
Waste handling, storage and disposal	✓ Public nuisance. ✓ Health problems	✓ Implement sustainable waste management principles of reduction, reuse and recycling. ✓ Provide solid waste handling facilities. ✓ Contract a NEMA licensed waste handler to collect and dispose waste. ✓ Sensitize workers on best waste management practices.	Colour coded waste collection bins@ 5,000 each, Contracting NEMA licensed waste handler @ 10,000 per month.	KETRACO
Noise and vibrations	✓ Hearing problems. ✓ Public nuisance. ✓ Interference with communication on site which could result to accidents/injuries. ✓ Noise from corona discharge and buzzing/humming sound from substations.	✓ Provide workers in noisy areas with appropriate personal protective equipment (ear muffs/ear plugs). ✓ Drivers to be sensitized against unnecessary hooting. ✓ Ensure vehicles and equipment are well maintained and serviced as per manufacturer's guidelines. ✓ The substations shall be 132/33kV substations and the buzzing/harming sound is not predicted but should this be the case, the proponent should consider creating noise shields. Creating a tree canopy (along the safe sections of the perimeter fence) can also help in shielding the noise.	Provision of ear plugs @ 500 each and Ear muffs @ 1,000 each	KETRACO
Air Pollution	✓ Dust Emission ✓ Exhaust emission	✓ Impose a maximum speed limit on dirt roads ✓ Provide workers working in areas likely to have dust emissions with suitable protective equipment ✓ Reduce idling of vehicles ✓ Ensure maintenance vehicles and equipment are well maintained and serviced as per manufacturer's guidelines.	Provision of dust masks @ 200 each, and coveralls@ 5,000 each	KETRACO

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES.)	Responsible party
Perceived Danger of Electrostatic and Magnetic Force	✓ Perceived Danger of Electrostatic and Magnetic Force	✓ Take the precautionary principle approach and ensure that a safe distance is maintained between residential units and the TL. ✓ Conduct education and awareness campaigns to dispel fear among communities on the effects of electrostatic and magnetic forces. ✓ No settlement should be allowed on the way-leave. ✓ Maintenance workers should work in intervals to avoid long exposure periods.	Awareness creation to dispel fear on effects of EMF @ 500,000	KETRACO
Aircraft navigation safety	✓ Damage to transmission lines and towers ✓ Damage to aircrafts ✓ Injuries to aircraft operators, construction workers, public and animals.	✓ Ensure the ball markers are always in place. ✓ Surveillance, accident investigation, and corrective actions.		KETRACO
Fire Outbreaks	✓ Fire Outbreaks	✓ Conduct fire risk assessment and prepare Fire Response Plan. ✓ Advise workers not to smoke on forested areas. ✓ Ensure compliance with fire safety regulations and ensure availability of all necessary fire safety equipment. ✓ Conduct regular training and fire drills for employees. ✓ Regularly monitor the way-leave and ensure there is no accumulation of flammable substances. ✓ Create fire-breaks (ploughed strips) on strategic areas of the TL ✓ Build capacity for workers and community on fire related issues including sources, fighting, and vigilance.	Training and fire drills for employees @ 200,000 per quarter Building capacity for workers and community on fire related issues @ 200,000 per quarter	KETRACO
Visual and Aesthetic Impacts	✓ Effect on Visual and Aesthetic	✓ Ensure removal of all temporary structures erected by the construction contractor and restore the sites to as close as possible to the conditions before construction. ✓ Maintain landscaping programme initiated during the construction phase. ✓ Creating a tree canopy (along the safe sections of the substations perimeter fence)	Maintaining landscaping program @50,000 a quarter, creating a tree canopy@100,000	KETRACO

7.4: ESMP for the Decommissioning Phase

Table 7.4: ESMP for the decommissioning phase of the proposed project

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
Social Impacts				
Project Induced Labour Influx related impacts e.g., GBV-SEA/SH	✓ Social conflict between the local community and the decommissioning workers due to religious, cultural or ethnic differences or competition for local resources. ✓ Increase in illicit behavior and crime including theft, physical assaults, substance abuse, and prostitution.	✓ Develop and implement a Local Recruitment Plan that will ensure employment of as many locals as is possible. Local laws require 30% of labour force to come from the locals. ✓ Formulate and implement a Labor Influx Management Plan that will ensure harmony between non-local workers and the locals and minimize effects of labour influx ✓ Conduct sensitization fora for employees on ethics, morals, general good behaviour, GBV-SEA/SH, and the need for the project to co-exist with the neighbours. The fora should be guided by the Stakeholder Engagement Plan.	Sensitization fora @ 1,000,000 Condoms @ 200,000 Free screening @200,000 Training on GBV @ 200,000	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
	✓ Increased burden on and competition for public service provision including water, energy, medical services, transport, and education. ✓ Spread of diseases such as HIV/AIDS, STDs and other communicable diseases. ✓ Gender Based Violence such as sexual exploitation and abuse of community members by project workers (SEA) and workplace sexual harassment (SH), and exploitative sexual relations and illicit sexual relations with minors. ✓ Child labor and school dropout ✓ Local inflation of prices due to increase in demand for goods and services ✓ Disregard of important cultural norms ✓ Gender mainstreaming issues including the two-thirds gender rule, gender inequality, gender equity, women participation in project meetings and activities etc.	✓ Provide guidance and counselling on drug abuse, HIV/AIDS, and other STDs to employees. ✓ Sensitize local community on communicable diseases (STDs and HIV/AIDS) and GBV-SEA/SH. ✓ Provide female and male condoms to workers. ✓ Cooperation with local law enforcement and introduction of sanctions (e.g., dismissal) for workers involved in criminal activities. ✓ Provision of water supply source to workers and prohibition of use from other community sources or ensure the project and community agree on the right to access water from community sources. ✓ Develop and implement the GBV Management Plan (Cognizant of 1. sensitivity of GBV, and 2. the need to ensure confidential reporting and responding to GBV cases reported); including plans for prevention, response and Grievance Redress Mechanism, and ensure that the project does not trigger or exacerbate other forms of GBV at the community level. Further, ensure codes of conduct are signed by all with physical presence on project site. ✓ Mandatory and regular training for workers on required lawful conduct in relation to GBV in host community in addition to social and cultural inductions to workers. The project should support survivors who choose the legal redress route by referring them to the legal redress referral pathway – which could include legal entities (NGOs, lawyers, police stations etc.). ✓ Provision of opportunities for workers to take advantage of entertainment opportunities away from rural host communities. ✓ Ensure that children and minors are not employed directly or indirectly on the project. To ensure minors or children are not employed directly or indirectly in the project, the proponent/contractor will monitor the employment register; in addition to ensuring that workers have national identification cards. ✓ Maintain an updated employee database on site. ✓ All criminal cases to be reported to the relevant authorities through appropriate channels. ✓ Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases.		
Gender biases	✓ Gender mainstreaming issues including the two-thirds gender rule, gender inequality, gender equity etc. ✓ Inability of women to attend project meetings and other decision-making fora. ✓ Unfavorable employment conditions for women including salary, maternity leave, working hours, security, periodic time off to afford them access to child and dependent care, etc.	✓ Develop and implement a Gender Mainstreaming Plan to reduce the risk of gender inequality and biases and ensure participation of women in decision making and sharing of project benefits. The plan should also ensure gender is mainstreamed in all aspects of the project. ✓ During the employment of project staff, the Contractor to give more preference to women applicants and to encourage women to apply. ✓ In implementing the Stakeholder Engagement Plan, the proponent to be sensitive to women's availability to attend meetings. ✓ For any community meetings held, the announcement to encourage women to attend and the organizers to design initiatives that reach out to more women to attend the meetings. ✓ Inclusion of women representatives in the Grievances Redress Mechanism.	Sensitization fora @ 200,000	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Conduct sensitization fora about the importance of women participation in the project. ✓ Inclusion of women representatives on Grievances Redress Committees ✓ Conduct sensitization fora with all community segments about the importance of women participation in the project. ✓ Identify and address women employee security issues, including their safety while traveling to and from work and on project-related business. ✓ The contractor to proactively recruit and appoint women workers to decision-making positions. ✓ Offer flexible work options for women workers, accord them their leave days, and where possible support their access to child and dependent care.		
Stakeholder engagement and grievances management.	✓ Stakeholder engagement is not aligned with the Stakeholders Engagement Plan. ✓ Inadequate or partial stakeholder identification. ✓ Lack of or inadequate stakeholder engagement. ✓ Untimely disclosure of relevant project information ✓ Inadequate or partial disclosure of relevant project information. ✓ Grievances are not managed and resolved in a timely manner ✓ Process of grievances management is not aligned with the Grievances Redress Mechanism, leading to escalation into legal claims. ✓ Exclusion of vulnerable individuals and households from the engagement process.	✓ Develop and implement a Grievances Redress Mechanism (GRM) to manage all grievances in a timely manner and ensure the grievances management process is aligned with the GRM. ✓ Periodic review of the SEP and GRM ✓ Continual improvement of the SEP and GRM ✓ Ensure that all stakeholders are identified and are included in the SEP, and engaged meaningfully, including vulnerable individuals and households. ✓ Implement project structured interventions to ensure vulnerable individuals and households effectively participate in, and benefit from the project. ✓ Conduct Free Prior Informed Consultations to ensure affected VMGs are engaged meaningfully and access culturally appropriate social and economic benefits. ✓ Implement the SEP and ensure all stakeholder engagement is aligned to the SEP ✓ Ensure timely disclosure of relevant project information, e.g., project instruments, project risk management plans, positive and negative impacts, full rights and entitlements of project-affected persons, project benefits, and project opportunities.	✓ Development and implementation of SEP @ 1,000,000 ✓ Development and implementation of GRM @ 500,000	✓ KETRACO ✓ Contractor
Project benefits and opportunities including employment, local sourcing, capacity building etc.	✓ Failure by contractor and the proponent to prioritize locals for jobs. ✓ Perception by the locals that labour is imported from outside the project area. ✓ Project benefits and opportunities (e.g., employment, project-structured interventions for disadvantaged groups, etc.) are inaccessible to project-affected persons, including vulnerable individuals and households (elderly, PWD, etc.) and VMGs.	✓ Develop and implement a Local Recruitment Plan that will ensure employment of as many locals as is possible and manage all aspects related to local employment. Local laws require 30% of labour force to come from the locals. ✓ Manage negative public perception through community sensitization and training ✓ All job advertisements to be made available to the local population /placed in locations accessible to locals. ✓ Develop and implement a Corporate Social Responsibility (CSR) Plan in consultation with all community segments. ✓ Implement the VMGP to ensure VMGs effectively participate in the project and access social and economic benefits that are also culturally appropriate. ✓ Implement project structured interventions to ensure vulnerable individuals and households effectively participate in, and benefit from the project.	✓ Sensitization and training @ 500,000	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
COVID-19	Spread of the disease due to; ✓ Workers seeking accommodation within project areas. ✓ Decommissioning of TL and contractor facilities etc. ✓ Contractor/KETRACO engaging local workforce. ✓ Contractor and KETRACO involving communities in project monitoring. ✓ Sensitization sessions on HIV/AIDs, GBV-SEA/SH etc. Increased high expectations on the project e.g., higher demand for jobs and high wages. There will be a risk of engaging children/minors to work in the project or engage in business activities to supply goods and services to the project, in order to supplement dwindling household income sources due to effects of COVID-19 Psychological effects of Covid-19 e.g., due to negative socio-economic effects, social isolation may lead to increased cases of GBV including, GBV-SEA, workplace Sexual harassment, as well as other forms of GBV at the community or family level attributable to the project. Due to COVID-19 effects the burden of taking care of the household might fall disproportionately on women, therefore making it difficult for them to take part in e.g., consultation fora, decision making etc. External sourcing of labour may be impeded by, (a) cessation of movement; and (b) unwillingness of some workers to live in unfamiliar locations during a pandemic (fear of contracting the virus), and especially in locations with a high number of infections/pandemic epicenters.	All staff, visitors, and community members should adhere to the government's covid-19 regulations, including; ✓ Regularly and thoroughly clean their hands using soap and running water or with an alcohol-based hand rub. ✓ Maintain at least 1 metre distance between themselves and others. ✓ When coughing or sneezing, cover mouth and nose with flexed elbow or use disposable tissue and discard after use. ✓ Avoid touching eyes, nose and mouth. ✓ Always wear a mask in public and safely dispose used masks. ✓ Greet people with a wave, a nod, or a bow instead of shaking their hands. ✓ Avoid going to crowded places. ✓ If they have a fever, cough, difficulty breathing, or any other COVID-19 symptom, they should seek medical attention. The proponent and contractor must; ✓ Monitor everyone's health for symptoms such as fever, cough, or difficulty in breathing. ✓ Ensure workers who have returned from an area where COVID-19 is spreading monitor themselves for symptoms for 14 days and take their temperature twice a day. ✓ Make sure workplaces are clean and hygienic and are regularly disinfected. ✓ Put sanitizing hand rub dispensers in prominent places around the workplace and ensure that workers and visitors have access to places where they can wash their hands with soap and running water. ✓ Display posters and use other communication measures such as toolbox talks, briefings at meetings, and internet to promote handwashing, respiratory hygiene, keeping social distance and other measures of combating COVID-19. ✓ Develop a response plan in case someone becomes ill with symptoms of COVID-19. ✓ Give additional support to disadvantaged and vulnerable groups/locals who have been further disenfranchised due to negative social and economic impacts of Covid-19. ✓ Manage high expectations on the project e.g., higher demand for jobs, CSR activities, salaries/wages etc. through training and information dissemination. ✓ Ensure that children and minors are not employed directly or indirectly on the project. ✓ Assist people to cope with stress and psychological effects during the COVID outbreak. ✓ Develop and implement a Gender Mainstreaming Plan with COVID-19 effects in mind to reduce the risk of gender inequality and biases. ✓ In sourcing external labour (adverts and interviews), ensure people know measures employed to protect them from contracting COVID-19.	Thermometers@6,000 each. Face masks@500 a pack and transparent plastic protective face shield@ 300 each. Disinfecting workplaces @5,000 a month. Alcohol based sanitizers, soaps and disposable tissue@ 20,000 a month. Hand washing systems@ 5,000 each. Posters@ 500 each.	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
Environmental Impacts				
Community health and safety	✓ Children may try to climb erected towers and risk falling ✓ Traffic accidents ✓ Open defecation is a community health hazard which can cause spread of diseases.	✓ Conduct sensitization fora on the dangers posed by the transmission line (especially on children) and ways of staying safe. ✓ Contractor to facilitate the community to keep vigil or employ security guards to ensure no kids climb the towers. ✓ Within settled areas, impose speed limits and ensure people, especially children, have the right of way. ✓ Contractor to provide mobile toilets	Sensitization fora on dangers of transmission lines@ 500,000 Support for community to keep vigil to ensure people especially kids do not climb towers or fall into open pits 7,000 per month Provision of mobile toilets @ 70,000 each	✓ KETRACO ✓ Contractor
Workers Health and Safety	✓ Falling objects i.e. from high levels of towers and excavations, ✓ collapsing of excavations, ✓ poor hygiene as the contractor may find it difficult to provide sanitary welfare in the bushes ✓ attack by wild animals, ✓ road accidents, ✓ Occupational diseases.	✓ Conduct job safety analysis for high risk activities and document safe work procedures. ✓ Identify all hazards before undertaking a process ✓ Conduct and continually review a risk assessment ✓ Hold daily morning toolkit talks where safety is the key issue ✓ Train workers on health and safety ✓ Ensure first aid kits and firefighting equipment are available on site. ✓ Ensure only qualified personnel operate demolition equipment and vehicles. ✓ Only allow trained and certified workers to deactivate or work on live sections of the TL. ✓ Prohibit access by unauthorized personnel into the demolition site ✓ Ensure each worker is covered under an insurance policy as per WIBA ✓ Ensure demolition equipment and vehicles are regularly inspected by approved inspectors and inspection records maintained. ✓ Where there are risks of attack by wild animals, ensure workers are accompanied by armed guards ✓ Collect daily security briefs and avoid insecure places ✓ Place warning signs where necessary ✓ Provide all necessary PPEs	Conduct and review of risk assessment @ 100,000, Training workers on health and safety @ 200,000, Provision of insurance policy for workers@ 500,000 a year, Hiring of armed gaurds@4,000 a day, Provision of PPE @ 10,000 per staff, and warning signs@ 50,000	✓ Contractor
Working at Height – transmission line towers	✓ Injury or fatality due to a fall from the tower	✓ Only qualified and experienced personnel should be allowed to climb the towers ✓ Every morning before beginning the works, there should be a tool box talk emphasizing on safety at heights ✓ No personnel should be allowed to climb the towers while drunk or under the influence of drugs ✓ There should be a ground supervisor constantly observing and conversing with the workers atop the towers. The officer should ensure workers observe safety precautions at all the times and should have emergency telephone contacts.	Safety gear; non –slip footwear @ 5,000 a pair, gloves @ 1,000 a pair, helmet @ 2,000 each, double hook safety harness @ 20,000 each.	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Workers climbing the towers must be provided with non-slip footwear, gloves, helmet, and double hook safety harness and should be compelled to use them all the time.	Inspecting the harness @ 20,000 every 3 months	
Demolition waste	✓ Public nuisance ✓ Health problems ✓ Contamination of soil and water resources ✓ Eye sore	✓ Provide mobile toilets for decommissioning workers to manage human waste. ✓ Implement sustainable waste management principles of reduction, reuse and recycling. ✓ Contract a NEMA licensed waste handler to collect and dispose demolition waste. ✓ Sensitize workers on best waste management practices. ✓ All transmission line equipment and structures not used for other purposes must be removed and recycled/reused as far as possible or they be taken to a licensed waste disposal site	Mobile toilets @ 70,000 each, NEMA licensed waste handler @ 10,000 a month,	✓ KETRACO ✓ Contractor
Noise and vibrations	✓ Hearing problems. ✓ Public nuisance. ✓ Interference with communication on site which could result to accidents/injuries. ✓ Disruption of animal behaviors. ✓ Psychological and physical stress among workers hence reduced productivity. ✓	✓ Install portable barriers to shield noisy equipment where necessary. ✓ Limit demolition activities to be between 6.00 am to 6.00 pm. ✓ Reduce idling of vehicles and demolition equipment. ✓ Provide workers in noisy areas with appropriate personal protective equipment (ear muffs/ear plugs). ✓ Drivers to be sensitized against unnecessary hooting. ✓ Ensure demolition vehicles and equipment are well maintained and serviced as per manufacturer's guidelines. ✓ Co-ordinate with relevant agencies and neighbouring communities regarding all demolition activities	Portable barriers @ 100,000, PPE @ 10,000 per staff, meeting with relevant authorities and community @ 200,000.	✓ KETRACO ✓ Contractor
Air Pollution	✓ Dust Emission ✓ Exhaust emission	✓ Watering all active demolition areas as and when necessary to lay dust. ✓ Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard. ✓ Impose speed limits. ✓ Provide workers working in areas likely to have dust or exhaust emissions with suitable protective equipment ✓ Reduce idling of vehicles and demolition equipment. ✓ Ensure demolition vehicles and equipment are well maintained and serviced as per manufacturer's guidelines.	Water sprinkling @ 10,000 a month , PPE; dust mask @ 200 each, coveralls @ 5,000 each.	✓ KETRACO ✓ Contractor
Rehabilitation of project site	✓ Visual and Aesthetic Impacts	✓ Implement an appropriate re-vegetation programme to restore the site to its original status. ✓ Consider use of indigenous plant species in re-vegetation. ✓ Restore site area through backfilling, landscaping and planting of trees, shrubs and grass on the open spaces to re-introduce visual barriers.	Revegetation program, landscaping and backfilling to restore project site @ 1,000,000	✓ KETRACO ✓ Contractor
Fire Outbreaks	✓ Fire Outbreaks	✓ Conduct fire risk assessment and prepare Fire Response Plan. ✓ Advise workers not to smoke on forested areas. ✓ Ensure compliance with fire safety regulations and ensure availability of all necessary fire safety equipment. ✓ Conduct regular training and fire drills for employees.	Training and fire drills for employees @ 500,000 Building capacity for workers and community	✓ KETRACO ✓ Contractor

Environmental/ Social Aspect	Impacts	Mitigation Measures	Estimated Cost (KES)	Responsible party
		✓ Regularly monitor the way-leave and ensure there is no accumulation of flammable substances. ✓ Create fire-breaks (ploughed strips) on strategic areas of the TL ✓ Build capacity for workers and community on fire related issues including sources, fighting, and vigilance.	on fire related issues @ 500,000	

CHAPTER 8: ENVIRONMENTAL AND SOCIAL MONITORING PLAN (ESMoP)

8.1: Environmental and Social Monitoring Plan

Table 8.1: Environmental and Social Monitoring Plan (ESMoP) for the Proposed Project

Monitoring Scope	Frequency				Monitoring Indicators	Monitoring means	Cost
	Pre-construction	Construction	Operations	Decommissioning			
Social Impacts							
Acquisition of wayleaves, and land for substation, and ancillary facilities.	Monthly	Quarterly	Bi-annually	-	✓ Ensure the following management plans are in place and are being implemented; Local Recruitment Plan, Resettlement Action Plan, Livelihoods Restoration Plan, Labor Influx Management Plan, Gender Mainstreaming Plan, Stakeholder Engagement Plan, Grievance Redress Mechanism, GBV Management Action Plan, and Vulnerable and Marginalized Groups Plan. ✓ No. of vulnerable individuals and households engaged, fairly and promptly compensated, and their livelihoods improved or restored back to pre-project levels, in line with the provisions of the RPF. ✓ Monitor compensation for land, loss of use, structures, crops, pasture and trees. ✓ What % of PAPs has been compensated? ✓ Records on average time given to PAPs to relocate ✓ No. of focused groups sensitization fora and counseling sessions held to discuss social vices associated with receiving an unexpected (large) income ✓ No. of sessions held by the Resettlement Committees and their minutes of meeting. ✓ Assess if compensation and other entitlements are being delivered in line with the RAP ✓ Assess if measures to restore or enhance livelihood of PAPS are being implemented. ✓ Review records of grievances and follow up to ensure appropriate corrective actions have been implemented. ✓ Check existence of escrow account for delayed compensation. ✓ Check to ensure land for ancillary facilities was acquired by the contractor on a willing seller willing buyer basis. ✓ Check to see land ownership documents for the substation and reports on the acquisition process. ✓ Monitor cases of land disputes and those due to lack of land ownership documents.	site visit, observation, meeting with PAPs,	Per diem and facilitation for 3no. staff @150,000 a month
Livelihood restoration	Monthly	Quarterly	Bi-annually	-	✓ Implementation of the livelihood restoration plan ✓ Records of training sessions held with all community segments including VMGs, vulnerable individuals, and households. ✓ Records of insurance cover taken for livestock ✓ Records of compensation for lost businesses and other sources of livelihoods.		

Monitoring Scope	Frequency				Monitoring Indicators	Monitoring means	Cost
	Pre-construction	Construction	Operations	Decommissioning			
					✓ Records of extra assistance given to VMGs (particularly minority VMGs) and vulnerable individuals and households.		
Gender biases	Monthly	Monthly by contractor and quarterly by KETRACO	-	Monthly by contractor and quarterly by KETRACO	✓ Ensure a Gender Mainstreaming Plan and a Stakeholder Engagement Plan that identifies women as an important focus group are in place and are being implemented ✓ No. of women employed in the project as a percentage to the total number of people employed. ✓ Ensure job advertisement and recruitment drives encourage women to apply. Rate the adverts and recruitment drives held. ✓ Scrutinize attendance list of project meetings and other decision-making fora and aggregate in terms of gender. ✓ Records reported cases of GBV-SEA/SH. ✓ No. of women PAPs compensated. ✓ No. of sensitization meetings held with women, signed minutes and list of participants. ✓ Reports on women employee safety and security issues. ✓ Report on women employees working conditions.		
Stakeholder engagement and grievances management	Monthly	Quarterly	Bi-annual	Bi-annual	✓ Implementation of the SEP, GRM and VMGP. ✓ No. of sensitization and training sessions held, including sessions held with vulnerable individuals and households, signed minutes and lists of participants. ✓ No. of meetings held to review SEP and GRM ✓ Attendance list and minutes for meetings held during stakeholder consultation ✓ Attendance list and minutes for meetings held during disclosure of project information, ✓ No. of reported grievances ✓ No. of cases of successfully resolved grievances by the GRM ✓ No. of grievance cases not successfully by GRM ✓ No. of grievance cases escalated to the law courts, and to the World Bank Grievances Redress System and Inspection Panel. ✓ Evidence of Free Prior Informed Consultations held with affected VMGs.		
Project benefits and opportunities including employment, local sourcing, capacity building etc.	Monthly	Quarterly	-	Bi-annual	✓ Proof of a Local Recruitment Plan and VMGP. ✓ Proof of job advertisements being made available to the local population ✓ Attendance list and minutes for sensitization meetings ✓ Proof of CSR Plan ✓ No. of CSR projects completed ✓ No of vulnerable individuals and households accessing project benefits and opportunities. ✓ Project structured interventions accessible to vulnerable individuals and households.		
COVID-19	Daily	Daily by contractor and quarterly by	Weekly	Daily by contractor and quarterly by KETRACO.	✓ Check to see workers and visitors keep social distance, sanitize their hands, and wear mask. ✓ Ensure proponent and contractor monitor workers and visitor for symptoms of COVID-19, regularly disinfect workplaces and keep them hygienic, provide sanitizing hand rub dispensers and hand washing systems, and display posters.		

Monitoring Scope	Frequency				Monitoring Indicators	Monitoring means	Cost
	Pre-construction	Construction	Operations	Decommissioning			
		KETRACO.			✓ Ensure the formulated Gender Mainstreaming Plan is aligned with COVID-19 effects in mind to reduce the risk of gender inequality and biases. ✓ Confirm minutes of meetings, trainings, and briefs to manage increased high expectations on the project. ✓ Confirm sessions held to assist people cope with stress and psychological effects.		
Project Induced Labour Influx related impacts e.g., GBV-SEA/SH etc.)	Monthly	Weekly by contractor and quarterly by KETRACO	Quarterly	Weekly by contractor and quarterly by KETRACO	✓ Implementation of the GBV Management Plan. ✓ Check employment records to ensure locals have been employed and minors are not employed. ✓ Minutes of sensitization meetings on morals, ethics, communicable diseases, HIV/AIDs, and GBV held with all community segments. ✓ Records of provision of both male and female condoms. ✓ Report of reported cases of GBV-SEA/SH. ✓ Check if contractor has contracted security guards and workers have badges or identification cards to access construction and decommissioning site. ✓ Verify Presence of an up-to-date employee database on site. ✓ No. of criminal cases reported to the relevant authorities through appropriate channels?	site visit, observation, meeting with contractor, interview some employee, meeting with community members	Per diem and facilitation for 3no. staff @150,000 per quarter
Culture, Heritage, and Norms		Weekly by contractor and quarterly by KETRACO	-	-	✓ Check whether contractor has contracted a cultural ambassador to guide and advice the project on issues of culture, heritage, and norms. ✓ Implementation of the VMGP. ✓ Minutes of meeting for sensitizations conducted for the contractor and their workers on culture, heritage, and norms to avoid conflicts with communities ✓ Records of gravesite excavations, cutting of sacred trees or interference with cultural sites by the contractor and procedures followed in line with acceptable community practices.	site visit, meeting with contractor, meeting with community members	
Livestock farming		Weekly by contractor and quarterly by KETRACO.	-	-	✓ Check if excavated pits are well secured and guards are on standby to prevent livestock from falling into the pits. ✓ No. of water pans developed. ✓ Check if there is unnecessary vegetation clearing. ✓ Check if water resources have been polluted by the contractor. ✓ Verify that sensitization fora have been conducted among workers and drivers on livestock safety. ✓ Records of any incident or accident involving livestock and corrective measures taken.	site visit, observation, meeting with contractor, meeting with community members	
Environmental Impacts							
Community health and safety		Daily by contractor and quarterly by KETRACO.	-	-	✓ Minutes of meeting for sensitization fora on community health and safety. ✓ Confirm excavated foundation pits are barricade and warning signs are well displayed. ✓ Confirm presence of safety features on each tower. ✓ Confirm that security guards have been contracted or community empowered to prevent people from accessing construction areas.	site visit, observation, meeting with contractor, meeting with community members	

Monitoring Scope	Frequency				Monitoring Indicators	Monitoring means	Cost
	Pre-construction	Construction	Operations	Decommissioning			
					✓ Records of traffic signs and adherence to speed limits within settled areas to ensure there is road safety. ✓ Records of any incident or accident involving children and any other community member and corrective measures taken. ✓ Records of grievances/complaints of noise/vibration ✓ No. of mobile toilets provided		
Destruction of existing vegetation and habitat		Weekly by contractor and quarterly by KETRACO.	-	-	✓ Records of sensitization meetings for workers to avoid unnecessary vegetation clearance. ✓ Verify vegetation clearing is selective and that it is cleared manually with no chemicals used. ✓ Check if unnecessary vegetation clearing has occurred and advise accordingly. ✓ No. of tree planting drives held and status of trees planted ✓ Report on mapping of water catchment areas ✓ Check spread of invasive species (*Lantana camara, Solanum mauritianum, Prosopis juliflora, Ipomoea spp* and others) in the project area and make recommendations	site visit, observation, meeting with contractor, meeting with KFS and KWS, meeting with community members	Per diem and facilitation for 3no. staff @150,000 per quarter.
Disturbance to Wildlife		Weekly by contractor and quarterly by KETRACO	-	-	✓ Records of awareness creation to staff on poaching/hunting game. ✓ No. of consultation meetings with KWS and community on animal breeding areas ✓ Records of relocation of threatened wildlife to safe areas ✓ Check if construction workers and vehicles use designated routes to avoid further disturbance of habitats and wildlife fodder. ✓ Check number of poaching incidences or accidents involving wildlife and actions taken. ✓ Records of any incident or accident involving wildlife and corrective measures taken.	site visit, observation, meeting with contractor, meeting with KFS and KWS, meeting with community members	
Avi-fauna disturbance and mortality		Weekly by contractor and quarterly by KETRACO	Quarterly	-	✓ Report on mapping of important bird migration corridors ✓ Records of bird safety features on the line ✓ Records of bird collision incidences or bird mortality due to collision and any further mitigation measures employed for repeated collision.	site visit, observation, meeting with contractor.	
Surface and underground water reserves including Dams, Rivers, Streams, Wetlands, Marsh-areas, Water-pans, lagas, springs, wells, and boreholes		Weekly by contractor and quarterly by KETRACO with water quality analysis	-	-	✓ Records of towers on the riparian zone and corrective measures taken. ✓ Ensure contractor has developed and is implementing an oil spill minimization and cleanup plan. ✓ No. of mobile toilets provided ✓ Ensure contractor is not abstracting water from local water resources illegally. ✓ Check if there is waste dumping or effluent discharge into water resources by the contractor/workers ✓ Bi-annual water quality analysis	site visit, observation, meeting with contractor, meeting with community members, lab analysis.	Per diem and facilitation for 3no. staff @150,000 per quarter. Water quality analysis @ 300,000 bi-annually

Monitoring Scope	Frequency				Monitoring Indicators	Monitoring means	Cost
	Pre-construction	Construction	Operations	Decommissioning			
		done bi-annually					
Mugie Conservancy and Engare Narok Forest		Weekly by contractor and quarterly by KETRACO	-	-	✓ Minutes of introductory meeting with Mugie and Engare Narok forest community. ✓ Report on mapping of vulnerable/endangered/old tree species. ✓ Minutes of sensitization meeting on poaching/hunting game. ✓ Records of provision of guards to protect workers from wildlife and wildlife from the workers. ✓ Check number of poaching cases or illegal logging and actions taken. ✓ Verify presence of security guards within Mugie to protect them from wildlife and wildlife from the staff. ✓ Verify if designated entry/ exit points and routes are used. ✓ Visual inspection of any dead wildlife	site visit, observation, meeting with contractor, meeting with representatives of Mugie and Engare Narok Forest	Per diem and facilitation for 3no. staff @150,000 per quarter.
Workers Health and Safety		Daily by contractor and quarterly by KETRACO	Quarterly	Daily by contractor and quarterly by KETRACO	✓ Ensure existence of an Environment, Health, and Safety Officer. ✓ Check to see the Labor Management Plan has been developed and is being implemented. ✓ Inspect health and safety documentation as per the Occupational Health and Safety Plan (OHSP) ✓ Check number of reported accidents, incidents and near misses and actions taken. ✓ Verify PPEs has been provided to workers and are used. ✓ Verify presence of trained first aiders and fire marshals at site and well equipped first aid boxes and fire equipment. ✓ Records of training held on health and safety. ✓ Records of insurance premiums. ✓ Records of morning tool kit talk. ✓ Records of incidents and accidents involving workers.	Site visit, observation, meeting with contractor, interview some employee.	
Working at Height – transmission line towers		Daily by contractor and quarterly by KETRACO	-	Daily by contractor and quarterly by KETRACO	✓ Verify that work at height training has been provided to workers. ✓ Records of morning tool kit talk. ✓ Verify if workers have been provided with appropriate PPE for work at height and are using them. ✓ Records of incidents and accidents involving workers.	Site visit, observation, meeting with contractor, interview some employee.	
Waste handling, storage and disposal		Weekly by contractor and quarterly by KETRACO	Weekly by contractor and quarterly by KETRACO	Weekly by contractor and quarterly by KETRACO	✓ Verify waste receptacles have been provided ✓ Confirm records of waste disposal through a NEMA licensed waste handler. ✓ Ensure sanitary conveniences have been provided to manage human waste. ✓ Check if there is evidence of waste burning on site ✓ Minutes of sensitization meetings on waste reduction. ✓ Ensure all remnants of loose gravel and concrete are effectively collected from the tower bases.	site visit, observation, meeting with contractor, interview some employee, meeting with community members	

Monitoring Scope	Frequency				Monitoring Indicators	Monitoring means	Cost
	Pre-construction	Construction	Operations	Decommissioning			
Noise and vibrations		Weekly by contractor and quarterly by KETRACO with bi-annual noise level analysis	Quarterly	Weekly by contractor and quarterly by KETRACO	✓ Records of workers' exposure to noise and whether contractor limit work to daytime only. ✓ Check vehicle and equipment maintenance and inspection records ✓ Verify that appropriate PPE has been provided to workers in high noise areas. ✓ Conduct bi-annual noise level analysis	site visit, observation, meeting with contractor, interview some employee, meeting with community members, noise measurements	Per diem and facilitation for 3no. staff @150,000 per quarter. Hiring of Noise Level Meter @20,000 bi-annually.
Air Pollution		Weekly by contractor and quarterly by KETRACO	Quarterly	Weekly by contractor and quarterly by KETRACO	✓ Inspect fugitive dust emissions from construction sites and exhaust emission from vehicles and machines. ✓ Check water sprinkling records to suppress dust emission. ✓ Check presence of speed limit signs. ✓ Verify appropriate PPE has been provided including dust masks, eye protection and coveralls) ✓ Check vehicle and equipment maintenance and inspection records.	site visit, observation, meeting with contractor, interview some employee, meeting with community members	Per diem and facilitation for 3no. staff @150,000 per quarter.
Soil Erosion		Quarterly	-	-	✓ Records of soil erosion mitigation measures implemented. ✓ Investigate effects on riverine vegetation. ✓ Records on rejuvenation of degraded areas with native vegetation species to improve ground cover.	site visit, observation, meeting with contractor.	
Cultural, archeological, and historical sites		Quarterly	-	-	✓ Verify No. of training sessions of KETRACO and construction staff on identification of archeological objects; No. of staff trained. ✓ Check No. of Chance Find cases of archaeological material reported and procedures followed.	site visit, observation, meeting with contractor, meeting with community members	
Air craft navigation safety		Quarterly	Quarterly	-	✓ Ensure KCAA approval is received. ✓ Check if conditions of approval from KCAA are implemented. ✓ Check conditions of ball markers. ✓ Records of aircraft accidents	Site visit, observation.	Per diem and facilitation for 3no. staff @150,000 per quarter.
Traffic disruption on road crossings during stringing		Quarterly	-	-	✓ Check availability of approval from Roads' Authorities. ✓ Check if conditions set in permit from relevant road authorities have been met. ✓ Check presence of road signs. ✓ Verify contractor has contracted traffic marshals to guide construction vehicles and other motorists in risky areas.	site visit, observation, meeting with contractor, interview some employee, meeting with	

Monitoring Scope	Frequency				Monitoring Indicators	Monitoring means	Cost
	Pre-construction	Construction	Operations	Decommissioning			
						community members	
Visual and Aesthetic Impacts		Quarterly	-	-	✓ Minutes of public consultation meeting. ✓ Comment on ancillary structures erected by contractor. ✓ Verify that backfilling, landscaping and planting of trees, shrubs and grass in disturbed areas has been done.	site visit, observation, meeting with contractor, interview some employee, meeting with community members	
Perceived Danger of Electrostatic and Magnetic Force		-	Quarterly	-	✓ Minutes of education and awareness campaigns held to dispel fear among communities on the effects of EMFs ✓ Ensure there is no settlement on the way-leave.	site visit, meeting with contractor.	
Fire outbreaks		Quarterly	Quarterly	Quarterly	✓ No. trainings and sensitization fora for workers and community held ✓ No. of fire outbreak incidents and how handled	site visit, observation, meeting with contractor, meeting with community members	
Demolition waste		-		Quarterly	✓ No. of mobile toilets provided. ✓ Confirm records of waste disposal through a NEMA licensed waste handler.	site visit, observation, meeting with contractor, meeting with community members	
Rehabilitation of project site		-	-	Quarterly	✓ Verify implementation of an appropriate re-vegetation programme to restore the site to its original status ✓ Verify that backfilling, landscaping and planting of trees, shrubs and grass in disturbed areas has been done.	site visit, observation, meeting with contractor, meeting with community members	

CHAPTER 9: ANALYSIS FOR ALTERNATIVES

9.1: Introduction.

One of the functions of the Environmental and Social Impact assessment process is to describe and evaluate various alternatives to the proposed project. Alternatives examined during the study are discussed below;

9.2: The "Do Nothing" Option

For this project, the no-development option would mean the proposed project will not be implemented. The implications of this would be no additional reliability and security of electricity supply to Laikipia and Samburu Counties, the economic status of people in the project area will not change, and there will be no creation of job and business opportunities. Given that the level of impacts associated with the project are low and that there is high probability of mitigation of these negative impacts, the "no-go" option would not be the most viable option in this instance.

9.3: Demand-Side Management Option

Demand Side Management (DSM) is a function carried out by the electricity supply utility aimed at encouraging a reduction in the amount of electricity used at peak times. This is achieved by influencing customer usage to improve efficiency and reduce overall demand. These efforts are intended to produce a flat load duration curve to ensure the most efficient use of installed network capacity. By reducing peak demand and shifting load from high load to low load periods, reductions in capital expenditure (for network capacity expansion) and operating costs can be achieved. One of the basic tools is the price differentiation (such as time-of-use tariffs) between peak demand time and low demand time. This option is practiced to a certain extent, but is currently not considered feasible for managing the level of growth forecast for Laikipia and Samburu Counties.

9.4: Line Routing Alternatives

In proposing the above line route, consideration was given to social and environmental impacts of the project over and above KETRACO's route selection criteria (highlighted in section 4.4.3). The proposed transmission line route is mainly parallel to the existing Loyangalani-Suswa Transmission line. Hence further disturbance of natural habitats, vegetation, and environment in general will be reduced since the route was already disturbed during implementation of Loyangalani- Suswa Transmission line. The line route has been located to avoid areas of dense settlement and where impacts on environment and local

people including; loss of farmland, structures, grazing land and environmentally sensitive areas area minimal.

The transmission line will however, overfly a land proposed for a school in Dam Nyeusi area. LR No. Sosian/Sosian Block III/1574 which will be affected by the TL is reserved for Nkirashi Early Childhood Development (ECD) & primary school. The land is about 12 acres and already hosts the Loyangalani-Suswa transmission line. Options available here include;

1. Re-route the line to avoid the school compound.
2. Use underground cable within the school compound.
3. Overfly the school compound (no tower in the school compound) but the client to offer the school, land for land compensation. The replacement land must have productive potential and locational advantages equivalent to or higher than the advantages of land taken. It is suggested that, the compensated land be adjacent to the school land and that the affected land remains the school property. Alternatively, the proponent can give an in-kind compensation which would involve implementation of a social investment project in the school as compensation for land impacted.

Re-routing the line (option 1) would either mean creating a large angle point (normally discouraged) to pass the school compound in the western side (the bigger stretch of the compound is on this side), or create a smaller angle point (normally encouraged) to pass the compound in the Eastern side. In this last instance, the TL would have to cross the Loyangalani-Suswa Line which is another complication.

Option 2 would be quite expensive.

Given that, the school is yet to be built and that, the Loyangalani-Suswa line has already affected the school, option 3 seems the most viable option.

9.5: Alternative processes and materials

The table below presents an analysis of alternatives materials and processes for the proposed electricity transmission project.

Alternative construction materials and processes	**Advantages**	**Disadvantages**
Use of wooden poles	✓ Low installation cost. ✓ Easy to transport. ✓ Readily available.	✓ Not durable due to rot and decay. ✓ Can easily collapse.

Alternative construction materials and processes	Advantages	Disadvantages
		✓ Susceptible to insect and animal attack.
Use of concrete poles	✓ Less costly compared to steel structures. ✓ Not susceptible to rot and decay. ✓ Not susceptible to insect and animal attack.	✓ Likely to collapse due to loose soils ✓ Suitable for lower voltage electricity lines ✓ Requires heavy machinery for installation because they are heavy ✓ Have low tensile strength and needs to be reinforced ✓ Low ground clearance of cables
Steel towers (proposed option)	✓ Low maintenance costs ✓ High conductor ground clearance ✓ Durable ✓ Not affected by extreme weather	✓ High installing costs ✓ Installation is time consuming ✓ Susceptible to corrosion
Underground transmission line	✓ Aesthetics will be maintained ✓ Suitable for short transmission distance ✓ Safe to people, wildlife and livestock ✓ Not affected by weather, trees, animals and other physical factors.	✓ High installation costs ✓ Not suitable for long distance transmission ✓ Difficult to repair and maintain compared to overhead transmission lines ✓ Not suitable for areas with hills
Overhead transmission line (proposed option)	✓ Less civil works compared to underground transmission ✓ Easy to repair and maintain ✓ Lower installation costs ✓ Appropriate for long distance transmissions ✓ More durable compared to underground transmission lines.	✓ Affected by extreme weather and may cause outages ✓ Susceptible to lighting strikes ✓ May interfere with flight paths and communication lines ✓

9.6; Conclusion

From the alternatives analysis, it can be concluded that the most feasible alternative is to implement the proposed project following the proposed line route and using the proposed materials and technologies. Mitigation measures will be applied to mitigate any adverse environmental, social, or cultural impact associated with the proposed project.

CHAPTER 10: RECOMMENDATIONS AND CONCLUSION

10.1: Introduction

An Environmental and Social Management Plan (ESMP) for the project has been developed to ensure sustainability of the site activities from construction through operation to decommissioning. The plan provides a general outlay of the activities, associated impacts, and mitigation action plans. Implementation timeframes and responsibilities are defined, and where practicable, the cost estimates for recommended measures are also provided.

A monitoring plan has also been developed and highlights the environmental performance indicators that should be monitored. Monitoring creates possibilities to call to attention changes and problems in environmental quality. It involves the continuous or periodic review of operational and maintenance activities to determine the effectiveness of recommended mitigation measures. Consequently, trends in environmental degradation or improvement can be established, and previously unforeseen impacts can be identified or pre-empted.

It is strongly recommended that a concerted effort is made by both KETRACO and the contractor to implement the Environmental and Social Management and Monitoring Plan provided herein. After commissioning of the transmission line project, statutory Environmental and Safety Audits must be carried out in compliance with the national legal requirements.

It is quite evident from this study that the construction and operation of the proposed transmission line project will bring positive effects in the project area including improved supply of electricity, cleaner environment, creation of employment opportunities, gains in the local and national economy, provision of market for supply of building materials, Informal sectors benefits, increase in revenue, improvement in the quality of life for the workers and community members, and Improved security.

Considering the proposed location, construction, management, mitigation and monitoring plan that will be put in place, the project is considered important, strategic and beneficial and given that no immitigable negative impacts were encountered and that no community objection was received, the project may be allowed to proceed.

10.2: Recommendations

Following the impact analysis presented in the previous sections, the following recommendations were made

- The proposed project to be implemented in compliance with the relevant legislation and planning requirements
- The proponent to ensure implementation of the mitigation measures provided in the ESMP
- The proponent to monitor implementation of the ESMP using the developed ESMoP
- The proponent to conduct an elaborate Resettlement Action Plan (RAP) to ensure that affected individuals and households and displaced communities are meaningfully consulted and are adequately and fairly compensated.
- The proponent will ensure that vulnerable and marginalized groups are not negatively impacted by the project and that they reap maximum benefits from the project. The proponent has undertaken a Social Assessment Study which subsequently informed the development of a VMGP. Further, the proponent will implement project structured interventions to ensure vulnerable individuals and households (present among VMGs and non-VMGs) effectively participate in, and benefit from the project.
- The proponent to ensure pending grievances associated with the Loyangalani-Suswa TL project are resolved and closed out before commencing the proposed project.
- The proponent to create and implement a Community Development Plan/Corporate Social Responsibility Plan to manage community expectations.
- The proponent to carry out a detailed Biodiversity Impact Assessment in areas of influence of the project prior to finalization of the TL alignment.
- The proponent to conduct an Avifauna survey especially in areas identified in the study prior to finalization of the TL alignment.
- The proponent to conduct a detailed noise mapping and assessment prior to finalization of the TL alignment. The noise assessment needs to include modelling to establish noise contours. The
- For any land acquisition within the L'partuk Community Group Ranch, which is an unregistered community ranch group, the community members should be sensitized in consecutive consultation sessions that, as per Community Land Act 2016, cash compensation for unregistered community land will be deposited in an interest-earning escrow account by the County Government. All the monies plus accrued interest will be released to the community once community land and the community are registered. Their views, opinions, and concerns regarding this matter, should also be sought and considered.
- The proponent to update this report after every 24 months or when unforeseen impacts are identified in the course of project implementation through monitoring.
- The proponent to conduct annual Environmental Audits and submit to NEMA

- NEMA to consider, approve and grant an Environmental Impact Assessment License to the proponent

10.3: Conclusion

From the foregoing, it is noted that;

- no immitigable negative impacts were encountered
- No objection from the community was received
- Identified potential negative impacts can be mitigated
- Benefits to the community, region, and the country at large are immense

The ESIA team, therefore, recommends to NEMA to consider, approve and grant an **Environmental Impact Assessment License** to the proponent and the proponent to implement the project with strict adherence to the proposed ESMP.

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