MINISTRY OF ENERGY
Republic of Kenya

REREC
RURAL ELECTRIFICATION & RENEWABLE ENERGY CORPORATION

THE WORLD BANK

KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

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

Comprehensive Project Report (CPR) FOR THE PROPOSED FOROLE OFF-GRID SOLAR PROJECT AT COORDINATES 3°42'53.3"N 37°58'04.1"E

Rev	Description	Date
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Norken International Ltd
ENGINEERING AND MANAGEMENT CONSULTANTS
ISO 9001:2015 CERTIFIED

CENTRIC AFRICA LTD

CERTIFICATION

This Comprehensive Project Report (CPR) has been prepared by ESIA /EA Firm of Experts, **Centric Africa Ltd, Reg. No.7112 and Norken International Ltd, Reg. No.0181.** The report has been written with diligence in accordance with the World Bank Safeguards Policies, Environmental Safeguards Standards (ESS), the EMCA 1999 *(Amended, 2015)* and the Environmental and Social Impact Assessment and Audit Regulations, 2003 to bring out the true nature of the intended development**.** The report was prepared based on the information provided by various stakeholders and village elders at Forole location in Marsabit County as well as from primary and secondary sources. It is therefore, issued without any prejudice.

We the undersigned, certify that the particulars in this CPR are correct and righteous to the best of our knowledge.

ESIA/EA FIRM OF EXPERTS:

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Disclaimer:
This ESIA report is strictly confidential to REREC (the Proponent) and any use of the materials thereof should strictly be in accordance with the agreement between the Proponent and the consultants; Norken International Limited and Centric Africa Limited (the Environmental Impact Assessor). It is, however, subject to conditions in the Environmental (Impact Assessment and Audit) Regulations, 2003 under the Kenya Gazette Supplement No. 56 of 13th June 2003.

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LIST OF ACRONYMS

ACRONYM	DEFINITION
ADR	Alternative Dispute Resolution
AoI	Area of Influence
CBOs	Community Based Organizations
CoK	Constitution of Kenya
CDI	County Development Index
CEMP	Construction Environmental Management Plan
CGRCs	County Grievance Redress Committees
CRA	Commission on Revenue Allocation
CSR	Customer Social Responsibility
CIDP	County Integrated Development Plan
CPS	Country Partnerships Strategy
DOSHS	Directorate of Occupational Safety and Health Services
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EPRA	Energy Petroleum Regulatory Authority
EPT	Energy and Petroleum Tribunal
EPRA	Energy and Petroleum Regulatory Authority
ESI	Electrical Supply Industry
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management Systems
EMCA	Environmental Management and Coordination Act
EMF	Electromagnetic Field
FGD	Focus Group Discussions
GDC	Geothermal Development Company
GoK	Government of Kenya
HDPE	High Density Poly Ethylene
IAs	Implementing Agencies
IEC	International Electro-technical Commission
IPPs	Independent Power Procedures
IPs	Indigenous Peoples
JV	Joint Venture
KETRACO	Kenya Electricity Transmission Company
KII	Key Informant Interviews
KOSAP	Kenya Off-Grid Solar Access Project
KPLC	Kenya Power and Lighting Company
LEP	Labour and Employment Plan
LGRCs	Local Grievance Redress committee
MGs	Mini Grids
MOE	Ministry of Energy
MSDS	Material Safety Datasheet
NEMA	National Environmental Management Authority
NGOs	Non-Governmental Organizations

NLC	National Land Commission
NTSA	National Transport and Safety Authority
OHS	Occupational Health and Safety
OM	Operation and Maintenance
OP	Operational Policies
PAD	Project Appraisal Document
PAPs	Project Affected Persons
PCU	Project Co-ordination Unit
PPAs	Power Purchase Agreements
PPEs	Personal Protective Equipment
PV	Photo-voltaic
REREC	Rural Electrification and Renewable Energy Corporation
RPF	Resettlement Policy Framework
SA	Social Assessment
SEA	Strategic Environmental Assessment
SHS	Solar Home Systems
SIA	Social Impact Assessment
SOP	Safe Operation Procedure
STDs	Sexually Transmitted Diseases
STI	Science, technology and innovation
SMMP	Social Management and Monitoring Plan
ToR	Terms of Reference
VMGF	Vulnerable and Marginalised Groups Framework
VMGs	Vulnerable and marginalized groups
VMGP	Vulnerable and Marginalised Group Plan
WB	World Bank
WMP	Waste Management Plan
WRA	Water Resources Authority

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EXECUTIVE SUMMARY

E-1- Introduction and Project Brief

The Ministry of Energy (MOE) hereinafter refer to as proponent is implementing the Kenya Off-Grid Solar Access Project (KOSAP) in 14 underserved counties in Kenya. The aim of the project is to provide clean and modern energy services through off-grid solar solutions. The Proponent is coordinating the implementation of the project through the implementing agencies; Kenya Power (KP) and the Rural Electrification and Renewable Emergency Corporation (REREC). The project is funded by the World Bank Group with $150 million and a $5 million grant from the Carbon Initiative for Development. The goal of the project is to bring electricity to around 250,000 households, 476 community facilities, and 380 boreholes in the target counties, benefiting low-income groups. It also includes the sale and installation of 150,000 efficient cook stoves. The project focuses on marginalized areas based on the County Development Index (CDI) and aims to address infrastructure deficits, lack of access to roads, electricity, water, and social services in these underserved counties. To ensure sustainability, the project relies on public funding, local community participation, and the institutional capacity of KP, REREC, and the MOE.

The KOSAP consists of four main components. The first component, focuses on the implementation of mini-grids to provide electricity to community facilities, enterprises, and households in areas where mini-grids are the most cost-effective option. The second component, aims to electrify households through standalone solar systems in areas without load clusters where standalone systems are the best technical and financial solution. The third component, supports the electrification of public institutions and community facilities using standalone solar systems. It also includes the installation of solar PV-powered water pumps for consumptive purposes. Lastly, the fourth component, provides funding for implementation support, technical assistance, and capacity building activities to ensure the sustainability and impact assessment of the interventions carried out under the other components of KOSAP.

In Marsabit County, one of the target counties, the Proponent is proposing to develop 15 No. mini grid facilities including Forole Mini Grid discussed in this report. In order to adhere to both national and donor requirements, the Proponent engaged the services to the consortium of Norken International Limited and Centric Africa Limited to undertake the ESIA. The ESIA has been conducted following the requirements outlined in the Environmental Management and Coordination Act (EMCA) 1999 and its amendments, as well as international environmental and social policies such as the World Bank's OP 4.01 on environmental assessment.

E-2- Project Categorization and Justification

In the World Bank context, there have been several projects supported by the organization that aim to provide electricity to communities located far from the national grid. These projects utilize off-grid approaches, meaning they are independent of a national or regional grid. The experience gained from these projects provides valuable guidance for designing sustainable off-grid electrification initiatives, particularly those targeting dispersed and economically disadvantaged communities. The Forole proposed site aligns with this category of projects that the World Bank has been involved in.

In the Kenyan context, the Environmental Management and Coordination Act (EMCA) of 1999, as amended in April 2019 through Legal Notice No. 31, classifies solar power farms and plants as medium risk projects. This categorization provides a framework for assessing and managing the potential environmental and social impacts associated with such projects. By categorizing the Forole site as a solar power facility, it falls within the medium risk project category as per the Kenyan legislative framework.

E-3 Approach and Methodology

The Environmental and Social Impact Assessment (ESIA) for the proposed project followed a structured process, beginning with kick-off meetings and online discussions involving the Proponent, Implementing

agencies, and the World Bank Environmental and Social Safeguard Team. These consultations were instrumental in establishing the project's scope, deliverables, timeline, and methodology. Subsequently, screening and scoping exercises were conducted to evaluate potential social and environmental risks. A thorough desk-based review was also undertaken to assess existing project documentation, legal requirements, and relevant plans.

The study employed a comprehensive approach to gather primary and secondary data for the project. Both qualitative and quantitative methods were utilized, with secondary data obtained through literature reviews. Primary data collection involved various techniques, including physical observations, photography, interviews, and stakeholder consultations. This comprehensive approach enabled a comprehensive examination of the project's environmental and social aspects, ensuring a holistic understanding of its potential impacts.

The study further involved the identification and assessment of potential impacts throughout the project's life cycle. Key areas of evaluation included land use, water resources, biodiversity, air quality, noise levels, community health and safety, and socio-economic conditions. To mitigate adverse effects, the study developed environmental and social management and monitoring plan, aiming to address both positive and negative impacts that may arise from the project. These measures aimed to ensure the project's sustainability and enhance its overall environmental and social performance.

E-4 Legislative Regulatory Framework

The evaluation, planning, and implementation of the proposed project is guided by the World Bank's Environmental and Social Framework, the national legislative framework, and the project's safeguard instruments. These measures aim to ensure environmental sustainability, protect the rights and needs of indigenous peoples and marginalized groups, and minimize adverse impacts through effective management and mitigation measures.

The Government of Kenya established the Environmental Management and Coordination Act (EMCA) in 1999, providing a legal framework for environmental management. EMCA takes precedence over other sectoral laws related to the environment. In 2013, the government formulated a national Environmental Policy with the goal of promoting sustainable management and use of the environment.

Collaboration and consultation among government agencies and stakeholders are essential for coordinating environmental management effectively. Key institutions in Kenya responsible for environmental issues include the National Environment Management Authority (NEMA), County Environment Committees, National Environmental Complaints Committee, National Environment Action Plan Committee, Standards and Enforcement Review Committee, National Environment Tribunal, and National Environment Council (NEC).

The project also adheres to the World Bank Safeguard Policies, which aim to improve decision-making processes, promote sustainable project options, and involve affected people in consultations. The applicable operational policies for this project include Environment Assessment, Natural Habitats, Indigenous Peoples, and Involuntary Resettlement. The Environmental and Social Impact Assessment (ESIA) considers these policies and addresses potential environmental and social concerns.

Additionally, the ESIA references other Safeguard Instruments prepared under the Kenya Off-Grid Solar Access Project (KOSAP), including the Environmental and Social Management Framework (ESMF), Resettlement Policy Framework (RPF), and Vulnerable and Marginalized Groups Framework (VMGF). These instruments provide procedures and guidelines for assessing and managing environmental and social aspects specific to the proposed subprojects under KOSAP.

E-5 Environmental Setting

The project area in Forole Center in Forole Sub Location, Forole Location Maikona Ward, North Horr Subcounty, Marsabit County, Marsabit County is characterized by young sedimentary rocks and loamy soils in the north, bordering the Ethiopian highlands. It contains significant deposits of limestone and sand. The majority of the county consists of an extensive plain, sloping gently towards the southeast, bordered by hills, mountain ranges, and volcanic cones to the west and north.

The proposed project is in Maikona ward, known for its prominent topographical feature, the Hurri Hills, and also houses the Chalbi desert, acting as a drainage system for the region. The county lacks permanent rivers, but it has four drainage systems, with Chalbi Desert being the largest, receiving run-off from surrounding areas. The people and livestock in area depend on surface and groundwater sources since permanent rivers are absent. The county has three water catchments, with springs found in the upper elevations of Mt. Marsabit and Mt. Kulal. The lower areas rely mostly on underground water through boreholes and shallow wells.

The area has fore zones: sub-humid, semi-arid (woodlands), arid (bushlands), and very arid (scrublands). The project area, located in the Maikona Ward, falls within the very arid/dwarf scrubland zone (ecological zone VI). The vegetation here is primarily dwarf-shrub grassland, and the ecological conditions are influenced by soil type, altitude, vegetation, rainfall patterns, and human activities.

E-6 Project Description

The Forole Mini Grid project aims to provide electricity to approximately 396 residential and 6 non-residential consumers in Forole Sub Location, Forole Location Maikona Ward, North Horr Subcounty, Marsabit County.

The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity. A 8.31km Low Voltage Power Distribution Network will be established to distribute the power to customers. The project utilizes solar panels with a total capacity of 100 kWp to harness solar energy. Solar power is a clean and renewable energy source that will provide a significant portion of the electricity needed for the project. A 250kWh Battery Energy Storage System is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions. A 60 kVA diesel generator is included to serve as a backup power source for periods of low solar generation or in case of battery depletion. It provides reliability and backup in the event of extended periods of cloudy weather or high demand. A 2,000-liter fuel tank is provided to store diesel fuel for the generator, ensuring continuous operation during extended periods of low solar or high demand. Additionally, a 100-kW solar PV inverter is used to convert the direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use.

The estimated cost of the project is around USD 364,414.91 although this amount may change as more detailed plans are developed.

The project consists of two main components: Hybrid Mini-Grids and power line reticulation lines. The Hybrid Mini-Grids will combine solar panels and diesel power generation. These energy sources will be integrated through a centralized photovoltaic plant connected to a 3-phase AC busbar line. The configuration is designed to prioritize direct supply from the solar generator during daylight hours, reducing reliance on battery storage. The battery storage will primarily be used when solar generation is low, or demand is high. The construction of power line reticulation lines will ensure the efficient distribution of electricity to residential, commercial, and other consumers, ensuring a reliable and efficient power supply.

To develop the Forole Mini Grid approximately 1.46 hectares of land will be acquired from the community in line with the national laws and World Bank provisions. In accordance with the World Bank's Operation Policy (OP) 4.12 on Involuntary Resettlement, an abbreviated Resettlement Action Plan (A-RAP) was prepared, outlining the principles and procedures for land acquisition and compensation. This plan is annexed to this ESIA.

E-7 Project Alternatives

Solar energy is identified as a non-polluting and site-specific option, and the proposed site for Forole MG is chosen as the most suitable location for the mini grid based on factors such as sunlight availability and the community's lack of grid connectivity. The use of wind power, thermal power, fossil fuels, and power import from neighboring countries are considered as alternative methods of power generation but are found to have limitations or environmental concerns. Solar energy is favoured due to its low production costs, versatility, clean nature, and economic savings. The "No Project" alternative is deemed unfavorable as it would maintain the current lack of electricity access and hinder socio-economic development. The project will be constructed using modern materials and technology, with a focus on public health, safety, security, and environmental requirements. The technology will involve a Battery Energy Storage System.

E-8 Stakeholder Engagement

It is important to highlight that two forms of stakeholder engagement were carried out for the project. The first form as noted earlier, focused on the acquisition of land for the project and involved the Proponent and the implementing agency (REREC). The second form of engagement was conducted specifically for the Environmental and Social Impact Assessment (ESIA) study.

For the ESIA study, various methods were employed to engage stakeholders, taking into consideration their different categories. Face-to-face discussions were held with government officials and key stakeholders, while separate focused group discussions were conducted with men, women, and youth. Additionally, a public baraza or meeting was organized to allow community members to participate. 20th January 2022

During the ESIA stakeholder engagement public meeting, which took place on January 20, 2022, a total of 42 stakeholders attended. The meeting provided an opportunity to discuss project details, including the preliminary design, positive and negative impacts, and mitigation measures. Stakeholders were encouraged to share their views and provide feedback on the project.

Some of the concerns raised by stakeholders included installation of a fence around the dispensary, construction of social hall or construction of teachers houses at Forole Primary school. The study team addressed these concerns by assuring stakeholders that project will be considered. Furthermore, public facilities such as schools, health centers, and boreholes would be connected to the electricity supply.

E-9 – Impacts and Mitigation Measures

The Environmental and Social Impact Assessment (ESIA) for the proposed Solar Mini-grid project has identified both positive and negative impacts across its different phases: pre-construction, construction, operation, and decommissioning. In the construction phase, positive impacts include local employment opportunities, boosting local businesses, and sourcing materials locally. During the operation phase, positive impacts encompass reliable power supply, economic improvement, education, health benefits, improved living standards, and enhanced security and communication. Similarly, the decommissioning phase offers positive impacts such as local employment and sourcing.

On the negative side, the pre-construction phase involves minor impacts like land acquisition, while the construction phase encompasses various minor to moderate impacts such as vegetation clearance, soil erosion, dust emissions, and occupational health and safety concerns. Challenges related to stakeholder

engagement, labor influx, child labor, and exclusion of vulnerable individuals are also anticipated. In the operation phase, negative impacts include waste generation, increased oil consumption, fire outbreaks, occupational health and safety concerns, and inadequate stakeholder engagement. Issues of exclusion, inadequate grievance management, and public health concerns may arise as well.

During the decommissioning phase, negative impacts primarily relate to solid waste generation, noise and vibration, and challenges in stakeholder engagement, labor influx, child labor, gender-based violence, and exclusion of vulnerable individuals and households.

Table 0-2 below present summaries of anticipated impacts and their corresponding levels of significance, both pre- and post-mitigation.

Table 0-1: Summary of Pre-construction, Construction, Operations and Decommissioning Impacts

Summary of Pre-construction Impacts		
Impact	**Significance Of Impact (Pre-Mitigation)**	**Residual Impacts (Post-Mitigation)**
Land acquisition	Minor	Negligible
Way leaves	Minor	Negligible
Stakeholder identification and consultations	Major	Minor
Summary of Construction and Decommissioning Phases Impacts		
Impact	**Construction phase**	**Decommissioning phase**
Impacts on Local Economy and Employment	Positive	Positive
Change in land use	Moderate	Positive
Site rehabilitation	Not Applicable	Positive
Topography	Minor	Not Applicable
Soil environment	Minor	Minor
Air Quality	Moderate	Moderate
Ambient noise	Minor	Minor
Visual intrusion and change in landscape	Minor	Positive
Waste generation and soil contamination	Minor	Minor
Impact on water environment	Minor	Not Applicable
Impacts from hazardous materials	Minor	Not Applicable
Fire hazards	Moderate	Minor
Impacts of construction material sourcing	Moderate	Not Applicable
Energy consumption	Negligible	Not Applicable
Occupational safety and health	Moderate	Moderate
Community safety and health	Moderate	Moderate
Labor influx	Minor	Minor
Child labor	Minor	Negligible
Cultural heritage	Minor	Not Applicable
Gender based violence, SEA and SH	Minor	Minor
Exclusion of VMGs, Vulnerable individuals and households	Major	Major
Risk of communicable diseases	Minor	Minor
Increased water demand	Negligible	Negligible
Forced labor	Minor	Negligible
Summary of Operation Phase Impacts		

Summary of Pre-construction Impacts		
Impact	**Significance Of Impact (Pre-Mitigation)**	**Residual Impacts (Post-Mitigation)**
Impact	**Significance Of Impact (Pre-Mitigation)**	**Residual Impacts (Post-Mitigation)**
Impact On Economy and Employment	Positive	Positive
Quality, reliable power supply	Positive	Positive
Reduction of pollution associated with thermal power generation, kerosine and wood fuel usage	Positive	Positive
Education	Positive	Positive
Health benefits	Positive	Positive
Improved standard of living	Positive	Positive
Security	Positive	Positive
Communication	Positive	Positive
Soil environment	Minor	Negligible
Waste generation and management	Minor	Negligible
Water environment	Negligible	Negligible
Landscape and visual impacts	Minor	Negligible
Increased oil consumption	Minor	Negligible
Increased storm water flow	Minor	Negligible
Fire outbreaks	Moderate	Minor
Water demand	Negligible	Negligible
Sanitary waste	Negligible	Negligible
Flooding	Negligible	Negligible
Noise and Vibration	Negligible	Negligible
Electric and magnetic fields (EMFs)	Negligible	Negligible
Dust Emission	Negligible	Negligible
Vehicle Exhaust emission	Minor	Negligible
Collision and electrical hazards from distribution infrastructure	Minor	Negligible
Occupational safety and health	Moderate	Minor
Community safety and health	Moderate	Minor
Gender based violence, SEA and SH	Minor	Negligible
Exclusion of VMGs, Vulnerable individuals and households	Major	Minor
Risk of communicable diseases	Minor	Negligible
Shocks and electrocution to the beneficiaries	Moderate	Minor
Risks related to poor and inadequate stakeholder engagement (conflict)	Minor	Negligible

E-10 Environmental and Social Management and Monitoring Plan

A comprehensive set of mitigation measures in the form of an Environmental and Social Management and Monitoring Plan (ESMMP) have been prepared for the project. The ESMMP serves as a comprehensive framework for the integrated management of all environmental and social impacts throughout the project's

lifecycle. It has been prepared to ensure that the social and environmental impacts and risks identified during the Environmental and Social Impact Assessment (ESIA) process are appropriately managed during the construction, operations, and decommissioning phases of the project. It specifies the mitigation and management measures that the project proponent and contractor are committed to implementing and outlines how organizational capacity and resources will be mobilized to achieve these measures. The ESMMP also ensures compliance with the relevant laws, regulations within Kenya, as well as the environmental and social sustainability requirements of the World Bank's Operational Policies (OPs).

These measures emphasize a proactive approach, prioritizing prevention rather than reaction. They encompass various aspects such as proper waste handling and disposal to prevent pollution, engaging stakeholders to address grievances, providing personal protective equipment (PPE) for workers, ensuring adequate supervision, and emphasizing good workmanship from the contractor. Specific plans are also outlined to address specific issues that may arise. The ESMMP also highlights environmental performance indicators that should be regularly monitored. Monitoring serves as a means to detect and draw attention to any changes or problems in environmental quality. It involves continuous or periodic reviews of the ESMMP implementation progress, allowing for adjustments and improvements as necessary.

While accommodating the recommended mitigation measures to the extent practical and economically viable, the project proponent and contractor should ensure that the measures do not compromise the economic viability of the project or have long-lasting adverse impacts on the environment.

For the mitigation measures to be successful, it is imperative that the Rural Electrification and Renewable Emergency Corporation (REREC) allocates sufficient resources for the implementation of the ESMMP. Adequate resources will enable the proper execution of the proposed measures and ensure their effectiveness in minimizing the identified negative impacts.

Following the project's commissioning, it is mandatory to conduct statutory Environmental and Safety Audits in accordance with national legal requirements. These audits serve to evaluate the environmental performance of the site operations and assess their compliance with the recommended mitigation measures.

E- 11 Conclusion

Based on the assessment findings, the consultant concludes that there are no substantial reasons to hinder the proposed project from progressing to the next stage of planning and development. However, this progression is conditional upon the implementation of the recommended mitigations and the monitoring of potential environmental and socio-economic impacts as outlined in the ESMMP.

It is in the opinion of the Environmental expert that the anticipated negative impacts can readily and effectively be mitigated and on the whole the proposed project does not pose any significant threat to the Environment and may be licensed to proceed

1 INTRODUCTION

The energy sector plays a critical role in the socio-economic development of a country. Kenya is committed to universal access to modern forms of energy by year 2030, as articulated in the national economic development blueprint, the Vision 2030 (the Vision). The goal of the Vision is to make Kenya a middle-income country enjoying a high quality of life by the year 2030. The objectives of the Vision have been adopted as GoK's national development objectives. Under this Vision, Kenya expects to achieve an economic growth rate of 10 % and above. Energy is identified as a critical enabler of this vision. Currently, only 45% of the households (4.3million), have electricity access from the national grid or mini-grids. The electrification rate is planned to be increased to 70 % by 2017 and 100 % by 2030. To attain these goals, policy and regulatory frameworks have been articulated for the energy sector through energy policy (Sessional Paper No.4 of 2004) and the Energy Act of 2006. A draft Energy Bill 2013 is under consideration. The government has strategies to accelerate access to modern energy services through public and private initiatives. The government, with support from development partners, has allocated substantial resources for development of energy infrastructure including exploitation, transmission and distribution.

The Ministry of Energy (MOE) Kenya is coordinating the implementation of the Kenya Off-Grid Solar Access Project (KOSAP) to provide access to clean and modern energy services through off-grid solar to 14 underserved counties. Marsabit County was identified as one of the underserved Counties and others include Mandera, Narok, Garissa, Tana River, Samburu, Isiolo, Marsabit, West Pokot, Turkana, Taita Taveta, Kwale, Kilifi and Lamu.

Driven by the imperative to provide equal opportunities across the entire Kenyan territory as key to achieving Kenya's Vision 2030, and the National target of achieving universal access to electricity by 2020, the GoK now seeks to close the access gap by providing electricity services to remote, low density, and traditionally underserved areas of the country. The World Bank's (WB) Country Partnerships Strategy (CPS) for Kenya (2014-18) also recognizes the access to basic electricity, as a key developmental issue. The Strategy sets at improving core infrastructure as one of the Projects the WB will be engaged in. It also emphasizes the importance of mobilizing concessional funding to expand the sector including electricity generation, transmission, and distribution to meet the Government's economic growth targets.

KOSAP directly promotes the achievement of these objectives by supporting the use of solar and clean cooking Solutions to drive electrification of households (including host communities), enterprises, community facilities, and water pumps in Marsabit County as one of the counties in Kenya that have been defined as "marginalized areas" based on the County Development Index (CDI) by the Commission on Revenue Allocation (CRA). According to the CRA as the communities in the marginalized areas have been excluded from social and economic life of Kenya for different reasons" (CRA, 2013).

Marsabit County and other identified underserved counties, collectively represent 72% of the Country's total land area and 20% of the Country's population, including historically nomadic societies that even today continue to rely on pastoralism. The population in Marsabit County is highly dispersed, at a density four times lower than the national average. They present profound infrastructure deficits, including lack of access to roads, electricity, water, and social services. There is also significant insecurity in certain areas, giving rise to substantial numbers of displaced persons and livelihood adaptations that further undermine economic prosperity.

1.1 Context

This ESIA report has been prepared based on Site visit baseline survey, desktop survey, documentation review, consultation with stakeholders and in accordance Environmental Management and Coordination (Amendment) Act, 2015 and World Bank's Environmental and Social Safeguards. The study has also assessed the requirement of the project with respect to the local and national regulations relevant to the project.Norken International Limited in Joint Venture with Centric Africa Limited were appointed by Ministry of Energy to undertake consultancy services for the Environmental and Social Impact Assessment (ESIA),

Social Assessment (SA) and Vulnerable and Marginalized Groups Plan (VMGP) as per the standard TOR and NEMA and WB ESS. As reported, land acquisition has not resulted in any economic or physical displacement and no resettlement is envisaged for the proposed project.

Due to the remoteness and sometimes dispersed nature of the target populations and considering the lifestyles and socio-economic status of those residing in underserved Counties, the Project is designed to address low affordability of the potential users, and sustainability of service provision. Therefore, sustainability of the proposed approach to energy access expansion beyond the Nationally owned power network is predicated on two primary factors - public funding, local community participation: and institutional capacity of Kenya Power and, Rural Electrification and Renewable Energy Corporation (REREC) and the Ministry of Energy (MOE) as the implementing agencies.

The project components are:

- Component 1- US$40M: Mini-grids for Community Facilities, Enterprises, and Households -This component will support electrification of areas where electricity supply through mini-grids represents the least cost option from a country perspective.
- Component 2- US$48M: Stand-alone Solar Systems and Clean Cooking Solutions for Households; This component will support electrification of households using standalone solar systems in areas where load clusters do not exist, and the best technical and financial solution is standalone solar systems.
- Component 3- US$40M: Stand-alone Solar Systems and Solar Water Pumps for Community Facilities; This component will support electrification of public institutions and community facilities using standalone systems. This component will also support the installation of solar PV-powered water pumps for consumptive purposes.
- Component 4- US$22M: Implementation Support and Capacity Building; This component will finance various technical assistance and capacity building activities to ensure the sustainability and measure the impact of the interventions devised and implemented within the other components of KOSAP.

The MOE provides overall coordination of the project as well as lead in the implementation of components 2 and 4. Components 1 and 3(a&b) will be implemented by the Kenya Power and Lighting Company (KPLC) and the Rural Electrification and Renewable Energy Corporation (REREC), respectively.

1.2 Project Overview

The proposed Project site is located on unregistered community land within Forole Center in Forole Sub Location, Forole Location Maikona Ward, North Horr Subcounty, Marsabit County at GPS coordinates of Latitude 3°42'53.3" N and Longitude 37°58'04.1"E. Maikona Ward borders Ethiopia to the North, Turbi ward to the east, North horr ward to the west and Kargi to the south. The nearest towns are Huri Hills and Turbi approximately 54km and 73km respectively. The project site is accessed via Forole-Turbi Road.

Figure 1. Map showing the proposed site

The solar mini grid will contain Solar panels, batteries, invertors, perimeter fence and length of transmission line to cover a circuit distance of approximately 7.1 km.

1.3 Purpose and Scope of Work

The Kenya Off Grid Solar Access Project (KOSAP) intends to support the Government initiative of ensuring increased electricity access to Kenyans, particularly among the low- income groups in off- grid areas. This proposed project is in line with the commitment of the Government of Kenya to reach 100% electricity access by 2023 through grid extension, stand-alone individual plant and autonomous solar mini- grids. Kenya Power as the implementing agency aims to develop the solar/diesel mini- grids to electrify areas that are not economically feasible through national grid extension. The Forole site was proposed as part of this project due to its isolated nature and the high cost of grid extension to the area.

This report discusses the environmental and social baseline within which the proposed solar power project is commissioned and assesses the potential adverse and beneficial impacts that the project could have, along with suitable mitigation measures and an Environmental and Social Management Plan (ESMP) for the project. The report also evaluates the environmental and social risks associated with the project and implements mitigation measures to avoid adverse impacts for the remainder of the project's lifecycle. The project must comply with international standards (World Bank Environmental and Social Safeguards) along with applicable national, state, and local regulations.

1.4 ESIA Process

The experts were assigned the task of carrying out Environmental and Social Impact Assessment of the proposed solar Mini-grid. The scope covered various activities related to; project planning activities, construction works of the proposed development which included all works of civil, mechanical, electrical or other nature necessary to construct, commission and decommissioning of the project. The output of this work is a comprehensive Environmental Impact Assessment project which will aid NEMA in deciding on the project. The report is also in compliance to Environmental and Social Safeguard Policies of the proponent's development partners.

The ESIA experts conducted the study with key activities as follows:

1. Undertook physical inspections of the proposed project area to establish the suitability of the proposed site/location to set up a solar Mini-grid.
2. Undertook literature review of relevant documents and provided concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.
3. Provided for a detailed description of the technology, procedures and processes to be used, in the implementation of the project.
4. Described materials to be used in the construction and implementation of the project, the products, by-products and waste to be generated by the project.
5. Gathered information and described the potentially affected environment/social economic and cultural setting of the project area.
6. Identification and consultation with stakeholders including the proposed project beneficiaries.
7. Gathered environmental and socio-economic data of the area by use of checklist of positive and negative impacts of the project on the environmental, health, safety and social cultural aspects of the community.
8. Analyzed and presented alternatives including project site, design and technologies
9. Identified and presented the most appropriate mitigation measures/interventions against negative impacts during construction, operation and decommissioning
10. Developed an Environmental, Health, Safety and Social Management Plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures.

1.5 ESIA Study Team

Below is the list of the planning and field team for the study:

S/No	Names	Position
1	Irene Mate	Senior Environmentalist-REREC
2	Hottensia Kabuki	Associate Expert, Environmental and Social specialist- Centric Africa Ltd
3	Lucy Bii	Environmental Expert- Centric Africa Ltd
4	Dickson Alubala	Environment, Health and Safety Specialist- Centric Africa Ltd
1.	Said Luba	Environmental Expert- Centric Africa Ltd.

1.6 Project Justification for the ESIA

This Environmental and Social Impact Assessment on the proposed solar Mini-grid in Forole was commissioned in order to examine its impacts on the environment and community prior to its construction. The purpose of the study was to determine the positive and negative effects of the mini-grid and to suggest ways to minimize the negative effects and maximize the positive effects. The ESIA was conducted in accordance with Section 58 of Environmental Legislation, EMCA 1999, and its 2015 Amendment and the Environmental Impact Assessment and Auditing Regulations (ESIA/EA) of 2003. Further, international environmental and social policies have been adhered to in this report especially the World Bank OP4.01 (Environmental assessment). In addition, appropriate sectoral legal provisions relevant to this project have also been referred to for the necessary considerations during the construction, commissioning, operation and decommissioning of the project.

This Assessment has identified both positive and negative impacts of the proposed project to the environment and community. The report proposes mitigation measures in the Environmental and Social

Management and Monitoring Plan (ESMMP) developed to mitigate the negative impacts and enhance positive impacts thus ensuring sustainability of the project.

1.7 ESIA Approach and Methodology

This Environmental & Social Impact Assessment (ESIA) has been conducted in compliance with the Environmental Impact Assessment Regulation as outlined under the Gazette Notice No. 56 of 2003 established under the Environmental Management and Coordination Act (EMCA) 2015 and EMSF and provisions of the World Bank OP 4.01. It involved largely an understanding of the project background, the preliminary designs and the implementation plan. The approach and methodology applied during the study enabled collection of both primary and secondary data. Qualitative and quantitative methods of data collection were employed. Secondary data was obtained through literature reviews while primary data was obtained through physical observations, photography, check lists, interviews and stakeholders' consultation. This ESIA has achieved the following:

- Identified all potential significant environmental and social impacts of the proposed Project and recommended measures for mitigation.
- Assessed and predicted potential impacts during site preparation, construction and operational and decommissioning phases of the Project.
- Guides compliance with project ESMF, WB OP. 4.01 and the national environmental and social regulations.
- Baseline data for monitoring and evaluating how well the mitigation measures are being implemented during the Project cycle.
- Promoted stakeholders' engagement and public participation.
- Environmental and Social Management Plan to avoid, mitigate and where not possible, offset the identified impacts so as to ensure sustainability of the proposed Projects.
- Recommends feasible, cost effective and culturally appropriate measures to be implemented to mitigate against the potential negative impacts while ameliorating the positive ones.

The assessment involved an understanding of the Project background, the Project designs and the implementation plan as well as Project commissioning. In addition, the baseline information was obtained through physical investigation of the site and the surrounding areas, interviews with surrounding community members through local administration and County structures, stakeholder mapping, photography and most importantly, discussions with the Client and the Project Design Team.

The following are the key activities undertaken during the study:

- Project background review: The first step was to gather and review information about the proposed project, including its location, purpose, and scope.
- Data collection: Both primary and secondary data were collected through various methods, including literature reviews, physical observations, photography, checklists, interviews, and stakeholders' consultation.
- Stakeholder engagement: Stakeholder engagement was an important aspect of the ESIA, as it allowed for the identification of potential environmental and social impacts, as well as the needs and concerns of the local community.
- Impact assessment: The collected data was used to assess the potential environmental and social impacts of the proposed project, both during the construction and operation phases.
- Mitigation and management planning: Based on the impact assessment, mitigation and management measures were developed to avoid, mitigate, or offset any negative impacts identified.

- Baseline data collection: Baseline data was collected for monitoring and evaluating the effectiveness of the mitigation and management measures during the project cycle.
- Report writing and submission: The final step was to write and submit the ESIA report, which included the results of the impact assessment, mitigation and management measures, and recommendations for the proposed project.

1.7.1 Screening and Scoping

1.7.1.1 Screening Methodology

The proposed project was evaluated during this stage, which was guided by EMCA (1999), the EMCA (amended) Act of 2015, and the Environmental and Social Management Framework (ESMF) of 2015. Electricity development activities are listed as projects requiring EIA prior to commencement in Schedule 2 of the EMCA, 1999. World Banks Social safeguards underpin and demonstrate this commitment. Other factors considered during the screening process included, among others, the physical site location, zoning, nature of the immediate neighborhood, sensitivity of the areas surrounding the site, and socioeconomic activities in the area. Following this screening, the project was subjected to scoping (to produce this Project report) as part of the ESIA process, based on the project category.

The scoping study covered the physical, biological, socio-economic and cultural environment within the Project proposed areas within Forole. The scoping study identified significant environmental and social issues associated with the proposed Works as well as sensitive receptors likely to be impacted by the Project Activities. The main aim of this is to enhance positive social opportunities and benefits as well as ensure that adverse social and environmental risks and impacts are avoided, minimized, and mitigated.
The below steps were followed.

1.7.1.2 Kick-off Meeting

Norken and Centric team had a brief kick-off meeting with the Proponent on 12th July 2021 followed by subsequent online meetings and discussion on various aspects of the project up to 20th January, 2022. The meetings addressed varied deliverables and thresholds to be achieved and maintained during this assessment in terms of scope of work, deliverables, timeline and the methodology. All communication and meetings were done online.

1.7.1.3 Desk based review and baseline assessment

A critical literature review of secondary data was done to establish the following:

- Relevant legislations and institutional framework governing the proposed project
- Licenses and permits requirements and conditions;
- Baseline information of the project area
- Types of waste likely to be generated

A comprehensive description of the KOSAP Component 1: project includes a desktop review of all the existing project documentation including the Project Appraisal Document and the four main safeguard framework documents prepared under KOSAP- these are Social Assessment, Vulnerable and Marginalized Group Framework, Resettlement Policy Framework and the Environmental and Social Management Framework.

1.7.2 Project Description

The consultant firm has concisely described the project location including its geographical, ecological and the general layout of associated infrastructure including maps at an appropriate scale where necessary. Location of all projects related development sites, including proximal offsite investments; general layout; flow diagrams/drawings of facilities/operation design basis, size, capacity, flow-through of unit operations, including pollution control technology included if any; pre-construction activities and construction activities; construction schedule; staffing size and support; facilities and services around; commissioning, operation and maintenance activities and plan.

1.7.3 Baseline Condition

This entails description and collection of relevant primary data within the project site's bio-physical, socio-economic, and cultural profile with respect to the biodiversity profile, land use types, cultural heritage and practices, social and economic issues likely to be affected, expected project activities to be involved during the design, construction, and operation of the proposed facility. The information also includes description of the community social structure, employment and labour market, sources and distribution of income, cultural/religious sites and properties, vulnerable groups, and indigenous populations. This also covers description of the sites' physical environment including their topography, land cover, geology, climate and meteorology, air quality and hydrology. This entails use of secondary data sources and for some specific environmental parameters the deployment of specialized equipment to measure and record the environmental readings as primary data for analysis and inclusion in the ESIA CPR report. The ecological and biophysical environment will focus on describing the *flora* and *fauna* resident in the Marsabit County at the mini-grid site level. This will be based on ecological surveys, KPIs on local indigenous knowledge on historical and status of rare, endemic, and endangered plant and animal species known to occur in these localities. Vegetation assessment was done to gain an understanding of the mini-grid sites habitat type. This has provided for an in-depth description of existing land use type and their linked socio-economic activities.

1.7.4 Impact Assessment Prediction

The anticipated impacts generated by the project and subsequent evaluation of their significance is provided by this report. A suite of field data collection methods was deployed including public forums discussions, Focus Group Discussions, Key Informant Interviews incorporating questionnaires for social risks assessment. Based on the outcome of the evaluation, the need for emphasis on critical areas was discussed. To accomplish this task an initial listing of the range of all issues and concerns identified during the study has been undertaken subsequently followed by analysis of the identified potential environmental and social impacts in terms of type (direct, indirect, cumulative, positive, negative), magnitude (local, widespread, random, severity) and duration (temporary, permanent, long term, short term). Consequently, an evaluation system will be used to categorize these impacts and evaluate them. This aided in determining the significance of the identified potential impacts in relation to established criteria or standards, geographic extent of effects, cumulative nature of the impact, community tolerance and preferences, etc. This culminated into generation of a short list of the most critical issues in terms of environmental, ecological, and social impacts both positive and negative associated which the different phases of the project activities that are likely to affect the baseline environmental and social conditions presently occurring at the mini-grid sites.

Socio-cultural risks linked to Component 1 of KOSAP were identified during the assessment. These include, Labour influx, Gender Based Violence, Sexual Exploitation and Abuse, workplace Sexual Harassment, Spread of HIV/AIDS, STDs & other communicable diseases, Gender biases and inequality exclusion of vulnerable and marginalized groups (VMGs) and vulnerable individuals and households from accessing project decision making and governance structures, engagement processes, opportunities, and benefits. The vulnerable individuals and households will include the poor, elderly persons, PWDs, the sick, poor women, poor single mothers, child-headed households. The VMG's include ethnic minority communities that are present in Forole area.

The impacts and risks were identified in relation to free, prior, and informed comprehensive stakeholder consultations on land acquisition for construction of mini-grid, contractor's facilities e.g., yard and workers camp site, way leave acquisition for the powerline distribution network; restricted access to grazing lands, water resources, soils and tree resources, economic/livelihoods displacement etc.

1.7.5 Environmental and Social Management Plan (ESMP)

The ESMMP as the implementation instrument of the ESIA has captured all the parameters that need to be monitored on a routine basis. The parameters as indicated in an Environmental and Social Management and Monitoring Plan (ESMMP) matrix, a detailed description of the implementation and monitoring program.

The ESMMP has a detailed arrangement of responsibilities for managing and monitoring the implementation of mitigation measures and the impacts of the project during construction, operation, and decommissioning. This include: a description of monitoring methodology, specific operations, and features to be monitored, monitoring reporting relationships and arrangements to ensure that monitoring is effective. Simple and straightforward monitoring processes established for ease of implementation through the project cycle. This plan follows through a description of the impacts and areas affected, key mitigation measures, monitorable indicators, timeframe, responsibilities, and budget implications.

The ESMMP include an implementation schedule and budget cost estimates for the mitigation measures both capital and recurrent costs estimates and the financing entity. It also describes institutional arrangements regarding the implementation of the ESMP among the implementing agencies, and the mini-grid contractor(s). This has specific responsibilities, procedures and resources required by each institutional actor engaged in implementing the ESMP.

The "Chance Find Procedures" has also been included in the ESMP as part of prevention and mitigation measures that will be implemented in the event physical cultural resources are encountered during subproject implementation.

Additionally, the ESMP has a component on contracting management that will ensure the implementation of the ESMP by all contractors and subcontractors. A contracting mechanism is included in the ESMP to incentivize contractors and their subcontractors to comply with the ESMP or alternatively penalize them for failure to comply with the ESMP. It also includes contractor clauses that will cover worksite health and safety, the environmental and social management of construction sites; labour camps/out of area workers, HIV/AIDS, and other Sexually Transmitted Diseases (STDs), stakeholder engagement plans, grievance redress mechanism, child protection, gender equity and sexual harassment, labor rights and the employment of community members. The ESMP also have a budget to guide the contractor on resources required for the implementation and monitoring of the ESMP.

Figure 3 overleaf is a summary of the methodology the firm will adopt in undertaking environmental and social impacts assessment for the proposed KOSAP project

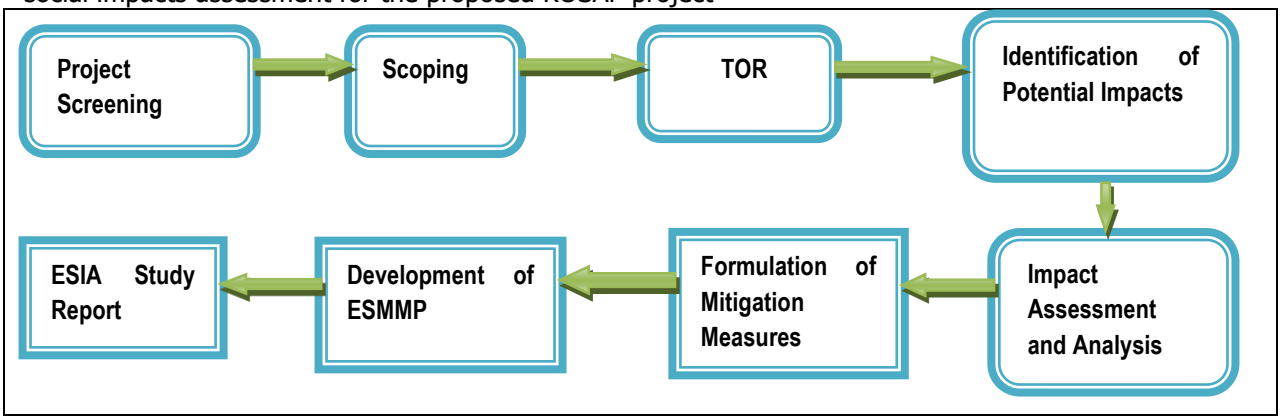


Figure 2: Summary of Environmental and Social Impact Assessment Methodology

1.7.6 Stakeholder Consultations and Participation

This assessment recognizes that consultation is an ongoing process throughout Project implementation phases. Under this Project consultation was undertaken during the ESIA process and will continue during the construction operational and decommissioning phases of the project. A suite of field data collection methods was deployed including public forums discussions, Focus Group Discussions, Key Informant Interviews incorporating questionnaires for social risks assessment with an aim of giving the community a platform to express their environmental and social concerns in relation to the project.

The public (local community members, laborer's and VMG's at Forole village) were consulted through a public baraza held at Forole center on 20th January 2022 where 42 community members from Forole location were in attendance including the area senior chief as well as villages elders were engaged through face-to-face discussions as well as engagement walks on the proposed project site. The meeting was held in accordance with the requirements of NEMA and the WB OP. 4.01 policy and guidelines for conducting an ESIA. The specific objectives of this public consultation were to: Disseminate information on the proposed project to the community members; Collect views and issues to be considered in the ESIA; Evaluate perceptions about positive and negative impacts of the project and; Receive concerns about environmental and social impacts and other implementation challenges.

Prior to the community engagement meetings, a two weeks' notice was done/issued to inform the community members of the meeting. This was done by the county renewable energy officer (CREO). The officer called local administrator (the Chief) of the area where the meeting was to take place and requested him to inform the people of the meeting in regard to KOSAP community engagement forums. The chief then informed the people about the meeting through announcement by word of mouth given by the local leaders' key among them was village administrator and village elders in Forole village.

In addition to Stakeholder consultations and participation, ion, baseline information was obtained through physical investigation of the site and the surrounding areas, community checklist, photography, and discussions with interested stakeholders.

The key activities undertaken during the assessment were:

- Continuous discussions with the stakeholders and accessing other sources of information on the proposed project details, the site planning and implementation plan,
- Physical inspection of the proposed site, photography, and interviews with project affected persons and interested stakeholders in the project area.
- Evaluation of the activities around the site and the environmental setting of the wider area. This was achieved through existing information, literature and physical observations
- Review of available documentation
- Reporting, review and submissions

1.7.7 Approach to Mitigation Measures

The ESIA includes a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse impacts on the environment. The identification of such measures is an iterative process which needs to be undertaken in parallel with the design to aid the incorporation of measures into the design during project development. Early adoption of appropriate mitigation will help reduce significant environmental impacts to a practicable minimum.

As part of the ESIA approach, the contractors to be hired will develop project specific Environmental and Social Management Plan (ESMP). These plans essentially set the framework for the Environmental and Social Management System for the Project moving forward. The assessment of the significance of impacts and identification of residual impacts has taken account of any incorporated mitigation measures adopted by the Project and is largely dependent on the extent and duration of change, the number of people or size of the resource affected and their sensitivity to the change. The criteria for determining significance are specific for each environmental and social aspect and are reported within each impact assessment chapter but generally for each impact the magnitude is defined (quantitatively where possible) and the sensitivity of the receptor is defined

1.7.8 Limitations

The limitation experienced during the study are illustrated below.

- ✓ Due to drought that was being experienced the community member were engaged in looking for water and pasture thus delaying in attending public participation meetings. This was mitigated by starting the meeting early enough
- ✓ Risk of being infected or transmitting COVID-19. The teams had to adopt preventive measures by wearing face mask and providing the community members with face mask and sanitizers during the public meetings and interactions.

1.8 Target Group for the ESIA Report

The ESIA Report has been prepared for use by different stakeholders to be involved in the construction and operation of the proposed solar mini-grid site. This 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 plant. In this regard, the report is useful to the following stakeholders:

- Funding agencies and donors;
- Relevant government ministries and agencies;
- Affected and Interested persons;
- Planners and Engineers to be involved in preparation of designs and plans
- Contractors to be engaged in the construction works

1.9 Assumptions

The Experts made the following assumptions in preparing this ESIA

- All the technical data and information provided by the proponent, implementing and the specialists are accurate and up-to-date.
- The design features will be put in place to minimize risks from external factors which could threaten the integrity of the facility which include: risks from landslides and other natural calamities; measures to minimize threats or damage from third parties e.g., terrorist attack
- The public involvement process has been sufficiently effective in identifying the critical issues that needed to be addressed
- The Proponent and the Contractor will implement the measures in the proposed ESMMP.
- The Proponent will undertake monitoring to track the implementation of the ESMMP to ensure that management measures are effective to avoid, minimize and mitigate impacts and that corrective action will be undertaken to address shortcomings and/or non-performances.

1.10 Uncertainties in Compiling Information

Uncertainty arises from a variety of aspects in any development, and for this particular study report has emanated from the following:

- The changes that may occur in baseline conditions, due to external factors over the lifetime of the project;
- Uncertainty related to Proponent's policy initiatives that might influence the assessment of future baseline and post-development conditions;
- Uncertainty in design information which should be dealt with by the definition of design parameters for the development by the Contractor and Proponent;
- Uncertainty in relation to project planning and implementation as the detailed program and means of construction may be influenced by the choice of Contractor and the detailed design of the development; and
- Uncertainty in the understanding of who the VMGs are, and their population.

1.11 Layout of the Report

Table 2. Structure of the ESIA Report

SECTION	TITLE	DESCRIPTION
Section 1	Introduction	(*This section*) Introduction to the Project and ESIA scope and methodology adopted.
Section 2	Project Description	Technical description of the Project & related infrastructure and activities.
Section 3	Baseline Settings-Environmental, Ecology and Social	Outlines Environmental, Ecology and Social Baseline status in the study area of the Project.
Section 4	Analysis of Alternatives and project justification	Provides information on site selection, power scenario within the project area and gives an analysis of Alternative
Section 5	Policy and Legislative Framework	Discusses the applicable environmental and social regulatory framework and its relevance for the Project. (The world bank safeguards and EMCA and environmental regulations).
Section 6	Stakeholder Engagement	Provides an overview of the stakeholder engagement activities undertaken during the ESIA, stakeholder categorization and profiling.
Section 7	Grievance Redress Mechanism	It details the provision of Grievance Redress Mechanism for the project.
Section 8	Impact Assessment and Mitigation Measures	This section includes details of identified environmental impacts and associated risks due to Project activities, assessment of significance of impacts and presents mitigation measures for minimizing and /or offsetting adverse impacts identified.
Section 9	Environmental and Social Management and Monitoring Plan	Outline of the ESMP considering identified impacts and planned mitigation measures and monitoring requirements.
Section 10	Impact Summary and Conclusion	Summary of impacts identified for the Project and conclusion of the study.

2 PROJECT DESCRIPTION

2.1 Introduction

This section provides a description of the project in terms of location, facilities and associated project infrastructure and activities during the project lifecycle and facilitates and identification of the potential impacts on resources and receptors that could result from project activities during the pre-construction, construction, operation, and decommissioning stages.

This will entail generation of electricity from solar, distribution of power within a 1.5-kilometer radius using wooden or concrete poles and retailing the same to the community. The total length of LV distribution network will be 8.31 Km. the community members will pay a connection fee of KES. 1000 once they apply for electricity.

The components of the proposed solar mini grid are provided as follows.

Table 3. Component of the proposed Solar Mini-grid

S/NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project is located within Forole Center in Forole Sub Location, Forole Location Maikona Ward, North Horr Subcounty, Marsabit County unregistered community land set aside for public use. Geographically, the site is located on Latitude 3°42'53.3" N and Longitude 37°58'04.1" E. The Ward borders Ethiopia to the North, Turbi ward to the east, North horr ward to the west and Kargi to the south. The nearest towns are Huri Hills and Turbi approximately 54km and 73km respectively. The project site is accessed via Forole-Turbi Road
2.	Land Size/Tenure	The proposed solar mini grid will be located on portion of land near the dispensary to the west and worship centre to the south East. The land is on 1.46 hectares unregistered community land set aside for public use
3.	Mini-grid Power	Minimum PV Inverter of 100kw; 250kWh Battery;60kva generator capacity
4.	Distribution line	LV Circuit of 8.31km
5.	Target Consumers	402 (396 Residential and 6 Non-Residential)
6.	Climatic condition	Maikona Ward has desert climate. There is virtually no rainfall during the year. The annual rainfall is 186 mm | 7.3 inches. The driest month is June. There is 1 mm | 0.0 inch of precipitation in June. Most precipitation falls in April, with an average of 43 mm | 1.7 inch. Marsabit County is influenced by the local steppe climate. The temperature here averages 29.1 °C | 84.4 °F. The county has arid climatic condition with the exception of the areas around Mt. Marsabit, Mt. Kulal, Hurri Hills and the Moyale-Sololo escarpment which represent typical semi-arid condition. The temperature ranges from a low of 15^0C to a high of 26°C, with an annual average of 20.5^0C (World Weather and Climate Information, 2015). It has a bi-modal rainfall pattern. The long rain season fall between April and May while the short rain season falls between November and December. Rainfall ranges between 200mm and 1,000mm per annum and its duration, amount and reliability increases with rise in altitude. North Horr (550m) has a mean annual rainfall of 150mm; Mt. Marsabit and Mt. Kulal experience 800mm while Moyale receives a mean annual rainfall of 700mm
8.	Site Conditions	The side is generally in open area with minimal and scarce *fauna* and *flora*.
9.	Road Accessibility	The project site is accessed via Forole-Turbi Road (Earth Road)
10.	Nearest Airport	Moyale Airport at about 100km and Marsabit Airport at 197km
11.	River/canal/nallah/ pond present in project footprint	No rivers or canals present in the village
12.	Protected areas (National Park/ Sanctuary)/ Forest land within 10 kms	None

2.2 Project Location

The project site is located within Forole Center in Forole Sub Location, Forole Location Maikona Ward, North Horr Subcounty, Marsabit County at GPS coordinates of Latitude 3°42'53.3" N and Longitude 37°58'04.1" E. The Ward borders Ethiopia to the North, Turbi ward to the east, North horr ward to the west and Kargi to the south.

The site soil is primarily sandy within the area. The project site is approximately 1.5km from the Kenya Ethiopia boarder and approximately 54km and 73km away from Huri Hills and Turbi towns respectively.

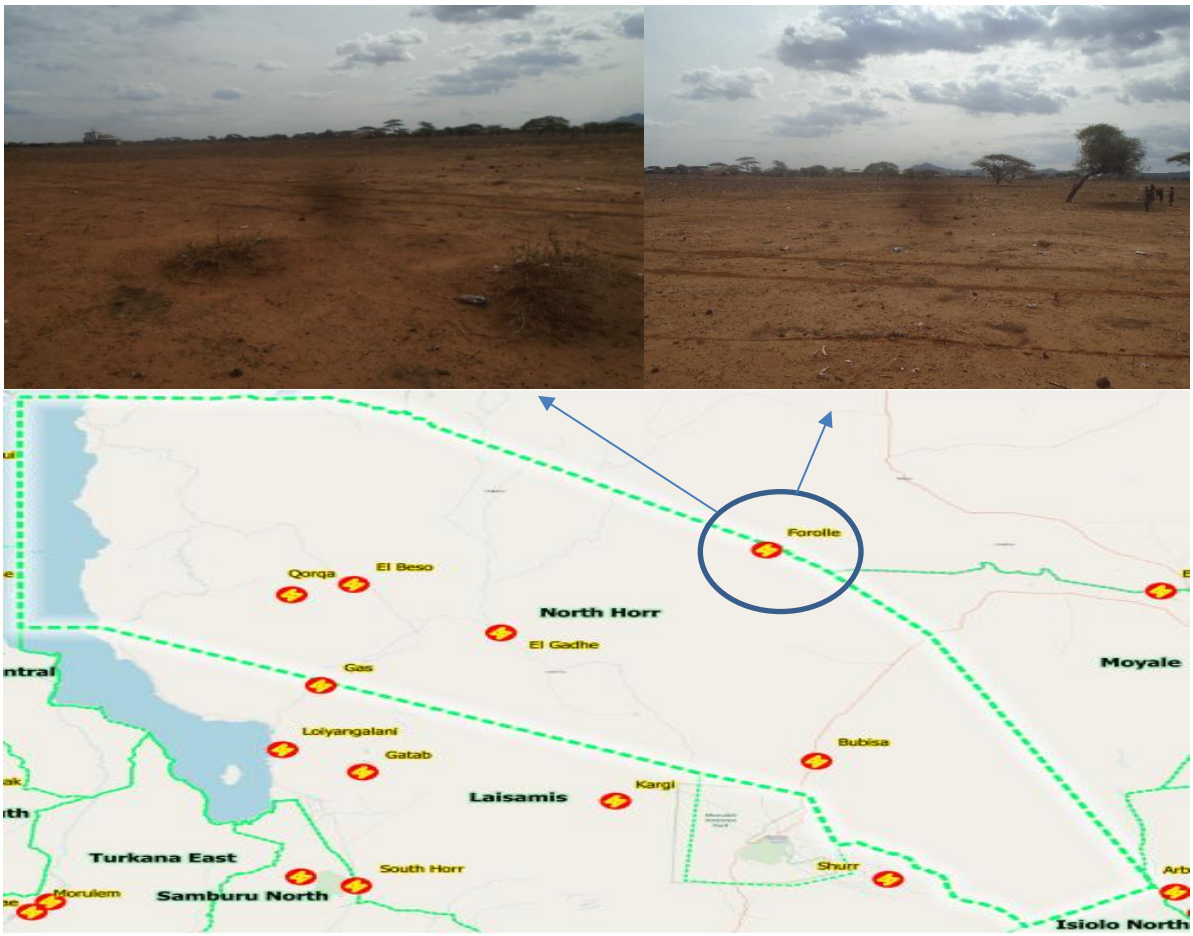


Figure 3: Proposed Forole Solar Mini-grid project location with scarce vegetation

2.2.1 Project site setting

The proposed Forole mini grid is in Maikona Ward, North Horr Sub County, Marsabit County. It falls under cluster 3 with a total of 48 mini-grids and lot 2 which has a total of 15 mini-grids characterized as Subproject sites in overwhelming/majority VMG counties (mostly pastoralist counties) with unregistered community land. Geographically, the proposed Forole site falls on coordinates' latitude 3°42'53.3"N and Longitude 37°58'04.1"E.

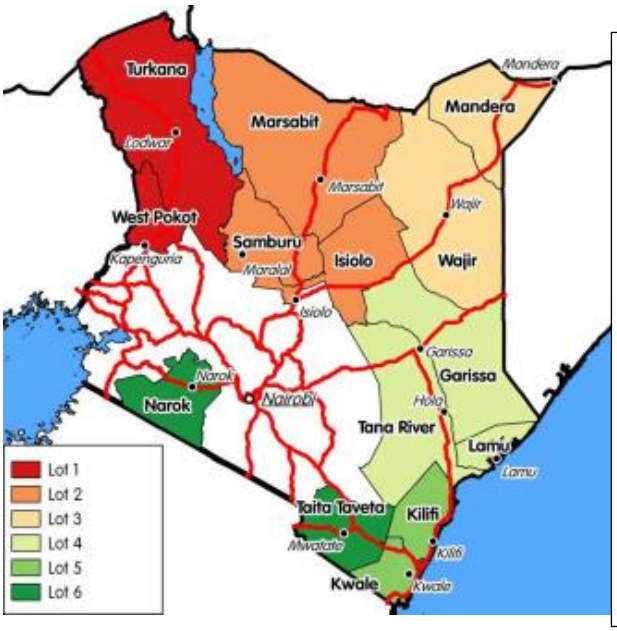


Figure 4: Map Showing the KOSAP Counties Lot 2

2.3 Land Requirement and Procurement Process

2.3.1 Land Requirement

2.3.1.1 Land Tenure

The entire county is categorized as trust land. In Forole area, the site falls on Unregistered Communal land set aside for public use.

2.3.1.2 Compensation Details

Compensation will be done in kind. The main key area for development activities identified by the community were installation of a fence around the dispensary, construction of social hall or construction of teachers houses at Forole Primary school.

2.4 Description of Project Facilities, Components and Activities

Name	Residential	Non-residential	LV Circuit (km)	Peak demand (kw)	Generation output (kw)	PV(DC-KWp)	Batteries	Generator (kva)	Generator Fuel Tank (L)	Cost (USD
Forole	396	6	8.31	64	100	100	250	60	2000	364,414.91

The proposed project will be having two components in one that is a Hybrid Mini-Grids (PV- and Diesel) and construction of Power line reticulation lines. The following sections are explanations for each of the components that will be implemented.

2.4.1 PV Hybrid Mini-Grid Sizing

The power system has been sized based on the energy parameters. These are:

- The proposed Residential & Non-Residential Users available
- The PV Capacity in kilo Watt peak.
- The storage battery Capacity
- The Inverter capacity in (kW)

The system will be modular, so that it can be upgraded easily to meet future demand needs. The proposed power plant will be configured as AC coupled due to the significant portion of daytime loads that can be fed directly from the solar PV generator without intermediate battery storage. This will include:

- PV modules with PV inverters,
- Diesel Genset,
- Deep-cycle lead-acid electrochemical batteries with liquid electrolyte (largely used in off-grid applications thanks to its well proven technology at baseline costs compared with other types of batteries).

The proponent will be required to apply for a NEMA ESIA variation of the license, during the design changes over the project lifespan.

2.4.2 Architecture and Basic Design Specifications

This hybrid power generation site is projected to generate power meant to serve 396households and 6 non-residential facilities. The proposed mini-grid installations will be built to comply the International Electro technical Commission (IEC) standards. It will have an installation of solar panels and battery house. The solar panels will have a connection to the batteries through underground cables. The Solar PV hybrid system is based on a centralized photovoltaic plant connected to a 3-phase 415V AC busbar line, where the multi-mode battery inverter and the diesel generator are also connected.

The standby generator will also be connected to the system as a backup. This generate or will have a capacity of 60 kVA with a fuel tank with a capacity of 2000l. To optimize this hybrid system the HOMER software will be used. The goal of the hybridization of diesel systems is to reduce fuel consumption by switching off diesel generator set(s) for several hours a day, in order to reach a PV energy, share in the final mix of at least 60% or more. The noise rating for the inverter and the diesel generator is 85-90dB.

The power will be distributed to the customers by overhead lines. The project site is expected to serve clients within a radius of 3km from the site (generation source).

The PV plant and the battery capacity have been sized accordingly to the daily demand and the solar resources. In addition to this Design architecture, the project site shall have a site office that shall also have a Control Room adjacent as well as a guard house. The guard house shall be constructed using concrete and masonry works whereas the control room and office can also be a containerized facility.

The Battery Energy Storage System (BESS) will comprise of Lithium-ion Battery pack that conforms to IEC standards with warranty of 10 years, 3,000 cycles minimum. The Lithium-ion Battery Power Packs will be used to cater for required energy capacity, or equivalent as per approved design, minimum 80% DOD for Lithium-Ion. Batteries will be capable of at least C/4 charge and discharge rate. Batteries will be charged by Battery Inverter / Charger. The project will use 250 kWh batteries.

2.4.2.1 Key Components of the Project

- **Solar Photovoltaic Panels**: The project utilizes solar panels with a total capacity of 100 kWp to harness solar energy. Solar power is a clean and renewable energy source that will provide a significant portion of the electricity needed for the project.
- **Battery Energy Storage System**: A 250 kWh Battery Energy Storage System is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions.
- **Diesel Generator:** A 60 kVA diesel generator is included to serve as a backup power source for periods of low solar generation or in case of battery depletion. It provides reliability and backup in the event of extended periods of cloudy weather or high demand.

- **Fuel Tank for Diesel Generator**: A 2,000-liter fuel tank is provided to store diesel fuel for the generator, ensuring continuous operation during extended periods of low solar or high demand.
- **Inverters and Chargers:**

  PV Inverter: A 100kW solar PV inverter is used to convert the direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use.

  Battery Inverter Charger: A 60 kW battery inverter charger is employed to manage the energy flow to and from the battery storage system. It ensures efficient charging and discharging of the battery, maximizing the system's overall performance.
- **Low Voltage Power Distribution Network:**

  A 8.31-kilometer Low Voltage (LV) power distribution network is established to distribute the generated electricity to the residential and nonresidential consumers. The LV network is designed to efficiently transmit power while minimizing losses, ensuring a stable supply to the customers.
- **Project Metrics:**

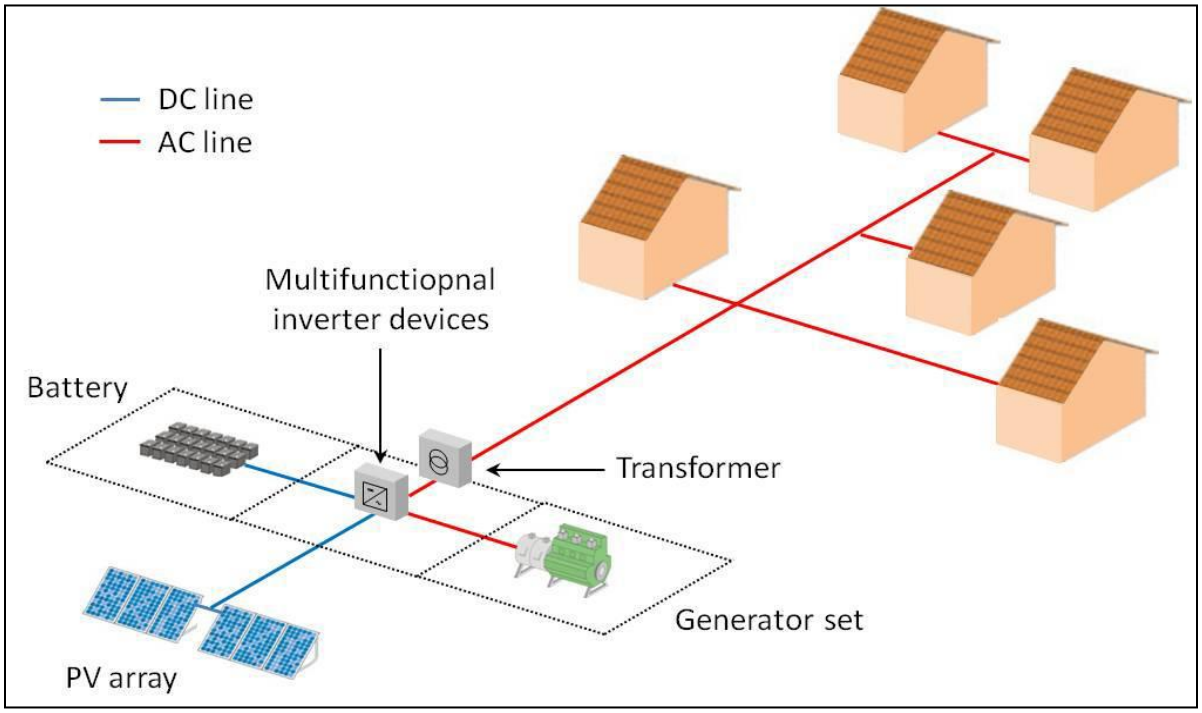
  Monthly Energy Demand: The project is expected to meet a total monthly energy demand of 10,320 kWh.

  Daily Energy Demand: The average daily energy demand is approximately 344 kWh, ensuring a consistent supply for the consumers.

  Peak Demand: The peak demand of the system is 64 kW, which is the maximum power requirement during any given moment.
- **PV Capacity**: The solar photovoltaic panels have a total capacity of 100 kWp.
- **Estimated Project Cost:** The estimated cost of the Forole Mini Grid project is approximately USD 364,414.91. It's important to note that this cost may be subject to change as more detailed plans and implementation phases are developed. The investment is expected to provide long-term benefits to the local community, improving their quality of life, economic opportunities, and access to modern amenities.

Figure 5 below illustrates a sketch of the proposed design as it will be set up at the proposed project site. In addition to this Design architecture, the project site shall have an Office that shall also have a Control Room adjacent as well as a guard house. The guard shall be constructed using Concrete and Masonry works whereas the Control room and Office can also be a containerized facility.

Figure 5: Illustration sketch of the proposed design of the proposed project



2.4.3 PV Generator

The PV generator consists of Silicon Crystalline Photovoltaic modules of capacity 100 kWp. The PV modules should comply with the norms IEC 61215 and IEC 61730. The outside junction box with the positive and negative terminals shall incorporate bypass diodes that have the function of preventing any possibility of the electrical circuit inside the module being broken due to the partial shading of a cell and shall be at least IP 65 and UV resistant.

The module support structure shall be ground-mounted on arid soil with a base made of concrete. The support shall have a tilt angle between 10° - 15° from the horizontal. No soil tests have been performed, at this stage of the proposed project design, but from the site inspection during the pre-feasibility study, ramming or screw foundations could be used. The support frame shall be of either lightweight aluminum or galvanized steel and it shall be easy for installation, maintenance and disassembly at the end-of-life cycle. These materials will be possibly sourced locally or from abroad and shipped to Mombasa port and transported via road to the site town.

Cables used within the PV generator shall have a voltage rating of at least 1,2 VOC; have a temperature rating higher than 40°C above ambient temperature; they will be UV-resistant; water resistant and it is recommended that they be flexible (multithreaded) to allow for thermal/wind movement of modules. The PV inverter shall be of type current source grid-tied to convert DC to an AC Sinusoidal current. String inverters shall be installed indoors or outdoors with a cover and suitable for desert conditions with high ambient temperatures and dust.

The project will use PV Array (DC-kW) 180 polycrystalline silicon modules with three strings connected in series. Each string will have five sets of panels connected in series, with output converged at the six-way combiners. The life expectancy of the PV modules is estimated at 25-30 years.

The batteries will be stored separately at site on a suitable leak proof base before being collected and transported by NEMA licensed waste collector for proper disposal.

2.4.4 Battery

- **Battery Energy Storage Systems**

The Battery Energy Storage System (BESS) will comprise of Lithium-ion Battery pack that conforms to IEC standards with warranty of 10 years, 3,000 cycles minimum. The Lithium-ion Battery Power Packs will be used to cater for required energy capacity, or equivalent as per approved design, minimum 80% DOD for Lithium-Ion. Batteries will be capable of at least C/4 charge and discharge rate. Batteries will be charged by Battery Inverter / Charger. The project will use 200kwh batteries.

- **Battery Rating**

The battery nominal voltage does not need to be established at this stage and different technology providers may offer different solutions on this issue. Nevertheless, it must be noted that the voltage class, either ELV or LV, will determine the electrical isolation and accessibility requirements of the battery room. The battery shall have at least the rated capacity of 2.16V at the C10 discharge rate according to DIN 43539-9.

- **Battery Performance**

The battery shall have a self-discharge when new of less than 5% per month (at 25^{o}C and fully charged) of its rated capacity and shall have a Coulombic efficiency of at least 85% and energy conversion efficiency of at least 85% when new and charged to more than 50% of capacity. The battery cycle life for discharge/charge regular cycles down to 80% DOD shall be more than 1500 cycles (According to IEC 896-1).

- **Lifetime**

The design lifetime of the batteries shall be of at least 8 years without losing more than 10% of the rated C10 capacity. When the batteries get damaged, they will be stored separately at the site and then transported to Nairobi for proper disposal.

- **Battery Cabling and Protections**

The battery connection point shall be as close as possible to the Multi-mode Inverter. Cables used to connect the battery shall have a temperature rating higher than 20 °C above ambient temperature. It is recommended that they be flexible (multithreaded) to allow for easy installation and maintenance. Fuses in cables that connect components to the battery shall be rated for D.C. use, be installed separately as close as possible to the battery terminals and rated to interrupt high fault currents from the battery. A neutralization kit will be provided at the site to manage any battery acid spills that may occur.

2.4.5 PV and Battery Inverter Charger

PV Inverter: A 100 kWp solar PV inverter will be used to convert the direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use.
Battery Inverter Charger: A 60kW battery inverter charger will be employed to manage the energy flow to and from the battery storage system. The inverter charger ensures efficient charging and discharging of the battery, maximizing the system's overall performance

2.4.6 Diesel Genset

The Diesel Generator Set shall have a capacity of 60 kVA. The rated consumption will follow a 0.25 L/h/kW curve at stand-by power. It should include a highly corrosion resistant enclosure, control panel and monitoring, fuel tank and circuit breaker protections. The Diesel Genset shall be suitable for indoor or outdoor installation and shall perform accordingly with Multi-mode Inverter and the mentioned architecture model. The Diesel Genset shall be working in a fully automatic manner with the above stated components.

The diesel gensets will have base mounted fuel tanks that will be factory tested for leaks. There will also be an external reserve fuel tank with a capacity of not less than 500 liters. The proponent, through the operating entity will have regular inspection by the manufacturer. The noise rating for the generator set will be 75dBA @ 1 meter at 75% load under free field conditions. The generator sets will have a high-quality noise absorbent and fire-retardant grade acoustic insulation material complying to IS 8183.

2.4.7 Powerhouse

The Battery, Multi-mode inverter and all monitoring equipment will be installed indoors with adequate air ventilation accordingly to the manufacturer's recommendations. Thus, a powerhouse or a containerized solution, considering the equipment manufacturer's recommendations shall be installed. All electrical boards and LV protections will also be installed indoors. The batteries will be installed in the powerhouse in a separate room, specifically for their use and meeting the electrical safety requirements according to its voltage class.

2.4.8 Distribution lines

Forole site will have a distribution line circuit of 8.31 km (LV). Supply of concrete poles for the distribution lines will be based on detailed survey and accessories like phase plates, circuit plates, number plates, danger plates, anti-climbing devices as per KPLC requirements/specifications. Erection of the Poles, fixing of insulator strings, stringing of conductor and earth wires along with all necessary line accessories and earthing will be as per KPLC requirements/specifications.

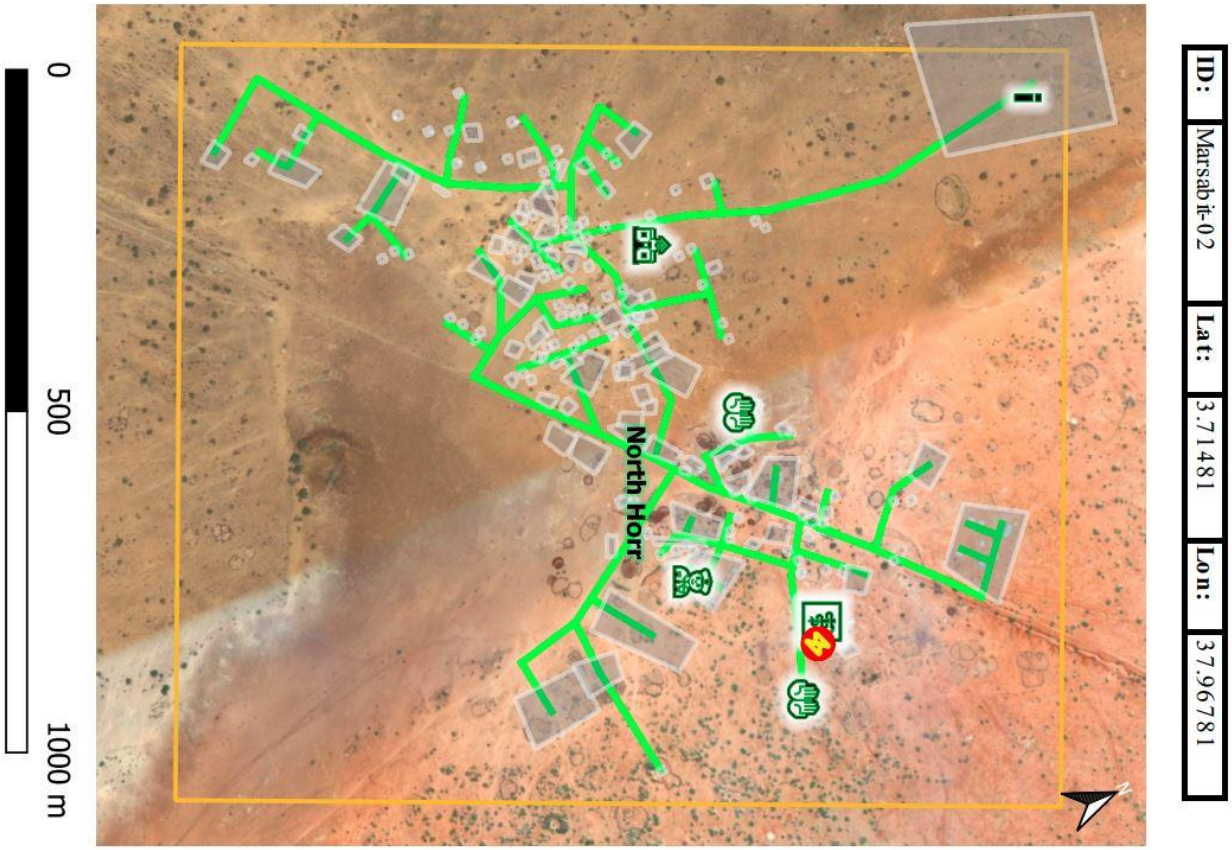


Figure 6: Powerlines Distribution Circuit in Forole Area

2.4.9 Project cost

Proposed Forole project cost is estimated at **USD. 364,414**

2.5 Project Phases and Activities

The main project activities include site clearance and leveling, civil works and construction of utilities and structures for the facilities, installation, and connection of the power plant.

2.5.1 Pre- Construction /Project Design

As part of the pre-construction stage, the Project is implemented jointly by the Ministry of Energy, Kenya Power and Lighting (KPLC) as well as Rural Electrification and Renewable Energy Corporation (REREC) who have conducted a feasibility study aiming at providing universal access to electricity in Kenya by 2022, universal access to modern energy services for cooking by 2030, as well as the impetus for growth in achieving Vision 2030. A conceptual design has been developed and will be taken forward for detailed design and implementation including the projects described in the previous section. This ESIA report forms part of the feasibility study. The MOE is currently applying for various permits and licenses including land acquisition for generation assets, wayleaves, contractor facilities and worker's camps. The procurement of various goods and services and contracting of private sector contractors and other consultants will begin after completion of the EIA process.

2.5.2 Construction Procedures

The project will be constructed based on applicable standards of Kenya, environmental guidelines and health and safety measures in line with OSHA Act 2007.

The project inputs will include the following.

- Construction of raw materials will include solar modules, inverter, wires, metals, among others. All these will be obtained from licensed dealers and especially those that have complied with the environmental management guidelines and policies.
- Construction machines will include machinery such as trucks, and other relevant construction equipment. These will be used for the transportation of materials, clearing of resulting construction debris.
- A construction labour force of both skilled and non-skilled workers will be required.

Construction activities will include the following:

- Contractor mobilization.
- Site Preparation.
- Procurement of construction material from approved dealers and transport to the site.
- Storage of PV modules delivery and their installation.
- Laying of internal electrical connections.
- Installation of inverters, Battery Energy storage system and transformers.

During construction, the contractor shall observe safety and shall erect warning signs to warn on any potential hazards, ensure proper and efficient use of Personal Protective equipment (PPE) for all on site and observe safe work procedures.

2.5.2.1 Soil Excavation

Soil will be excavated to pave way for the construction of the Solar Mini-grid. Soil excavation process shall be done with utmost care to ensure that the excavated soil is not improperly heaped or not carried away by any surface flows to any nearby surface waters causing siltation. The excavated soil will be used to backfill, and any remainder shall be disposed appropriately in accordance with the environmental management plan. Company safety and environmental policy and other established local environmental protection regulations/standards shall guide the contractor. This will include appropriate safety wear at all times and the contractor will appoint a safety officer on site during all construction activities.

2.5.2.2 Construction Supervision and Safety

Throughout the construction phase, supervision shall be carried out by the KPLC to ensure:

- Workers use personal protective equipment (such as hand gloves, helmets, safety shoes ear muffs, overalls and dust coats) at all times as is appropriate
- Motorized equipment are checked to ensure that they are in good working condition, safe to use and produce minimal noise levels and reduced smoke emission.
- Provision of first aid kit and firefighting equipment (portable cylinders) and placement at strategic positions for access
- Proper disposal of waste material and toilet facilities are provided for construction workers
- Emergency response procedures are in place and all workers are aware of them like in case of fire.
- Any work involving deep excavations, elevated heights and lifting heavy loads, poses a number of risks to personnel. The contractor shall develop a worksite plan before commencement of each of the construction. This will ensure that personnel are equipped with the correct protective clothing and equipment and are ready to work safely while also safeguarding the environment.
- Workers shall be provided ablutions facilities and changing rooms

2.5.2.3 Mini-Grid Components

The following components are planned to be constructed and operated on site. The same will need to undergo regular maintenance during the operation phase.

1. Technician Room
2. Battery Room
3. Generator Room
4. PV Array/Panels
5. Distribution network
6. Guard house.

2.5.2.4 Land Tenure

Land ownership in Marsabit County is mainly community land, trust land and private land. The land for the proposed site is on communal land. The community has since offered the land to the project proponent establishment of the proposed project.

2.5.2.5 Compensation Details

Compensation for the land for the proposed project will be in kind; as a token of appreciation for the land taken by the community, the Proponent will undertake some projects for the community.

2.5.3 Operational Activities

The Solar Mini-grid will be operated and maintained by the O&M contractor for the first seven years and then handed over to KPLC. During operation phase of the project, no unauthorized person shall access the Solar Mini-grid site. This is in line with company policy to ensure safety of staff and the public. Routine maintenance is to be done under supervision by authorized staff. Throughout the project life, the KPLC shall adhere to all requirements of National Environmental Management Authority (NEMA) and any other applicable legislation regarding environmental and socio – economic impacts.

2.5.4 Project's Decommissioning Activities

Kenya Power shall submit a decommissioning plan to NEMA in good time prior to decommissioning. The decommissioning plan should include a restoration plan.

At the decommissioning/demolition phase, the following activities will take place;

- Removal of Solar Mini-grid panels and Diesel Generator and their associated switching equipment's

- Removal of electrical fittings, bus bars and steel poles/structures
- Demolish and carefully handle components that contain oil and fuels like the Diesel generators
- Ensure proper handling of the demolished materials and have an authorized and guided transportation and disposal away from human settlement, water bodies and wildlife conservation area in line with NEMA requirements for safe disposal
- Demolish and remove all the concrete works

The host environment should be rehabilitated and restored to its former state through:

- Approved and appropriate landscaping methodology.
- Planting of vegetation.
- Removal of any soils that may have been impacted by oils or fuels for offsite (away from the project area) remediation.

2.6 Resource Requirement

2.6.1 Workforce Requirement

The size and the composition of the workforce will be at the discretion of the contractor(s). The contractors will adhere to the Employment Act of 2007 in the recruitment and management of the employees. It is recommended that the contractor seeks unskilled labor from the surrounding areas. During the operating phase, the following people will be needed: operations and maintenance heads, engineers, and technicians. Unskilled workers will mow the grass and clean the modules as needed during the project's operation period. Trained security guards will also be employed during the operations phase.

2.6.2 Water Requirement and Source

Water is key in the construction of this project. Water will be required for potable use and in the construction of the foundations for the control room, guard house and any other works. The contractor will source water from elsewhere rather than the community dam because water may not be enough for the community for use during construction and operation.

The contractor has several options for accessing water in Forole. One source is a seasonal river. Another source is water pans and shallow wells, although these tend to dry out quickly. The main source of water in the village is from boreholes, of which there are three within the area, with the closest one located 2km from the proposed site. This borehole water is distributed to the community through a central water point in the village.

In Ole Sere, water is provided by a community water project through rainwater harvesting. The proposed project area mainly depends on borehole water and the community water project for domestic water.

2.6.2.1 Construction Phase

It has been estimated that approximately 50,000 liters of water will be required per day for civil works during construction stage. Further, water will be required for workers at project site. However, this quantity of water requirement will vary depending upon the mobilization of construction workers at site. The water for the construction phase will be sourced from the local water points, the nearest is located at about 1/2km to the proposed site. The available water points within Forole area are sourced from water pans and Borehole within the area.

2.6.2.2 Operation Phase

The water required during operation phase of the project will be mainly for washing the face of the solar modules, Minimal water will be used for this purpose. Water requirement during operational phase of the project will be met from the water vendors in the area.

As previously stated, employees (direct and contractual) will be employed to work during the operation phase. For this workforce, approximately 5,000 Liters of water will be required for domestic consumption.

2.6.3 Raw Material Requirement

2.6.3.1 Construction Phase

The major raw materials required for the construction phase will be solar modules, fencing materials, construction materials like cement, sand, and aggregate. The fencing materials and the construction materials will be sourced from the local hardware facilities. Solar Modules for the project along with associated structures will be obtained from appropriate sources within or outside the country.

- **Input Materials and Equipment and Machinery**

Works and construction activities are expected to use quality construction materials and procedures to ensure quality work, occupational and public safety and environmental protection. The following inputs and equipment will be required for construction:

Lorry	Concrete mixers
Plumbing equipment	Welding machines, wheelbarrows
Electrical equipment	Excavators
Raw construction materials (Sand, cement, natural building stone blocks, hard core, gravel, concrete among others).	Paints, solvents, whitewash, etc.,
Timber (e.g., doors and frames, fixed furniture, etc.),	Labor force (of both skilled and unskilled workers).
Generator Sets and Fuels (Diesel)	Bus bars, Switch gears, Circuit breakers
Lightning arrestors and Steel structure members	Water
Solar panels	Poles
Conductors	Meters
Hardcore	Glass

2.6.3.2 Operation Phase

There will not be major requirement of raw materials during operation phase. Only maintenance spares will be required at this phase.

2.6.4 Power Requirement

Power requirement during the construction phase will be met through Diesel Generators sets. The exact number of Diesel Generator sets to be used, as well as the quantity of fuel, will be ascertained once the project is in the implementation stage.

2.6.5 Road Access Requirement

Existing roads will be utilized as far as possible during the construction and operational periods. No new road will be constructed because there is an existing road to the Solar Mini-grid. The flow of traffic to the site during the construction period will increase and management of traffic will be paramount. During operations there will be virtually very low traffic considering because once operational the Solar Mini-grid will require minimal maintenance.

2.7 Fire Safety and Security

2.7.1 Construction Phase

Appropriate firefighting system and equipment shall be provided throughout the construction period. The fire extinguishers will be well distributed according to the fire risks and will be available in areas such as

the site office, installation of a shut-off switch to disconnect the solar panels from the electrical system, security area, storage yard etc. A comprehensive emergency response plan with all the emergency numbers will be well displayed at the site and on the fence. Signage, danger plates and name plates will also be displayed at the site.

2.7.2 Operation Phase

- **Site security**

The proposed site is within Forole Centre. The site is in an area that is basically open and in close proximity to residential and public facilities. This calls for proper security measures to be put in place to protect both human and domestic animals from accessing the Solar Mini-grid site. Therefore, the Mini-grid will have a chain link fence to keep off the electrical installation away from access by unauthorized persons or animals. A gate will be constructed at the entrance to the site which will be locked at all times. The Mini-grid will be lit at night, and a photocell will be used to automatically switch on the lights at a set time each evening. The Mini-grid will also be guarded at all times by two security guards during the day and two guards at night.

- **Fire safety**

Suitable fire protection and fighting systems that will include portable fire extinguishers, automatic fire detection system and means of fire communication will be made available at the entire PV array area, inverter stations, main control room and switchyard.

The systems and equipment's will align to the Kenyan Fire Reduction Rules of 2007. The Fire protection and fighting systems will be maintained and serviced after every 6 months. Because off-the-grid systems generally involve an underground wiring system, they are much less prone to weather accidents that lead to fires. They are also much smaller than the typical power grid, so if a fire were to start (against all odds), it would remain contained in a small area. The maintenance contractor using a Vegetation Management Program with mechanical methods will help provide effective vegetation control during the dry season.

An effective grounding system will be installed during power wiring for protection against lightning damage. In addition, lighting arrestors and surge protectors will be installed. To reduce hotspot effects, the contractor will ensure that panels are installed without obstructions. This means they won't be too close or in the shade of anything else, as this will cause shadows on each other.

Physical barriers consisting of conduits and short circuit withstanding capacity will be part of the design to prevent rodents from gnawing on a cable during the operation phase. To ensure the workers are not exposed to occupational hazards from contact with live power lines and cables during maintenance, and operation activities will ensure they: employ prevention and control safety measures associated with live power lines; employ measures to prevent, minimize, and control injuries related to electric shock; all electrical installations should be performed by certified personnel and supervised by a certified person; ensure that there are no equipment, appliances and machinery with unsafe electrical conditions. No equipment or machinery with worn-out or un-insulated wires and conductors; and ensure all electric installations and cables are properly labeled.

To prevent and avoid hotspots and their negative effect on solar panels, the panel design will take hotspot problems into consideration without obstructions of vegetation or building. Vegetation undergrowth will be controlled through regular slashing and cleaning up of the project site.

2.8 Pollution Streams during Construction Phase

2.8.1 Solid Waste Generation

2.8.1.1 Construction Phase

The key solid waste that is expected to be generated during construction phase include. Broken solar panels and PV Modules, Hazardous waste like waste oil, lubricants, oil contaminated rags and Domestic soil from the temporary site office.

The hazardous wastes will be stored onsite at separate designated covered area provided with impervious flooring and secondary containment. The storage containers/ bins/ drum will be clearly marked, and color coded for their hazards. The waste will then be collected by a NEMA approved waste handler.
Any broken solar panels or PV Modules will be sent back to the vendor as part of buyback arrangement. Alternatively, the e-waste will be disposed by licensed waste handlers in sites that are licensed by NEMA and local authorities to dump e-waste. All the other domestic solid waste will be disposed at the nearest municipality dumpsite.

2.8.1.2 Operation Phase

During operation phase, waste generated from the project will include domestic waste at site office, scrap materials like scrap tools, damaged PPEs etc.; hazardous waste like waste oil, lubricants, used transformer oil; damaged batteries; electronic waste like damaged PV modules etc.

The hazardous wastes will be stored onsite at separate designated covered area provided with impervious flooring and secondary containment. The storage containers/ bins/ drum will be clearly marked, and color coded for their hazards. The waste will then be collected by a NEMA approved waste handler.

Any broken solar panels or PV Modules will be sent back to the vendor as part of buyback arrangement. Alternatively, the e-waste will be disposed by licensed waste handlers in sites that are licensed by NEMA and local authorities to dump e-waste. All the other domestic solid waste will be disposed at the nearest municipality dumpsite.

The operations of this site will consist of a Battery Energy Storage System (BESS) comprising of Lithium-ion Battery pack. Expired lithium batteries are hazardous; sometimes leakages from these batteries are possible. Procedures for the management and disposal of the lithium batteries, including temporary storage, transport and final disposal will be implemented.

Any solar panels or batteries removed from the array for disposal will first be collected and stored in the covered 10ft container provided by the Contractor before being collected and transported by NEMA licensed waste collector for proper disposal. The Contractor will ensure hazardous items are shipped offshore to a facility licensed to handle hazardous waste.

2.8.2 Air Emissions

2.8.2.1 Construction Phase

Air quality will be impacted due to onsite construction activities. The likely emissions from construction activities would include the following:

- Dust emissions from the dusty roads leading to the site.
- Increased vehicular emissions due to the high traffic of vehicles transporting construction materials,

PV Modules, and accessories.
- Dust emissions from site clearing, material handling, piling and use of the construction machinery.
- Exhaust emissions from the diesel generator.

The high dust emissions arising from various activities such as piling, transportation of material (loading and unloading), vehicular movement (on unpaved roads) should be minimized through sprinkling of water and maintaining vehicular speed to 10-15 km/hr.

All the vehicles and the Diesel generator should be well maintained and serviced to reduce the rate of exhaust emissions.

2.8.2.2 Operation Phase

It is expected that the normal operations of the site will produce minimal gaseous emissions from all the operating areas. The minimal gaseous and fugitive dust emissions will be attributed to the in and out movement of the maintenance vehicles. It will be ensured that well maintained vehicles are used for maintenance purposes.

2.8.3 Liquid Waste Generation

2.8.3.1 Construction Phase

The liquid effluents generated during the construction phase will include domestic sewage from temporary site camp and office areas. As part of the site preparation stage, septic tank will be constructed for the camps and site offices. Sewage disposal trucks should be used to periodically remove the sludge/sewage from the septic tank.

2.8.3.2 Operation Phase

The operational phase will have negligible wastewater generation at site camps and offices. Septic tank and soak pits will be provided at the site office for disposal of sewage.

2.8.4 Noise Emissions

2.8.4.1 Construction Phase

Noise emissions will be generated from piling, movement of vehicle and other construction machinery and operation of the Diesel Generator. The main noise receptors will be the neighboring settlements and the construction workers. Noise from Diesel Generators will be minimized through provision of acoustic enclosures and occasional maintenance of the generator. Every single noise generating activity will be restricted to Day time only.

2.8.4.2 Operation Phase

Under normal operations, none of the activities of solar power plant will generate noise. The only noise that can be generated at this phase is during the maintenance works and it will be restricted to daytime only. However, during cloudy periods and when solar energy is low, the backup generator that will be utilized will produce noise. Mufflers and silencers will be installed so as to minimize noise pollution from the backup generator.

2.9 Safety of the Facility

As is with other projects, the proposed project is prone to both natural and man-made disasters. However, it is difficult to prevent the occurrence of natural disasters, but the consequences could be reduced by engineering measures. Man-made disasters on the other are preventable. The following safety concerns will be addressed in the proposed project.

a) Natural Disasters

In order to reduce the impacts of any potential natural disaster, the proposed project will be designed according to acceptable standards and code and shall be able to reasonably withstand any impacts which may arise as a result of the worst credible seismic event.

b) Malicious Damage or Theft

The proposed project could be prone to malicious damage such as terrorist attack or theft. To prevent the occurrence of such events, the following measures will be taken:

- Regular monitoring and inspection of the project and its associated infrastructure.
- 24-hour guard of the premises/office block

c) Hazard Risk Assessment

An emergency response procedure will be prepared by the KPLC and be communicated to the contractor. As a minimum requirement, the emergency management plan will cover the following aspects:

- Safety regulations
- Scope of the safety emergency plan
- Notification of local authorities
- Details of the proposed project
- Aim of the safety emergency plan
- Objectives of the study emergency plan
- Emergency arrangements, procedures and plans
- Roles and responsibilities in the event of an emergency
- Evacuation of people
- The role of local communities
- Regular testing of the safety emergency plan
- The risk assessment will include as a minimum:
    - A general process of the project being investigated
    - A description of the potential major incidents associated with that type of installation and the consequences of such incidents
    - An estimation of the probability of a major incident
    - A copy of the site emergency plan
    - An estimation of the damages in the case of an explosion or fire
    - An estimation of the effects of toxic gas releases.
    - The potential effect of an incident on the project or part thereof or an adjacent project or part thereof.
    - The potential effect of a major incident on any other installations, members of the public and residential areas.
    - Meteorological tendencies
    - The suitability of existing emergency procedures for the risks identified.
    - Any requirements laid down in the OSHA 2007 and EMCA 1999.
    - Recommendations regarding any organizational measures

3 BASELINE SETTINGS- ENVIRONMENT AND SOCIAL

3.1 Study Area

The project site is located within Forole center, Forole location, Maikona Ward in North Horr Subcounty, Marsabit County. Based on the secondary information of the region, the following baseline information on environment, ecology and social has been discussed under the sections below.

3.2 Environment Baseline

3.2.1 Geology and Soil

The county is generally covered with young sedimentary rocks with loamy soils in the north bordering the Ethiopian highlands. The county has considerable deposits of Limestone and sand. The soils in the project location were predominantly sandy soil with patches of depressed land of loam soil.

3.2.2 Topography

Most of the county constitutes an extensive plain lying between 300m and 900m above sea level which gently slopes towards the south east. The plain is bordered by hills and mountain ranges and is broken by volcanic cones and calderas to the west and north of the county. Marsabit County prominent topographical features are Ol Dongo Ranges in the south west, Mt Marsabit in the central part, Hurri Hills in the North east, Mt. Kulal in the North West and Sololo-Moyale escarpment in the north east.

The proposed project is located in Maikona ward whose prominent topographical feature is Hurri Hills. In addition, the ward has the only desert in the Country –Chalbi desert. In addition, the desert acts as a drainage system and it receives run-off from the surrounding lava and basement surfaces of Mt. Marsabit, Hurri Hills, Mt. Kulal and the Ethiopian plateau.

3.2.3 Hydrology and Drainage

There are no permanent rivers in the county, but four drainage systems exist. Chalbi Desert is the largest of these drainage systems. The depression receives run-off from the surrounding lava and basement surfaces of Mt. Marsabit, Hurri Hills, Mt. Kulal and the Ethiopian plateau. The seasonal rivers of Milgis and Merille to the extreme south flow eastward and drain into the Sori Adio Swamp. Other drainage systems include the Dida Galgallu plains which receive run-off from the eastern slopes of Hurri hills, and Lake Turkana into which drain seasonal rivers from Kulal and Nyiro Mountains. Forole community depends on water pans and boreholes.

Plate: 1: A water pan at Forole village

3.2.4 Ground Water Development

The people and livestock in Marsabit County rely on surface or ground water since there are no permanent rivers. There are three water catchments in the county i.e. the upper horizon of mountains and hills, over 1,500m to the summits of Mt Marsabit and Mt Kulal where there are a number of springs. The second catchment is 1,200m to 1,500m, still on Mt. Marsabit are springs like Badassa, Songa and Balesa Bongole. The rest of the county, which generally lies between 400 and 460m, depends mostly on underground water (i.e. boreholes and shallow wells). There are three functioning boreholes in Forole sub location indicating presence of underground water, however, the water is slightly salty.

3.2.5 Ecological Conditions

Marsabit County lies in four main ecological zones. They include: sub-humid, semi-arid (mainly woodlands), arid (predominantly bushlands) and very arid (scrublands). Forole Sub Location is located in Maikona Ward that fall within Very Arid/Dwarf Scrubland zone. The typical vegetation is dwarf-shrub grassland or a very dry form of bushy grassland. In extreme period of rainfall failure, the only vegetation available in this area is dwarf-shrub. The area's ecological conditions are influenced by the soil type, altitude, vegetation, rainfall pattern and human activities. The area is categorized as Very Arid/Dwarf Scrubland Zone falling in the ecological zone VI.

Animals found in the project area include the Somali ostriches, dik-dik, Avian Spps (Kite, Heron, Sacred Bird and Marabou Stork).

3.2.6 Climatic Conditions

Maikona Ward has desert climate. There is virtually no rainfall during the year. The annual rainfall is 186 mm | 7.3 inches. The driest month is June. There is 1 mm | 0.0 inch of precipitation in June. Most precipitation falls in April, with an average of 43 mm | 1.7 inch. Marsabit County is influenced by the local steppe climate. The temperature here averages 29.1 °C | 84.4 °F.

The county has arid climatic condition with the exception of the areas around Mt. Marsabit, Mt. Kulal, Hurri Hills and the Moyale-Sololo escarpment which represent typical semi-arid condition. The temperature ranges from a low of 150C to a high of 26oC, with an annual average of 20.50C (World Weather and Climate Information, 2015). It has a bi-modal rainfall pattern. The long rain season fall between April and May while the short rain season falls between November and December. Rainfall ranges between 200mm and 1,000mm per annum and its duration, amount and reliability increases with rise in altitude. North Horr (550m) has a mean annual rainfall of 150mm; Mt. Marsabit and Mt. Kulal experience 800mm while Moyale receives a mean annual rainfall of 700mm.

3.3 Socio-economic Environment

3.3.1 Community Profile

The proposed project site is within Forole center in Forole Sub Location, Forole Location, Maikona Ward, North Horr Subcounty in Marsabit County. The nearest major town are Huri Hills approximately 54km South West and Turbi approximately 73km South East of the site. The village is approximately 1.5km from the Kenya Ethiopia boarder.

Forole village has an approximate population of 1,400 people with about 276 households. This number has greatly reduced due to insecurity in the area with over 300 households relocated. Insecurity is mainly conflicts between the Borana and Gabra communities. The approximate number of people per household is five. 50% of the village are indigenous while 50% are settlers from Huri Hills, Balosa and Dukana. The most vulnerable people were identified as windows and orphans. The primary religions are Islam and Christian while the primary ethnic group are Gabra. Other ethnicity include: Borana, Wayu (Wata) and

Kikuyus (teachers, nurses and officers). The inhabitants are mainly pastoralists keeping livestock such camel, cattle, goats, shoats, and donkeys. They also practice small scale business ventures.

Table 4: Demographic profile of Forole Location

Attribute	Magnitude/Number
Approx. population	1400
Households	276
Gender.	Male – 52% Female – 48%
Ave. No. per household	5 per household
Indigenous	Indigenous- 50% Settlers – 50%
Vulnerable classes	Windows, Orphans
Dominant ethnic group	Gabbra
Other groups	Borana, Wayu (Wala), Kikuyu
Primary religion	Islam
Land ownership	100% communal land
Employment (formal/Informal)	Formal – 10% Informal – 90%

Plate: 2 Church neighbouring the proposed site

3.3.2 Socio-economic status of Study Area

3.3.2.1 Demographic Profile

The information shared on community profile by the area chief (Forole location) showed that Forole has a population of approximately 1,400, and with an estimated number of households to be 276 with an average of 5 people per household. Forole has a gender ration that is currently estimated to be about 52% male and 48% female.

3.3.2.2 Educational Infrastructure

Forole village has three ECD Centers and one primary school - Forole Primary School. The school has a total of 205 pupils (117 Boys and 88 Girls) with 7 teachers. The school completion rate among the boys is higher than that of the girls. Approximately 60% of the students complete and enroll to higher education level. The average distance a student walks to the school is 2km while the furthest distance is 15km. The school is not connected to power therefore a hindrance to delivering the curriculum.

Marsabit County in general has a total number of 252 ECDE Centres, 231 primary schools, 43 secondary schools and 4 polytechnics. There no o colleges and no universities. This means that majority of youths cannot acquire technical skills within the county. There is thus need for the establishment of more polytechnics, tertiary colleges and universities.

3.3.2.3 Occupation and Livelihood Profile

Forole community is mainly pastoralists with livestock. Major livestock kept are camel, cattle, sheep, goats, and local chicken. The community relies of livestock products for food at the household level and for income generation. Formal employment is 10% while 90% is informal. Other sources of income in the society

include sale of wood fuel/charcoal and firewood, building materials and operation of small-scale businesses. Due to the aridity of the county, food production (crop growing) is limited and contributes little to food security.

Marsabit is an arid and chronically food deficient county. Recurrent droughts occur every one to three years. They are a major challenge for the development of the county, resulting in significant losses for the population and resources being required for emergency relief rather than longer term development. Drought reduces the availability of and access to water, leading to loss of livestock, shortage of food and loss of biodiversity. In recent years, lack of water has resulted in loss of approximately 20 percent of livestock in the county. Limited pasture has led to overgrazing and forest encroachment, further exacerbating environmental degradation.

Insecurity in Forole is a great challenge that has contributed to relocation of about 300 people to neighbouring regions due to community conflicts between the Gabbra and Borana.

3.3.2.4 Land Use

Most of the land in Marsabit County is owned communally except for a few demarcated and privately owned sections (with a mean holding size of 0.8 ha) in Saku constituency (Marsabit Central). Less than one percent of land is registered, predominantly in urban areas and in the mountains with a higher level of agricultural activity. There is one indigenous and gazetted forest (Mt. Marsabit, 152.8 km^2) and two non-gazetted forests, Mt. Kulal and Hurri Hills with a total area of 750 km^2, where there is potential for agroforestry.

Land in Forole is communally owned. There are no private land owners. The land is used for homesteads, public infrastructures (schools, dispensary etc.) and mainly for livestock grazing, underground water is also harnessed from the land.

An abbreviated Resettlement Action Plan (A-RAP) outlining the principles and procedures for land acquisition and compensation is annexed to this ESIA. An A-RAP applies where affected persons are not physically displaced, and less than 10% of their productive assets are lost, or fewer than 200 people are displaced. In the case of KOSAP sub-projects, there is no physical displacement of affected persons, and the foreseen impacts on livelihoods such as grazing occasioned by mini-grid construction, wayleaves acquisition, and implementation of community projects are considered minor. A-RAPs will be implemented for sub-project sites on registered and unregistered community land/group ranches.

3.3.2.5 Health facilities

Forole has only one public health dispensary. Main service provided is Out-patient services. The facility lacks water, electricity, beds, adequate toilet facility and other basic equipment.

3.3.2.6 Social and Physical Infrastructure

Water: There are three boreholes within Forole. They are the main sources of water in the village. Water pans and shallow well are common however they dry out fast.

Borehole water is supplied to the community through a common water point stationed in the village. The boreholes were constructed by the county government over 6 years ago. The water from the boreholes with frequent breakdowns has changed from fresh to saline.

Sanitation: There are few Private toilet facilities provided in the school, dispensary and few households within the area. Open defecation (OP) also practiced in the village leading into poor waste management.

Road Network: Roads connectivity within the area is very poor and not regularly maintained. The main forms of transport within the area are Motor bikes. There are no public vehicles for the public to use, therefore Police vehicles are mainly used to provide alternative modes of transport. The community is accessed via Forole-Turbi earth road.

Mobile Network Coverage: *Safaricom* is the only Network coverage within the village and majority of people have access to the internet services.

Power/electricity: - the community is not connected to the mains. The population use mainly portable solar at the household for charging mobiles and lighting

4 ANALYSIS OF ALTERNATIVES AND PROJECT JUSTIFICATION

This section analyses the project alternatives in terms of site and technology. Solar projects are non - polluting energy generation projects which are site specific and dependent on the availability of solar irradiance resource. The current site selected is a high solar power potential site with high irradiation and consistent sunny days throughout the year.

4.1 Site Selection

Solar projects are non-polluting energy generation projects which are site-specific and dependent on the availability of solar irradiance resource.

Minigrid Sites under KOSAP were selected based on a number of factors.

1. Geophysical Factors-Proximity to Hills-Shade effect, Soil erosion, Drainage of the area, Flooding etc.
2. Land identified is free from any dispute on ownership or any other encumbrances
3. Proximity to public utilities-Schools, Dispensaries, Places of worship and community settlements
4. No squatters, encroachers or other claims to the land
5. The Size of the Minigrid to be constructed and the optimal coverage of a Minigrid in terms of the number of people to be reached.
6. The Land identified should be on spaces set aside for public use within the community centres.

The land was identified by the beneficiary communities and confirmed by technical staff to be suitable for the sub-project and free from any environmental or health risks. The impacts on the Community will be marginal and will not result in displacement of households or cause loss of household's incomes and livelihood.

The site identified was considered against the criteria highlighted above and was found suitable for Minigrid construction.

The proponent identified one location for the proposed solar project within Forole center near the dispensary to the west and worship center to the south east. The site was identified based on the location of settlement areas, commercial/ public facilities in Forole. The site is within the center and well positioned to service the center and the settlement areas within Forole area.

Further details on the other locations identified were not available.

- No settlement present in the project site;
- The project site land is predominantly unregistered community land;
- The project site has few scattered trees and shrubs and located between school and community settlement area (manyattas);
- The project site land is medium highland and only single crop is cultivated during the post-monsoon season;

The proposed project site has the following location advantages:

- The land is unoccupied and does not have any ecological sensitive receptor such as national parks, Wildlife Sanctuary within 10 km radius;
- No cultural property of archeological importance within 5 km radius and
- The closest available power from National grid is located at about 54 km away, at Huri Hills

PROPOSED PROJECT SITE & PROXIMITY TO CONSUMER SITES

4.2 Power Scenario at Forole

Forole location has an estimate of 1400 number of people with approximately 276 households currently within the area. Due to insecurity approximately 300 more have relocated. The proposed solar off grid project is estimated to cover up to 402 residential and non-residential consumers within the area. This will reach out to over 70% of the population within the area.

Like in most parts of Kenya, the main source of energy in Marsabit County is wood fuel which is used both for cooking and lighting, while kerosene is predominantly used for lighting. The main type of fuel used by households is both a factor of the socio-economic status of households and availability of alternative low-cost energy. As a result, the proportion of households using firewood as main source of cooking fuel is 92.6%, charcoal is 5.6%, and paraffin is 1.4% while biomass residue is 0.2%. Electricity coverage is mostly restricted to urban centres of Marsabit, Moyale, Sololo and Laisamis. The county is not served by electricity from the national grid but by diesel generators and solar energy. Moyale and Sololo are connected with electricity from Ethiopia. Despite massive gains in electricity connectivity in rural Kenya, majority of the households in Marsabit still use firewood as their main source of lighting energy.

The existing sources of energy at Forole location include solar powered appliances supplied by private enterprises such as delight. The current energy availability provided by the solar appliances is insufficient and does not meet the objective of the aim of project. Solar energy is mainly utilized for lighting and charging mobile phones. Whereas wood fuel is utilized for cooking, heating water and providing for warmth.

The use of firewood and charcoal contributes to massive environmental degradation, increased health risks and additional workload for women and girls, and increased emissions of carbon content. Moreover, low enrollment, retention and transition for girls is partly attributed to increased workload related to energy search (firewood). The county has a huge potential for renewable energy which can tapped through wind and solar energy and hence be channeled to productive sectors within the county as well as export to other counties.

Failure to construct and operate the mini-grid in Forole will lead to the failure of achieving one of the Kenya's national long-term development policies that aims to transform Kenya into a newly industrializing, middle-income country, by providing a high quality of life to all its citizens by 2030 in a clean and secure environment. Beneficiaries will be households, public and community institutions, enterprises and community facilities that cannot access electricity through the national grid and whose use of electricity will replace kerosene and other fuels for lighting and other activities like pumping water.

4.2.1 Vision 2030

Kenya Vision 2030 is the country's development blueprint covering the period 2008-2030. It aims to transform Kenya into a newly industrialized, *'middle income' country providing a high-quality life to all its citizens by the year 2030.'*

Vision 2030 is based on three key pillars namely: Economic, Social, and Political. These pillars are anchored on the following foundations:

- Macroeconomic stability.
- Continuity in governance reforms.
- Enhanced equity and wealth creation opportunities for the poor.
- Infrastructure.
- Energy.
- Science, technology and innovation (STI).
- Land reform.
- Human resources development.
- Security; and
- Public sector reforms.

This policy recognizes that infrastructure, and in particular, a reliable power supply is vital in sparking economic growth. The challenges facing the power sector in Kenya include weak transmission and distribution infrastructure, high cost of power, low per capita power consumption, and low electricity access countrywide.

The Proponent aims to generate power mainly for community use which will contribute towards meeting the growing energy needs and targets as envisioned in Vision 2030.

4.3 Analysis of Alternative

As per IFC Performance Standards, an analysis of probable alternatives for the chosen technology and location of project site along with other similar factors that contribute to the project as a whole has been carried out. The following scenarios have been taken into consideration:

- Alternate Location for Project Site
- Alternate Sources of Energy
- Zero or No Project Alternative

4.3.1 Alternate Location for Project Site

In determining the most appropriate site for the establishment of the mini-grid, several options were explored. This site selection process considered the following criteria:

- The availability of primary resources required for the operation of the mini-grid i.e., Sunlight
- Availability of land to locate the site and associated infrastructure.
- The availability and accessibility of infrastructure for the provision of services, manpower and social structure for the construction and operation of the solar mini-grid.
- General environmental acceptability in terms of social impacts, water utilization, general

ecology, etc.

Forole was identified as the most suitable area for the establishment of the proposed mini-grid based on the following factors:

Location: The area is in a predominantly pastoral setting. The population density is low, and majority of the surrounding land is de-vegetated grazing lands and tree cover is currently low at 15%. There is enough grazing land for the community and use of the site to construct the mini grid will not significantly impact grazing land.

Proximity to consumer sites: Forole location has an estimate of 1400 number of people with approximately 276 households currently within the area. Due to insecurity approximately 300 more have relocated. The proposed solar off grid project is estimated to cover up to 402 residential and non-residential consumers within the area. This will reach out to over 70% of the population within the area.

4.3.2 Alternate Sources of Energy

Harnessing solar energy is an eco-friendly process, with an inexhaustible solar resource and minimal pollution. There are minimal fuel requirements for operational activities. Solar energy has a short development timeframe, more predictable energy output and low maintenance costs as compared to some other forms of renewable energy sources.

The possible alternatives to solar energy include;

- **Wind power:** shortfalls associated with wind power includes; lack of time series data of wind, trained human resources to intricate design of wind power etc., providing wind power for Forole residents is technically and financially challenging, expensive to install, dependent on wind pattern (not strong in Forole). However, generation is cheap, low emissions & insignificant pollution levels.
- **Thermal power:** High fossil consumption, high emissions levels, high water consumption levels (water highly scarce in Forole area). Besides coal and petroleum products used in thermal power processing are not readily available within Forole area and may have to be sourced from far locations. Therefore, thermal power option based on coal and petroleum products is not a viable option for Forole. It however has high distribution and large-scale production potential
- **Nuclear power:** disadvantages include; use of other fuel sources, has hazards associated with radioactive materials, expensive disposal of waste, high cost of project and long gestation period. The mode however does not emit smoke particles, low fuel cost, low emission levels and continuous electricity production.
- **Wood fuel/ Firewood:** The use of firewood and solid waste for electricity generation using thermal technology is another option. But the issue of air pollution and destruction of vegetative cover through firewood harvesting and charcoal burning already are environmental problems of serious concern which will further aggravate the natural environment. For these reasons, the wood fuel options evaluated above seem inappropriate for Forole on environmental as well as economic grounds

Solar energy was a desirable option because:

- It has low energy-production costs
- The project is environment friendly with minimal greenhouse gas emissions
- Versatile installation

- It is a clean source of energy hence minimal impact on the environment air quality
- Economic savings.

4.3.3 Zero or No Project Alternative

The No Project option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. This option will, however, involve several losses both to Forole area and the North Horr as a whole. The village and the surrounding area will continue to have no electricity, and this will not help in maximizing and utilizing the area facilities. The No Project Option is the least preferred from the socio-economic and partly environmental perspective due to the following factors:

- The socio-economic status of target communities the local economy would remain unchanged.
- Generation of employment opportunities through expansion of business activities that would have been spurred by availability of electric power will not occur
- Opening up the area for investors will not occur.
- Health benefits that come with electricity will not be realized
- The targeted consumers will forgo the desired electricity supply in the area
- The country won't meet its energy requirement
- The objectives of the government's efforts towards achieving Vision 2030 will not be realized.

From the analysis above, it becomes apparent that the no project alternative means no project to the local people and the Government of Kenya and the benefits outlined above and other indirect benefits that would accrue from construction of the proposed project.

It is thereby concluded that the 'do-nothing' option is not a good option economically and should therefore be discouraged and rejected. It is therefore imperative for KPLC to establish a new solar mini-grid in the area and supply the community with clean energy.

4.3.4 Analysis of Alternative Construction Materials and Technology

The proposed solar Mini-grid will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. Equipment that guarantees efficient use of locally available materials will be encouraged to ensure reliability in supply with minimum power loss and good design to allow efficient distribution of power in the area.

The support structures in the Solar Mini-grid can be wooden or steel. Because of its durability and strength, steel is the best choice and all support structures will be steel. Perimeter fence can be a reinforced wire mesh fixed to support structures that can be wooden, concrete or steel. Alternatively, a stone perimeter wall can be constructed and this is the option of choice since it is more durable, offer better protection and requires less maintenance.

The design of the solar mini-grid will be easy to install and dismantle with minimum labor requirements and maintenance costs will be minimal. The process material that are input for the proposed project such as generator diesel fuel and oil and water for cooling the generator and for cleaning purposes are critical elements. There is no alternative for generator oil and water for standby generator cooling and for mini-grid facilities cleaning water. So, the task was to assess alternative water and Diesel generator oils and fuel sources for the project.

4.3.5 Solid Waste Management Alternatives

A lot of solid wastes will be generated from the proposed project. An integrated solid waste management system is recommendable. First, the KPLC will give priority to reduction at source of the materials. This option will demand a solid waste management awareness program in the management and the staff. Recycling and reuse options of the waste will be the second alternative in priority. This will call for a source separation program to be put in place. The third priority in the hierarchy of options is combustion of the waste that is not recyclable. Finally, the KPLC will need to establish partnership with NEMA approved waste handlers for regular waste removal and disposal in an environmentally-friendly manner. In this regard, a NEMA registered solid waste handler would have to be engaged. This is the most practical and feasible option for solid waste management.

4.3.6 Alternative Solar Mini-Grid Site

The identification of potential Mini-grid site for the proposed Forole Solar Mini-grid involved site visits to the study area, preliminary site assessments and consultations among the concerned departments of the KPLC, MOE and REREC. Two sites have been proposed by the community:

Site A-consultations among the community members found that the site belonged to any individual and according to the best practice of avoiding physical displacement the land was found to be unviable.

Site B- is portion of land which is next identified for the Mini-grid. The site identified is part of a larger piece of land which had been identified by the community for setting up community service projects. Between site A and B, site A was rejected because it would result in physical displacement and site B was found to be suitable for the project.

The appropriateness of potential Mini-grid sites identified by the KPLC during the initial site visits was assessed in terms of various suitability criteria and technical restrictions stipulated by KPLC, as outlined below:

- Load growth - the location of Mini-grid first and foremost is informed by the existing and also load growth of an area. Technical studies show that the area will experience load growth over time and there is need to supply electricity.
- Size – proposed potential sites need to be sufficient for the average size of Solar Mini-grid and associated auxiliary facilities. Therefore, the size acquired must meet the required size.
- Topography – consideration is given to the topography of potential sites whereby flat or gently sloping topography is preferred. An ideal gradient for the natural ground is 1:100. A gentle slope facilitates surface drainage and movement of vehicles and people on-site during construction. A steep slope requires costly leveling (cut and fill) for the construction of the solar Mini-grid. In addition, a steep slope inhibits movement, makes vehicle access problematic and increases the potential for environmental impacts during construction as well as operation e.g., steeper slopes have higher surface water flow rates and therefore higher erosive potential. The proposed site is flat and cost-effective during construction.
- Hydrology – consideration is given to the proximity of potential sites to adjacent water courses and wetlands where there may be potential impacts in terms of erosion and siltation of water courses, as well as implications associated with storm-water control at the Solar Mini-grid site. The site is not close

to water resources or wetland and so no impact to water sources through siltation. Further, construction of drainage is not complicated.

- Geology and soils – consideration is given to the soil type present within the potential site whereby stable soil and founding conditions are preferable. Less stable soils, i.e., shallow, dispersive soils and soils with poor drainage present an erosion hazard if not managed correctly, and also require the installment of additional, costly foundation infrastructure. The soils at the site are well drained.
- Flora and fauna – potential sites need to be assessed in terms of their ecological value at both a macro and micro scale i.e., within the site and the environment surrounding the site. Both a faunal and floral investigation may be required, with particular emphasis on ensuring the protection of endemic and red data species and their habitat, should they be present. An identified site that has a high ecological value may be excluded from the list of potential sites. The site is not of a high ecological value.
- Visibility – highly visible sites i.e., on a ridge / elevated terrain are considered less favorable in that they have a high visual impact on the surrounding landscape. Sites that are hidden or out of site e.g., behind a hill, may be considered more suitable; the site is on flat part near chief's office and may not create sharp visual impact because it is not on an elevated point.
- Access – it is preferable that potential sites are located in close proximity to existing public roads so as to avoid the need for construction of new access roads of considerable length. Access is also important particularly as it relates to the transportation of the solar panels, batteries and generator to the site, which are heavy weights and requires the use of a low-bend vehicle. As such, long access routes with sharp bends are to be avoided and the site should not be located in an area that has excessively steep inclines or declines that could hinder access, particularly during periods of heavy rainfall; the site is well accessible as it along the road.
- Distance to site – it is important that the site be located strategically within the receiving area's electrical load Centre; this is true of the proposed site. The site is within Forole Centre.
- Adjacent land use – adjacent land use has implications for access and required clearances for the power lines extending from the solar plant site, i.e., it is important that the land surrounding the Mini-grid is relatively clear of obstructions which might otherwise inhibit / obstruct the path of the power lines out of the Mini-grid. Current and future development planning of adjacent land use should therefore also be considered. The site and the developments around do not pose a hindrance for incoming and outgoing feeders.
- Public acceptability – public acceptance criteria relate to such issues as the possible adverse impact on public health, quality of life, and local land and property values. During the public consultations there was overwhelming support for the project with mitigation measures being put in place for the negative impacts.

4.3.7 Conclusion

Based on the above-mentioned suitability criteria and technical requirements, the proponent decides to put up the Solar Mini-grid within Forole area. Relocation option to a different site is an option available to the proponent. The project proponent can look for alternative land to accommodate the scale and size of the project. However, this will be a costly venture, may take a long time although there is no guarantee that the land would be available in the targeted area. It is recommendable that the proponent be allowed to install the project in the proposed site.

5 POLICY LEGAL AND REGULATORY FRAMEWORKS

5.1 Introduction

This Chapter outlines the existing national and international environmental and social legislation, policies, and institutions applicable to energy generation that guide the development of the Project.

As Kenya is a signatory to various international conventions and laws, national projects need to be aligned with their requirements; relevant international conventions and laws are therefore presented in this chapter.

Finally, a summary of the World Bank (WB) Environmental and Social operational policies relevant to this Project are presented.

5.2 Environmental Policy Framework

The Kenya government formulated a national Environmental policy in 2013 whose goal is better quality of life for present and future generations through sustainable management and use of the environment and natural resources.

According to the said policy Kenya has a wide variety of ecosystems namely mountains, forests, arid and semi-arid areas (ASALs), freshwater, wetlands, coastal and marine all offering many opportunities for sustainable human, social and economic development. These ecosystems are natural capitals which provide important services such as; regulatory services, provision services, cultural services and supporting services implying that he survival and socio-economic wellbeing of Kenyans is ultimately intertwined with the environment.

The policy comes in handy as it provides a framework to guide the country's efforts in addressing the ever-growing environmental issues and challenges such as: Environmental governance, Loss of biodiversity, valuation of environmental and natural resources, rehabilitation and restoration of environmentally degraded areas, urbanization, waste management and pollution, climate change, energy, security and disaster management, public participation, environmental education and awareness, data and information, poverty, chemicals management

One of the principles of the policy which this project must adhere to is that the right to development should be exercised taking into consideration sustainability, resource efficiency and economic, social and environmental needs.

5.3 Institutional, Regulatory and Legal Framework

The multi-faceted nature of the environment and the need to integrate environmental considerations in all development planning and activities calls for cooperation and consultation among responsible government agencies and stakeholders at all levels. At present there are several institutions and departments which deal with environmental issues in Kenya. Some of the key institutions include:

a) National Environment Management Authority (NEMA)

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

b) County Environment Committees

According to EMCA (Amendment), 2015, every governor shall, by notice in the Gazette, constitute a County Environment Committee (CEC) of the County. The County Environment Committees are responsible for the proper management of the environment, development of county strategic environmental action plan, every five years including implementation of the plans among others.

c) National Environmental Complaints Committee

The Committee performs the following functions:

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

d) National Environment Action Plan Committee

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

- Contain an analysis of the Natural Resources of Kenya with an indication as to any pattern of change in their distribution and quantity over time.
- Contain an analytical profile of the various uses and value of the natural resources incorporating considerations of intergenerational and intra-generational equity.
- Recommend appropriate legal and fiscal incentives that may be used to encourage the business community to incorporate environmental requirements into their planning and operational processes.
- Recommend methods for building national awareness through environmental education on the importance of sustainable use of the environment and natural resources for national development.
- Set out operational guidelines for the planning and management of the environment and natural resources.
- Identify actual or likely problems as may affect the natural resources and the broader environment context in which they exist.
- Identify and appraise trends in the development of urban and rural settlements, their impact on the environment, and strategies for the amelioration of their negative impacts.
- Propose guidelines for the integration of standards of environmental protection into development planning and management.
- Identify and recommend policy and legislative approaches for preventing, controlling or mitigating specific as well as general diverse impacts on the environment.
- Prioritize areas of environmental research and outline methods of using such research findings.
- prejudice to the foregoing, be reviewed and modified from time to time to incorporate emerging knowledge and realities and;
- Be binding on all persons and all government departments, agencies, States Corporation or other organ of government upon adoption by the national assembly.

e) Standards and Enforcement Review Committee

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

f) National Environment Tribunal

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

g) National Environment Council (NEC)

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

The project proponent will adhere to any directive issued by the above institutions that are relevant to the project

5.4 Kenya Policy Provisions

5.4.1 Kenya Energy Policy, 2014

The Energy Policy sets out the national policies and strategies for the energy sector that align to the Constitution of Kenya and Kenya's Vision 2030.

The Energy Policy envisages promoting an energy mix that includes solar energy at both the household/institutional levels as well as large-scale solar energy generation. The Government of Kenya has initiated and has been promoting programmes for the provision of electricity to institutions far from the grid through solar PV systems. The Government has also embarked on a programme to provide solar/diesel and solar/wind hybrid generation capacity to off-grid stations.

The Policy strategizes the need to:

- promote the widespread use of solar energy while enforcing existing regulations and standards.
- provide incentives to promote the local production and use of efficient solar systems.
- provide a framework for connecting electricity generated from solar energy to the national and isolated grids, through direct sale or net metering.
- promote the use of hybrid power generation systems involving solar and other energy sources; and
- facilitate the generation of electricity from solar energy by, among other things, funding, provision of land, fast-tracking issuance of permits and licenses, as well as acquisition of data and information to realize at least 100 MW from solar by 2017, 200 MW by 2022 and 500 MW by 2030.

The Kenya Electricity Supply Industry (ESI) is one of the sub-sectors in the energy sector which the Ministry of Energy and Petroleum oversees on behalf of the Government of Kenya (GoK). Under the Energy Act of 2006, the Ministry is responsible for formulation and articulation of policies to provide an enabling environment for operators and other stakeholders in the energy sector. Relevant stakeholders in the ESI are briefly described below.

5.4.2 The constitution of Kenya

Environmental management and natural resources utilization is enshrined in the Kenya constitution 2010 under several articles. In article 69 of the Constitution of Kenya, 2010, the State clearly undertakes to carry out the following:

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

- ✓ Eliminate processes and activities that are likely to endanger the environment; and
- ✓ Utilize the environment and natural resources for the benefit of the people of Kenya.

The constitution in article 42 emphasizes the need for a clean and healthy environment through management of substances that may pollute the environment or cause harm to human health. The right to a clean environment is further enforced by article 70. Article 186 and the fourth schedule allocate functions of natural resources management and environmental protection to both the national and county governments.

The county government on the other hand shall Control air pollution, noise pollution and other public nuisances as stipulated in article 3 of the fourth schedule and in article 10, the county government shall implement specific national government policies on natural resources and environmental conservation.

Public participation is entrenched in several articles across the Kenya constitution 2010. Article 6 provided for devolution and access to services. Responsibilities in major decision-making process have been bestowed to the public (in the bill of rights, articles 118, 174, 196 and 201). The constitution further in article 21 section 3 requires safeguarding the rights and interests of marginalized groups for equity in public service provision. This can be effectively achieved through active involvement of such groups in decision making process at all levels. Hence need to involve the local people in the project area in studies, design and implementation of the proposed project facilities.

The principles of land policy that ensure land is held, used and managed in a manner that is equitable, efficient, productive and sustainable is set out in article 60 of the constitution. Proper land management by regulating the use of any land, or any interest in or right over any land, in the interest of defending, public safety, public order, public morality, public health, or land use planning is ensured by the constitution in article 66.

In regard to environmental protection and natural resources management, article 62 sub-article 1 stipulates what constitutes public land. Both the Land Act22 and the Land Registration Act23 refers to the definition given under the Constitution of Kenya (2010) to be the one to apply in each of the respective statutes. The public land areas are held by the national government in trust for the people of Kenya and shall be administered on their behalf by the National Land Commission as stated in article 62 sub-article 3. The land commission shall also monitor and have oversight responsibilities over land use planning throughout the country regardless of the classification as stated in article 67-2(h).

Private Land under Article 64, includes any land that is vested in a natural or artificial person, and any other land declared through an Act of Parliament. The Constitution 2010 has emphatically stated that: freehold land cannot be owned by a non- citizen of Kenya; and a leasehold interest of over 99 years cannot be held by a non-Kenyan citizen.

Article 63 of the constitution, Community land includes land currently under the Land (Group Representatives) Act; land currently classified as trust lands, community forests, land that is transferred to the community by any process of law, ancestral land and lands traditionally occupied by hunter-gather communities inter alia. Community land is a new category of land explicitly created by new constitution 2010. The term —community‖ would require a legal definition to allow transfer of land that is currently forest, protected areas or other public land to such communities. Ethnicity may determine the community land however; Article 27 is prohibiting discrimination on the basis of ethnicity. Ancestral land too is not defined, nevertheless, it may be applied to any group or community which identifies itself as traditionally holding a specific area and which it has legal claim as its own.

For the purposes of this project, the constitution of Kenya provides for sound environmental management and sustainability and therefore this study provides one of the tools through which this can be achieved.

Table 5. Kenya power stakeholders and their roles

Stakeholders	Role
Kenya Power Company	Responsible for distribution and retail supply of electrical energy to end users. Kenya Power purchases power in bulk from the Kenya Electricity Generating Company Limited (KenGen) and the Independent Power Producers (IPPs) through bilateral contracts or Power Purchase Agreements (PPAs) approved by the Energy Regulatory Commission (ERC) (1).
The Energy and Petroleum Regulatory Authority (EPRA)	Established by the Energy Act of 2019. The EPRA's mandate extends beyond electricity and includes natural gas (including petroleum), renewables and all other forms of energy. The generation, transmission, distribution, supply, import and export of electricity can only be carried out by parties in possession of a license, or a permit issued by the EPRA. If the capacity involved is for own use and less than 1 MW, authorization is not required. Although the generated electricity is expected to be less than 1 MW (0.3 – 1 MW), the fact that the generated electricity is intended for use in a factory and there is a possibility for connection to the national grid and sale of excess power to the government, The project requires a license from the EPRC to generate electricity as stipulated in the Energy Act, 2019.
Ministry of Energy and Petroleum	Aims to facilitate provision of clean, sustainable, affordable, reliable, and secure energy services for national development while protecting the environment.
The Rural Electrification and Renewable Energy Corporation (REREC):	Is established under Section 43 of the Energy Act, 2019 as a corporate body. The Corporation is the successor to the Rural Electrification Authority established under section 66 of the Energy Act No. 12 of 2006 (now repealed) and subject to this Act, all rights, duties, obligations, assets and liabilities of the Rural Electrification Authority existing at the commencement of this Act is to be automatically and fully transferred to the Corporation and any reference to the Rural Electrification Authority in any contract or document shall, for all purposes, be deemed to be a reference to the Corporation.
The Geothermal Development Company (GDC):	Is a 100% state-owned company, formed by the Government of Kenya as a Special Purpose Vehicle to fast track the development of geothermal resources in the country. The creation of GDC was based on the government's policy on energy - Sessional paper No. 4 of 2004, and the energy Act No. 12 of 2006.
The Kenya Electricity Transmission Company (KETRACO):	Was incorporated on 2nd December 2008 and registered under the Companies Act, Cap 486 pursuant to Sessional paper No. 4 of 2004 on Energy. KETRACO's mandate is to design, construct, operate and maintain new high voltage electricity transmission infrastructure that will form the backbone of the National Transmission Grid, in line with Kenya Vision 2030.
Energy and Petroleum Tribunal (EPT):	The tribunal is established under section 25 of The Energy Act, 2019. The tribunal is established for the purpose of hearing and determining disputes and appeals in accordance with The Energy Act, 2019 or any other written law. In relation to the proposed Project, any disputes or appeals if they arise will need to be addressed by the EPT.

5.4.3 Policy paper on Environment and Development (Sessional Paper No. 6 of 1999)

The overall goal of this Sessional Paper is to ensure that environmental concerns are integrated into the national planning and management processes and provide guidelines for environmentally sustainable development. The objectives of the Paper are to conserve and manage the natural resources of Kenya including air, land, flora, and fauna and promote environmental conservation about soil fertility and conservation, biodiversity, to foster afforestation activities, and to protect water catchment areas. More

(1) As per the Energy Act of 2019, this role will now be performed by the Energy and Petroleum Regulatory Authority (EPRA).

importantly, the Policy emphasizes the enhancement of public awareness and appreciation of the essential linkages between development and environment, involving NGOs, private sector, and local communities in the management of natural resources and their living environment and ensures that an environmental impact assessment report is undertaken for all public and private projects and programmes.

The proposed solar plant facility must ensure that it promotes this integrated approach to environmental management and development, without compromising the livelihoods of the local community.

5.4.4 National Policy on Water Resources Management and Development, 1999

While the National Policy on Water Resources Management and Development enhances a systematic development of water facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as wastewater. The Policy therefore calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution. This implies that industrial and business development activities should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating therefrom.

During construction, water will be required for concrete works and during the operational period water supply may be necessary for cleaning the PV modules.

5.4.5 Sessional Paper No. 10 of 2014 on the National Environmental Policy, 2014

The overall goal of this Session Paper is to ensure better quality of life for present and future generations through sustainable management and use of the environment and natural resources. This Session Paper calls for the use of environmentally sound technologies based on the best available techniques and policies as a way of minimizing negative impacts to the environment.

Section 5.6 of this Session Paper focusses on infrastructure development and environment and makes explicit policy statements to ensure sustainable management and use of the environment and natural resources during the construction and operation of infrastructure developments. These policy statements require the commitment of the government to:

- Ensure Strategic Environmental Assessment (SEA), Environmental Impact Assessment, Social Impact Assessment and Public participation in the planning and approval of infrastructural projects.
- Develop and implement environmentally friendly national infrastructural development strategy and action plan.
- Ensure that periodic Environmental Audits are carried out for all infrastructural projects

In line with the above policy statements, this ESIA has been conducted for the proposed solar project (including the associated infrastructure) to ensure that environmental and social issues are appropriately addressed.

Once approved by NEMA, the Project Proponent will also need to conduct periodic Environmental Audits to ensure continuous conformity with the overall goal of this Session Paper. In addition, this ESIA has considered analysis of alternatives including alternatives to technology to ensure that the best available and appropriate technology is used.

5.5 National Legal Framework

5.5.1 Administrative Framework

In 2001, the Government established the administrative structures to implement the Environmental Management and Co-ordination Act of 1999 (EMCA). The main administrative structures are described in the following sections:

Table 6. Administrative stakeholders and their roles

Stakeholders	Role
NEC	The **National Environmental Council** is responsible for policy formulation and directions for the purposes of EMCA. The Council also sets national goals and objectives and determines policies and priorities for the protection of the environment. *The proponent should ensure that the project abides by the set goals and objectives of the Council.*
NEMA	The responsibility of NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment. *This ESIA has been prepared for submission to NEMA for review and approval prior to the commencement of the Project activities, in compliance to the EMCA.*
NECC	EMCA has also established a National Complaints Committee, which provides the administrative mechanism for addressing environmental harm. The Committee has the mandate to investigate complaints relating to environmental damage and degradation. The members of the **National Environment Complaints Committee** include representatives from the Law Society of Kenya, NGOs, and the business community. *The proponent should address all issues arising from the Project in accordance with the above requirements, including a clear policy of stakeholder engagement and feedback.*
WRA	Water Resources Authority is responsible for regulation of water resources issues such as water allocation, source protection and conservation, water quality management and pollution control and international waters. One of its functions among others is to receive water permit applications for water abstraction, water use and recharge and determine issue, vary water permits; and enforce the conditions of those permits as well as formulate and enforce standards, procedures and Regulations for the management and use of water resources and flood mitigation. *The project area experiences serious water scarcity. The proponent will have to purchase water for use during construction.*

5.6 Relevant statutes

The current legal provisions for natural resource management in Kenya are contained in over seventy sector-specific statutes. For a long time, the country lacked an umbrella legislative guide for harmonious and holistic environmental management. As such, resources were managed sectoral in accordance with the statutes that were in place.

As these statutes were contradictory at times, in 1999, the Government of Kenya enacted the Environmental Management and Co-ordination Act (EMCA) which is an umbrella legal framework under which the environment is being managed. EMCA establishes the institutional framework under which environmental management is to be coordinated. EMCA prevails over all other Sectoral laws relating to the environment in cases of conflict or contradictions. It also grants the public a *locus standi* in matters of the environment.

Table 7. National Legal Framework

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
	NATIONAL POLICY FRAMEWORK		
1.	Vision 2030	Kenya Vision 2030 is the current national blueprint for development from its inception in 2008 until the milestone year of 2030. This plan is the national long-term development policy that aims to transform Kenya into a newly industrialised, middle-income country by 2030. The Vision is comprised of three key pillars (economic, social, and political), two of which are projected to be positively affected by project implementation.	Under Vision 2030, Energy is identified as one of the key sectors that form the foundation for socio-political and economic growth. Promoting equal opportunities across the entire Kenyan territory and enhancing access to competitively priced, reliable, quality, safe and sustainable energy is essential to the achievement of this vision.
2.	The Energy Policy, 2014	The Energy Policy sets out the national policies and strategies for the energy sector that align to the Constitution of Kenya and Kenya's Vision 2030. The Energy Policy envisages promoting an energy mix that includes solar energy at both the household/institutional levels as well as large-scale solar energy generation. The Government of Kenya has initiated and has been promoting programs for the provision of electricity to institutions far from the grid through solar PV systems. The Government has also embarked on a programme to provide solar/diesel and solar/wind hybrid generation capacity to off-grid stations. The Policy strategizes the need to: ✓ promote the widespread use of solar energy while enforcing existing regulations and standards. ✓ provide incentives to promote the local production and use of efficient solar systems. ✓ provide a framework for connecting electricity generated from solar energy to the national and isolated grids, through direct sale or net metering. ✓ promote the use of hybrid power generation systems involving solar and other energy sources; and ✓ facilitate the generation of electricity from solar energy by, among other things, funding, provision of land, fast-tracking issuance of permits and licenses, as well as acquisition of data and information to realize at least 100 MW from solar by 2017, 200 MW by 2022 and 500 MW by 2030.	

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		The Kenya Electricity Supply Industry (ESI) is one of the sub-sectors in the energy sector which the Ministry of Energy and Petroleum oversees on behalf of the Government of Kenya (GoK). Under the Energy Act of 2006, the Ministry is responsible for formulation and articulation of policies to provide an enabling environment for operators and other stakeholders in the energy sector. Relevant stakeholders in the ESI are briefly described below.	
3.	Policy paper on Environment and Development (Sessional Paper No. 6 of 1999)	The overall goal of this Sessional Paper is to ensure that environmental concerns are integrated into the national planning and management processes and provide guidelines for environmentally sustainable development. The objectives of the Paper are to conserve and manage the natural resources of Kenya including air, land, flora, and fauna and promote environmental conservation about soil fertility and conservation, biodiversity, to foster afforestation activities, and to protect water catchment areas. More importantly, the Policy emphasizes the enhancement of public awareness and appreciation of the essential linkages between development and environment, involving NGOs, private sector, and local communities in the management of natural resources and their living environment and ensures that an environmental impact assessment report is undertaken for all public and private projects and programmes.	The proposed solar plant facility must ensure that it promotes this integrated approach to environmental management and development, without compromising the livelihoods of the local community.
4.	National Policy on Water Resources Management and Development, 1999	While the National Policy on Water Resources Management and Development enhances a systematic development of water facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as wastewater. The Policy therefore calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution. This implies that industrial and business development activities should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating therefrom.	During construction, water will be required for concrete works and during the operational period water supply may be necessary for cleaning the PV modules. Appropriate water treatment and waste handling must be incorporated into the Project design to be in alignment with this policy
5.	Sessional Paper No. 10 of 2014 on the National Environmental Policy, 2014	The overall goal of this Session Paper is to ensure better quality of life for present and future generations through sustainable management and use of the environment and natural resources. This Session Paper calls for the use of environmentally sound technologies based on the best available techniques and policies as a way of minimizing negative impacts to the environment. Section 5.6 of this Session Paper focusses on infrastructure development and environment and makes explicit policy statements to ensure sustainable management and use of the environment and natural resources during the	In line with the above policy statements, this ESIA has been conducted for the proposed solar project (including the associated infrastructure) to ensure that environmental and social issues are appropriately addressed. Once approved by NEMA, the Project Proponent will also need to conduct periodic Environmental Audits to ensure continuous conformity with the overall goal of this Session Paper. In addition, this ESIA has considered analysis of alternatives

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		construction and operation of infrastructure developments. These policy statements require the commitment of the government to: ✓ Ensure Strategic Environmental Assessment (SEA), Environmental Impact Assessment, Social Impact Assessment and Public participation in the planning and approval of infrastructural projects. ✓ Develop and implement environmentally friendly national infrastructural development strategy and action plan. ✓ Ensure that periodic Environmental Audits are carried out for all infrastructural projects	including alternatives to technology to ensure that the best available and appropriate technology is used.
6.	The Poverty Reduction Strategy Paper (PRSP) of 2001	The PRSP has the twin objectives of poverty reduction and enhancing economic growth. The paper articulates Kenya 's commitment and approach to fighting poverty; with the basic rationale that the war against poverty cannot be won without the participation of the poor themselves.	• The proposed project aims at provision and access of renewable electricity geared towards improved economic performance and thus will contribute to poverty alleviation in the project area.
7.	National Environmental Action Plan (NEAP) of 1994	The NEAP for Kenya was prepared in mid 1990s. It was a deliberate policy whose main effort is to integrate environmental considerations into the country 's economic and social development. The integration process was to be achieved through multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and the conservation of natural resources forms an integral part of societal decision-making.	• The NEMA does not approve a development project unless the impacts of the proposed project are evaluated and mitigation measures proposed for incorporation in the project 's development plan, which is in line with the requirements of the NEAP. The project will be reviewed by NEMA for approval before implementation.
8.	Environmental and Development Policy (Session Paper No.6 1999)	As a follow-up to the foregoing, the goal of this policy is to harmonize environmental and developmental goals to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development.	The proponent: • Is undertaking an Environmental Impact Assessment, Social Impact Assessment and Public participation as part of the planning and approval of infrastructural projects. • Will ensure that periodic Environmental Audits are carried out for the project
9.	The National Energy and Petroleum Policy 2015	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. This policy stipulates the transformation of the Rural Electrification Authority (REA) to Rural Electrification and Renewable Energy Corporation (REREC) to be the lead agency for development of renewable energy resources.	The policy is relevant to the project in the sense that the project will provide sustainable and reliable energy supply and measures will be put in place to protect and conserve the environment during its development. REREC will oversee the development of the mini grid and maintenance.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
10.	The Gender and Development Policy (Sessional paper no.2 2019)	The overall goal of this policy is to achieve gender equality by creating a just society where women, men, boys, and girls have equal access to opportunities in the political, economic, cultural, and social spheres of life.	• In the absence of appropriate measures, the project can exacerbate gender inequalities and sexual and gender-based violence. In adherence to this policy, measures will be put in place to: • ensure gender inclusivity in decision making, employment opportunity and access to the energy generated from the Mini-Grid • mitigate social risks including sexual and gender-based violence, and any form of discriminations
11.	The HIV/AIDS Policy 2009	In summary, the policy aims at: i. Establishing and promoting programmes to ensure non-discrimination and non- stigmatization of the infected. ii. Contributing to national efforts to minimize the spread and mitigate against the impact of HIV and AIDS. iii. Ensuring adequate allocation of resources to HIV and AIDS interventions;	The proposed project is to be implemented in the rural setting at Forole area. The area is not economically empowered hence few HIV/AIDS prevention resources are available. This policy shall provide a framework to both the project proponent and contractor to address issues related to HIV/AIDS during the entire project phase.
12.	Workplace Policy on HIV/AIDS	The main objective of this Policy is to provide a framework to address HIV and AIDS in the workplace. The principles that guide the Policy are in accordance with international conventions, national laws, policies, guidelines and regulations. They include recognition of HIV/AIDS as a workplace issue; Non-discrimination; Gender equality, Safety and Health work Environment, Workplace ethics and Confidentiality.	The requirements of this policy are expected to be fulfilled by all contractors and their subcontractors, especially in regard to having an internal company HIV Policy and worker sensitization initiatives. This policy is of paramount relevance to the project as the implementation of the proposed mini-grid construction and operation is expected to spur substantial in-migration into the project area by people seeking employment opportunities. This, coupled with the expected economic growth, increased financial spending power and disruption of social / cultural norms may result in predisposing factors associated with the spread of HIV/AIDS such as prostitution and adultery.
NATIONAL LAWS			
1.	The Constitution of Kenya, 2010	The Constitution of Kenya promulgated in 2010 is the supreme law of the republic and binds all persons and all State organs at all levels of government. The Constitution provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectoral legislative documents are drawn.	The proposed project complies with the Constitution by proposing a structure in its ESIA on how to deal with Social, Health, safety and environmental issues for sustainable development.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
2.	Environmental Management and Coordination Act, 1999 (And the Amendments Of 2015)	The EMCA is a framework environmental law in Kenya. This Act (assented to on January 14, 2000) provides a structured approach to environmental management in Kenya. With the EMCA coming into effect, the environmental provisions within the sectoral laws were not superseded; instead, the environmental provisions within those laws were reinforced to better manage Kenya's ailing environment.	The proposed project will be undertaken in accordance with relevant sections of the EMCA, specifically Clauses 58 – 63. These sections of the Act are operationalised by subsidiary legislation promulgated under the Act and specifically Legal Notice (L.N.) 101: Environment (Impact Assessment and Audit) Regulations, 2003.
3.	L.N. 101: EIA/EA Regulations, 2003 And 2016 Amendments	These regulations provide the framework for undertaking EIAs and EAs in Kenya by NEMA licensed Lead Experts and Firms of Experts. An EIA or EA Study in Kenya is to be undertaken by a firm duly licensed by the NEMA. The EIA/EA Regulations also provide information to project proponents on the requirements of either an EIA or EA as required by the EMCA.	The proposed project is subject to relevant provisions of these regulations and subsequently, the ESIA has been undertaken in accordance with the requirements.
4.	L.N. 120: Water Quality Regulations, 2006	This regulation provides for the sustainable management of water used for various purposes in Kenya. The regulation contains discharge limits for various environmental parameters into public sewers and the environment.	The contractor will be required to properly manage the effluent from construction activities in accordance with the above regulations prior to discharge into the environment.
5.	L.N. 121: Waste Management Regulations, 2006	Generally, it is a requirement under the regulations that a waste generator segregates waste (hazardous and non-hazardous) by type and then disposes them in an environmentally acceptable manner.	Waste to be disposed in accordance with these regulations.
6.	L.N. 61: Noise and Excessive Vibration Control Regulations, 2009	The general prohibition of these regulations states that no person shall make or 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.	Rules 13 and 14 of the regulations define the permissible noise levels for construction sites. These noise limits will be applicable to the proposed project.
7.	Licenses and Permits Required Under The EMCA	The subsidiary legislations under the EMCA are partially monitored using permits and licenses. Subsequently all licenses and permits required during the construction phase shall be the responsibility of the individual contractors and their agents. During the operational phase, all permits, and licenses required to operate the project will be the responsibility of the proponent.	The following permits to be available for inspection during the construction and operational phases of the project: ✓ Waste Transport License under Legal Notice 121: The Environment Management and Coordination (Waste Management) Regulations 2006 for disposal of all types of wastes; and Noise Permit under Legal Notice 61: The Environment Management and Coordination (Noise and Excessive Vibration Control) Regulations, 2009.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
8.	Occupational Health and Safety Act, 2007	The Occupational Safety and Health Act (OSHA) was enacted to provide for the health, safety and welfare of persons employed in workplaces, and for matters incidental thereto and connected therewith.	The contractors will be required to fully comply with Legal Notice 40 titled: Building Operations and Works of Engineering Construction Rules, 1984 (BOWEC). Each contractor will develop and implement a formal construction health and safety plan.
9.	L.N. 31: The Safety and Health Committee Rules, 2004	These rules came into effect on April 28, 2004, and require that an Occupier formalise a S&H Committee if there is a minimum of 20 persons employed in the workplace. The size of the S&H Committee will depend on the number of workers employed at the place of work	The contractor will be required to constitute Health and Safety Committee to oversee safety and health at the construction site
10.	L.N. 24: Medical Examination Rules, 2005	These rules provide for Occupiers to mandatorily undertake pre-employment, periodic, and termination medical evaluations of workers whose occupations are stipulated in the Eighth Schedule to the OSHA and the First Schedule to this Rules. Workers that fall under the above two schedules are required to undergo medical evaluations by a registered medical health practitioner duly registered by the DOSHS.	The contractor should that the workers exposed to hazards and or accidents undergo requisite medical examinations as required by these rules
11.	L.N. 25: Noise Prevention and Control Rules, 2005	The rules set the permissible level for occupational noise in any workplace (which includes construction sites) The Proponent is to ensure that • any equipment brought to the site for use shall be designed or have built-in noise reduction devices that do not exceed 90 dB(A). those employees that may be exposed to continuous noise levels of 85 dB(A) are medically examined as indicated in Regulation 16. If found unfit, the occupational hearing loss to the worker will be compensated as an occupational disease.	The contractor to ensure that equipment is serviced properly and/or use equipment that complies with the threshold noise values provided in the act. Alternatively, each contractor will be required to develop and implement a written hearing conservation programme during the construction phase.
12.	L.N. 59: Fire Risk Reduction Rules, 2007	Several sections of the rules apply to the proposed project as enumerated below. - Regulation 16 requires Proponents to ensure that electrical equipment is installed in accordance with the respective hazardous area classification system. It is also a requirement that all electrical equipment is inspected every six months by a competent person and the Proponent is required to keep records of such inspections. - Regulation 22 provides a description of the functions of a fire-fighting team. - Regulation 23 requires Proponents to mandatorily undertake fire drills at least once a year.	The proponent is expected to comply with the requirements of L.N. 59: Fire Risk Reduction Rules, 2007 by i. Carrying out, and record, a fire risk assessment identifying any possible dangers and risks. ii. Reducing, or where possible remove, the risk of fire and take precautions to deal with the remaining risks. Developing an emergency plan should a fire occur which includes evacuation procedures etc

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		- Regulation 34 requires Proponents to develop and implement a comprehensive written Fire Safety Policy Regulation 35 requires a Proponent to notify the nearest Occupational S&H area office of a fire incident within 24 hours of its occurrence and a written report sent to the Director of DOSHS within 7 days.	
13.	NEMA Guidelines for E-Waste Management, 2010	The E-waste Guidelines were developed to streamline the procedures of handling and disposal of e-waste generated by various sectors to enhance environmental conservation. The e-waste guidelines provide a framework for identification, collection, sorting, recycling and disposing of electrical and electronic waste (e-waste). The guidelines include approaches to enhance environmental protection, environmental awareness, categories of e-waste, e-waste treatment technologies and disposal procedures.	The Proponent and Contractor should put into use the e-waste guidelines in the handling and disposal of e-waste that will potentially be generated by the project i.e. solar array panels during all phases of the project.
14.	Draft E-Waste Regulations, 2013	These regulations were prepared in 2013 but are yet to be promulgated. Some sections of these regulations that apply to the proposed project include: • Regulation 13 stipulates proper transportation of e-waste • Regulation 16 requires all electrical and electronic equipment to bear labels indicating the year and country of manufacture • Regulation 17 states prohibitions on poor e-waste disposal • Regulation 18 requires Environmental Sound Management of e-waste Regulation 26 and 29 defines offences relating to false information, and general penalty, respectively.	The Proponent should ensure that procurement of equipment (electronic and electrical equipment) that will generate e-waste is done in accordance with the regulations. The Contractor should ensure that handling, storage and disposal of the e-waste in an environmentally sound manner
15.	The Energy Act, 2019	The Energy Act of 2019 deals with all matters relating to all forms of energy including the generation, transmission, distribution, supply and use of electrical energy as well as the legal basis for establishing the systems associated with these purposes. The Act also established the Energy and Petroleum Regulatory Authority (EPRA).	The proponent is in line with the Energy act regulations in the following ways. - The proponent has identified an available site - alignment of the Mini-Grid Project to County development plans. - the Mini-Grid proponent has the technical and financial capability to conduct the project The proponent has conducted the necessary engagement with the community.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
16.	The Energy (Solar Photovoltaic Systems) Regulations, 2012	These regulations shall apply to a solar PV system manufacturer, importer, vendor, technician, contractor, system owner, a solar PV system installation and consumer devices. The Regulations prohibits any person from designing or installing any solar PV system unless he/she is licensed by EPRA.	The Regulations regulates the design and installation of PV systems. The persons engaged in the designing and installation of the Mini-Grid shall be licensed by EPRA
17.	The Public Health Act (Cap. 242)	The Act prohibits the proponents from engaging in activities that cause environmental nuisance or those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety.	The proponent will be in line with the regulations of this act and will ensure suppression of infectious diseases and maintain proper sanitation during all the phases of the project.
18.	Community Land Act, 2016	This Act is critical for the proposed project is within community land. Section 6(1) of the Act provides that 'county governments shall hold in trust all unregistered community land on behalf of the communities for which it is held'. Furthermore, Section 6(2) maintains that 'the respective county government shall hold in trust for a community any monies payable as compensation for compulsory acquisition of any unregistered community land'. Section 30(1) states that 'Every member of the community has a right to equal benefit from community land'. Section 26(1) provides that 'a community may set aside part of the registered community land for public purposes and Sub-section (2) holds that 'where land is set aside for public purposes under Sub-section (1), the (Land) Commission shall gazette such parcel of land as public land'. These provisions offer a window for the proposed project to acquire land for project works legally for communities as necessary and to convert the same into public land. This is useful for the project as once done powerful groups will not have opportunity to exclude them on account of their socio - economic statuses. In any event, Section 35 holds that, 'subject to any other law, natural resources found in community land shall be used and managed- (a) Sustainably and productively. (b) For the benefit of the whole community including future generations. (c) With transparency and accountability; and (d) On the basis of equitable sharing of accruing benefits.	- The proposed project site falls on community land and the land belongs to the community in Forole. The community has since offered to the land in kind for project use. The establishment of the mini grid will convert communal land to industrial use for long term. Further, based on community need assessment the proponent will undertake in kind development project to support the community water needs. The proponent should adhere to the provision of this legislation

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		The concept of community land has been defined broadly enough to include VMGs. Women, children, old people, and future generations have been thought of as PAPs and thus their rights secured in this Act	
19.	The Land Act, 2012	The Land Act 2012 is the substantive law governing management of land in Kenya. It provides for the legal regime that will govern inter alia, the administration and management of public land and private land; contracts over land, leases, charges, compulsory acquisition, easements and related rights. The state organ responsible for land matters in Kenya is the National Land Commission (NLC).	Part VIII of the Land Act 2012 (Articles 107 – 133) describes the process that needs to be followed for compulsory acquisition of interests in public land. This part of the Land Act will be followed by the Proponent/Contractor for securing the and upon which the proposed solar power plant will be developed.
20.	Environment and Land Court Act, No. 19 of 2011	This Act gives effect to Article 162(2)(b) of the Constitution to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes	The project Grievance Redress Mechanism provides legal address as an option for alternative dispute resolution. The PAPs can seek redress on disputes relating to land and environment through the Environment and Land Court or if they are dissatisfied with NLC's decision in matters relating to compulsory land acquisition.
21.	The Physical and Land Use Planning Act, 2019	This Act of Parliament makes provision for the planning, use, regulation, and development of land and for connected purposes.	The proposed site is not in contravention of any Zoning regulations. The project site is within unregistered community land; necessary county approvals will be sought by the proponent e.g., Project design approval and change of use. The approvals shall be issued by the Physical planner in the department of Lands, Housing and Urban Development – Marsabit County.
22.	The Employment Act No 11 of 2007	This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the energy sector.	With the Contractor and the Project Proponent being primary employers during the construction and operational phases of the Project, respectively, they are bound by this law to abide to its stipulations on employee management and relations
23.	The Work Injury Benefit Act, 2007	This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment	The Proponent and Contractor will maintain an insurance policy cover for its employees, record of accident, carryout proper accident investigations; organize for pre-employment and regular medical examinations for staff.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
24.	Children Act, 2012	This is an Act of Parliament to make provision for care and protection of children; to give effect to the principles of the Convention on the Rights of the Child and the African Charter on the Rights and Welfare of the Child for connected purposes	The Proponent and contractor will not employ children in any manner that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.
25.	Persons with Disability Act, Chapter 133	This Act provides for the protection of the rights of people with disabilities ensuring they are not marginalized and that they enjoy all the necessities of life without discrimination. The Act guarantees that (1) No person shall deny a person with a disability access to opportunities for suitable employment. (2) A qualified employee with a disability shall be subject to the same terms and conditions of employment and the same compensation, privileges, benefits, fringe benefits, incentives or allowances as qualified able-bodied employees. (3) An employee with a disability shall be entitled to exemption from tax on all income accruing from his employment.	The Act will be adhered to in order to ensure that persons with disability are included in all decision making that affects their lives and also monitored to make sure they are not excluded from project benefits and that negative impact of the project do not adversely affect them.
26.	The Sexual Offences Act,2006	This is a comprehensive law that criminalizes a wide range of behaviours including rape, sexual assault, defilement, compelled or induced indecent acts with child imbeciles or adults, gang rape, child pornography, child trafficking, child sex tourism, child prostitution, exploitation of prostitution, incest by male and female persons, sexual harassment, deliberate transmission of HIV or other life threatening sexually transmitted disease, stupefying with sexual intent, forced sexual acts for cultural or religious reasons among others. The Act also has orders for medical treatment for victims including free HIV prophylaxis, emergency pregnancy pill and counselling. The Act provides stiff penalties in which most of the crimes attract minimum of ten years imprisonment which can be enhanced to life imprisonment.	This Act mitigates the risk of GBV-SEA/SH foreseen in the mini grid project particularly during the construction and decommissioning phases due to labor influx.
27.	Air Quality Regulations (2014)	Regulation 3 stipulates that 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 Proponent and contractor will implement mitigation during construction to ensure neighbouring properties are not impacted by nuisance dust

5.7 National Administrative Requirements

A brief description of the relevant enforcement agencies with respect to the institutional framework is described in the table below.

Table 8: Relevant Enforcement agencies

Main Actors	Key Functions
Ministry of Energy	Under the leadership of a Cabinet Secretary, the ministry is responsible for formulation and articulation of energy policies through which it provides an enabling environment for all stakeholders. Its tasks include national energy planning, training of manpower and mobilization of financial resources.
Energy and Petroleum Regulatory Authority (EPRA)	The Energy Act establishes the EPRA to, among other functions: regulate production, conversion, distribution, supply, marketing and use of renewable energy; collect and maintain energy data; ensure, in collaboration with the Kenya Bureau of Standards, that only energy-efficient and cost-effective appliances and equipment are imported into the country; and co-ordinate the development and implementation of a national energy efficiency and conservation action plan. The powers of the Authority include, but are not limited to, the power to: issue and renew licenses and permits for all undertakings and activities in the energy sector; manage electric power tariffs and tariff structures; investigate tariff charges; formulate, set, enforce and review environmental, health, safety and quality standards for the energy sector; approve electric power purchase and network service contracts for all persons engaging in electric power undertakings; investigate and determine complaints or disputes between parties over any matter relating to licenses and license conditions under the Energy Act; and impose such sanctions and fines as may be appropriate for violation.
Energy and Petroleum Tribunal	The Energy Act establishes the Tribunal to hear and determine civil disputes and appeals from the EPRA and any other licensing authority relating to the energy and petroleum sector. The Tribunal has powers to grant equitable reliefs including, but not limited to injunctions, penalties, damages, specific performance, and the power to, on its own motion or upon application by an aggrieved party, review its judgments and orders.
Rural Electrification and Renewable Energy Corporation (REREC)	The main purposes of the RERC are to spearhead development of renewable energy resources in Kenya and to accelerate the pace of rural electrification in the country. The REREC is mandated under The Petroleum Act to undertake feasibility studies and maintain data with a view to availing the same to developers of renewable energy resources and provide an enabling framework for the efficient and sustainable production, conversion, distribution, marketing, and utilization of renewable sources in Kenya.
Renewable Energy Resource Advisory Committee	The Committee is intended to play an advisory role to the Cabinet Secretary for the Ministry of Energy and Petroleum on the criteria for allocation of renewable energy resource, licensing of renewable energy resource areas, management of water towers and catchment areas, development of multi-purpose projects such as dams and reservoirs for power generation and management and development of renewable energy resources.

5.8 International Safeguard Requirements

The table below shows the applicability of World Bank Safeguards as it applies to the proposed project in Forole area.

Table 9. World Bank Safeguards

S. No.	Safeguard Policies	Applicability	Description
1.	Environmental and Social Impact Assessment (**OP/BP 4.01**)	The policy is applicable to this project because there are environmental and social concerns associated with the construction and operation of the proposed project. In response, the KPLC has commissioned and Environmental impact assessment in order to identify and address the potential impacts to a level that is acceptable.	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 environmental and social screening, analysis of actions and mitigation of their likely environmental and social impacts and monitoring.

S. No.	Safeguard Policies	Applicability	Description
2.	Indigenous People (**OP/BP 4.10**)	The policy is applicable because the main inhabitants of Forole who are the Gabra classified as a marginalized group in Kenya. The Gabra are main inhabitants of Forole, other beneficiaries are the Borana/Wayu(Wala) and kikuyu will be beneficiaries of the proposed solar mini-grid. Further the proponent will continue to engage the beneficiaries in a culturally appropriate way and allow for decision making in a free, prior and informed consent manner throughout the phases of the project.	The objective of this policy is to (i) ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; (ii) ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and (iii) ensure that indigenous peoples receive culturally appropriate and gender and intergenerational inclusive social and economic benefits.
3.	Land Acquisition and Involuntary Settlement (**OP/BP 4.12**)	The policy is applicable for the entire project because there is land acquisition for the Mini-grid, Wayleaves, contractor facilities and worker's camps	The objective of this policy is to (i) avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; (ii) assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them; (iii) encourage community participation in planning and implementing resettlement; and (iv) provide assistance to affected people regardless of the legality of land tenure.
4.	Natural Habitats (**OP/BP 4.04**)	The proposed project will not significantly affect natural habitats due to its area of coverage. Additionally, caution will be taken to ensure minimum disruptions to habitats as guided by the (Environmental and Social Management and Monitoring Plan) ESMMP.	This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work.

5.8.1 World Bank Policy OP 4.01 Environmental Assessment

World Bank requires environmental assessment for projects proposed for the Bank financing to help ensure that they are environmentally sound and sustainable, and thus improve on decision making. 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.

Category A: A proposed project is classified as Category A if it is likely to have significant adverse impact on the environment. A project with complicated impact or unprecedented impact which is difficult to assess is also classified as Category A. The impact of Category A projects may affect an area broader than the sites or facilities subject to physical construction.

Category B: A proposed project is classified as Category B if its potential adverse environmental impact is less adverse than that of Category A projects. Typically, this is site-specific, few if any are irreversible, and in most cases normal mitigation measures can be designed more readily.

Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impact. Projects that correspond to one of the following are, in principle, classified as Category C.

The World Bank has well-established environmental assessment procedures, which apply to its lending activities and to the projects undertaken by borrowing countries, in order to ensure that development projects are sustainable and environmentally sound. Although its operational policies and requirements vary in certain respects, the World Bank follows a relatively standard procedure for the preparation and approval of an environmental assessment study, which;

(i) Identifies and assesses potential risks and benefits based on proposed activities, relevant site features, consideration of natural/human environment, social and trans-boundary issues.

(ii) Compares environmental pros and cons of feasible alternatives.

(iii) Recommends measures to eliminate, offset, or reduce adverse environmental impacts to acceptable levels (sitting, design, technology offsets).

(iv) Proposes monitoring indicators to implement mitigation measures.

(v) Describes institutional framework for environmental management and proposes relevant capacity building needs.

The assessment considers: the natural environment (air, water, and land); human health and safety) social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources); and transboundary and global environmental aspects. OP4.01 is triggered because the project is likely to have adverse environmental and social impacts that are considered in this ESIA report.

5.8.2 World Bank Policy OP 4.04 Natural Habitats

The policy is designed to promote environmentally sustainable development by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. The policy seeks to ensure that World Bank-supported infrastructure and other development projects considers the conservation of biodiversity, as well as the numerous environmental services and products that natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water area where most of the native plant and animal species are still present).

This project will have an interaction with natural habitats observed on site, this policy will be triggered since the project will be implemented in a rural and remote area that may not negatively affect diverse flora, fauna, and avifauna.

5.8.3 World Bank Policy OP 4.12 Involuntary Resettlement

The policy states that —where large-scale of population displacement is unavoidable, a detailed resettlement plan, timetable, and budget are required. Resettlement plans should be built around a development strategy and package aimed at improving or at least restoring the economic base for those relocated.

Experience indicates that cash compensation alone is normally inadequate. Voluntary settlement may form part of a resettlement plan, provided measures to address the special circumstances of involuntary resettled people are included. Preference should be given to land-based resettlement strategies for people dislocated from agricultural settings. If suitable land is unavailable, non-land-based strategies built around opportunities for employment or self-employment may be used.

Involuntary resettlement is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The objective of this policy is to avoid

or minimize involuntary resettlement, though participation in resettlement planning and implementation and, where this is not feasible, to assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects. *The project site is located within communal land. This policy is thus is triggered since there is land take and take procedures will align to the RPF prepared under this project.*

5.8.4 World Bank Policy OP 4.10 Indigenous Peoples

This policy contributes to the Bank 's mission of poverty and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies and cultures of indigenous peoples. For all projects that are proposed for Bank financing and affect indigenous peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consultation. *This policy is thus not triggered as there are no indigenous persons in the project area.*

5.8.5 Alignment of WB and GoK policies to this project

- Both the World Bank safeguards policies and GoK laws are generally aligned in principle and objective: Both require Environmental and Social Assessment before project design and implementation (which also includes an assessment of social impacts).
- Both require public disclosure of ESIA reports and stakeholder consultation during preparation.
- While OP 4.01 of World Bank stipulates different scales of ESIA for different category of projects, Kenya 's EMCA requires environmental screening to be undertaken for new projects. In the event that notable environmental impacts will occur as a consequence of the sub- project, then an EIA will be undertaken for those sub-projects. If there would only be minimal impacts for a sub-project then the results of the environmental screening will be prepared and submitted to NEMA and the World Bank.
- Where EMCA requires Strategic Environmental Assessments, OP 4.01 requires that an Environmental Assessment be conducted, the complexity and nature of which depends on the project category.
- EMCA recognizes other sectorial laws while WB has safeguards for specific interests.
- The Bank requires that stakeholder consultations be undertaken during planning, implementation and operation phases of the project which is equivalent to the EMCA requirements. Additionally, statutory annual environmental audits are required by EMCA.
- In Kenya, it is a mandatory requirement under EMCA 1999 for all development projects (Schedule Two) to be preceded by an EIA study. Thus, under the Laws of Kenya, environmental assessment is fully mainstreamed in all development process consistent with World Bank safeguard policies on EA. Further, in order to fully insure against triggers to WB safeguard policies, individual investments will be screened against each policy as part of the EIA project report requirements

5.9 Environmental and Social Management Framework (ESMF) for KOSAP

An Environmental & Social Management Framework (ESMF) for KOSAP was prepared by the Environment & Social Unit, Safety, Health & Environment (SHE) Department of Kenya Power in liaison with REA (now REREC) and MoEP now (MOE). The purpose of the Environmental and Social Management Framework

(ESMF) was to provide a procedure for environmental and social assessment of the proposed REA, KPLC and MoE subprojects.
The framework was prepared because the geographic coverage for KOSAP was generally known but the exact locations for the sub projects had not been identified. The ESMF provides guidelines for MoE, KPLC & REREC in determining the appropriate level of environmental and social assessment required for the sub-projects and in preparing the necessary environmental and social mitigation measures for these sub-projects.
This ESIA report for Forole Project Site is guided by this KOSAP ESMF.

5.10 Resettlement Policy Framework (RPF) for KOSAP

A resettlement policy framework report was prepared following the Kenyan laws and World Bank policy (O.P 4.12) on involuntary resettlement. The RPF states that K-OSAP component 1 (Mini-grids for Community Facilities, Enterprises, and Households) which involves installation of mini-grids will require land acquisition.
The Framework seeks to avoid, manage, and/or mitigate potential risks arising out of damage to assets, disruption to work, temporary negative impacts on livelihoods and/or in the unlikely case of displacement. The RPF proposes guidelines to develop a Resettlement Action Plan and propose an implementation framework for RAP to mitigate such effects. The RPF states that involuntary resettlement and land acquisition will be avoided where feasible, or minimized or compensated where it cannot be eliminated. Where involuntary resettlement and land acquisition are unavoidable, resettlement and compensation activities will be conceived and executed as sustainable development programs, providing resources to give PAPs the opportunity to share project benefits.
The Ministry of Energy has partnered with the community who are the owners of the land and the County government of Marsabit in identifying land for the proposed project. The sub-project site will be acquired compulsorily by NLC, and in-kind compensation in form of priority community projects provided to affected communities. Further, A-RAPs has been prepared and implemented in sub-project sites on community land (unregistered and registered) and private land. The A-RAP stipulates procedures and actions for acquiring land and compensating affected communities. The A-RAP also document the land acquisition consultations undertaken with affected communities.

5.11 Vulnerable and marginalized Groups Framework (VMGF) for KOSAP

As noted above the KOSAP project trigged O.P 4.10 policy on Indigenous People and therefore a Vulnerable and Marginalized Groups Framework (VMGF) was prepared for use by the Ministry of Energy (MOE) and the implementing agencies KPLC and REREC and other stakeholders. The framework was prepared then because was known that IPs are present in all the 14 target project counties. However, at that stage of project preparation, the exact sub-project sites were not yet identified and the exact impacts of the project on VMGs were not yet completely known. The VMGF describes the policy requirements and planning procedures that during the preparation and implementation of components especially those identified as occurring in areas where VMGs are present.
The purpose of the VMGF is to guide management of issues related to Vulnerable and Marginalised Groups (VMGs) during the development and operation of proposed sub projects and to ensure effective mitigation of potentially adverse impacts while enhancing sharing of benefits.

In regards to the Solar Mini-grid in Forole, the main inhabitants are the Gabra community are classified as VMGs in Kenya other inhabitants include the Borana, Wayu and few kikuyus. The ESIA did not identify any adverse impact on the Ajuran community therefore, a Vulnerable and Marginalized Group Plan (VMGP) will not be required. However, elements of the VGMP such as inclusion of VMGs in the stakeholder

engagement process and representation on the locational grievance redress committee will be captured in the ESMP.This will help to ensure that the Gabbra community is able to access culturally appropriate benefits and opportunities from the project in a manner that is gender-sensitive and intergenerationally inclusive. The ESMP will strive to maintain the cultural and social fabric of the Gabbra community while also promoting sustainable development.

5.12 Comparison between the World Bank and Kenyan Laws to this Project

A comparison between the WB policies and the Kenyan law is presented in this section. The objective is to find out any gaps and propose a recommendation.

Table 10: Comparison between the WB safeguard policies and the Kenya Legislation

World Bank safeguard Policies	Kenyan laws	Comparison	Recommendation
O.P 4.01 **requires screening to determine level of environmental and social assessment to be done** **An ESIA is prepared before project implementation**	EMCA requires screening of project to determine level of environmental and social assessment to be done An ESIA is required once determination is done	Similar both require screening	Screening has been done and the project is established as medium risk which requires and ESIA
ESIA is needed once determination had been established and should be prepared identifying all environmental and social impacts and mitigation measures proposed to address the impacts	ESIA is needed once determination had been established and should be prepared identifying all environmental and social impacts and mitigation measures proposed to address the impacts	Similar-both require ESIA depending on the project impacts	ESIA is prepared in line with EMCA /EIA regulations and makes reference to WB safeguard policies
O.P 4.12 **Land Acquisition and Involuntary resettlement should be avoided wherever possible or minimized and exploring all alternatives**	The Government and any other organization shall prevent internal displacement linked to development projects to the extent possible by exploring other alternatives.	Similar**-** displacement in projects should be avoided to the extent possible by exploring alternatives.	WB policy is more elaborate than the Kenyan Law.
O.P 4.10 **on indigenous people seeks to promote the inclusion of these group in development project and especially through consultation to ensure they also share in the project benefits and ensure negative impacts do not disproportionately fall on them** **The policy requires these groups to be consulted separately to enhance their participation**	The Constitution of Kenya 2010 article 56 provides for the right of marginalized communities and the importance of their input in decision making that regards them. National Gender and Equality Act and the Children's Act and Persons with disability Act seeks to promote the inclusion of these persons in all issues as they are often overlooked and left out. Emphasis is also on consulting with them	Similar-both seek to promote inclusion of these group so that they do can share the projects benefits and ensure that negative impacts of the project do not fall on them disproportionately WB needs a social assessment to be conducted	WB policy more elaborate and the two are being used to compliment
Project affected persons should be meaningfully	EMCA requires that the project owner seeks the views of the	Both are similar	Consultation has been done and will be progressed in line with

World Bank safeguard Policies	Kenyan laws	Comparison	Recommendation
consulted and be given opportunities to participate in planning and implementing of projects and especially where there is resettlement	people who are affected and explain the project information to them and especially the impacts of project and also obtain their opinions or comments		the two WB policy and Kenya legislation

6 STAKEHOLDER ENGAGEMENT

This section profiles the key stakeholders for the Forole solar mini-grid project site and assesses their potential concerns and levels of influence. The process of stakeholder engagement involved.

i. Stakeholder identification and analysis
ii. Planning how the engagement with stakeholders will take place.
iii. Disclosure of information.
iv. Consultation with stakeholders
v. Addressing and responding to grievances; and
vi. Reporting to stakeholders

6.1 Legal Requirement for Stakeholder Engagement

The overall objective and the spirit of the Kenya constitution is to involve citizens in project formulation and implementation at the local level. This is enshrined in our constitution in Article 35 which provides that 'every citizen has the right of access to information held by the state; and information held by another person and required for the exercise or protection of any right or fundamental freedom'.

Further public participation is an essential and legislative requirement for environmental authorization. The ESIA team undertook the stakeholder consultation (SC) for the proposed project in accordance with the requirements for as stipulated in the EMCA, 1999 and its 2015 amendments and ESIA/EA Regulations 2003. The main purpose of public participation is to provide project information to stakeholders and allow them the opportunity to provide input and comment on the project, including issues and alternatives that are to be investigated, thereby facilitating informed decision-making.

Therefore, public participation was a key component of the ESIA of the proposed solar Mini-grid in Forole. Project information was shared with different stakeholders mainly government officers and also community/project affected persons/beneficiaries. The positive and negative views of the stakeholders on the project were sought. The exercise was conducted through a public meeting/baraza, key informant interviews. In addition, gender and intergenerational dimensions of the community members were considered and three separate focus group discussions sessions were held with the men, women and the youth.

The disclosure process will take into consideration any challenges that may impact the affected persons' ability to participate in the dissemination of the ESIA findings. These could include mobility issues, disabilities, or illiteracy. The goal is to ensure that everyone who may be impacted by the proposed project has the opportunity to understand the process of the ESIA and provide input.

6.2 Objectives of Public Participation

- To assess the level of stakeholder interest and support for the project.
- To enable stakeholder's views to be considered in project design and implementation.
- To establish and maintain constructive relationships and means for effective and inclusive engagement with project affected parties on issues that could affect them.
- To ensure appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely and accessible matter.

The purpose of stakeholder engagement/participation is to identify stakeholders and to allow such parties the opportunity to provide input and comment on the project, including issues and alternatives that are to be investigated, thereby facilitating informed decision-making. Stakeholder participation involves both disseminating information about the project as well as gathering primary data from stakeholders regarding the project. Therefore, data collection was a key component of the EIA of the proposed project. The first source of information was literature review of project documents, site visit coupled with observations and

discussion with the project engineers and other project officers. Further information and views on the project were also sought from other government officers at the county and from the target community.

Part of the key project information that was shared with the stakeholders to enable them to understand the project included; positive and negative impacts of the project including potential opportunities. The information specifically focused on; the objective, nature and scale of the project, potential risks and impacts of the project on local communities, mitigation measures to the negative impacts, need for future consultations and means of raising and addressing impacts.

6.3 Stakeholder Consultation and Disclosure Requirement for the Project

Public participation is both necessary and legally required for environmental authorization. The ESIA team conducted a public stakeholder consultation for the proposed project in accordance with the EMCA, 1999 and EIA/EA Regulations 2003 requirements for an EIA study and the World Bank OPs 4.01 Environmental & Social assessment. The primary goal of public stakeholder participation is to identify project affected persons (PAPs) and other stakeholders and provide them with the opportunity to provide input and comment on the EIA process, including issues and alternatives to be investigated, facilitating informed decision-making. In complying with the public participation process (PPP) for the EIA, consultations were carried out to ensure that issues, concerns and potential impacts identified by all stakeholders from public and government were addressed fully.

Public participation was a key component of the ESIA of the proposed solar mini grid sub-project at Forole. The views and opinions of the Project affected persons (PAPs) and other stakeholders' in terms of positive and/or negative impacts of the sub-project was sought. The exercise was conducted through interviews and Focus group discussions conducted with PAPs and other stakeholders. There was a Public Baraza for members of the community where they got a chance to air out their views in regard to the proposed project which will be implemented in their neighborhood.

The respective minutes and list of participants for the public consultation undertaken at Forole center is enclosed under appendices in page 11-6 of this report. Further, an initial communication was shared with the county commissioner Marsabit and Chief for Forole location on 6th January 2022, two (2) weeks prior to the public participation meeting held on 20th January 2022 at Forole center. Background information document (BID) with project details was posted clearly on one of the regular shops at Forole shopping center.

6.4 Stakeholder Characterization and Identification

A stakeholder is "a person, group, or organization that has a direct or indirect stake in a project/organization because it can affect or be affected by the Project/organization's actions, objectives, and policies" Stakeholders thus vary in terms of degree of interest, influence and control they have over the project. Stakeholders are classified in the following two categories.

- **Project affected persons**- Stakeholders who have a direct impact on or are directly impacted by the project.
- **Interested parties** - Stakeholders who have an indirect impact or are indirectly impacted by the project.

In line with the nature of the project and its setting in Forole the stakeholders have been identified and listed in the table given below.

Table 11. Identified Stakeholders

Stakeholders		Consultation Tool
Project affected Persons	Individuals	**Public Meeting** ✓ Public meetings were held at Forole community baraza point on 20th January 2021. ✓ The first meeting was held with attendance of 42 community members. **Focus Group Discussions (FGD)** ✓ For the first consultations the FGDs were conducted with the men, women, youth while the second consultation was with the men, women, youth and VMGs. 18 males, 10 women and 12 youths represented each group.
	Institutions	**Key Informant Interviews (KII)** ✓ During the second round of consultations, the KII for Forole Primary school and Forole Dispensary was conducted through a one-on-one interview.
	Institutions/ Households	✓ The chief was also interviewed on the Community Profile of Forole.
Interested Parties	Interested Parties: • County Government of Marsabit	**Meeting** During the first consultation a meeting was held with the County Governor and county officials

6.4.1 Stakeholder Mapping

Stakeholder mapping is a process of examining the relative influence that different individuals and groups have over a project as well as the influence of the project over them. The purpose of a stakeholder mapping is to:

- ✓ Identify each stakeholder group.
- ✓ Study their profile and the nature of the stakes.
- ✓ Understand each group's specific issues, concerns as well as expectations from the project
- ✓ Gauge their influence on the Project.

The significance of a stakeholder group is categorized considering the magnitude of impact (type, extent, duration, scale, and frequency) or degree of influence (power and proximity) of a stakeholder group and urgency/likelihood of the impact/influence associated with the stakeholder group in the project context. The magnitude of stakeholder impact/influence is assessed taking the power/responsibility and proximity of the stakeholder group and the group is consequently categorized as negligible, small, medium, or large. The urgency or likelihood of the impact on/influence by the stakeholder is assessed in a scale of low, medium, and high. The overall significance of the stakeholder group is assessed as per the matrix provided in Table below.

Table 12: Stakeholder Significance and Engagement Requirement

		Likelihood of Influence on/ by Stakeholder		
		Low	Medium	High
Magnitude of impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

6.5 Stakeholder Analysis

The table below has been used to classify the identified stakeholders (directly or indirectly impacting the project) in accordance with their levels of influence on the project. The influence and priority have both been primarily rated as:

- **High Influence**: This implies a high degree of influence of the stakeholder on the project in terms of participation and decision making or high priority to engage with the stakeholder.
- **Medium Influence**: Which implies a moderate level of influence and participation of the stakeholder in the project as well as a priority level to engage the stakeholder which is neither highly critical nor are insignificant in terms of influence; and
- **Low Influence**: This implies a low degree of influence of the stakeholder on the project in terms of participation and decision making or low priority to engage that stakeholder.

The intermediary categories s of low to medium or medium to high primarily imply that their influence and importance could vary in that range subject to context specific conditions or also based on the responses of the project towards the community.

The coverage of stakeholders as stated above includes any person, group, institution, or organization that is likely to be impacted (directly or indirectly) or may have interest/influence over project. Keeping this wide scope of inclusion in stakeholder category and the long life of project, it is difficult to identify all potential stakeholders and gauge their level of influence over project at the outset of the project. Therefore, the project proponent is advised to consider this stakeholder mapping as a live document which should be revised in a timely manner to make it comprehensive for any given period.

6.6 KEY SUMMARY OF COMMUNITY CONSULTATION MEETING LEADING TO LAND IDENTIFICATION AND GRC CONSULTATION-(SCREENING LEVEL) PROCESS

The project team addressed the community during the Baraza, seeking their consent for the project. The land required for the Mini-grid was 2-5 acres and falls under the category of Community land, jointly owned by the community and governed by the Community Land Act 2016. The team's surveyor explained various methods of acquiring land, including allocation, adjudication, compulsory acquisition, settlement programs, transfers, and long-term leases.

They informed the community about their rights and entitlements, such as the right to refuse to give the land, seek compensation for the project land, or accept the project. They also have the right to resettlement assistance and livelihood restoration measures if their livelihood strategies are impacted.

The community were presented with different options for land compensation, including cash payment after land valuation, land-for-land compensation, and compensation in kind through community projects like classrooms, dispensaries, or boreholes, which is the preferred option. The team highlighted the importance of collective decision-making involving all community members and encouraged community consent through signed agreements by representatives nominated by the community. They explained the concept of advance possession, requesting the community to allow the implementing agency to commence construction on the land while the transfer process is ongoing, with community consent.

The community in Forole agreed to set aside land for Mini grid construction. A Land Identification form was signed by the representative of the community, the county government and the Implementing Agencies summarizing the process of land identification and the agreements reached with the community. The Land Identification Form is attached at the end of this report.

6.7 KEY FEEDBACK RECEIVED DURING STAKEHOLDER CONSULTATION PROCESS

A Consultative Public Participation (CPPs) session is conducted to provide project information and facts to the local community and other stakeholders especially local government administrator thus giving them a platform to enable them to express their appreciation, concerns and fears as well as contribute ideas and opinions towards the project sustainability.

The MoE representative assisted by the KPLC representative gave a description of the KOSAP project and clarified that its objective was to electrify Forole because the area is not connected to the national grid. They also informed the community that they would access the electricity at a subsidized cost and that the public facilities such as the schools, hospitals and public boreholes would also be connected at the same cost (one thousand shillings). The environmental and social experts shared with the community the ESIA process and discussed the potential impacts associated with the project and the proposed mitigation measures that would reduce the significance of the adverse impacts.
It was also explained that compensation for the land identified by the community for the proposed project will be done in-kind; as a community project chosen from education, health or water sector. The Ministry of Energy through its implementing agency (KPLC) would undertake a project for the community in water, health or education sector up to a cost of the value of the cost of the land taken and informed by the NLC valuation criteria. The community was to choose the project of their own choice in the three sectors. Other methods compensation for community land is payment in cash and land for land

A detailed CPP and community engagement for Forole Solar Mini Grid was held in Forole village, Forole Location, at Forole center on 20th January 2022 chaired by the area senior chief Mr. Matthew Mamo Gonicha. The general stakeholder consultation was done in a public meeting (Baraza) organized at Forole community baraza point at the center. The main general baraza was attended by 42 community members from Forole location. The meeting was chaired by the area senior chief assisted by the elders. In addition, during the FGD 18 males, 10 women and 12 youths were in attendance. The feedback received during the stakeholder consultation process have been summarized below.

Table 13: Summary for Forole Community Baraza

No.	Name	Issue	Comments	Response
1.	Kala Duba Community member – Forole	CSR	Pumping community water from borehole	• There was another planned borehole solarization project underway
2.		Unauthorized access	Restriction of unauthorized access to the project site to reduce damage to the plant	• Team of experts and engineers shall assess the site and determine the extent of fencing needed and materials to be used to prevent unauthorized access by both people and animals • The mini grid shall be provided with security personnel and installed with adequate notices prohibiting unsafe access in and out of the substation
3.	Elema Community member – Forole	Connection and usage costs	Installation and periodic electrical consumption	• The installation fee shall be one thousand shillings and continuous consumption will paid through tokens depending on one's magnitude of usage
4.	Solomon Elder – Forole	Employment opportunities	Employment opportunities to the skilled and unskilled labour/personnel from Forole community	• Only competent persons will be expected to carryout wiring and this shall be determined by engineers • Opportunities shall be shared through the chief's office who would determine whether the community shall be considered. All unskilled labour shall be given to the locals.

No.	Name	Issue	Comments	Response
				• The nature/type of housing shall not limit access to power. Proper assessment shall be conducted and determined on how power will be supplied in the temporary manyatta houses
5.	Abdub Community member – Forole	Risk of fire outbreaks and household accidents Risk of e-waste pollution	Fire incidents/ utility accidents e-waste handling i.e., solar panels other electronic materials	• Should there be a fire incident investigation by KPLC team should determine the damage of property and cause of fire. If determined it was a power surge or KPLC fault the owner of the household shall be compensated based on damage made. • The total watt\no. of panels and related accessories has already been determined by the engineers and should there be an excess, it shall be the responsibility of the contractor to handle.
6.	Gobana Community member - Forole	Lighting capacity	Capacity for street lighting	• The proposed project was enough to light up all identified public utilities (schools, dispensary, hospital, market).
7.	Matthew Mamo Chief- Forole	CSR	In kind compensation	• The project considered households within 3km of the project site. • A committee will be identified to monitor progress of the selected project and this will be on voluntary bases to help address community needs. • The proposed site was considered after being assessed and found viable based on the project specifications

6.7.1 Positive Comments about the Project from the Participants

Some of the positive impacts that were identified by the participants include the following.

- ✓ Learning in school and homes will improve due to availability of lighting. In school ICT will be integrated in teaching and learning
- ✓ Access to power will greatly boost communication and businesses in the area therefore contributing to positive economic growth within Forole and neighbouring villages
- ✓ Employment opportunities will increase for the locals including the youth and women due to increase in business opportunities
- ✓ Security will improve due to availability of lighting within the streets and households
- ✓ Medical services will improve due to availability of refrigeration services

6.7.2 The identified negative impacts of the project

Some of the negative impacts that were identified by the participants include the following.

- ✓ **Electrocution:** Some of the members raised concerns of possible accidents from electrocution to the locals, mentioning need to educate the community on the dangers of electricity and safe precaution measures. They also suggested use of concrete poles.
- ✓ **Employment Disputes:** There was a concern over the possibility of disputes arising between the local community with people of different cultures in the construction sites. The community suggested that proponent should consider employing local construction workers.
- ✓ **Dust, emissions and spills:** The participants expressed concern over possibility of generation of dust within the project site and surrounding areas during construction phase (excavation works and transportation of building materials) and spillage from the generator and other machinery resulting to pollution of underground water and air.

The proponent will ensure that dust levels at the site are minimized through sprinkling water in areas being excavated and along the tracks used by the transport trucks within the site. Additional mitigation measures presented in this report will be fully implemented to minimize the impacts of dust generation. Generator and other machinery shall be well maintained to ensure that there is no spillage and the emissions are within set standards.

Other concerns

- Some members felt all stakeholders should be well enlightened about the project to eliminate spread of wrong information. Emphasis was made on informing the members about the possible negative impacts from the project
- Some of the members asked whether they be required to pay the cost of connection or only the daily usage
- When the project would commence and how long it would take to complete were asked
- Questions were also raised on whether the labor and raw materials will be sourced from the community.

6.7.3 Additional Responses from the Consultant

The consultant while addressing the community's issues raised, gave the following response.

- ✓ Resident, business or public facility will be connected to the electricity at an affordable cost
- ✓ That the Contractor/KOSAP will rehabilitate and plant trees after the construction phase of the project
- ✓ Every household would pay Ksh 1000 for power installation
- ✓ All non-skilled labor will be sourced from the Forole Community
- ✓ He assured the community that the project will commence soon after ESIA

6.7.4 Consent

The Community members present agreed unanimously accepted the Project Proposal.

6.7.5 Community Presentation

6.7.5.1 Adult to youth Representation

During the stakeholder's consultation adults were more represented than the youth as shown in the table below.

6.7.5.2 Gender Representation

Table 14. The consultative meeting had a wide representation

Category	Male	Female
Youth	8	4
Adult	60	10
TOTAL	**68**	**14**

6.7.5.3 Heads of Households

It was noted during the stakeholder consultation that male are the household heads.

6.8 Focused Group Discussions analysis

The in-depth interviews were used as a tool for stakeholder identification and mobilization as well as collection of baseline data to enable identification of the likely project impacts. In addition, it provided an

opportunity to the participants to raise their fears and concerns as well as make recommendation as pertains to the project.

During the discussions, information was gathered different roles, livelihood, health issues, challenges, perception of quality of life, education options for children, health care and project perception.

The consultative meeting had a wide representation as follows:

Table 15. The consultative meeting had a wide representation

Category	Male	Female	Total
Youth	8	4	12
Adults	60	10	70
TOTAL	**68**	**14**	**82**

The Focus Group Discussions targeted community representative, Grievance Redress committee, Health sector, education sector, Male and female representatives and the youth/Associations. During the discussions, information was gathered different roles, livelihood, health issues, challenges, perception of quality of life, education options for children, health care and project perception.

The community members were told of the need to have focus group discussions to discuss the project further and allow the people more opportunities to ask questions or give suggestions regarding the project. Therefore, three separate meetings for men, women and youth were held. In these meetings the message on the project was echoed again especially on benefits and impacts (both positive and Negative) of the project to the community, rights of the community in regard to land and the need to have a grievance redress committee with representation from all groups in the community.

The target groups of the FGD were Males, Females, Health sector, Education sector as well as and the Youths.

6.8.1 Female Stakeholders' Consultation and Participation

The females' participants in the FGD were 10 and between 20-60 years of age. The following were their responses.

Plate: 3 Women FGD meeting in progress at the time of assessment

6.8.2 Male Stakeholders' Consultation and Participation

- ✓ The male participants were 15 in number between 36-55 years of age. The male participants are household heads. The following were the response during the male FGD.

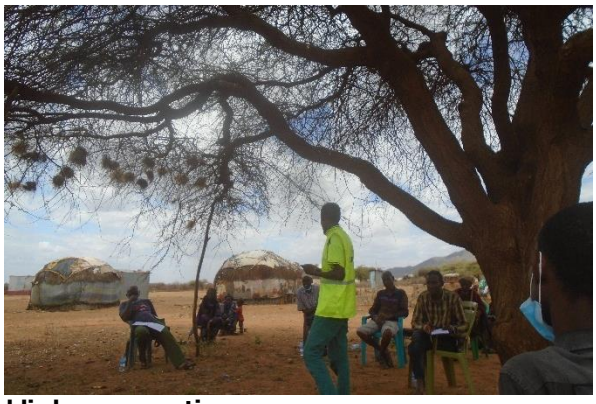



Plate: 4 public baraza meeting

Plate: 5 Male FGD

6.8.3 Youth Stakeholders' Consultation and Participation

- ✓ The youth participants were 12 in number, and consisted of 8 males and 4 females. The following opinions were provided by the youth participants during the FGD.

6.8.4 Education Stakeholders' Consultation and Participation

- ✓ The Education Stakeholder in Forole was the head teacher at Forole Primary School which is a government sponsored institution. The head teacher has worked at the school for 8 years. The following responses were recorded from the stakeholder.

Plate: 6: Youth FGD

6.9 Stakeholder Engagement and Grievance Management Post ESIA

During implementation of the project or construction phase, stakeholder engagement will be progressed to ensure the community and other stakeholders are kept abreast of the progress of the project. For the target community this will take the form of meetings and focus group discussions between local community and the contractor which will also act as forums for the community to ask questions or provide feedback. Therefore, the contractor will prepare a stakeholder engagement plan to guide on the engagements with various stakeholders guided by the Stakeholder Engagement Plan prepared during ESIA

Objectives and Principles of Stakeholder Engagement

Stakeholder engagement is the basis for building strong, constructive, and responsive relationships that are essential for the successful management of a project's environmental and social impacts.

In order to ensure effective engagement and consultation of all stakeholders, the contractor and the proponent KPLC will apply the following principles.

- Ensure the affected persons are provided opportunities to express their views on project risks, impacts and mitigation measures, and response provided.
- Begin consultations early even before construction begins because there is a lapse of time between ESIA consultations and implementation time. Identification of environmental and social risks and impacts should continue an ongoing basis as risks and impacts arise.
- Consultations should continue in a manner that is transparent, objective, meaningful and allow for ease in accessing information in a culturally appropriate local language(s) and format that is understandable to affected and interested persons.
- Consultations with affected persons and interested parties should avoid manipulation, interference, coercion, or intimidation.
- Consultations should also pay attention to the needs of VMGs, vulnerable individuals and households.

The contractor shall identify the stakeholders early and consider appropriate methods for engaging them. The stakeholder engagements will be reported to KPLC on monthly basis alongside the construction progress reports.

7 GRIEVANCE REDRESS MECHANISM

7.1 Introduction

Grievance mechanisms should receive and facilitate resolution of the affected institutional or communities' concerns and grievances. Community concerns should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities, at no cost and without retribution. Mechanisms should be appropriate to the scale of impacts and risks presented by a project. Grievances can be an indication of growing stakeholder concerns (real and perceived) and can escalate if not identified and resolved. The management of grievances is therefore a vital component of stakeholder management and an important aspect of risk management for a project. Projects may have a range of potential adverse impacts to people and the environment in general, identifying grievances and ensuring timely resolution is therefore very necessary. As such the project has developed a grievance management process to serve as a guide during project implementation.

The constitution of Kenya section 159, Land and Environmental Court Act 2011, National Land Commission Act 2012, and Land Act 2012 advocates for alternative dispute resolution mechanisms before seeking formal legal redress in disputes relating to environment, land, and resettlement. In practice this can be the village head and other local or traditional dispute resolution mechanisms.

The Land Act 2012 and National Land Commission Act 2012 obligate the NLC to support grievances and disputes related to resettlement or land amicably in conjunction with the implementing agencies-KPLC/REREC. KPLC/REREC will be expected to put in place mechanisms and structures that arbitrate or negotiate with PAPs whenever there are any grievances concerning land or environment.

7.2 Grievance Mechanism

One of the key roles of the Grievance Redress Committees, is to address disputes led by the administrative chiefs. All PAPs will be informed how to register grievances or complaints, including specific concerns about land and environment. The PAPs will be informed about the dispute resolution process, specifically about how the disputes will be resolved in an impartial and timely manner. Environmental and Land Court will provide opportunity for appeal when a solution will not be found using the established local mechanisms. The court will deal with land related disputes. However, the Land Act 2012 and Environment and Land Court Act 2011 advocates for Alternative Dispute Resolution (ADR) methods in tackling land related disputes. Alternative dispute resolution approaches will be given preference and based on customary rules, arbitration, or third-party mediation. ADR will be promoted or defended as a resolution to disputes related to land.

It was explained to the community that it is important to put in place a project grievance redress mechanism (GRM). The GRM to be set should borrow heavily from the existing conflict resolution structures in the community. The need for a GRM is to provide the community and other stakeholder's opportunity to share project information and raise questions and grievances about the project and the community members are free to raise any complain or request information about the project. The project will have a three-tier grievance redress mechanism as follows.

1. Locational grievance redress committee.
2. County Grievance Redress committee
3. National Grievance Redress committee
4. The last level of the GRM for the community or project affected persons will be arbitration or legal redress in a court of law once all the three levels have been exhausted.

Further the members of the project/ grievance redress committee will be chosen by the community members themselves. The committee chosen will be in charge of giving project information to the community and be a focal point for reporting project related issues of concern or grievances. Its composition should have representatives from all groups in the community including men, women, youth and persons with disability.

7.3 National Grievances Redress Committee (NGRC)

NGRC has been established at the National level to ensure participatory and transparent implementation of the project. The NGRC will help the project carry out its mandate efficiently- particularly ensuring effective and amicable settling of disputes among the communities/PAP.

Members to **NGRC** include representation from the following agencies and entities

1. Representative from the Ministry, chair of the Committee
2. Representative from NLC to handle matters that involve land take
3. Representative of the Implementing Agencies (IA)-KPLC and REREC
4. Representative from the Ministry's Legal office to guide on Alternative Dispute Resolution methods
5. Representative from the County Grievance Redress Committee-depending on the matter at hand; Land or Environment
6. Representative from Gender and Social Development Office who will be responsible for ensuring gender issues are well addressed.
7. Representative from NEMA to handle environmental issues
8. County Surveyor/Physical planner from the county Lands office
9. Project Affected Person's-to represent the matter before the committee

Functions of the National Grievances Redress Committee

a) Ensuring effective flow of information between PAPs, the implementing agency and the County Grievance Redress committee on matters brought before the committee
b) Co-ordinate County Grievance Redress Committees (LGRC)
c) Co-ordinate activities between the various organizations involved; facilitate grievance and conflict resolution at the highest level
d) Resolving disputes that may arise within the project. If it is unable to resolve any such problems, the PAP's can seek legal redress.

7.4 County Grievance Redress Committees (CGRC)

CGRC has been established at the county level to ensure participatory and transparent implementation of the project. The CGRC will help the project carry out its mandate efficiently- particularly ensuring effective communication with the communities.

Members to **CGRC** will include representation from the following agencies and entities

1. Representative of NLC, to grant legitimacy to the acquisition process and ensure that legal procedures as outlined in Land Act 2012
2. Representative of the implementing agency
3. Representative of NEMA to handle environmental issues
4. The County Administration representative, which will provide the much-needed community mobilization, and support to the sub-project.
5. County Land Survey Officer will survey all affected land and produce maps.
6. The County Gender and Social Development Officer who will be responsible for ensuring gender programs are adhered to.
7. The County Lands Registrar will verify all affected land and validate the same.
8. Two PAP representatives from Location Grievance Resettlement Committee – act as voice for the PAPs
9. NGOs and CBOs locally active in relevant fields

The CGRC will have the following **specific responsibilities:**

a) Ensuring effective flow of information between PAPs and the implementing agency
b) Coordinate Locational Grievance Redress Committees (LGRC)
c) Coordinate activities between the various organizations involved; facilitate grievance and conflict resolution; and provide support and assistance to vulnerable groups.
d) Conducting extensive public awareness and consultations with the affected people so that they can air their concerns, interests, and grievances.
e) Resolving disputes that may arise within the project. If it is unable to resolve any such problems, channel it to the National Grievance Redress committee before utilizing the appropriate formal grievance procedures.

7.5 Locational Grievance Redress Committee (LGRC)

Since counties are large, further decentralized Grievance Redress Committee for Forole has been established and will handle the grievances arising from Forole solar off grid project.

At the time of assessment, it was noted that the committee was constituted in October 2021 during the land acquisition forum. The membership of LGRCs were elected from each category of PAPs except the locational Chief and assistant chiefs who will be automatic members of the team by virtue of their positions.

The implementing agency representatives present during this forum included MoE, KPLC and REREC (County Renewable Energy Officer). They held a consultative forum with the community and constituted an LGRC consisting of six (6) members. The members consisted of members all identified and elected from each category of PAP except for the location Chief and village administrator who are automatic members of the team.

It was however identified that the LGRC was yet to elect their chairperson and secretary and also yet to formulate a leadership structure among themselves.

The LGRCs will work under guidance and coordination of CGRC and the implementing agencies. Their membership comprises of the following:

1. The locational Chief, who is the Government administrative representative at the locational unit and who deals with community disputes will represent the Government in LGRC
2. Assistant Chief, who supports the locational Chief and Government in managing local community disputes in village units will form membership of the team.
3. Female PAP, elected by women PAPs, will represent women and children related issues regarding the project
4. Youth representative, elected by youths, represents youth related concerns in the LGRCs
5. Male representatives elected by the members of the PAPs
6. Vulnerable persons representative will deal and represent vulnerable persons issues in the LGRCs.
7. CBO representatives

The committee representatives present during the public consultation forum informed that they were yet to have an initial meeting and equally the members were yet to be informed of their specific roles on the project.

The LGRC will be assigned specific roles for the projects. The anticipated roles will include the following;

The roles of LRCCs will include among others:

a) Mobilizing the community members on the supply of power and identify community members who want power in Forole
b) Conducting extensive public awareness and consultations with the affected people.

c) Help ensure that local concerns raised by PAPs as regards to the project are promptly addressed by relevant authorities.
d) Resolve manageable disputes that may arise relating to the project. If it is unable to resolve/help refer such grievances to the CGRCs instituted.
e) Ensure that the concerns of vulnerable persons such as the disabled, widowed women, orphaned children affected by the sub project are addressed.
f) Assist the community in recording grievances, including helping those who cannot write or read.
g) Help the vulnerable groups access project benefits
h) Ensure that all the PAPs in their locality are informed about the project

7.6 Available Grievance Redress Mechanism - Maslaha

The Maslaha is a body comprising of village elders that plays a significant role among the local communities and is respected. They have the mandate to resolve conflicts including land related conflicts; natural resources related conflict e.g., pasture; interclan conflicts; among others.

The Maslaha is composed of village elders of good reputation and who have knowledge of customs and culture of the local communities. Village elders forming the Maslaha are not elected, as long as one has a good reputation in the society and is regarded as impartial then he is welcomed in the council. Women are not part of this forum. Maslaha decisions are strongly respected. In case a person defies their decision, the person will be fined and/or banned from attending any social functions e.g., burials, marriages or any other function that brings the community together. The person is may be excommunicated from the community.

Further, the use of maslaha as an alternative system of dispute and conflict resolution in solving issues of rape and other forms of gender and sexual based violence is not advocated for in this project based on the fact that the system is recognized as contributing to the rise of such cases due to the nominal compensation required from offenders. Grievances not resolved by the Maslaha will be taken to the second level.

This assessment prefers this as the first level of grievance or conflict redress on the basis that gender, VMG and youth inclusion shall be considered.

The IA should ensure that the existing LCRC works in coordination with Maslaha which is the existing form of grievance mechanism in the area.

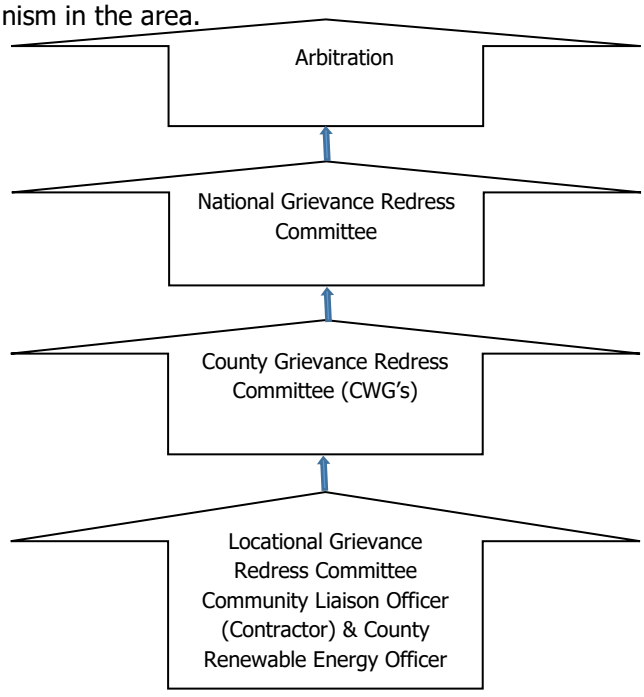


Figure 8. KOSAP Grievance Redress Mechanism

It should be noted that if complainants are not satisfied with the grievance process, even after arbitration they have the right to present their complaint through the court system.

It is expected that most disputes will be resolved at the lowest level-Locational Grievance Redress Committee in coordination with existing GRM.

A record of any/all grievances received and handled should be kept at all phases of the implementation process.

8 IMPACT ASSESSMENT AND MITIGATION MEASURES

8.1 Introduction

This Section identifies and discusses both negative and positive Environmental and Social impacts the proposed micro-grid at Forole village may bring to the physical, biological, as well as socio-economic environments and overall trigger World Bank safeguard policies. Mini grids development just like any other development project has the potential to create a range of impacts on the environment, both negative and positive. In this chapter the potential proposed project's impacts are identified, assessed, outlined, rated and analyzed. The impacts are assessed according to each project phase, namely:

- Pre-Construction phase
- Construction Phase
- Operational Phase and
- Decommissioning Phase.

The purpose of the Impact Assessment and Mitigation is to identify and evaluate the significance of potential impacts on identified receptors and resources according to defined assessment criteria which include but not limited to world bank safeguard policies, and to develop and describe measures that will be taken to avoid or minimize any potential adverse effects and enhance potential benefits.

8.2 Identification of Impacts

This Section identifies and discusses both negative and positive impacts associated with the proposed construction of solar Mini-grid. The impacts are identified across all the phases namely: Pre-construction Phase, Construction Phase, Operational Phase and Decommissioning Phase.

Identification of project's positive and negative environmental impacts was done through observations, literature review, consultations and use of experts' analysis. The positive impacts are presented first then the negative impacts and their mitigation measures.

8.3 Impact Assessment Methodology

An impact is essentially any change to a resource or receptor brought about by the presence of the Project component or by the execution of a Project related activity. In general, the assessment of impacts will proceed through an iterative process considering four key elements:

- Prediction of potential impacts and their magnitude (i.e., the consequences of the development on the natural and social environment);
- Evaluation of the importance (or significance) of potential impacts taking the sensitivity of the environmental resources or human receptors into account;
- Development of mitigation measures to avoid, reduce or manage the potential impacts or enhancement measures to increase positive impacts; and
- Assessment of residual significant impacts after the application of mitigation and enhancement measures.

Where significant residual impacts remain, further options for mitigation may be considered and impacts re-assessed until they are as low as reasonably practicable for the Project and would be deemed to be within acceptable levels:

8.4 Defining Impact

Impacts will be defined in a number of ways, including:

- Nature of impact: positive or negative;
- Type of impact: direct, indirect, or cumulative;
- Duration of impact: temporary, short-term, national, international
- Scale of impact: onsite, local, regional, national, international.

8.5 Assessment of Significance

Criteria for assessing the significance of impacts will stem from the following key elements:

- Status of compliance with relevant Kenyan legislation, policies and plans and any relevant Kenyan or industry policies, standards or guidelines, as well as international best practice standards and guidelines;
- The magnitude (including nature, scale and duration) of the change to the natural or socioeconomic environment (e.g. an increase in coastal erosion, or an increase in employment opportunities), expressed, wherever practicable, in quantitative terms. The magnitude of all impacts is viewed from the perspective of those affected by considering the likely perceived importance as understood through stakeholder engagement;
- The nature and sensitivity of the impact receptor (physical, biological, or human). Where the receptor is physical, the assessment considers the quality, sensitivity to change and importance of the receptor. For a human receptor, the sensitivity of the household, community or wider societal group is considered along with their ability to adapt to and manage the effects of the impact; and
- The likelihood (probability) that the identified impact will occur. This is estimated based upon experience or evidence that such an outcome has previously occurred.

It is generally accepted that significance is a function of the magnitude of the impact and the likelihood of the impact occurring.

For this assessment, significance has been defined in **Error! Reference source not found.** based on five levels described in table below;

Table 16: *Categories of Significance*

Category	Significance
Positive impacts	Positive impacts provide resources or receptors, most often people, with positive benefits. It is noted that concepts of equity need to be considered in assessing the overall positive nature of some impacts such as economic benefits, or opportunities for employment
Negligible impacts (or Insignificant impacts)	Negligible impacts (or Insignificant impacts) are where a resource or receptor (including people) will not be affected in any way by a particular activity or the predicted effect is deemed to be 'negligible' or 'imperceptible' or is indistinguishable from natural background variations.
Minor	An impact of minor significance ('Minor impact') is one where an effect will be experienced, but the impact magnitude is sufficiently small (with or

	without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value.
Moderate	An impact of moderate significance ('Moderate impact') is one within accepted limits and standards. Moderate impacts may cover a broad range, from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly to design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is ALARP (as-low-as-reasonably-possible). This does not necessarily mean that 'Moderate' impacts have to be reduced to 'Minor' impacts, but that moderate impacts are being managed effectively and efficiently.
Major	An impact of major significance ('Major impact') is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. An aim of EIA is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e., ALARP has been applied). It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones in coming to a decision on the Project.

For environmental impacts the significance criteria used in this ESIA is shown in **Error! Reference source not found.**

Table 17: Overall Significance Criteria for Environmental Impacts

Receptor sensitivity	**Impact Magnitude**		
	Low	**Medium**	**High**
Low	Minor	Minor	Moderate
Medium	Minor	Moderate	Major
High	Moderate	Major	Major

For the social impact assessment, the perceptions of stakeholders, expressed as opinions around certain issues, can be as important as actual impacts. Consequently, the concept of perception is explicitly brought into the evaluation of significance after an impact is evaluated. When an impact is of significant stakeholder concern, this may be causing to raise the significance rating. This prompts the formulation of more rigorous and appropriate mitigation measures which focus on the source of the impact and also address stakeholder perceptions. The risk of not addressing

stakeholder perceptions is that reputational damage could arise, resulting in the loss of a 'social license to operate.

8.6 Magnitude of Impact

The impact assessment describes what will happen by predicting the magnitude of impacts and quantifying these to the extent practical. The term 'magnitude' covers all the dimensions of the predicted impact to the natural and social environment including:

- the nature of the change (what resource or receptor is affected and how);
- the spatial extent of the area impacted, or proportion of the population or community affected;
- its temporal extent (i.e., duration, frequency, reversibility); and
- where relevant (accidental or unplanned events), the probability of the impact occurring.

For social impacts, the magnitude considers the perspective of those affected by taking into account the likely perceived importance of the impact, the ability of people to manage and adapt to change and the extent to which a human receptor gains or loses access to, or control over, socio-economic resources resulting in a positive or negative effect on their well-being (a concept combining an individual's health, prosperity, their quality of life, and their satisfaction).

8.7 Sensitivity of Resources and Receptors

Sensitivities are defined as aspects of the natural or social environment which support and sustain people and the physical environment. Once affected, their disruption could lead to a disturbance of the stability or the integrity of that environment. For ecological impacts, sensitivity can be assigned as low, medium or high based on the conservation importance of habitats and species. For habitats, these are based on naturalness, extent, rarity, fragility, diversity and importance as a community resource.

For socio-economic impacts, the degree of sensitivity of a receptor is defined as 'a stakeholder's (or groups of stakeholders') resilience or capacity to cope with sudden changes or economic shocks. The sensitivity of a resource is based on its quality and value/importance, for example, by its local, regional, national or international designation, its importance to the local or wider community, or its economic value.

8.8 Likelihood

Terms used to define likelihood of occurrence of an impact are explained in Table 19 below.

Table 18: Explanation of Terms Used for Likelihood of Occurrence

An impact with a		
High probability	Refers to a very likely impact	Refers to very frequent impacts
Medium probability	Refers to a likely impact	Refers to occasional impacts
Low probability	Refers to rare impacts	Refers to rare impacts

	As far as one-time events (e.g., air emissions) or slowly developing effects are concerned (e.g., impacts on local lifestyle)	As far as possibly recurring impacts are concerned, such as accident or unplanned events (e.g., traffic accident, fire)

8.9 Definition of Mitigation Measures

Mitigation measures are developed to avoid, reduce, remedy or compensate for significant potential negative impacts, and to create or enhance potential positive impacts, such as environmental and social benefits. In this context, the term "mitigation measures" includes operational controls as well as management actions. These measures are often established through industry standards and may include:

- Changes to the design of the project during the design process (e.g., changing the development approach);
- Engineering controls and other physical measures applied (e.g., wastewater treatment facilities);
- Operational plans and procedures (e.g., waste management plans); and
- The provision of like-for-like replacement, restoration or compensation.

For potential impacts that are assessed to be of major significance, a change in design is sometimes required to avoid or reduce the significance. For potential impacts assessed to be of moderate significance, specific mitigation measures such as engineering controls are often sufficient to reduce these impacts to ALARP ('as-low-as-reasonably-possible') levels. This approach takes into account the technical and financial feasibility of mitigation measures. Potential impacts assessed to be of minor significance are usually sufficiently managed through good industry practice, operational plans and procedures.

In developing mitigation measures, the first focus is on measures that will prevent or minimize potential impacts through the design and management of the Project rather than on reinstatement and compensation measures.

8.10 Positive Impacts During Construction Phase

This section enumerates and discusses the positive impacts associated with the proposed project during construction phase of the project.

8.10.1 Creation of Employment Opportunities

Various employment opportunities will be available during construction. The opportunities will be both skilled and unskilled. Majority of the unskilled and semi-skilled jobs will be taken up by the local community. Employment of the locals will increase skill transfer from the contractors.

The approximate number of workers to be employed by the proposed project is not yet known, however, this will contribute to easing unemployment level in the area. There will be a trickledown effect to the economy at large resulting from new income revenues as well as services provided through this project.

The impact significance is low as it will employ few people over a short period

Enhancement Measures

- Contractor should ensure that they prioritise the local community in allocating job opportunities.
- Contractor should ensure that job opportunities are not discriminatory
- Equal opportunities should be given to both men and women

8.10.2 Improving local economy

During this phase, the project will require supply of building materials most of which will be sourced locally at the nearest trading centre and its environs to the extent possible. Therefore, the project will provide ready market for local enterprises with such materials and boosts the local economy.

The businesses that will benefit during this phase are such as hotel, shops, artisan industries and food vending who will be benefit directly from the construction, as people working there will need commodities from them. This will promote the informal sector in securing some temporary revenues and hence improved livelihoods.

One of the responsibilities of the beneficiaries of the proposed Solar Mini-grid is to undertake wiring of their premises before there are connected and payment of a connection fee of Ksh 1000. The MOE through its implementing agency KPLC should consider supporting at least 50 households that are very poor through installation of ready boards to offset the cost of wiring so that they can also access electricity.

The impact significance is low as it will buy few materials over a short period of time

- REREC should ensure that their contractors/suppliers remit taxes and have a tax compliance certificate
- Prioritise local purchases over imports.
- Remit taxes on behalf of employees
- Contractor should prioritise local purchases over imports;
- Contractor should give preference to local labour which increases the local's ability to spend

8.11 Positive Impacts during Operation Phase

8.11.1 Quality, Reliable Power Supply

There is no electricity in Forole. This is a maiden project with an aim of supplying power through solar because the area is far away from the national power grid. Once operational, household and public institutions (dispensary, primary school) and shopping centre in the area will greatly benefit from the stable power supply.

The impact significance is high as it will provide power where it wasn't for a long period

Enhancement Measures

- KPLC should ensure that they have a functional customer support team and a field response team;
- KPLC should ensure that they communicate power outages early to consumers

8.11.2 Employment Creation

Employment opportunities will also be created during the operation phase of the project. Opportunities that will be created include unskilled, semi-skilled to skilled jobs. These will involve security personnel, and staff to operate and maintain the Mini-grid. Employment will increase skill transfers.

The impact significance is low as it will employ people to manage the mini grid facility.

Enhancement Measures

- KPLC should ensure that they prioritise the local community in allocating job opportunities.
- KPLC should ensure that job opportunities are not discriminatory
- Equal opportunities should be given to both men and women

8.11.3 Reduction of Pollution Associated with Thermal Power Generation, Kerosene and Wood Fuel Usage:

Residents in the area use different sources of energy. Electricity supply will imply that as many as are willing can apply for connection and get connected. This will result in reduced individuals and organizations using diesel generators, less reliance on kerosene, wood fuel and charcoal. This would mean less carbon dioxide is released to the environment and destruction of forests will be reduced hence decreasing greenhouse gases.

The impact significance is high as it will provide cleaner energy over a long period of time for many households

Enhancement Measures

- KPLC should ensure that the power provided cost is competitive to discourage the locals from using unclean source of power.
- KPLC should ensure that they communicate power outages early to consumers

8.11.4 Improvement of Local and National Economy

The mini-grid project will ensure supply of a stable power that will reduce damage to the electronics and this will result in promotion of businesses both in the formal and informal sectors. Availability of power will enable businessmen to scale up their businesses while making it is possible to set up businesses such as salons, barber shops, photocopying machines, cyber cafes, welding, refrigeration of drinks among others. This will result in income improvements at the

individual level and for the national economy. More customers will be connected and retail of reliable electricity by the power utility firm will attract increased tax revenues to the government.

The impact significance is low as it will buy few materials over a long period of time

Enhancement Measures

- KPLC should ensure that their contractors/suppliers remit taxes and have a tax compliance certificate
- Prioritise local purchases over imports.
- Remit taxes on behalf of employees

8.11.5 Education

Access to electricity at the household level and schools will create opportunities for children be able to study even for longer hours. Additionally, children in households can also access education programs being aired through different radio and T.V. channels. Schools will be able to take advantage of information technology and communication that are becoming a way of life in education sector and learning in general.'

The impact significance is high as it will provide power to schools over a long period for additional study time in the night and morning

Enhancement Measures

- KPLC should consider having the transmission lines are closer to schools for them to benefit from the power supply;
- KPLC should consider partnering with the county government in providing street lighting to improve security for children and teachers leaving for school early or leaving late for home

8.11.6 Health Benefits of the Project

Solar energy for lighting is better than kerosene lamps that are in use currently. This is because kerosene lamps emit particles that cause air pollution. The health risks posed by this indoor air pollution mainly include acute lower respiratory infections. Additionally, insufficient illumination (low light) conditions can cause some degree of eye strain and reading in these conditions over long periods of time may have the potential to increase the development of nearsightedness in children and adults. The project will result in many families replacing kerosene lamps for lighting with electricity there-by reducing chances of the afore-mentioned disease incidences.

8.11.7 Improved Standard of Living

Availability of power will result in lifestyle changes through improved night lighting, pumping of water instead of manual pumping and refrigeration to maintain food safety and quality.

8.11.8 Security

The area will benefit from improved security since houses, businesses and public institutions will be well lit using electricity. This is as a result of more security flood lights bulbs which helps keep off opportunistic crimes including gender-based violence.

8.11.9 Communications

Access to electricity will lead to improved communication. This will be enabled by the fact that charging of mobile phones will be easier and cheaper. Access to mass media like radio and T.V will provide opportunity for the households to access a wide range of information which is useful for decision making.

8.12 Positive Impacts during Decommissioning Phase

8.12.1 Employment Opportunities

Once the project has served its purpose it will then be decommissioned. This will involve demolition and removal of the facility. During demolition, unskilled, semi-skilled and skilled employment opportunities will be available to the public.

8.12.2 Site Rehabilitation

After demolition of the proposed project, rehabilitation of the project site will be carried out to restore it to its original status or to a better state than it was. This will include replacement of topsoil and re-vegetation which will lead to restoration of the visual, vegetative and aesthetic state of the site.

8.13 Negative Impacts during Pre-construction Phase

8.13.1 Land Take

The identified site for the proposed Mini-grid is on a 2.02343 Ha unregistered Communal land set aside for public use. The assessment found that;

- No residential houses or businesses premises were on the piece of land
- No socio-economic activity was taking place on the land
- No physical relocation will take place.

8.13.2 Way Leaves

Supply of electricity will involve passing of low voltage (LV) lines to connect the customers to power. It is estimated that a total of 13.1 km of LV circuit will be constructed mainly along the road reserve and along the boundaries to supply power.

The impact significance for this impact is assessed minor considering the community wilfully allocated the land for project construction.

Mitigation Measures

- Land for mini-grids will be acquired by NLC compulsorily and affected communities compensated in-kind.
- The contractor will sign and adhere to the agreement for use of community land for contractor facilities and worker's camps, and restoration of the site after use.
- The construction activities will be restricted to within the allocated land and the immediate surroundings only.
- After construction work, any land taken for a temporary basis for storage of material will be restored to their original form.
- Consultations with the community during construction of the low voltage lines

8.14 Negative Impacts During Construction Phase

Despite the positive impacts identified, the project will also have negative impacts. However, adverse impacts are not anticipated due to its size and nature and most of the impacts will be experienced during construction phase of the project. The negative impacts and their mitigation are discussed below.

8.14.1 Vegetation Clearance

The construction process of the proposed Mini-grid and other associated facilities and structures will involve clearing of the existing vegetation cover (mainly grass) and trees. The project site is located in open area with minimal settlement around besides the dispensary and residential homes. Both the magnitude and sensitivity of this impact will be low. The impact will be direct, permanent and minor.

Mitigation Measures

1. Clear only the necessary areas
2. Ensure proper demarcation and delineation of the project area to be affected by construction works.
3. Specify locations for vehicles and equipment, and areas of the site which should be kept free of traffic, equipment, and storage.
4. Designate access routes and parking areas
5. Re-vegetation including planting of trees around the plant/facility

8.14.2 Soil Erosion Impact

During clearing of the area to pave way for ground-breaking soil erosion may take place. This will be due to surface run off or blowing away by the wind if not properly managed. This is bound to happen because the soil will be loose. The area is gently sloppy on the lower side and surface run off can also result to soil erosion. The impact significance will be minor due to the nature of the works and the fact that construction activities will be confined in the small project area.

Mitigation Measures

- The contractor shall avoid ground-breaking during the seasons of high rainfall to avoid erosion.

- Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled.
- The contractor should ensure that construction related impacts like erosion and cut slope destabilizing should be addressed through landscaping and grassing, carting away and proper disposal of construction materials
- Use silt traps where necessary
- Cover soil stockpiles.
- Landscaping with grass on areas without electrical installation (lower areas)
- The contractor should ensure recovery of exposed soils with grass and other ground cover as soon as possible.
- The contractor should put up proper drainage to avoid unnecessary erosion and do compaction of spoil areas to avoid land instability in form of soil subsidence, slip and mass movement.
- Areas compacted by vehicles during site preparation and construction should be scarified (ripped) by the contractor in order to allow penetration of plant roots and the re growth of the natural vegetation

8.14.3 Contamination of Soil from Fossil Fuels

The potential sources of soil contamination during construction phase are oil /fuel leaks or spills from machinery used in site preparation and trucks used in transporting construction materials. Depending on the size and source of the spill, liquid and gaseous state, petroleum hydrocarbons may remain mobile for long periods of time, threatening to contaminate the soil. The significance of the impact to the soil will be minor due to the nature of the works and the fact that construction activities will be confined in the small project area.

Mitigation Measures

- Construction vehicles must be maintained in good state and proper servicing to ensure no oils are likely to leak
- Care must be exercised not to spill any fossil fuels
- Any contaminated soil shall be scooped and disposed-off appropriately.

8.14.4 Dust Emissions

Initial activities such as site clearing, excavation if done in dry weather conditions will result in dust pollution. Dust emission from construction machinery is regarded as a nuisance when it reduces visibility and is aesthetically displeasing. This is expected during construction works. Dust will be generated from construction earthworks, transportation activities and aggregate mixing.

The receptors were noted to be mainly residential and a health facility. The distances from a source that dust impacts can occur is highly site specific and will depend on the extent and nature of incorporated mitigation measures, prevailing wind conditions, rainfall and the presence of natural screening. Due to the variability of the weather, it is impossible to predict what the weather conditions will be when specific construction activities are being undertaken. Therefore, the assessment of construction dust impacts is typically qualitative.

Mitigation Measures

- The construction area should be fenced off to reduce dust to the public
- Sprinkle loose surface earth areas with water to keep dust levels down.
- Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas;
- Masks should be provided to all personnel in areas prone to dust emissions during construction
- Stockpiles of excavated soil should be enclosed/covered/watered during dry or windy conditions to reduce dust emissions.
- Drivers of construction vehicles must be sensitized so that they limit their speeds so that dust levels are lowered.
- Trees can be planted around the plant provided they do not cast shadows to the solar panels to act as wind breakers and hence decrease dust pollution

8.14.5 Vehicle Exhaust Emissions

Exhaust emissions are likely to be generated by the construction vehicles and equipment. Motor vehicles that will be used to ferry construction materials would cause air quality impact by emitting pollutants through exhaust emissions. There are few Receptors (settlements) within 500 m of the project site and the impact magnitude will be medium and sensitivity medium hence the impact significance will be moderate.

Mitigation Measures

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

8.14.6 Pollution from Solid Waste Generation

It is expected that solid waste will be generated during construction phase of the project. Solid waste is anticipated to be produced during site preparation, civil works, spoil from excavations and will include; mortar, wood, paper, waste paper wrappings, conductor off cuts, masonry chips and left-over food stuffs. Effects of mismanaged waste include:

- Public nuisance due to littering or smell in case of rotting
- Contamination of soils and water courses
- Creation of breeding grounds for vermin like rodents and cockroaches

The significance of this impact will be minor due to the nature of the works and the fact that construction activities will be confined in the small project area.

Mitigation Measures

- Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is top soil last;
- Segregate waste and dispose of appropriately using a licensed waste handler
- Provide litter collection facilities such as bins and create awareness campaigns to segregate as early as possible, using the appropriate bins
- Contractor to put in place and comply with a site waste management plan

- The contractor should comply with the requirement of OSHA ACT 2007 and Building rules on storage of construction materials
- Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time
- Recovery of materials remains and return to stores
- Re-use of materials where possible
- Proper budgeting to avoid waste generation

8.14.7 Impacts on Water Resources and Water Quality

During construction, excavation activities will involve soil exposure which results in soil erosion due to wind and surface runoff due to rains. Seepage from spilled fuels and oils and leaking machinery can also negatively impact groundwater water which could lead to potential contamination. Generally, due to the localized area of impact, the overall significance of the related impacts on water quality is considered to be minor, provided the necessary mitigation/ management measures are implemented. The people in Forole area use an earth dam as the main source of water and care must be exercised to avoid any pollution to the water source.

Mitigation Measures

Measures shall be put in place to minimize erosion and sediment mobility, especially during construction. These measures include:

- Clear the necessary areas only.
- Appropriate remedial measures shall be implemented by the contractor in the event of erosion.
- Infrastructure shall be designed to ensure that contaminated run-off does not reach watercourses.
- In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect.
- No vehicle maintenance and service shall be done at project site but in approved garages or service stations to avoid any possible oil and fuel spills that could contaminate soils and possibly ground water quality.
- Ensure that potential sources of petro-chemical pollution are handled in such a way to reduce chances of spills and leaks.
- Construction activities to avoid any unchanneled flow of water at the site
- Storage areas that contain hazardous substances should be bundled with an approved impermeable liner and provision for a pit to be made in case of oil spill.
- The excavation and use of rubbish pits during construction should be strictly prohibited.
- A waste disposal area should be designated within the active construction area and this should be equipped with suitable containers i.e., skips or bins of sufficient capacity and designed to contain and prevent refuse from being blown by wind,
- Areas contaminated by spilled concrete and/or fuels and oils leaking from vehicles and machinery should be cleaned immediately.

- The contractor to source for alternative source of water for construction purposes to avoid potential conflict with the community

8.14.8 Noise and vibration

During construction activities noise pollution will occur and is bound to be a nuisance and a disturbance to neighboring communities. This noise is from construction equipment, excavation works, concrete mixing and vehicles coming to site but will be temporary. From the prediction of the specialist study on ambient noise quality measurements, the traffic noise that will be emitted by traffic accessing the proposed project site during construction is expected to have an adverse impact on ambient noise. The level of traffic noise will increase depending on the traffic volume. General guideline indicates that an increase of 20% in traffic volume approximates to a noise level increase of around 1 dB, while a doubling of traffic volume results in a noise level increase of about 3 dB. It is however, worth noting that the level of noise is attenuated with increase in distance from the source and thus the sites/objects in close proximity to the source will receive more noise in comparison to those at remote location. The impact significance has therefore been assessed minor. This due to the fact that the impact magnitude is low and the receptor sensitivity is medium. The site is on very close proximity to Forole dispensary and few residential houses nearby.

Mitigation Measures for Noise and Vibration

These proposed mitigation measures aim to ensure that noise generated during construction is kept to minimum and adheres to relevant noise standards. They include:

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

8.14.9 Impacts from Hazardous Materials

Some hazardous materials will be used during construction phase of the project. They include insulating oil, paints, solvents and oils. Spilled chemicals can contaminate soil as well as pollute water resources. Additionally, hazardous and flammable substances if improperly stored and handled on site become potential health hazard for construction workers and the public. The

amount of hazardous waste generated will be minimal. The significance of the impact will be minor due to a low magnitude and medium sensitivity.

Mitigation Measures

- Maintenance of construction vehicles will not be done on site
- All hazardous products and waste should be labelled and handled properly to avoid contact with the ground
- Material handling to be done by trained and qualified staff
- The contractor site should have designated area (concrete bunded) for storing hazards materials

8.14.10 Accidental Oil Spills or Leaks

There is possibility of oil leaks from construction vehicles. The construction machines on the proposed site have moving parts which will require continuous oiling to minimize the usual corrosion or wear and tear. These processes may lead to oil spill to the ground. The impact significance will be minor due to the nature of the works and the fact that construction activities will be confined in the small project area.

Mitigation Measures

- In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately.
- It is proposed that the refuelling and maintenance of vehicles will not take place at the construction site.
- Contractor to create awareness for the employees on site on procedures of dealing with spills and leaks from oil for the construction machinery
- Vehicles and equipment must be serviced regularly and kept in good state to avoid leaks.
- In case of spillage the contractor should isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent materials and/or other materials approved by materials.
- Proper training for the handling and use of fuels and hazardous material for construction workers.
- All chemicals should be stored within the bunded areas and clearly labelled detailing the nature and quantity of chemicals within individual containers.

8.14.11 Fire Hazards

During construction of the project, fire hazards are likely to occur especially when precaution measures are not taken to account. Smoking is one of causes of fires and this can happen if cigarette butts are left carelessly. Additionally, keeping of fuels onsite during construction can be a potential cause of fire. This impact is evaluated to be of moderate significance. All the construction activities will be confined at the project site hence high sensitivity and low magnitude.

Mitigation Measures

The following measures should be put in place to prevent fire hazards:

- Create awareness to the construction workers on potential fire hazards
- Provision of firefighting equipment (extinguishers) on site during construction.
- No smoking shall be done on construction site
- 'No smoking' signs shall be posted at the construction site
- A fire evacuation plan must be posted in various points of the construction site including procedures to take when a fire is reported.

8.14.12 Impacts of construction material sourcing (e.g., quarrying)

The construction of the project will utilize materials such as; stone, ballast, sand and hardcore. It is anticipated that they will be obtained from quarry and mining operations. Conscious or unwitting purchase of these materials from unlicensed operations indirectly supports, encourages and promotes environmental degradation at the illegal quarry sites and causes medium to long term negative impacts at source, including landslides. The significance of this impact will be moderate due to high sensitivity and low magnitude.

Mitigation Measures

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

8.14.13 Increased Water Demand

During the construction of the project there will be increased demand for water by the construction workers and the construction works. Water will be mostly used in the construction works and for wetting surfaces or cleaning completed structures. It will also be used by the construction workers to wash themselves and even drink. Although the sensitivity of the receptor (surface water) in the project area is high owing to unavailability of feasible alternative source of water for the local community, the overall significance of impacts is assessed to be negligible due to negligible magnitude of the impact.

Mitigation Measures

- Prudent use of available water
- Consultations with the project local committee on use of water in the community to avoid conflicts with the community
- Contractor to make own arrangements to provide water for construction works different from the community dam to avoid any conflicts with community.

8.14.14 Energy Consumption

The construction works will consume fossil fuels (mainly diesel) to run transport vehicles and construction machinery. Fossil energy is non-renewable and its excessive use may have serious environmental implications on its availability, price and sustainability. This impact will be negligible owing to the size of the project that will require very few trucks during the construction phase.

Mitigation Measures

Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. Complementary to these measures, the contractor shall monitor energy use during construction and set targets for reduction of energy use.

- Regular maintenance of vehicles to ensure efficient consumption of fuels.

8.14.15 Occupational Health and Safety Impacts

There are several activities involved during construction. These activities can pose potential health and safety risks to the workers. The activities include excavation, backfilling, civil works, pole erection, stringing of conductors. Risk of accidents and incidents are likely during construction activities. As already noted during construction, the safety and health of employees may be exposed to risk as a result of the use of tools and other machinery to construct the Mini-grid. Occupation safety and health risks includes accidents, fall from heights, pricks by sharp objects etc. The impact on occupational health and safety during the construction phase is evaluated to be of moderate significance. All the construction activities will be confined at the project site hence high sensitivity and low magnitude.

Mitigation Measures

- The contractor should use skilled personnel for activities that demand that.
- Awareness creation/Tool box talks on safety to workers while at construction site and documentation kept
- Workers coming to the site should be knowledgeable on safety precautions to take
- Appropriate PPE (helmet, safety harness, gloves, safety shoes, masks, climbing irons among others)
- Proper housekeeping and maintain good hygiene
- Close supervision of workers
- Engagement of trained first aider on site
- Provide safe drinking water for workers
- Availability of equipped first aid box on site
- Risk assessment by contractor of the construction activities and implement mitigation measures appropriately
- Adherence to occupational Safety and Health Act 2007
- Establish Safety committees
- The contractor must acquire insurance for the workers-WIBA cover

8.14.16 Community Safety -Access to Site by General Public

If access to the Mini-grid site is not controlled then it can lead to people entering the site including animals. This can result to accidents. Impact significate is rated as moderate considering the high impact magnitude and low receptor sensitivity.

Mitigation Measures

- Proper barricading
- Awareness creation to community
- Hazard communication.
- Controlled access to the site by designated personnel
- Maintain records of any person who comes to site

8.14.17 Spread od HIV/AIDS and STIs

HIV and AIDS remain a major challenge in Kenya as well as in Marsabit County. The epidemic continues to adversely impact on all spheres of the County; economic, social and health sectors. With an estimated HIV prevalence of 5.7% (National HIV Estimates 2014) Marsabit County is ranked as a medium-epidemic county. With 21,159 People Living with HIV (PLHIV) in the county, it is of concern that two thirds of this population are women and over 2,600 of them are children. These facts prompt us to audit our efforts towards elimination of mother-to-child HIV transmission (eMTCT) and other related programmes.

The project construction will improve the economic status of some of the people employed thus increasing the disposable income with the probability of indulgence in substance abuse and using the money to solicit for sex. Researchers have indicated that HIV prevalence rates are higher in areas where there is high disposable income as might be the case during construction of the project

Mitigation measures include:

- Develop and implement at HIV/AIDS Policy to promote awareness of HIV/AIDS and access to treatment.
- Employees contractors and subcontractors will be required to follow, and will be trained in, the Worker Code of Conduct which includes context specific guidelines on worker-community interactions, worker-worker interactions and alcohol and drug use.
- Employees, contractors, and subcontractors will be trained and educated to improve awareness of transmission routes and methods of prevention of sexually transmitted infections, communicable diseases and vector borne diseases, notably malaria, prior to working on the Project site. Other diseases will be covered as appropriate.
- Provide access to free condoms at all worker sites and accommodation.
- Work with NGOs or the Ministry of Health to develop and implement a community sensitisation programme on HIV/AIDs and communicable diseases.
- Continue to implement a programme of stakeholder engagement including a grievance mechanism in communities in the Project Area.

- Monitor health trends during Project construction (and operations) in order to be aware of and respond appropriately to any negative health trends that may be linked to the Project and its workers.

8.14.18 Increase in competition for scarce resources and strain on public utilities

The influx of workers in the area is expected to lead to increase in demand for public amenities such as hospitals, transport, schools water resources etc. This could lead to a loss of access to these services by locals especially those who could be among the vulnerable categories. Due an increase in demand, cost of housing near the sites will disadvantage the locals.
The nature of the project will require technical skills that might not be available in the community. This might require movement of construction workers into the community.. It is expected that technically skilled personnel might be sourced from outside the community while the unskilled labour is expected to be sourced locally. It is therefore a possibility that the neigbouring communities might go out looking for opportunities in project area thus creating competition. The significance of this impact is considered to be minor because the receptor sensitivity will be medium, and the impact magnitude is low.

Mitigation Measures

- ❖ Reduction of labour influx by tapping into the local workforce to the extent possible
- ❖ Recruitment of local workforce to the extent possible especially unskilled and semi-skilled jobs
- ❖ Consultations with and involvement of local community in project planning and other phases of the project
- ❖ Awareness-raising among local community and workers on the need to have a good /cordial working relation
- ❖ Sensitization/awareness to workers regarding engagement with local community.
- ❖ Contactor shall make provision to provide resources needed by the workers if the need for such resources may result to competition e.g., water
- ❖ Establishment and operationalization of an effective Grievance Redress Mechanism accessible to community members
- ❖ The contractor and the project/community grievance redress committee to work closely address complains raised on time.
- ❖ Gender considerations in employment opportunities
- ❖ Appropriate compensation for work done
- ❖ Respect for community values/culture
- ❖ Prompt payments as per the contractual agreements/terms

8.14.19 Child Labor

Implementation of the project will lead to increased opportunities for the host community to sell goods and services to the incoming workers. This can lead to child labor to produce and deliver these goods and services, which in turn can lead to school truancy. The impact significance is

rated minor, based on low sensitivity of the receptor and medium magnitude of the impact.

Mitigation Measures

- Awareness creation to the community that child labor is illegal and that children have a right to education.
- Communication to the contractor that child labor is illegal and adherence to employment act is required.

8.14.20 Gender Based Violence- SEA and SH

Gender-based violence (GBV) is an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially ascribed (i.e., gender) differences between males and females. It includes acts that inflict physical, sexual or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. GBV in project may manifest in terms of sexual exploitation and abuse (SEA) and workplace sexual harassment (SH).

Sexual Exploitation and Abuse (SEA) is any actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including but not limited to, profiting monetarily and socially from the sexual exploitation of another. Sexual abuse is further defined as "the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions." Women, girls, boys and men can experience SEA.

Workplace sexual harassment (SH) includes unwanted sexual advances, request for sexual favors and sexual physical contact.

Sexual exploitation and abuse (SEA) of community members by project workers and sexual harassment (SH) among project workers are forms of GBV that are a potential risk and impacts to this proposed project. GBV has serious and far-reaching negative effects including physical injuries resulting in death or disfigurement, psychological trauma, infection with HIV/AIDS, unwanted pregnancies, social stigmatization and exclusion and economic deprivation among others. Consequently, it is incumbent that preventive measures be mooted to prevent occurrence of such cases.

There is no incident of gender-based violence in Forole as identified during FGD with Men, women and youths. However, it cannot be ruled out during project implementation. Thus, the significance of this impact is considered to be Minor considering low sensitivity of the receptor and low magnitude of the impact.

Mitigation Measures

To manage GBV risks, the contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The plan should have an Accountability and Response Framework. The plan will include the necessary measures for prevention and response. The contractor can make reference to World Bank's Good Practice Note for Addressing Gender-

based Violence in Investment Project Financing involving Major Civil Works (Sept 2020) for further guidance.
It should be noted that the decision to report a GBV case lies with the survivor or the guardians if the survivor (in case of a minor) and such a decision must be respected. Therefore, the contractor or project will only refer the survivor of guardian to the established referral pathway, including the nearest police station with a gender desk for handling GBV cases. Also, should a survivor choose legal redress, the project will similarly facilitate him/her by referring him/her to the nearest established legal support facility that offers legal support to GBV survivors.

Key tasks will include:

- Community engagement to create awareness on SEA/SH risk/ issues
- Creating awareness to workers on the need to refrain from SEA/SH incidences
- Mandatory awareness creation for workers on required lawful conduct in the community and legal consequences for failure to comply with laws
- Mandatory signing and implementation of code of conduct for the workers
- Creation of partnership or liaison with specialized actors in GBV who can respond appropriately in case of any incidence (provide contacts to community)
- Ensure a survivor centered approach in responding to SEA/SH incidences i.e., decision to report lies with the survivor or the guardian in case of a minor.
- Contractor to provide established referral pathway including police station with a gender desk for handling SEA/SH cases and also free toll numbers/hot lines for reporting GBV
- The contractor will also facilitate any survivor who decides to take legal action by referring them to the nearest established legal support facility that offers legal support to GBV survivors.
- Ensure Confidential reporting and responding to SEA/SH cases if reported;
- Encourage reporting of all SEA/SH incidences to the chief or the grievance redress committee members or community elders; and
- Ensure all complaints on SEA/SH or harassment are reported directly through CREO - county renewable energy officer.

8.14.21 Public Health Impacts

Construction works/activities will bring people together and new interactions between people are likely to happen. These interactions are likely to pose risks to the social fabric of the community. Such risks include public health related issues such as (COVID-19 infections and spread, HIV/AIDS, communicable and sexually transmitted diseases (STDs). The receptor sensitivity is medium and low magnitude, hence Minor significance.

Proposed Mitigation Measures

- Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training, awareness campaigns and community *Barazas.*

- Awareness creation and consultations with local communities prior and during construction on the dangers of these diseases
- Informing workers on local cultural values and health matters.
- Provision of condoms to workers
- Allowing migrant workers time to be with their families
- The contractor is impressed upon not to set a construction camp on site.
- The contractor will provide public education/information about HIV/AIDS transmission and prevention measures.
- Ensure equal treatment of workers
- Provide all appropriate COVID-19 preventive measures including campaign to maintain individual measures at the work place.

w) Public Health Impacts Sanitary Waste

Currently at the site there is not sanitary waste system (toilet) except one that is being constructed for the dispensary. There is need to dispose sanitary waste in manner that will not pose health hazards to the workers and the community. The receptor sensitivity is medium and low magnitude, hence Minor significance.

Mitigation Measures

- Construct/ install pit latrines for both genders clearly labelled

8.14.22 Forced Labor

During construction of the mini-grid the risk of forced labor is likely to occur and precaution is need to safe guard the community from being subjected to forced labor. The impact significance is rated minor, based on low sensitivity of the receptor and medium magnitude of the impact.

Mitigation Measures

- ❖ Contractor must adhere to the employment Act which outlaws any form of forced labor
- ❖ Community to report any form of forced labor at the site
- ❖ Contractor to ensure that all workers have a national ID card or documentation to show they are adults (above 18 years).

8.14.23 Risks related to Inadequate Stakeholder Engagement

Lack of timely and adequate stakeholder engagement during construction is a recipe for dissatisfaction among stakeholders affected and can result to grievances which may turn to conflicts and delays in project construction. With the implementation of the mitigation measures the impact significance is minor.

Mitigation measures;

- ❖ The contractor will design and implement a stakeholder engagement schedule to ensure various stakeholders are engaged at and informed about the project on a timely basis and respond to issues that the stakeholders may require.

- The contractor will also prepare and implement a grievance redress mechanism to deal with grievances. The grievance redress mechanism committee of this GRM should also include representatives from the community.

8.15 Negative impacts during Operation phase of the project

NOTE: According to the MOE the proposed project will be constructed by a third party (contractor) on behalf of REREC. The contractor will also operate and maintain the solar mini-grid for a period of seven years and then hand over the plant to Kenya Power. Therefore, mitigation measures against negative impacts during the first seven years will be monitored by KPLC.

8.15.1 Solid Waste Generation

The proposed Mini-grid is expected to generate some amounts of solid waste during its operation phase. The type of the solid waste generated during the operation of the project will consist of paper, drums, plastic, cables, meters, panels. Such wastes can be injurious to the environment. Some of these waste materials especially the plastic, cables, metals, polythene among others are not biodegradable hence may cause long-term injurious effects to the environment. The overall impact significance on land due to waste disposal during O&M phase has been assessed as minor due to medium sensitivity and low magnitude.

Mitigation measures

The contractor will be responsible for efficient management of solid waste generated by the project during its operation. In this regard, the contractor;

- Will provide waste handling facilities such as labelled waste bins for temporarily holding solid waste generated at the site.
- He shall put in place an emphasis on prudent waste generation and will give priority to reduction at source. This option will demand a solid waste management awareness among the employees.
- Separation of hazardous waste from non-hazardous waste is required
- Use long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated.
- He will ensure that waste is disposed of regularly and appropriately.
- Waste should then be handled, collected, transported and disposed according to the Environmental Management and coordination (waste management) regulations of 2006.

8.15.2 Liquid Waste/Oils Generation

The solar Mini-grid will have a small diesel backup generator which will operate in the event that the solar energy is limited for example during rainy and cloudy seasons. From its operations there will be waste oil. There is also potential for oil spills and accidents during oil loading to the generator, storage and operations. These oil spills can pollute the soil and even ground water. The liquid waste to be generated is hazardous hence may cause long-term injurious effects to the environment. The overall impact significance on land due to liquid waste disposal has been assessed as minor due to medium sensitivity and low magnitude.

Proposed mitigation measures

- Proper storage of the oil is required to ensure no leakages/ spills to the ground
- Frequent inspection and maintenance of the generator to minimize leakages.
- No vehicles should be serviced or maintained at the Mini-grid area.
- The waste oil or used oil must be disposed-off using NEMA approved waste handlers
- Proper training for the handling and use of fuels for the operators of the Mini-grid.
- In the event of accidental leaks, contaminated top soil should be scooped and disposed of in accordance to the law

8.15.3 Increased oil Consumption

The proposed Mini-grid shall consume fuel/oil in the process of backing up the solar energy required. The fuel is produced mainly through non-renewable resources, implying this will have adverse impacts on these non-renewable resources base and their sustainability. The impact will be of minor significance.

Mitigation Measures

To ensure efficient energy consumption during the operation phase of the project, the contractor to install an energy-efficient lighting system at the project site facilities. This will contribute immensely to energy saving during the operational phase of the project. In addition, the plant operators will be sensitized to ensure energy efficiently in their daily operations.

8.15.4 Increased Storm Water Flow

The panels, building roofs and pavements of the proposed Mini-grid will lead to increased volume and velocity of storm water or run-off flowing across the area covered by the solar panels during operation phase. This will lead to increased amounts of storm water entering the drainage systems. The impact will be of minor significance.

Mitigation Measures

- Construct the drainage system in a way to follow natural drain of the water
- Concrete only the required area and leave the rest of the land with vegetation like grass
- Construct rain harvesting system on the control buildings/office and harness into storage tanks for use

8.15.5 Fire Outbreaks

Carelessness and negligence both at the solar mini-grid and by the beneficiaries of electricity may cause fires. With the mitigation measures in place the impact is evaluated to be of moderate significance due to high sensitivity and low magnitude.

Mitigation Measures

- The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points
- Detection/alarm systems that can detect fire should be considered and installed
- A fire risk assessment and evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported.
- Workers especially operators of the plant must be trained on fire fighting and management
- 'No smoking' signs shall be posted within the Mini-grid area
- A fire Assembly point should be identified and marked

8.15.6 Visual Impacts

Once complete the Mini-grid will present visual impacts, both by its physical presence and by visual impacts of its associated structures. Visual intrusion caused by the Mini-grid may cause alteration to the natural scenery of the project area. Some people however, do not notice structures or do not find them objectionable from an aesthetic perspective. To some, the Mini-grid and its utilities may be viewed as part of the infrastructure necessary to enhance everyday lives and activities while to other it represents economic development. The project and its surrounding area are new for such developmental project and will have visual impacts during initial period of Project and the same will disappear over a period of time. Based on the above, significance of visual impact on landscape during operation phase of the project has been assessed as minor due to low receptor sensitivity and impact magnitude being medium.

Mitigation Measures

- The visual negative impacts can be mitigated through putting up a fence round to keep off/screen the solar panels.
- Planting of short trees along the fence

8.15.7 Water demand

During this period the demand for water will be lesser than that used in construction. However, some amounts of water will be needed in wiping of the panels and use at the solar plant facility. Therefore, caution need to be exercised to ensure prudent use of water. The impact is assessed to be negligible due to very low magnitude of the impact.

Mitigation Measures

- There is need to source for a sustainable water source for use
- Install water-conserving automatic taps
- Encourage water harvesting from rooftops and storage for cleaning purposes (washing the panels off dust)
- Any water leaks through damaged pipes and faulty taps should be fixed promptly.

8.15.8 Sanitary waste

Although there are few people who will be running the Mini-grid during operation phase provision for disposal of sanitary waste must be put in place through septic tanks. The impact is assessed to be negligible due to very low magnitude of the impact.

Mitigation Measures

The area is not served by a sewer system and sanitary waste will be drained through use of septic tanks.

8.15.9 Flooding

Flooding may occur and cause damage to the plant and other associated infrastructure but the risk of occurrence is low since the area is not known for regular flooding. The impact is assessed to be negligible due to very low magnitude of the impact.

Mitigation measures

- Ensure drainage channels are free of any obstruction at all times i.e., not blocked
- Construct more channels and or expand existing ones

- ❖ Raise foundations of the solar panels and ensure a proper and firm concrete base
- ❖ Create flooding diversions and or spill ways to divert water from getting into the solar power facility

8.15.10 Workers Occupation Health and Safety

Working within the Mini-grid can poses potential health hazards and accidents to workers. Therefore, caution must be taken to ensure that the Mini-grid does not pose a health and safety risks to workers. Because the maintenance activities will be conducted less frequently, the impact magnitude on occupational Safety and Health will be low. Considering that the accidents may result in injuries and death, the sensitivity is considered to be High. Therefore, the significance is Moderate.

Mitigation Measures

- ❖ Ensure only qualified staff are employed to work in the facility
- ❖ All workers operating the Mini-grid must be equipped with appropriate and adequate person protective equipment (PPE) such as; safety footwear, helmet among others.
- ❖ Operators must be skilled on firefighting management
- ❖ Annual environmental audits should be done
- ❖ WIBA cover for staff is mandatory

8.15.11 Hazardous waste

The amount of hazardous waste generated will be very low and possibly originate from maintenance works and would include; used up batteries, damaged panes, waste oil, and their containers, used rags and spent clean-up rags. This impact is assessed as minor due to medium sensitivity and low magnitude.

Mitigation Measures

- ❖ These waste wastes should not be mixed with other non-hazardous waste
- ❖ Operator to have a designated waste storage area for absolute lead-acid batteries awaiting disposal
- ❖ These wastes should be disposed by NEMA approved handlers

8.15.12 Noise and Vibration

Negligible noise and vibration will be produced during operation phase of the project and would be from the backup generator.

Mitigation Measures

The generator room should be made sound proof to ensure no noise of a nuisance level will be produced. The contractor should also monitor noise levels by taking tests and putting in appropriate measures.

8.15.13 Electric and magnetic fields (EMFs)

Electric magnetic fields are only anticipated during operation period, but these are negligible. The exposure to would be little EMFs is highly negligible because the EMFs produced by the electrical installation are low. Consequently, the study does not anticipate impacts of EMFs.

8.15.14 Shocks and electrocutions to the beneficiaries

Majority of the beneficiaries who will be customers and users of the power have not used electricity before. Failure to take appropriate precaution while interacting with electricity can result in electric shocks, fires and even electrocution/death. Impact significate is rated as moderate considering the high impact magnitude and low receptor sensitivity.

Mitigation Measures

The following precaution/preventive measures need to be observed in order to prevent risk of electric shocks, fires and electrocutions.

- Inspect the wiring of the houses before connecting power
- Safety awareness campaigns to the community before connection of power on safety precautions such as
    - Require community to engage a certified technician to do wiring in the premises
    - Use of quality materials while wiring
    - Refraining from individual illegal extensions of power lines to other houses
    - Observing safety measures while using electricity such as not touching sockets and switches with wet hands or wiping with wet cloths
    - Keeping off all electricity infrastructure e.g., not tying livestock on electric poles, no cutting earth wires that run along some electric poles, not interfering with sockets or switches
    - Reporting any electric wire/conductors if found fallen on the ground
    - Report any incident regarding electricity at the local office –staff in charge of operating the Mini-grid

8.15.15 Community safety -Access to the facility by general public

Once operational the facility/plant will need controlled access from the public to avoid any safety risks. The contractor will put the following measures to ensure the public will not access the site without permission. Impact significance is rated as moderate considering the high impact magnitude and low receptor sensitivity.

Mitigation Measures

- Fencing off the facility to keep of community members, children and livestock from entering into the facility
- Controlled access to the site only with prior approval
- Maintain records of any person who comes to site

8.15.16 Risks related to poor or inadequate stakeholder engagement (Conflict)

During operation of the project there are grievances that may arise from community and other stakeholders related to poor or inadequate engagement of stakeholders and other need for information or challenges in using power by the community. Therefore, the contractor will design and implement a grievance redress mechanism to deal with grievances. The grievance redress mechanism committee should also include representatives from the community. With the implementation of the mitigation measures the impact significance is minor to negligible.

Mitigation measures

- ❖ Employ from the community to the extent possible
- ❖ Engage the community members and other stakeholders in a timely manner
- ❖ Work closely with the GRM committee members in solving the conflicts
- ❖ Solve all conflicts/grievances at the earliest time possible
- ❖ Ensure all grievances are logged and closed
- ❖ Monitoring the pattern of grievances to come up will long term measures

8.15.17 Gender Based Violence- SEA/ SH

Gender based violence risk is also possible during operation phase although the labor force will be smaller. the impact is assessed as minor due to the low magnitude and medium receptor sensitivity. Therefore, measures must be put in place to address GBV risks.

Mitigation Measures

To manage GBV risks, the contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The plan will include the necessary measures for prevention and response.

Key tasks will include

- Community engagement to create awareness on GBV risk/ issues
- Creating awareness to workers on the need to refrain from GBV incidences
- Mandatory awareness creation for workers on required lawful conduct in the community and legal consequences for failure to comply with laws
- Mandatory signing and implementation of code of conduct for the workers
- Creation of partnership or liaison with specialized actors in GBV who can respond appropriately in case of any incidence (provide contacts to community)
- Ensure a survivor centered approach in responding to GBV incidences i.e., decision to report lies with the survivor or the guardian in case of a minor.
- Contractor to provide established referral pathway including police station with a gender desk for handling GBV cases and also free toll numbers/hot lines for reporting GBV
- The contractor will also facilitate any survivor who decides to take legal action by referring them to the nearest established legal support facility that offers legal support to GBV survivors.

- ❖ Ensure Confidential reporting and responding to GBV cases if reported;
- ❖ Encourage reporting of all GBV incidences to the chief or the grievance redress committee members or community elders; and
- ❖ Ensure all complaints on GBV or harassment are reported directly through CREO - county renewable energy officer.

8.15.18 Public Health Impacts –HIV/AIDs

There is potential for HIV/AIDs risks during operation phase. Therefore, the contractor need to

put measures to prevent the same. Based on the fact that the receptor sensitivity will be medium and the impact magnitude low, the impact significance will be Minor.

Mitigation Measures

- Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff awareness and awareness campaigns for the community
- The contractor will provide public education/information about HIV/AIDS transmission and prevention measures.
- Provision of condoms to workers
- Allowing migrant workers time to be with their families

8.15.19 Public health Impacts -Covid 19 disease

It is likely that the project will be implemented during the Covid 19 pandemic and so preventive measures must be put in place to prevent the disease from spreading. The receptor sensitivity will be medium and the impact magnitude low, therefore, the impact significance will be Minor.

Mitigation Measures

- Social distance must be observed
- Provision of hand wash facilities before access
- Provide thermal guards for temperature check and monitoring for workers and any other person coming to site
- Enforce wearing of masks
- Make provision for testing and treating especially of workers
- Display Ministry of Health guidelines on COVID 19 at strategic points and ensure adherence
- Create awareness on COVID 19 preventive measures
- Provision of contact numbers for the nearest health facility for testing and treatment
- Adhering to any other measures from the ministry of health which may be issued from time to time

8.15.20 Dust emissions

During operation phase not much dust will be generated from the facility but wind and dust storms are potential impacts. This impact will be negligible because there will be no activities on site that will have the potential to generate dust.

Mitigation Measures

- Trees can be planted around the plant/facility provided they do not cast shadows to the solar panels to act as wind breakers and hence decrease dust pollution
- Ensure planting of grass around and within the facility compound

8.15.21 Vehicle exhaust emissions

Exhaust emissions are likely to be generated by the vehicles coming to the facility though on a low risk. Due to the low magnitude of the impact and the low sensitivity, the significance will be minor.

Mitigation Measures

- Drivers of the vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered.
- Company vehicles should be well maintained

8.16 Negative impacts during decommissioning phase

Preparation for decommissioning

The solar power plant may be decommissioned due to various reasons and there are impacts that will need to be mitigated. Once the KPLC makes the decision for decommissioning the following will be required;

- ❖ Prepare a Decommissioning Plan and submit to NEMA and the County Government of Marsabit to obtain approval for implementation.
- ❖ Implement the decommissioning plan including backfilling, revegetation, disposal of waste material, recycling of recyclable material among other(10

Some of the negative impacts associated with the proposed project during its decommissioning phase include;

8.16.1 Noise and Vibration

The demolition works will lead to significant deterioration of the acoustic environment within the project site and the surrounding areas. This will be as a result of the noise from demolition works. The impact significance has been assessed minor due to the fact that the impact magnitude is low and the receptor sensitivity is medium.

Mitigation Measures

Significant impacts on the acoustic environment will be mitigated by the KPLC who will put in place several measures that will mitigate noise pollution. The following noise-suppression techniques will be employed to minimize the impact of temporary noise at the project site.

- ❖ Install portable barriers to shield compressors and other small stationary equipment where necessary.
- ❖ Use quiet equipment (i.e., equipment designed with noise control elements).
- ❖ Co-ordinate with relevant agencies in case the noise produced will require a license.
- ❖ Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible.
- ❖ Demolish mainly during the day when most of the neighbours are out working.

8.16.2 Solid Waste Generation

Demolition of the Mini-grid and related infrastructure will result in generation of solid waste. The waste will contain the materials used in construction including concrete, metal, wood, glass, paints, adhesives, sealants and fasteners, conductors, poles solar panels and batteries. Although demolition waste is generally considered as less harmful to the

environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. The impact will be of major significance due to high magnitude and medium receptor sensitivity. The batteries and panels need to be disposed in a specific way, in accordance to the manufacturer's guidelines and relevant regulations (both National and Marsabit County Government regulations).

Mitigation Measures

- Demolition contractor to adhere to the various manufacturer's guidelines and requirements regarding demolition and disposal
- Segregation of waste in order to separate hazardous waste from non-hazardous waste and other streams of waste
- Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements
- Adequate collection and storage of waste on site
- Safe transportation to the disposal sites / designated area
- Hazardous waste must be disposed by NEMA approved waste handler

8.16.3 Dust Emissions

Some dust will be generated during demolition works. This will affect demolition staff as well as the neighbors. The impact will be of minor significance.

Mitigation Measures

High levels of dust concentration resulting from demolition or dismantling works will be minimized as follows:

- Watering all active demolition areas to kill dust.
- Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard.

8.16.4 HIV/AIDs awareness and prevention

Interactions during the decommissioning phase will be for a very limited time. The project will sensitize workers and the surrounding communities on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training and awareness campaigns/ to the community. This impact is assessed to be Minor due to the low magnitude and medium receptor sensitivity.

8.17 Social Protection

There will adequate mechanisms in place to protect local vulnerable population especially women and minors from risks associated with influx of workers (harassment, underage sex). This system will ensure having security on site provided by the contractor as well as sensitization and enforcement by the contractor. There will also be a code of conduct established for contractor employees and contract workers acknowledging a zero-tolerance policy towards child labor and child sexual exploitation. Additionally, the contractor will employ their skilled staff and apply unskilled construction labor from the local population as far as possible to minimize on influx of foreigners into the community.

8.18 Social Inclusion

Gender Mainstreaming

Projects usually affect women and men differently, and their roles are highly delineated. The project shall ensure that both men and women are equally consulted about the project and benefit from employment and other opportunities the project will present.

In addition, among communities, some groups are faced with barriers that prevent them from fully participating in political, economic, and social life. Disadvantage is often based on social identity, which may be derived from gender, age, economic status, ethnicity, disability, among other factors. These factors make some groups of people more vulnerable to project impacts than others alongside posing barriers to accessing project benefits. Thus, development projects affect people differently but vulnerable groups are more severely affected than those that are better off. In this project, some groups of the society that can be categorized as the vulnerable. These include the very poor, poor female headed households, poor children headed households, the poor elderly and the special needs persons (disabled). To ensure social inclusion and social sustainability, deliberate effort must be made to ensure the vulnerable take advantage of the project benefits as well as shielding them adverse impacts of the project.

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

Environmental and Social Management and Monitoring Plan (ESMMP) for development projects provides a logical framework within which identified negative environmental and socio–economic impacts can be mitigated and monitored. The ESMMP has been developed to be used as tool to manage the environmental and social impacts that the activities of the proposed project will cause. The contractor before construction will refer to this ESMMP and develop specific implementation plans. In addition, the ESMMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done.

9.1 Purpose and Objectives of ESMMP

Serve as a guiding document for the specific objectives of the ESMMP are to:

- Environmental and social monitoring activities for the supervising consultant, contractor and the client management including requisite progress reports.
- Provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment and/or the affected population
- Provide instructions to relevant Project personnel regarding procedures for protecting the environment and minimizing environmental and/or the affected population effects, thereby supporting the Project goal of minimal or zero incidents.
- Document environmental concerns and appropriate protection measures; while ensuring that corrective actions are completed in a timely manner.

9.2 Auditing of ESMMP

The Ministry of Energy and the contractor shall conduct an initial and subsequent annual self-audit to the ESMMP to ensure that the system for implementation of the ESMMP is operating effectively. The World Bank will also supervise progress during regular supervision missions. The audit shall check that a procedure is in place to ensure that:

- The ESMMP being used is the up-to-date version;
- Variations to the ESMMP and non-compliance and corrective action are documented;
- Appropriate environmental training of personnel is undertaken;
- Emergency procedures are in place and effectively communicated to personnel;
- A register of major incidents (spills, injuries, complaints is in place and other documentation related to the ESMMP.
- A discrete mechanism for safely and confidentially reporting issues of SEA and of GBV at the community level triggered by the Project
- Referral pathways are in place for support of survivors of SEA and of GBV at the community level triggered by the Project
- Ensure that appropriate corrective and preventive action is taken by the Contractor once instructions have been issued

9.3 Incident Reporting

In line with the requirement of the Occupational Health and Safety Act (OSHA) 2007, EMCA 1999 and its 2015 revisions, and World Bank EHS guidelines, all ESHS incidents, accidents, dangerous occurrences

including occupational diseases shall be promptly reported to the respective regulatory institutions in the prescribed manner and template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank.

Records of all incidents shall also be maintained and made available for inspection on site throughout the project implementation phase. Investigation shall be conducted, and a corrective action plan developed for every reportable incident to prevent recurrence.

9.4 Management Responsibility of ESMMP

In order to ensure the sound development and effective implementation of the ESMMP including monitoring implementation of GBV and SEA, it will be necessary to identify and define the responsibilities and authority of the various persons and Organizations that will be involved in the project.
The following entities should be involved in the implementation of this ESMMP:

- ✓ Kenya Power And Lighting/Rural Electrification and Renewable Energy Corparation/Ministry of Energy
- ✓ NEMA Marsabit County
- ✓ Contractor
- ✓ Supervising Consultant;
- ✓ County Government of Marsabit
- ✓ Community members

9.4.1 Kenya Power and Lighting/Rural Electrification and Renewable Energy Corporation/ Ministry of Energy

KPL and REREC in conjunction with MOE the project proponent will be charged with the responsibility of ensuring that the proposed development has been put up in an environmentally sound manner. This can be achieved by inclusion of environmental specifications in the tender documents, selection of renowned environmentally conscious contractors and supervision to ensure that the objectives of this ESMMP are met.

9.4.2 National Environment Management Authority (NEMA)

The responsibility of NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government of Kenya in the implementation of all policies relating to the environment. Specific NEMA roles are listed below.

- ✓ Reviewing and provide approval or issuance of improvement comments on the project ESIA report.
- ✓ Issue ESIA license and the associated conditions
- ✓ Routinely monitor the ESMP, ESIA license conditions compliance and issuance of compliance note or stoppage or improvement orders to the project

9.4.3 Contractor

The persons/firms contracted to put up the proposed water Projects plant will be required to comply with the requirements of the ESMMP within this report. To ensure strict compliance environmental specifications and social risk mitigation measures that address project related SEA and GBV at the community level and SH of this ESMMP should form part of the contract documents. The contractor will be required under the contract to engage a competent Environment Safety Health and Safety Advisor/officer to advise them on the ESMP compliance; Undertake risk assessments and prepare project specific Construction ESMPs for review and approval and implement the approved C-ESMP.

Records and reports on the following environmental, health and social issues of the proposed project should be kept.

- *Safety*: hours worked, recordable incidents and corresponding root cause analysis (lost time incidents, medical treatment cases), first aid cases, high potential near misses, and remedial and preventive activities required (for example, revised job safety analysis, new or different equipment, skills training, and so forth).
- *Environmental incidents and near misses*: environmental incidents and high potential near misses and how they have been addressed, what is outstanding, and lessons learned.
- *Major works*: those undertaken and completed, progress against project schedule, and key work fronts (work areas).
- *E&S requirements*: noncompliance incidents with permits and national law (legal noncompliance), project commitments, or other E&S requirements.
- *E&S inspections and audits*: to include date, inspector or auditor name, and records reviewed, major findings, and actions recommended and implemented.
- *Workers*: number of workers, indication of origin (expatriate, local, nonlocal nationals), gender, age and skill level (unskilled, skilled, supervisory, professional, management).
- *Training on E&S issues*: including dates, number of trainees, and topics.
- *Footprint management*: details of any work outside boundaries or major off-site impacts caused by ongoing construction—to include date, location, impacts, and actions taken.
- *External stakeholder engagement*: highlights, including number of formal and informal meetings, and information disclosure and dissemination—to include a breakdown of women and men consulted and themes coming from various stakeholder groups, including vulnerable groups (e.g., disabled, elderly, children, etc.).
- *Details of any security risks*: details of risks the contractor may be exposed to while performing its work—the threats may come from third parties external to the project.
- *Worker grievances*: details including occurrence date, grievance, and date submitted; actions taken and dates; resolution (if any) and date; and follow-up yet to be taken—grievances listed should include those received since the preceding report and those that were unresolved at the time of that report.
- *External stakeholder e.g., community grievances*: grievance and date submitted, action(s) taken and date(s), resolution (if any) and date, and follow-up yet to be taken—grievances listed should include those received since the preceding report and those that were unresolved at the time of that report. Grievance data should be age and gender-disaggregated.
- Major changes to contractor's environmental and social practices.
- *Deficiency and performance management*: actions taken in response to previous notices of deficiency or observations regarding E&S performance and/or plans for actions to be taken—these should continue to be reported until KPLC determines the issue is resolved satisfactorily

9.4.4 Consultant

The sourced consultant will have to ensure that the relevant sections related to the contractor's responsibilities are up to date and is being used by the contractor. Periodic audits of the ESMMP will have to be done to ensure full compliance. The Consultant will also be responsible for mitigating social risks (detailed above) during implementation stage and developing monthly and quarterly E&S monitoring reports as envisaged in the project ESMF.

9.4.5 County Government of Marsabit

The relevant departmental officers within Marsabit County will be called upon where necessary during Project implementation to provide the necessary permits and advisory services to the Ministry of Energy.

9.5 Environmental and Social Management Plan

The ESMP is integrated into the overall project planning process and covers all project cycle phases. The prediction of impacts aids in the development of a robust management plan that will be implemented in order to minimize the negative effects on the environment. For each area of impact, mitigation measures have been prepared.

Broad cost estimates have been included to provide an indication of the resources required to successfully implement the control measures. These can be used for planning or to help prioritize implementation, and they can be refined further by the Project team. The roles and responsibilities for the implementation and enforcement of environmental and social controls (including health and safety) will need to be designated to individuals with the capacity and capabilities to undertake the work. The internal reports stipulated below should be submitted to management for record.

9.5.1 Management Plan during Construction Phase

The contractor will prepare targeted management plans to deal with specific environmental and social aspects guided by the ESMMP and any other emerging issues on the ground. The contractor shall prepare these plans and have them approved by both the proponent and the Bank before they mobilize to the site:

- Construction management plan
- Rehabilitation and site closure plan
- Local recruitment plan
- Workplace health and safety plan
- Community safety plan
- Emergency management and response plan
- SEA/SH Prevention and Response plan
- Stakeholder Engagement management plan
- Grievance Redress mechanism
- Labor influx management plan

9.5.2 Management Plan during Operational Phase

The operation phase of the proposed project will be mainly power supply, line maintenance and clearing of wayleaves. A contractor (contracted to run the plant for a number of years before handing over to KPLC) will be responsible for all the mitigation measures for negative impacts during the operation phase for the first seven years after which responsibility will be KPLC. This will be done by implementation of the following steps:

- Inspections
- Inspections
- Corrective action
- Reporting

A detailed Environmental and social management plan for preconstruction, construction and decommissioning phase is well illustrated in **table 42.**

Table 42: Environmental and Social Management Plan Social Impacts

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Local employment	-Prioritize hire of locals for all unskilled labour. -Implement a local recruitment plan that is fair and transparent (including recruitment processes that ensure inclusivity of both men and women, vulnerable individuals, minority clans, ethnic groups and VMGs. -Adhere to labour laws, and labour management practices (timely renumeration, equitable compensation for both genders for equal work etc.) -Create awareness to workers and the community on worker and project grievance redress mechanisms.	Construction Operations Decommissioning	Contractor REREC O&M Contractor/KPLC	-Fair and transparent local recruitment plan in place. -Recruitment processes (job adverts, interviews, selection etc.). -Number of locals employed based on gender, vulnerability, ethnic group, clan etc. -Type of employment (skilled, semi-skilled and unskilled). -Grievances raised, those aggrieved, status of resolution.	Quarterly	Contractor's cost
Local Sourcing	-Source materials from local businesses/communities, and where necessary give opportunities to businesses owned or operated by vulnerable individuals.	Construction Decommissioning	Contractor REREC	-Number and types of businesses sourced from, businesses owned and operated by vulnerable individuals, types and quantities of materials etc.	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Land acquisition and compensation for land and assets on land	In line with the RPF provisions; -Prepare and implement an **Abbreviated Resettlement Action Plan (A-RAP)** to guide land acquisition for the mini-grid, and wayleaves for power distribution. Further, the proponent will fast-track A-RAP preparation to ensure that land acquisition and contractor mobilization to the site is undertaken after the A-RAP is finalized, cleared, and disclosed. -The contractor will implement and adhere to agreements for temporal use of land and restoration of land after use. -Compensate affected communities in-kind (priority project) for the loss of land. -The construction activities will be restricted to within the allocated land and the immediate surroundings only. -After construction work, any land taken for a temporary basis for storage of material will be restored to their original form. -Consultations with the community on the low voltage lines.	Pre- Construction	Contractor- *(contractors' facilities, workers camps)* Proponent- *(project land for generation assets)*	-Land Acquisition and consultation report (consultation (minutes and lists of participants). -Type and amount of compensation paid to affected persons. - Priority community project implemented and handed over to affected communities. -Signed agreements with communities on the use and restoration of their land.	Quarterly	Value of compensation in kind project will be equivalent to the value of land acquired as per NLC

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-The design of the distribution line will utilize the existing road reserves. However, any damage to structures, crops, trees, community facilities and other assets will be compensated in line with the RPF provisions.					
Labor Influx and related impacts (SEA/SH, HIV/AIDs and other STIs)	-Tap into the local workforce to the extent possible to reduce labor influx. -Recruit local workforce to the extent possible especially for unskilled and semi-skilled jobs. -Consult with and involve local community in project planning and other phases of the project. -Raise awareness among local community and workers on the need to have a good /cordial working relation -Sensitize workers regarding engagement with local community. -Make provision to provide resources needed by the workers if the need for such resources may result to competition e.g., water. -Establish and operationalize an effective Grievance Redress Mechanism accessible	Construction Decommissioning	Contractor REREC	-Records of employees/updated employee register. -Number of local community employees and external employees/ updated employee register.	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	to community members. -The contractor and the project/community grievance redress committee to work closely address complains raised on time. -Include gender considerations in employment opportunities. -Provide appropriate compensation for work done. -Respect for community values/culture. -Prompt payment of workers as per the contractual agreements/terms.					
Child labor	-Employ workers who are 18 years and above, and with a valid national ID at the time of hire. -Implement and monitor the employment register regularly. Compliance with the national labor laws and labour management practices. -Put visible signage on site "**No Jobs for children**" -Do not allow children at the project site.	Construction Decommissioning	Contractor REREC	-Updated employment register indicating locals employed, their ages, national identification numbers etc. -Grievances raised, aggrieved persons and status on resolution etc.	Quarterly	20,000.00
GBV- SEA and SH	-Prepare an SEA/SH Prevention and Response	Construction Operations Decommissioning	Contractor REREC	-Minutes of awareness creation sessions for the	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	Action Plan, to manage the SEA/SH risks. -The Action Plan to be proportionate to potential SEA/SH risks, and to include measures such as awareness creation for communities and workers; identification of referral services for survivors and a GRM that ensures confidential reporting of GBV cases. -Implement a code of conduct signed by all those with physical presence on site.			community and workers on GBV-SEA/SH. -Code of conduct signed by all those with physical presence on site. -GRM that ensures confidentiality of GBV cases in place. Documented referral services for survivors. -Grievances raised, aggrieved persons and status on resolution etc		
Forced Labor	-Adhere to the Employment Act which outlaws any form of forced labor. -Report any form of forced labor at the site. -Ensure that all workers have a national ID card or documentation to show they are adults (above 18 years).	Construction Decommissioning	Contractor REREC	-Number of reported cases of forced labor.	Quarterly	20,000.00
Risks related to Inadequate stakeholder engagement	-Prepare a stakeholder engagement/consultation plan (SEP) that is proportionate to the subproject and the identified stakeholders.	Construction Operations Decommissioning	Contractor REREC	-Availabiliy of and implementation of the Stakeholder Engagement Plan. -# of stakeholder consultations held	Quarterly	30,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-Timely and prior disclosure of project all project information, including project instruments, the full rights and entitlements of project affected persons, sub-project positive and negative impacts and opportunities, proposed subproject budget. -In line with the SEP, undertake adequate consultations prior to construction and throughout the project cycle with all segments of the community and other relevant stakeholders. -Prepare and implement a grievance redress mechanism to deal with grievances. -The grievance redress committee to include representatives from the community. -Sensitize stakeholders on SEP and GRM.			-Record of stakeholder consultations held (minutes of meetings and list of participants). -Information disclosed, to whom it was disclosed (men women, PWD, youth, vulnerable individuals and households etc., methods and languages used in the disclosure (culturally appropriate and accessible), grievances raised and status on resolution etc. -Concerns raised andactons raised.		
Exclusion of VMGs and vulnerable individuals and households	In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following.	Pre-construction Construction Operations Decomissioning	Contractor REREC	Minutes of consultative meetings with all community segments including	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	• Early identification and inclusion of VMGs and disadvantaged groups. • Meaningful consultation to effectively participate in the project. • Timely and prior disclosure of relevant project information to VMGs and disadvantaged groups. • Adequate and ongoing consultations with VMGs and disadvantaged groups in line with the SEP. • All concerns or grievances raised are fully resolved in a timely manner. • Access to culturally appropriate project benefits and opportunities.			VMGs and vulnerable individuals and households, grievances raised and status on resolution etc.		
Inaccessibility of project benefits to	-Consult VMGs and Vulnerable individuals and households on charges for sub project	Operations	O&M Contractor	-Interventions to enable those vulnerable access	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
VMGs and other vulnerable individuals due to affordability challenges	services, and put in place specific interventions to ensure the vulnerable equally access project benefits.		KPLC	project benefits. -Number of complaints raised by VMGs/vulnerable individuals regarding access to project services. -GRM that is culturally appropriate and accessible. Grievances raised and status on resolution etc		
Inadequate grievances management	Constitute a Local Grievances Committee is in consultation with all community segments, and incorporates the existing local dispute resolution mechanism. -Implement a workers grievances mechanism. -Awareness on the culturally appropriate and accessible GRM to all community segments including VMGs, vulnerable individuals and households and CSOs -All reported grievances are	Construction Operations Decomissioning	Contractor REREC	-Local Grievances Committee in place, composition of committee, awareness of community and workers on project and worker GRMs, updated GRM logs, types of grievances -Availability of grievance redress process -Number of grievances reported	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	logged, dated, processed, resolved and closed out in a timely manner. -Proportionate representation of VMGs and vulnerable individuals in the local grievances committee. -GRM provides for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.			-Number of grievances resolved in a timely manner -Number of grievances escalated to national courts and the World Bank Grievances Redress Service and Inspection Panel.		
Impacts on Security	-A Security Management Plan that involves a threat assessment and analysis should be developed by the Contractor and the Proponent. -The plan should address security threats such as Terrorism, bomb threats, workplace violence and vandalism etc. of the solar plant. -Working hours should be kept within daylight hours during the construction phase -Security personnel should be trained on how to deal with the community to avoid confrontations -Access in and out of the site	Construction Operations Decommissioning	Contractor REREC	-A Security Management plan -Number of reported crimes -Number of complaints	Monthly	300,000

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	should be strictly controlled by a security company -The contractor should provide workers with identity tags and prohibit access of unauthorized people to the construction site. -A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process -The Project Contractor should also be guided by the Voluntary Principles on Security and Human Rights in managing security during the construction phase.					
Environmental Impacts						
Vegetation clearance	1. Clear only the necessary areas 2. Ensure proper demarcation and delineation of the project area to be	Construction	Contractor REREC	-Number of trees cleared -Planted trees	Once off	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	affected by construction works. 3. Specify locations for vehicles and equipment, and areas of the site which should be kept free of traffic, equipment, and storage. 4. Designate access routes and parking areas 5. Re-vegetation including planting of trees around the plant/facility					
Soil erosion	1. Avoid groundbreaking during the seasons of high rainfall to avoid erosion. 2. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled. 3. Construction related impacts like erosion and cut slope destabilizing should be addressed through landscaping and grassing, carting away and proper	Construction	Contractor REREC	Assess size of rills or Gulleys forming from accelerated run off from compacted areas	Quarterly	Part of contractor's fee

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	disposal of construction materials 4. Use silt traps where necessary 5. Cover soil stock piles 6. Landscaping with grass on areas without electrical installation (lower areas) 7. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled.					
Contamination of soil from fossil fuels	1. Ensure wastewater generated is discharged or drained into approved drainage facilities 2. Construction vehicles must be maintained in good state and proper servicing to ensure no oils are likely to leak 3. Care must be exercised not to spill any fossil fuels 4. Any contaminated soil shall be scooped and	Construction	Contractor REREC	Records of any leakages from construction equipment/ vehicles.	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	disposed-off appropriately. 5. No servicing vehicles on site					
Dust emissions	1. The construction area should be fenced off to reduce dust to the public 2. Suppress dust during dry periods by use of water sprays; **3.** Stockpiles of excavated soil should be enclosed/covered/watered during dry or windy conditions to reduce dust emissions. 4. Burning of woody debris & construction waste to be prohibited **5.** Use of personnel protective equipment (PPE) -masks should be provided to all personnel in areas prone to dust emissions 6. Restrict speed on loose surface roads during dry or dusty conditions	Construction	Contractor REREC	-Visual Observation of dust -Provision of PPEs especially masks	Daily	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	7. Keep stockpiles and exposed soils compacted and re-vegetate as soon as possible. 8. Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas Plant short trees to break speed of wind					
Vehicle exhaust and emissions from Generator	1. Drivers of construction vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered. 2. Maintain all machinery and equipment in good working order to ensure minimum emissions of carbon monoxide, NOX, SOX and suspended particulate matter	Construction	Contractor REREC	-Engine maintenance records - inspection of stacks	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	3. Maintain equipment in good running condition – no vehicles to be used that generate excessive black smoke 4. Use of diesel which is Sulphur- free to run the power producing generators to be encouraged 5. The stack chimney of the generators will be increased from its normal height of 3 meters to 6 meters					
Solid waste generation	1. Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is top soil last; 2. Segregate waste 3. Provide litter collection facilities such as bins	Construction	Contractor REREC	Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	4. Contractor to put in place and comply with a site waste management plan 5. The contractor should comply with the requirement of OSHA ACT 2007 and Building rules on storage of construction materials 6. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time 7. Recovery of materials remains and return to stores 8. Re-use of materials where possible 9. Proper budgeting to avoid waste generation 10. Proper disposal of waste in line with solid waste regulation					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	11. Construction wastes to be managed in accordance with construction standards in Kenya					
Impacts on Water Resources and Water Quality	1. Clear the necessary areas only. 2. Appropriate remedial measures shall be implemented by the contractor in the event of erosion. 3. Infrastructure shall be designed to ensure that contaminated run-off does not reach water source i.e., earth dam. 4. Contractor to develop an oil-spill containment plan as part of the emergency response plan. In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect. 5. No vehicle maintenance and service shall be done at project site	Construction	Contractor REREC	-Oil spill containment plan. -Provision of fuel/oil drip and spill trays	Quarterly	150,000

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	6. Ensure that potential sources of petro-chemical pollution are handled in such a way to reduce chances of spills and leaks.					
Noise & vibration	1. Construction activities to avoid any unchanneled flow of water at the site 2. Storage areas that contain hazardous substances should be bunded with an approved impermeable liner and provision for a pit to be made in case of oil spill. 3. The excavation and use of rubbish pits during construction should be strictly prohibited. 4. A waste disposal area should be designated within the active construction area and this should be equipped with suitable containers i.e., skips or bins of sufficient capacity and	Construction	Contractor REREC	Noise levels- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Quarterly	150,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	designed to contain and prevent refuse from being blown by wind, 5. Areas contaminated by spilled concrete and/or fuels and oils leaking from vehicles and machinery should be cleaned immediately					
Impacts from Hazardous materials -	1. Maintenance of construction vehicles will not be done on site 2. All hazardous products and waste should be labelled and handled properly to avoid contact with the ground 3. Dispose hazardous waste through a NEMA approved waste handler	Construction	Contractor REREC	Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00
Accidental Oil Spills or Leaks	1. In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately. 2. Refueling and maintenance of vehicles	Construction	Contractor REREC	Records of all accidental spills and number of liters	Quarterly	150,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	will not take place at the construction site. 3. Create awareness for the employees on site on procedures of dealing with spills and leaks 4. Vehicles and equipment must be serviced regularly and kept in good state to avoid leaks. 5. In case of spillage the contractor should isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent materials and/or other materials approved by materials. 6. All chemicals should be stored within the bunded areas and clearly labeled detailing the nature and quantity of chemicals within individual containers.					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Fire Hazards	1. Create awareness to the construction workers on potential fire hazards 2. Provision of firefighting equipment on site during construction. 3. No smoking shall be done on construction site 4. 'No smoking' signs shall be posted at the construction site 5. A fire risk assessment and evacuation plan should be prepared and must be posted in various points of the construction site including procedures to take when a fire is reported. 6. Designate an assembly point	Construction	Contractor REREC	-Records of any Fire incidences -Fire equipment and evacuation plan	Quarterly	100,000.00
Impacts of construction material sourcing (e.g., quarrying)	1. Source all building materials such as stone, sand, ballast and hard core from NEMA approved sites. 2. Ensure accurate budgeting and	Construction	Contractor REREC	Sources of raw materials (from local community)	Quarterly	Part of contractor's cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	estimation of actual construction materials to avoid wastage. 3. Reuse of construction materials where possible.					
Increased water demand	1. Prudent use of available water 2. Consultations with the project local committee on use of water in the community to avoid conflicts with the community 3. Source and utilize a sustainable and reliable water supply for both construction and operation phase.	Construction	Contractor REREC	Water usage records	Quarterly	Part of contractor's cost
Energy Consumption	1. Ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used.	Construction	Contractor REREC	Energy consumption records	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	2. Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. 3. Complementary to these measures, they monitor energy use during construction and set targets for reduction of energy use.					
Occupational Health and safety Impacts	1. Use skilled personnel for activities which demand skills/technical tasks 2. Awareness creation/Tool box talks on safety to workers while at construction site 3. Workers coming to the site should be knowledgeable on safety precautions to take 4. Appropriate PPE (helmet, safety harness,	Construction	Contractor REREC	Records of any near misses, incident, and accidents. Records of corrective actions implemented if there was an accident.	Quarterly	1,000,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	boots, masks, climbing irons) 5. Proper general house keeping 6. Close supervision of workers 7. Risk assessment by contractor of the construction activities and implement mitigation measures appropriately 8. Adherence to occupational Safety and Health Act 2007 9. Availability of equipped first aid box on site 10. Provide safe drinking water for workers 11. Engagement of trained first aider on site 12. Ensure the WIBA cover is taken for the staff 13. Establish safety committees					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Community safety –access	1. Proper barricading 2. Hazard communication. 3. Controlled access to the site by designated personnel 4. Maintain records of any person who comes to site	Construction	Contractor REREC	Presence of a controlled access and records of every person accessing the site	Daily	20,000.00
Public Health Impacts	1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training, awareness campaigns and community *Barazas.* 2. Awareness creation and consultations with local communities prior and during construction on the dangers of these diseases 3. Informing workers on local cultural values and health matters.	Construction	Contractor REREC	Number of awareness creation sessions conducted. -Availability of and distribution of condoms	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	4. Provision of condoms to workers 5. Allowing migrant workers time to be with their families 6. The contractor is impressed upon not to set a construction camp on site. 7. The contractor will provide public education/information about HIV/AIDS transmission and prevention measures. 8. Ensure equal treatment of workers 9. Provide all appropriate COVID-19 preventive measures including campaign to maintain individual measures at the workplace.					
Sanitary waste	Construct/ install pit latrines for both genders clearly labelled	Construction	Contractor REREC	Presence of separate and clean washrooms for	Quarterly	300,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
				both the gents and ladies		
Solid Waste Generation	1. Provide waste handling facilities such as labelled waste bins 2. Emphasis on prudent waste generation and give priority to reduction at source 3. Solid waste management awareness to operators 4. Operator to contract a NEMA licensed waste handler to collect and dispose solid waste	Operation	O&M Contractor KPLC	Presence of well-maintained receptacles and centralized collection points	Quarterly	50,000.00
Liquid Waste/Oils Generation	*1.* Proper storage of the oil is required to ensure no leakages 2. Frequent inspection and maintenance of the generator to minimize leakages.	Operation	O&M Contractor KPLC	-Engine maintenance records -Oil spill containment plan	Quarterly	200,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	3. No vehicles should be serviced or maintained at the Mini-grid area. 4. The waste oil or used oil must be disposed-off appropriately. 5. Proper training for the handling and use of fuels for the operators of the Mini-grid. 6. In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately.					
Increased oil Consumption	1. Efficient energy consumption 2. Install an energy-efficient lighting system	Operation	O&M Contractor KPLC	Energy consumption records	Quarterly	No additional cost
Increased storm water flow	1. Construct the drainage system in a way to follow natural drain of the water 2. Concrete only the required area and leave the rest of the land with vegetation like grass	Operation	O&M Contractor KPLC	Provision of a drainage system and a rain water harvesting system	Quarterly inspections	200,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	3. Construct rain water harvesting system on the control buildings/office and harness into storage tanks for use					
Fire Outbreaks	1. The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points 2. Detection/alarm systems that can detect fire should be and installed 3. A fire evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported. 4. Workers especially operators of the plant must be trained on fire management	Operation	O&M Contractor KPLC	-Provision of serviced fire equipment, evacuation plan and safety signages -Records of fire safety training	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	5. 'No smoking' signs shall be posted within the Mini-grid area 6. A fire Assembly point should be identified and marked					
Water demand	1. Ensure prudent use of water. 2. Install water-conserving automatic taps. 3. Any water leaks through damaged pipes and faulty taps should be fixed promptly.	Operation	O&M Contractor KPLC	Water usage records	Quarterly	20,000.00
Sanitary waste	1. Provide sanitary waste facilities for both genders clearly marked 2. Disposal of waste through septic tanks	Operation	O&M Contractor KPLC	Presence of separate and clean washrooms for both the gents and ladies	Quarterly	No additional cost
Flooding	1. Ensure drainage channels are free of any obstruction at all times i.e., not blocked	Operation	O&M Contractor KPLC	-Provision of drainage system -Raised foundations for the structures	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	2. Construct more channels and or expand existing ones 3. Raise foundations of the solar panels and ensure a proper and from concrete base 4. Create flooding diversions and or spill ways to divert water from getting into the solar power facility					
Occupation health and Safety	1. Ensure only qualified staff are employed to work in the facility 2. All workers operating the Mini-grid must be equipped with appropriate and adequate person protective equipment (PPE) such as; safety footwear, helmet among others. 3. Operators must be skilled on firefighting management	Operation	O&M Contractor KPLC	-Provision of PPEs and WIBA cover -Environmental audit reports	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	4. Annual environmental audits should be done 5. WIBA cover for staff is mandatory					
Hazardous waste-damaged panels	1. Segregation from other waste streams 2. Proper disposal through a NEMA approved/licensed handler	Operation	O&M Contractor KPLC	Presence of well-maintained receptacles and centralized collection	Quarterly	200,000.00
Noise and Vibration	1. Generator room should be soundproof to ensure no noise of a nuisance level will be produced. 2. Monitor noise levels	Operation	O&M Contractor KPLC	Noise levels- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Quarterly	Part of contractor's cost
Shocks and electrocutions	1. Inspect the wiring of the houses before connecting power 2. Safety awareness campaigns to the community before connection of power on	Operation	O&M Contractor KPLC	-Records of awareness sessions conducted -Incidences report	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	safety precautions such as: ○ Require community to engage a certified technician to do wiring in the premises ○ Use of quality materials while wiring ○ Refraining from individual illegal extensions of power lines to other houses ○ Observing safety measures while using electricity such as not touching sockets and switches with wet hands or wiping with wet cloths ○ Keeping off all electricity infrastructure e.g., not tying livestock on electric poles, no cutting earth wires that run along some electric poles, not interfering with sockets or switches ○ Reporting any electric					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	wire/conductors if found fallen on the ground o Report any incident regarding electricity at the local office –staff in charge of operating the Mini-grid					
Community Safety- Access to site by general public	1. Fencing off the facility to keep of community members, children and livestock from entering into the facility 2. Controlled access to the site only with prior approval 3. Maintain records of any person who comes to site	Operation	O&M Contractor KPLC	Presence of a controlled access and records of every person accessing the site	Daily	Part of contractor's cost
Risks related to poor or inadequate stakeholder engagement (Conflict)	1. Employ from the community to the extent possible 2. Engage the community members and other stakeholders in a timely manner 3. Work closely with the GRM committee	Operations	O&M Contractor KPLC	Grievance records	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	members in solving the conflicts 4. Solve all conflicts/grievances at the earliest time possible 5. Ensure all grievances are logged and closed 6. Monitoring the pattern of grievances to come up will long term measures					
Gender Based Violence –SEA and SH	To manage GBV risks, the contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The plan will include the necessary measures for prevention and response and must ensure survivor-based approach	Operations	O&M Contractor KPLC	-SEA/SH Prevention and Response Action Plan -Grievance records	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Public Health Impacts – HIV/AIDs	1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff awareness and awareness campaigns for the community 2. Provision of condoms to workers 3. Allowing migrant workers time to be with their families	Operations	O&M Contractor KPLC	Number of awareness creation sessions conducted. -Availability of and distribution of condoms		20,000.00
Public health Impacts -Covid 19 disease	1. Social distance must be observed 2. Provision of hand wash facilities before access 3. Temperature check and monitoring of the temperature of workers and any other person coming to site 4. Enforce wearing of masks	Operations	O&M Contractor KPLC	Availability of hand washing facilities Utilization of hand washing facilities Number of Covid-19 cases reported	Quarterly	30,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	5. Make provision for testing and treating especially of workers 4. Provision of contact numbers for the nearest health facility for testing and treatment 5. Adhering to any other measures from the ministry of health which may be issued from time to time					
Dust Emission	**1.** Trees can be planted around the plant/facility provided they do not cast shadows to the solar panels to act as wind breakers and hence decrease dust pollution 2. Ensure planting of grass around and within the facility compound	Operations	O&M Contractor KPLC	Visual inspection	Quarterly	50,000.00
Vehicle Exhaust Emissions	1. Drivers of the vehicles must be sensitized so that they do not leave vehicles idling so that	Operations	O&M Contractor KPLC	Engine maintenance records	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	exhaust emissions are lowered. 2. Company vehicles should be well maintained					
Noise and Vibration	1. Install portable barriers to shield compressors and other small stationary equipment where necessary. 2. Use quiet equipment (i.e., equipment designed with noise control elements). 3. Co-ordinate with relevant agencies in case the noise produced will require a license. 4. Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible.	Decommissioning	Contractor REREC	Noise levels- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Once off	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	5. Demolish mainly during the day when most of the neighbors are out working.					
Solid Waste Generation	1. Demolition contractor to adhere to the various manufacturer's guidelines and requirements regarding demolition and disposal 2. Segregation of waste in order to separate hazardous waste from non-hazardous waste and other streams of waste 3. Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements 4. Adequate collection and storage of waste on site 5. Safe transportation to the disposal sites / designated area 6. Hazardous waste must	Decommissioning	Contractor	Presence of well-maintained receptacles and centralized collection points	Daily	700,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	be disposed by NEMA approved waste handler					
Dust Emissions	Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard	Decommissioning	Contractor	Visual inspection	Daily	20,000.00
Public Health-HIV/AIDS	The project will sensitize workers and the surrounding communities on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training and awareness campaigns/ to the community.	Decommissioning	Contractor	Records of awareness creation sessions conducted. -Availability of and distribution of condoms	Once off	20,000.00
	Total					4,680,000.00

Table 42: Institutional Framework and Compliance/Implementation of the ESIA/ESMP

No	Institution	Role/Function
1	The National Environment Management Authority (NEMA	NEMA: ▪ Approve the ESIA Report ▪ Issue EIA License for project implementation ▪ Carry out independent Audit to determine compliance with ESMP
2	Directorate of Occupational Safety and Health Services (DOSHS)	DOSHS: ▪ Provides OSH permits for workplaces of the project including campsites and quarries ▪ Conduct inspections to ensure conformance to OSHA
3	Water Resources Authority (WRA)	WRA ▪ Provides necessary water abstraction permits for boreholes and surface water sources (rivers, streams etc.) ▪ Monitor water use in the region and provide guidance water use
4	National Land Commission (NLC)	NLC ▪ Verify the identified land for the purposes of ascertaining land ownership ▪ Transfer of land ownership details to the proponent
5	National Gender and Equality Commission	The Commission: ▪ Ensures that there is gender equality and equity throughout the implementation of the project. ▪ Representatives will monitor and evaluate gender quality and equity with regards to job provision and harassment cases on site to ensure compliance with the law
6	County Government of Marsabit	County Governments will: • Provide approval for the project & project site ▪ Approval of community land consent & verification • Provide support
7	Supervision Consultant	Supervising Consultant ▪ Will engage the following dedicated full-time safeguards staff to support risk management ✓ Supervising Engineer (RE) ✓ Social Safeguards Specialist ✓ Environmental Safeguards Specialist ▪ Review and approval of the ESMPs and other plans ▪ Day to day supervision of Contractor implementation of the ESMPs and other plans ▪ Regular reporting on the ESMP implementation ▪ Has full time Environmental, Health and Safety and Social Specialists
9	Contractor	**Contractor** ▪ Will engage the following dedicated full-time safeguards staff; ✓ Environmental Safeguards Specialist ✓ Social Safeguards Specialist ✓ Registered Occupational Health and Safety (OHS) Expert ▪ Will Prepare the CESMPs and other plans before commencing construction. ▪ Will Operationalize and implement the CESMPs. ▪ Has full time Environmental, Health and Safety and Social Specialists. ▪ Carries out day to day management of ES, H& S risks. ▪ Reports on incidents and accidents to the Resident Engineer and regulators.

10 IMPACT SUMMARY AND CONCLUSION

10.1 Introduction

The Ministry of Energy (MOE) Kenya is coordinating the implementation of the Kenya Off-Grid Solar Access Project (KOSAP) to provide access to clean and modern energy services through off-grid solar to Forole Village, Forole Location, Maikona Ward, and North Horr Subcounty in Marsabit County. During the implementation of the project, there shall be some impacts both positive and negative. The negative impact shall be controlled through suggested mitigation measures.

10.2 Impacts Requiring Detailed Assessment

During the assessment of the proposed site the following negative impacts were identified by the experts in consultation with the community and other stakeholders. They included air pollution (dust/particulate, smoke emissions and noise/vibrations) which shall be minimized through sprinkling of water in dusty areas, provision of mouth masks to reduce the inhalation of emissions by the construction worker, repair of vehicles and grout machineries to avoid excess emission of smoke. Degradation of vegetation and associated fauna. Destruction of trees and other vegetation shall be avoided at any cost. Construction waste generation like empty cement bags, cartons, and empty containers of paint shall be managed through collection and dumping in receptacles later transported to dispose to designated by the authorities. Accidents (falls, slips, flying object are some of the causes of accidents) during construction shall be managed by provision of PPEs to the construction workers. Signage and warnings shall be placed conspicuously. Fire or explosion within the store shall be managed by training the workers and installing fire extinguishers with construction materials.

10.3 Conclusion

Before implementation of the project, environmental and social impact assessment has been undertaken to fulfil the legal requirements, obtain background biophysical information of the site, assess and predict the potential environmental and social impacts and associated mitigation measures during the project cycle, suggestions of possible alterations to the proposed design based on the assessment findings were made, public and stakeholder consultation and participation was undertaken, an environmental and social management plan (ESMP) and monitoring plan were developed. The project has been guided by World Bank safeguards regulations and EMCA 1999 *(amended 2015).* During the ESIA various stakeholders including VMGs were consulted, and their views incorporated in the report.

During the preparation of this report for the proposed development, it is observed and established that most of the negative social and environmental impacts can be mitigated and have potentially short term low significant effects. The positive impacts are highly rated and will benefit the community at Forole and the county at large. The project proponent, the implementing agency and the contractor must adhere to prudent implementation of the social and environmental management and monitoring plan. The contractor should commit to obtaining all necessary permits and licenses from the relevant authorities and have qualified and adequate personnel to do the project as proposed. The ESIA has proposed adequate safety and health mitigation measures as part of the relevant statutory requirements.

The analysis of the ESIA has demonstrated that the construction and operation of the proposed Solar Mini-grid will have positive impacts to the government and Kenyan society at large. The impacts will include; Increase in reliable and sustainable clean energy, employment to local community members, increase in the national/local investment, increase in government revenue, improvement of standards of living for Forole community members. However, despite the outlined positive impacts, the proposed development

will cause some negative impacts such as; noise, dust generation, soil erosion, oil spills, fire hazards, electrocution, shocks, solid waste generation, occupational health hazards, social risks such as labour influx, demand for resources, gender-based violence, conflicts, public health impacts (HIV & AIDs, COVID 19) among others that need to be avoided, reduced and mitigated against.

An Environmental and Socio- economic Management Plan (E&SMP) outline has been developed to ensure sustainability of the project area activities from construction through operation to decommissioning. The plan provides a general outlay of the activities, associated impacts, mitigation action plans and appropriate monitorable indicators. Implementation timeframes and responsibilities are defined, and where practicable, the cost estimates for recommended measures are also provided.

A monitoring plan that highlights some of the environmental performance indicators that should be monitored has been developed. 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 and mitigation measures proposed.

From the findings of this study, the following conclusions are made:

- The proposed project will generate socio-economic benefits which would not be realized if the 'NO development option'' is considered.
- The beneficiary community has been consulted among other stakeholders and project information shared including the negative impacts and the views of the stakeholders is that the project is long overdue.
- The potential adverse impacts associated with the proposed project are possible to mitigate successfully. The impacts before implementation of mitigation measures are assessed as very low to medium low and the ratings are expected to improve further with the implementation of the proposed mitigation measures
- The impacts that will be adverse will be temporary during the construction phase and can be managed to acceptable levels with the implementation of the recommendation of the mitigation measures for the project.
- The project will be designed, constructed, and operated according to the acceptable industry norms and standards. Successful implementation of the proposed ESMMP will ensure environmental sustainability

The project is located in Forole village in Marsabit County. This area is influenced by anthropogenic activities and no sensitive environment ecosystems were identified at the proposed project site. As a result, there will be no direct interaction of the project activities at the time of construction with the natural sensitive ecosystem. As discussed in Chapter 8 of this assessment, the environmental and social impacts will be minor and easily mitigated.

The proponent/contractor to consult all relevant service providers and authorities (i.e., County Administrators, NEMA, amongst others) to harmonize the projects infrastructural and socio-economic developments with existing facilities.

The proposed project design has integrated mitigation measures with a view to ensuring compliance with all the applicable laws and procedures. The Solar Mini-grid and associated structures will be installed to the required planning/architectural/structural designs and standards. During project implementation, operation

and decommissioning stages sustainable environmental management would be ensured; avoiding inadequate use of natural resources, conserving nature sensitively and guaranteeing a respectful and fair treatment of all people working on the project, general public at the vicinity and the expected beneficiaries of the project.

In relation to the proposed mitigation measures that will be incorporated during construction, operational and decommissioning phases; the development's input to the society and environment; the project is considered beneficial and important

10.4 Recommendations

It is recommended that during the project cycle the proponent and contractor shall adhere to ESMP to minimize risks and delays that may occur. This shall also reduce the cost of the project in the long run. It is also suggested that the positive impacts that emanate from such activities shall be enhanced as much as possible.

The implementation of the proposed mini grids project will provide possibilities for local communities to improve their livelihoods, Marsabit County to flourish, and Kenya as a whole to grow. Despite the possibility of both positive and negative environmental and social consequences, the study team took the effort to arrive at the best possible position by weighing the many possibilities available for adoption. It was critical to involve all key stakeholders in this process in order to ensure that significant impacts and concerns were taken into account during the evaluation.

The triggered World Bank safeguard policies will be mitigated to acceptable levels utilizing the EMSP, followed by strict adherence to the ESIA's monitoring plan. According to the findings, negative consequences are mostly short-term and manageable to tolerable levels. As a result, the ESIA analysis considers the project acceptable and gives an outline of mitigation measures to alleviate the project's negative consequences. In addition, regular inspections should be scheduled to track the implementation of the Environmental and Social Management Plan, as well as the processes for discovering unanticipated occurrences and impacts and implementing necessary mitigation measures.

The incorporation of the Environmental and Social Management Plan into the development of this project will ensure adequate control of any impacts caused during the project's lifecycle. This will be an excellent opportunity for long-term development. The analysis concludes that the project is environmentally and socially sustainable if the mitigating actions recommended are executed in accordance with world bank safeguard policy and Kenyan regulatory frameworks.

This assessment also provides the following:

1. The **Bid Documents** prepared for the Project incorporates the Environment, Social Health and Safety Provisions discussed under Chapter 8 (Environment and Social Impact Assessment and Mitigation Measures).
2. The Project **Contract Document** should include provisions for the contractor preparing and implementing site specific **Environment and Social Management Plan** (ESMP), appendices to the ESMP will include:
    - ✓ Stakeholder Engagement plan
    - ✓ Health, Hygiene and Safety Plan
    - ✓ Labour Management Plan

- ✓ Child Protection Strategy
- ✓ Waste Management Plan
- ✓ Contractors Code of Conduct including provisions on Violence Against Children (VAC), SEA, and SH
- ✓ Gender Based Violence and Sexual Harassment Prevention Plan
- ✓ Grievance Redress Mechanism
- ✓ GBV Action Plan, including:
    - SEA Prevention and Response Strategy
    - SH Policy
    - GBV Mitigation Plan
    - SEA Grievance Mechanism
    - SH Grievance Mechanism
- ✓ HIV/Aid & Communicable Diseases Prevention Strategy
- ✓ Local Recruitment plan
- ✓ Labour influx management plan

3. The contractor shall engage a fulltime basis environment and social safeguards officer who will be in charge of ensuring compliance of the contractor to environment and social provisions provided by the ESIA and Construction Environment and Social Management Plans (CEMP) prepared by the contractor. The officer will participate in monthly and quarterly meeting and will generate monthly and quarterly environment and social safeguards compliance reports. The recruitment of a community liaison officer who will act as a link between the community and the contractor
4. At Project Implementation Stage, the Contractor will report monthly to the Project management team comprising of the Consultant and the Project proponent on how ESHS provisions detailed in this ESIA are addressed. In addition, as per the requirement of the Occupational Health and Safety Act (OSHA) 2007, EMCA 1999 and its 2015 revisions, and World Bank EHS guidelines, all ESHS incidents, accidents, dangerous occurrences including occupational diseases shall be promptly reported to the respective regulatory institutions in the prescribed manner and template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank. Records of all incidents shall also be maintained and made available for inspection on site throughout the project implementation phase. Investigation shall be conducted, and a corrective action plan developed for every reportable incident to prevent recurrence
5. At Project completion stage, within the defect's liability Period, the Ministry of Energy will initiate an Initial Environment and Social Audit and subsequent annual audits for the Project as required by EIA/EA Audit regulation of the year 2003. The audit will develop an Environment and Social Audit Action Plan (ESAAP) that will be used to track Project Environment and Social Compliance during Project operation stage.
6. Diligence on the part of the contractor and proper supervision by the KPLC is crucial for mitigating the potential impacts and ensuring structural strength, safety, and efficient operation of the project

Lastly, this CPR to be cleared and approved by WB while the National Environment Management Authority (NEMA) to issue ESIA license subject to annual environmental audits after operating for one year. It is recommended that an Environmental Audit (EA) be undertaken annually.

Authorization Opinion

In terms of NEMA requirement the environmental practitioner is required to provide an opinion as to whether the activity should or should not be authorized. The expert is reticent to venture such an opinion since we are not an elected entity mandated to make decisions on behalf of authority. Nevertheless, in this section a qualified opinion is ventured and in this regard the Lead expert believes that sufficient information is available for NEMA to take a decision. The fundamental decision is whether to allow development which brings socio-economic advantages and is consistent with planning and certain development and social responsibility and upliftment of policies, but which may impact on an area as a result of negative impacts identified. The Lead Expert believes that the ESIA have shown that the applicant's preferred alternative and technological alternatives are generally acceptable. The ESIA has also assisted in the identification of essential mitigation measures that will mitigate the impacts associated with the project to within acceptable limits.

In conclusion, the expert is of the opinion that on purely 'environmental' grounds (i.e., the project's potential socio-economic and biophysical implications) the application as it is currently articulated in the applicant's proposal should be approved provided the essential mitigation measures are implemented. It is in the opinion of the Environmental Consultant that the anticipated negative impacts can be readily and effectively mitigated and the proposed project does not pose any significant threat to the Environment and may be licensed to proceed.

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12 APPENDICES

Summary of Appendices	
Appendix 1:	Abbreviated Resettlement Action Plan (A-RAP)
Appendix 2:	Summary of Community Consultation Meeting Leading to Land Identification and GRC Constitution
Appendix 3:	Lists of Attendance for the Land Acquisition Meeting
Appendix 4:	Summary of Community Consultation meeting during ESIA Public Participation
Appendix 5:	Lists of Attendance for ESIA Public Participation Meeting
Appendix 6:	Lead Expert's Practicing Licence

ABBREVIATED RESETTLEMENT ACTION PLAN (A-RAP)

1. Forole Sub-project Site

The Forole sub-project site is on unregistered community land and held in trust by the County Government of Mandera on behalf of the community, in line with the Community Land Act 2016. The proposed site is uninhabited, has no structures, community facilities, or encumbrances. Consultations leading to the identification and selection of the sub-project site are captured in the Environmental and Social Screening report for Forole. *Refer to Chapter 3 of the ESIA for the comprehensive socio-economic profile.*

2. Actual Census Survey of PAPs and Valuation of Affected Assets

The number of project-affected persons (PAPs) is 1400 (approximately 276 households). The land acquisition-related impacts are loss of land and pasture. Mitigation measures include in-kind compensation for loss of land and pasture, and designing power distribution lines to avoid impacting trees, crops, structures, and community facilities. No physical displacement is anticipated; however, there is minimal loss of pasture occasioned by the acquisition of land utilized by the community for grazing. The 1.46 Hectares identified for the sub-project will be acquired compulsorily by the National Land Commission (NLC). The proposed site will be valued and compensated in line with the provisions of the Resettlement Policy Framework (RPF) prepared under KOSAP. *Refer to section 4.1 of the ESIA for the sketch map of the site.*

3. Compensation Measures Agreed with the PAPs and other Resettlement Assistance to be Provided

The proponent requested the community identify three priority projects, whereby one out of the three would be provided as in-kind compensation for loss of land and pasture. The Forole community proposed installation of a fence around the dispensary, construction of social hall or construction of teachers' houses at Forole Primary school. The value of the priority community project will be proportional to or higher than the value of land under acquisition. In addition, loss or damage to crops, trees, structures, and community facilities will be compensated in line with the provisions of the RPF, and as summarized in the entitlement matrix below.

3.1 Entitlement Matrix

Types of Impact	Person(s) Affected/ Eligible for Compensation	Compensation/Entitlement/ Benefits	Responsible organization
1. Loss of Land			
Loss of unregistered community land.	Community.	Compensation in-kind as prioritized by the community.	REREC
Loss of land in unregistered group ranches.	Group ranch members.	Compensation in-kind as prioritized by the community.	
Loss of land in registered group ranches.	Group ranch members.	Compensation in-kind as prioritized by the community.	
Loss of land owned by the National Police, county governments and the Ministry of Interior	Government agencies.	No compensation for public land allocated to another government body.	

Loss of land owned by the Kenya Forest Service (KFS) and Kenya Wildlife Service (KWS).	Government agencies.	No compensation for public land allocated to another government body. However, payment of conservation fees to KWS and KFS as stipulated under their respective regulations is foreseen.	
2. Loss of Use on Land			
Loss of use on public land (e.g., grazing, farming etc.).	Communities utilizing public land.	Communities do not own public land; however, they utilize public land with consent from the relevant agencies. The project will implement the infrastructure project prioritized by the community as compensation for the loss of public land use.	REREC
Loss of use on unregistered community land, unregistered group ranches and registered group ranches (e.g., grazing, farming etc.).	Communities utilizing unregistered community land, unregistered group ranches, and registered group ranches.	Compensation in-kind as prioritized by the community.	
3. Loss of /Damage to Assets on Land			
Trees	Community members on unregistered community land; community members utilizing public land; members of registered and unregistered group ranches and government entities.	During detailed design for power distribution lines and construction of the mini grid and community project, any crops, structures, trees, and community facilities shall be avoided to the extent possible. However, loss or damage to the above will be compensated/restored at full replacement cost,[2] in line with the provisions of the RPF.	REREC
Crops			
Structures			
Community facilities e.g., water sources (earth pans, boreholes etc.).	Community members on unregistered community land, community members utilizing public land, and members of registered and unregistered group ranches.		

4. Consultations with PAPs About Acceptable Compensation Options and Alternatives that have been Considered

Detailed consultations with PAPs on land acquisition and compensation, including the modalities of acquiring land and compensation options, were undertaken during the Environmental and Social Screening, Environmental and Social Impact Assessment, and the NLC land valuation process. The following sections provide a summary of the consultations.

[2] A cost basis that will yield compensation sufficient to replace assets, plus necessary transaction costs associated with asset replacement).

4.1 Engagement of Project -Affected Persons (PAPs)

Local administration and County Renewable Energy Officers (CREOs) supported the proponent and implementing agency (IA) to mobilize community members and other stakeholders for public consultations and engagement activities. National and county government entities, community segments (men, women, youth, elders, persons with disability, vulnerable and marginalized groups, etc.), NGOs, and local leaders were engaged through key informant interviews, community meetings, and focus-group discussions. The proponent and IA implemented appropriate measures to ensure PAPs effectively participated in the consultations. *Refer to Chapter 6 of the ESIA on public consultation and engagement.*

Once the compensation award and Bill of Quantities (BoQs) are known, the Implementing Agency (IA) will engage the community and agree on the community project to be executed as in-kind compensation. During these consultations, the IA and the community will define the roles and responsibilities of the community in monitoring the implementation of in-kind compensation and maintenance once the IA hands it over to the community. Thus, the IA and the community will effect an agreement to be signed by the local leadership; representatives of the Grievance Redress Committees at the locational, county, and national levels; A-RAP Implementation Committee, and Implementing Agencies.

4.2 Identification of Community Representatives

The Forole Locational Grievance Redress Committee (LGRC), constituting a chairperson, secretary, and three members, was formed through community consensus. The committee's membership comprises men, women, youth, persons with disabilities, and ethnic minorities. The LGRC is responsible for engaging PAPs and resolving complaints. Refer to Chapter 6 of the ESIA on the Grievance Redress Committees. Further, the community will constitute the A-RAP Implementation Committee responsible for coordinating community engagements on the A-RAP and monitoring the implementation and closure of the A-RAP. The representation of the committee will consider gender, vulnerability, and intergenerational sensitivities.

4.3 Summary of Consultations on Land Acquisition and Compensation Options

Date	Objective	Implementing Entities	Land Acquisition and Compensation Aspects Discussed	Key Issues Raised	Responses Given
October 24th 2020	Environmental and Social Screening. Voluntary land donation (VLD). Constitution of the Locational Grievance Redress Committee (GRC).	Ministry of Energy (MoE) Kenya Power (KPLC) Rural Electrification and Renewable Energy Corporation (REREC)	Site identification and land allocation for the sub-project. Criteria for VLD. Community entitlements (forms of compensation and implications for each).	None	None
January 1st 2022	Environmental and Social Impact Assessment.	Consultants MoE KPLC REREC	Land acquisition through compulsory acquisition (not voluntary land donation). Selection of three priority community projects, whereby one is to be implemented as in-kind	Community requested for installation of a fence around the dispensary, construction of social hall or construction of teachers houses at Forole Primary school.	The proponent has set aside KES 1 million to implement the priority in-kind compensation project. The value of the project will be proportional to or greater than the value of land.

			compensation for land.		NLC will determine the value of land.
May 2023	Compulsory Land Acquisition.	NLC	Site inspection and inquiries. Land valuation. Award of compensation.		

5. Institutional Responsibility for Implementation of the ARAP

Entity	Role
Ministry of Energy	• Coordinate A-RAP implementation and provide budget for in-kind compensation.
National Land Commission	• Implement the statutory process for compulsorily land acquisition, including site gazettement and inspections, inquiries, valuation, and award of compensation.
REREC	• Monitor all land acquisition and compensation aspects (including A-RAP closure), complemented by a third-party monitor. • Provide budgets for stakeholder engagement, grievance management, and monitoring, including the facilitation of the Land Acquisition and Compensation Implementation Committee, and the Grievance Redress Committee.
Mini-grid Contractor	• Implement in-kind compensation concurrently with the solar mini-grid project.
Supervising Consultant	• Monitor and report on implementation of in-kind compensation, and overall project compliance with social safeguards.
Grievance Redress Committees	• Formed at the locational, county, and national levels, and responsible for resolving complaints, including A-RAP related grievances.
A-RAP Implementation Committee	• Coordinate A-RAP engagements at the community level, monitoring A-RAP implementation and closure.
Affected Community	• Responsible for the operation and maintenance (O&M) of in-kind compensation project. An agreement stipulating the O&M roles and responsibilities of the community will be effected.

6. Procedures for Grievance Redress

The Project procedures for grievance redress were established through a public consultation process and informed by the existing conflict resolution structures in the community. The Grievance Redress Mechanism (GRM) comprises tiers at the project, county, and national levels. *Refer to Chapter 7 of the ESIA for a detailed GRM.*

7. Implementation Timetable and Budget for the ARAP Implementation

7.1 Timelines

The proponent will commission the community project by May 25th, 2025, before operationalizing the mini-grid. The mini-grid contractor will implement the mini-grid and the community project simultaneously. The Supervision Consultant and IAs will implement a commitment register to ensure the mini-grid contractor can achieve the agreed-upon milestones. The register will be complete with clear and practical timebound indicators, which can be monitored by all parties – the PAPs, IAs, the Ministry, third-party monitor, and the Bank.

7.2 Budget

The proponent has set aside KES 1 million for the community project (budget captured in the ESMP). The compensation award from NLC and the Bill of Quantities will inform the final cost of the community project. The costs for in-kind compensation, stakeholder engagement, grievance management (including the facilitation of the GRCs and the A-RAP Implementation Committee), and monitoring are covered under the project.

Appendix 2: Summary of Community Consultation Meeting Leading to Land Identification and GRC Constitution

MINUTES OF COMMUNITY CONSULTATION MEETING HELD ON 24/10/2021 IN FOROLE

1.

AGENDA

- Public forum: Welcoming and opening remarks
- Project information: KOSAP and the Forole mini grid
- Project Land requirements: Disclosure of community rights and entitlements to compensation, the options and implications)
- Potential environmental and social risks and impacts: positive and negative impacts and project opportunities.
- Grievance Redress Committee
- Focus Group Discussions: Men, Women and Youth.
- Review of feedback from FGD's by all community members.

In attendance (refer to annexed list of participants)

MIN 1.0 WELCOMING AND OPENING

The project team introduced themselves to the community as follows;

	Name	**Title/Institution**
1.	Dorothy Kagweria	Ministry of Energy
2.	Ms. Irene Kawira	Snr. Environmentalist (REREC)
3.	Ms. Agnes Gachoki	Snr. Surveyor (REREC)
4.	Mr. Kioko Maithya	Social Safeguards Officer (REREC)
5.	Amina C. Abdi	CGM, Land & Energy
6.	Salim Lesuper	Surveyor, Marsabit County Government
7.	Abdillahi Jillo	National Lands Commission (NLC)
8.	James Chege	REREC supervisor, Marsabit
9.	Osman Galgallo	CGM-Land, Marsabit

2.0 KOSAP AND FOLOREMINI GRID

Ms. Dorothy Kagweria informed the participants that the proposed project is part the Kenya off Grid Solar Access Project (KOSAP) which is funded by the World Bank and is being implemented by the Ministry of Energy, the Kenya Power and Lighting Company (KPLC) and the Rural Electrification and Renewable Energy Corporation (REREC). MoE will provide overall coordination of the Project including responsibility for safeguards, due diligence and compliance monitoring. REREC will implement the mini grid and will be responsible for the implementation of Resettlement Framework Plan, Environmental Social Management Framework and Social Assessment. She said the Government is committed to providing electricity to communities that have not been served by the national grid such as Folore because it recognises energy as an enabler to development.

She said KOSAP entails the following components;

1. Provision of electricity through solar mini grids to households, enterprises and community facilities,

2. Provision of energy services through solar home systems for and clean cooking technologies for households
3. Provision of solar power to electrify boreholes as well as to power community facilities
4. Community engagement and education as well as capacity building and institutional support for the national and county Governments

She further said KOSAP is being implemented in 14 counties. In Marsabit County 16 minigrids including one to be sited at Forole will be implemented in addition to stand-alone solar projects (public facilities) and solarisation of boreholes. The agenda of the visit she said was to; undertake an environmental and social screening of the proposed project site, to sensitize the community on the project land requirements and community rights and entitlements, explain the Project Technical architecture and connection requirements, discuss potential environmental/social risks and impacts and mitigation and sensitize community on grievance redress mechanism. The proposed mini grid will comprise a solar system and a thermal unit (generator) and those residing within 1.5 km radius from the project site will be connected to power. Those living beyond this radius can benefit from solar home systems. She said for one to be connected he/she will be required to pay a one-off connection fee of Kshs 1000. Thereafter they shall be buying prepaid tokens in order to access electricity. Tokens can be purchased through a vendor or directly through the mobile money platforms (Mpesa).

3.0 PROJECT LAND REQUIREMENTS: RIGHTS AND ENTITLEMENTS OPTIONS AND IMPLICATIONS

The Surveyor, Ms. Agnes Gachoki told the Baraza that the main purpose of the Baraza was to seek community consent for the project. Land required for the construction of the Mini grid is 2-5 acres. Land in Forole, falls under the Community land category. It is yet to be registered, has no title but is jointly owned by the community. Its use and management is governed by the Community Land Act 2016.

She explained the various forms of acquiring land including; allocation, land adjudication process, compulsory acquisition, settlement programs, transfers, and long-term leases.

Agnes also told the community on their rights and entitlements to the following;

1. They can refuse to give the land.
2. They can opt to seek compensation for the project land.
3. They can refuse or accept the project.
4. The right to resettlement assistance in addition to compensation for affected assets, where the more vulnerable individuals/households have been identified among them.
5. The right to livelihood restoration measures where the project has impacted their livelihood strategies, if they choose compensation.

The surveyor further informed the meeting that there were several options on land compensation;

a) Payment of cash for the land that has been identified for the project. For this to take place the land is has to be valued first. All monies payable as compensation for acquisition unregistered community land are then held in trust by the county government. Any such monies shall be deposited in a special interest earning account by the County Government and shall be released to the community upon registration of the community land.
b) Compensation of land for land. The community would identify a similar piece of land in value to the project site and request that the same is purchased for the community.
c) A further option is compensation in kind. This option is for the community to grant land for the project and request for compensation in kind. This could be in the form of a project for the benefit of the community like the construction of classrooms, dispensary or a borehole. This is the most preferred option.

She said the surveyor will need to pick exact GPS points of the land proposed for the project and with community consent the land will be registered in the name of the implementing agency. The surveyor encouraged the community to make an informed decision that collectively involved every member of the community i.e. Men, men, women, the marginalised and PLWDs. Land consent would have to be signed by at least five representatives nominated by the community. She disclosed to the meeting what the term advance possession on land issues meant and requested them to consider allowing the implementing agency to take possession of the parcel and commence construction of the project even as the land transfer process was on-going.

MIN 4.0 SOCIAL AND ENVIRONMENTAL ISSUES

The Environmental specialist Ms. Irene Kawira Mate said that there were both positive and potential negative impacts that were likely to emanate due to the construction of the project.

POTENCIAL POSITIVE IMPACTS

1. Employment and Wealth Creation - locals will be prioritized for unskilled and semi-skilled employment opportunities, therefore creating an income source for especially youth. Other services to be procured locally could include accommodation, catering and cleaning,

2. Access to electricity

The area will be supplied with power for domestic and commercial use for those residing within 1.5 kilometre radius from project site,

3. Improved Standard of living

Locals to use domestic electric appliances such as iron boxes etc., improved lighting, longer business operating hours, ability for children to study at home, locals can diversify their businesses and create alternative livelihood opportunities, as well as improved security. Access to electricity will also limit exposure to smoke associated with kerosene lamps, a major cause of lower respiratory infections.

4. Reduced disease burden and mortality rates

Residents currently use firewood and kerosene lamps for lighting, causing indoor pollution. Replacing kerosene lamps and firewood for lighting with electricity will reduce disease burden at the family level and on the government.

5. Benefits to Education

Access to reliable electricity at the household level and schools will create opportunities for children to study, access more information through informative TV channels and radios. This will increase the amount of time spent by children studying and accessing valuable information translating into better results and an informed society.

6. Improved Security

There will be enhanced security arising from well-lit social, commercial and individual premises. This is as a result of improved security lighting, which will help ward off opportunistic crimes and gender-based violence.

7. Improved communication and access to information

Access to electricity will lead to improved communication for the beneficiaries. For example, charging of mobile phones will be easier and cheaper. Project beneficiaries will have access to information on local, national and international social, economic, political affairs.

8. Gender Considerations

Both men and women will access electricity and benefit from opportunities electrification brings. Lighting, internet and television will improve access to information therefore, women will benefit from information especially on health and nutrition, among others. Women will have an opportunity to engage in productive uses of power including baking bread, blending juices, running salons and so on and elevate themselves economically.

POTENNIAL NEGATIVE IMPACTS AND THEIR MITIGATION

NO	POTENTIAL NEGATIVE IMPACT	PROPOSED MITIGATION MEASURES
1.	Dust emission	The Contractor/EHS officer will ensure strict enforcement of on-site speed limit regulations, Cover stock piles of fine materials with tarpaulin during windy conditions and Provide and enforce use of PPEs by construction workers
2.	Exhaust emission	Regular maintenance of equipment to increase their efficiency and reduce generation of exhaust emission Avoiding equipment and vehicles running unnecessarily to reduce emission
3.	Noise Pollution	Construction activities to be restricted to daytime, drivers and machine operators instructed to switch off engines when not in use. Drivers will avoid hooting especially when passing through sensitive areas such as mosque.Noise abatement generators and heavy-duty equipment are insulated or placed in enclosures to minimize ambient noise levels. Use equipment with low noise ratings
4.	Oil spills	Contractor and EHS will ensure proper storage, handling and disposal of new oil and used oil wastes, maintain plant & equipment to avoid leaks which should be carried out in contractors' yard (off the site), provide oil interceptors along the drains leading from potentially oil spill/leak prone areas. Oil absorbent material, traps and storage drums will be used to contain and control any minor releases of engine and other equipment oil and there shall be regular inspection and maintenance of the transformers to minimize spillage
5.	Soil erosion	Levelling of the project site to reduce run-off velocity and increase infiltration of storm water into the soil and restriction of construction vehicles to use existing access roads. Any compacted areas are ripped to reduce run-off. Site excavation works be planned in such a manner that a section is completed and rehabilitated before another commences. The contractor will ensure proper compacting of soil when constructing the mini grid.
6.	Visual/aesthetic impacts	Contractor will design structures at the site in such a way as to improve the beauty of the surroundings. Restore site area through backfilling and landscaping and Plant locally occurring trees and shrubs on the open spaces to re-introduce visual barriers
7.	Solid waste	Construction materials left over at the end of construction will be used in other projects rather than being disposed of. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time. Segregate waste according to type & dispose waste by dumping at designated landfills only. Reuse packaging materials such as cartons, cement bags, metal containers and plastic containers to reduce wastes on site. Put up well protected mobile collection units/storage for obsolete batteries before collection by a licensed waste handler by NEMA, which should be properly equipped and shall be protected from solar radiation, humidity and temperature
8.	Increased demand for raw materials	Harness rainwater and storm-water whenever possible for use in dust prevention & construction work. Consultations with the project local committee on use of water in the community to avoid conflicts with the community. Construct borehole to meet water demand. Promote recycling and reuse of water.Ensure that damage or loss of materials at the construction site is kept to a minimum through proper storage and use Employing

		water conservation techniques and only using the required amounts of water to prevent wastage Providing adequate water storage reservoirs at the construction site to meet project needs during periods of high demands externally and refill tanks during the periods of low demands
9.	Loss of flora & natural habitat	Clearing of vegetation & trees will be strictly controlled & only done if it's absolutely necessary
10.	Occupational health & safety risks	Contractor and EHS officer will enforce adherence to safety procedures and prepare contingency plan for accident response in addition safety education and training shall be emphasized. Provide workmen's compensation cover (WIBA) for construction staff. Register the project site as a workplace with DOSH Develop, document and display prominently an appropriate SHE policy for operation works. Formation & training of a Health and Safety Committee. Provide suitable, efficient, clean and adequate sanitary conveniences for workers Ensure that machinery, equipment, PPEs, appliances and hand tools used in construction and power generation comply with the prescribed safety and health standards and be appropriately installed maintained and safeguarded Train and supervise workers regarding construction and power generation machinery and as well as safe work procedures Equipment such as fire extinguishers MUST be inspected by a government authorized person. The equipment may only be used if a certificate of examination has been issued Ensure that materials are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency; Provide a well-stocked first aid boxes which are easily available and accessible should be provided within the premises Provide sufficient number of trained first aiders with their contacts prominently displayed within the site. Carry out safety and health inductions and toolbox talks for all workers to enhance awareness on safety and health requirements Provide workers with PPEs and training them on equipment use and risks Contractor to register the mini grid construction site as a workplace with the Directorate of Occupational Safety and Health Services (DOSHS) Placing safety signs where there are safety hazards control the movement of vehicles, motorists and pedestrians around the site. Create awareness to the public on the potential impacts of powered lines to prevent electrical hazards
11.	Open excavations	Barricade the proposed project area using high visibility tape to avoid falls into open excavations Pole pits should be dug and poles erected immediately and where inevitable the pit shall be covered to avoid falls and injury to humans and animals or traffic accidents. Contractor to compensate any injuries to the public and animals arising from his negligence Provision of adequate warning signs to promote good safety culture at project site

12.	Increase in social vices	Encourage public participation with the locals Proper training of construction staff on local cultural behaviour and responsible community interaction Prioritize locals for certain jobs for locals. Sensitize workers and communities on HIV/AIDs prevention and mitigation through staff inductions and awareness campaigns
13.	Contractors Yard Site and Workers camp	Liaison with local administration for identification of possible sites for Contractor's Yard. Contractor to consult with community and if required pay compensation for temporal use of site. Contractor to ensure restoration of contractor's yard and workers. Contractor and community to have a written agreement on the above-mentioned mitigation measures
14.	Sanitary waste	Provide clearly marked sanitary waste facilities for both genders and ensure disposal of waste through septic tanks.
15.	Spread of communicable diseases and HIV/ AIDs	Awareness creation and consultations with local communities prior and during construction. Informing workers on local cultural values and health matters. Provision of condoms to workers. Allowing migrant workers time to be with their families. The contractor is impressed upon not to set a construction camp on site. The contractor will provide public education/information about HIV/AIDS transmission and prevention measures. Awareness sensitization and disciplinary action. Ensure equal treatment of workers Develop and implement a STD/HIV/AIDS awareness plan on prevention and mitigation
16.	Risk of Covid-19.	Avoid holding community meetings where many persons congregate until advised so by MoH Sensitize all community segments and project workers on COVID-19 and precautionary measures that need to be observed.
17.	Stakeholder engagement and information disclosure	Contractor to develop and implement the Stakeholder Engagement Plan to guide consultations and information disclosure to stakeholders Contractor to ensure that community engagement and disclosure is done prior to project mobilization Contractor to ensure full disclosure to communities on positive and negative impacts as well as opportunities
18.	Labour influx into project area	The contractor to develop & implement a Labour Influx Management Plan, Workers' Camp & Accommodation Management Plans and as part of C-ESMP and monitor all mitigation measures, including codes of conduct signed by all with physical presence on site, prioritization of local recruitment, induction of workers on GBV-SEA/SH, GRM for staff, avoid child and forced labour and enforce sub-contractor compliance of the same. Contractor to develop a recruitment plan Establishment and operationalization of an effective Grievance Redress Mechanism accessible to community members The contractor and the project grievance redress committee to work closely address complains raised on time. Contractor to hire Community Liaison Officers to work closely with the supervision consultant and the community Gender considerations in employment opportunities Appropriate compensation for work done

		Prompt payments as per the contractual agreements/terms
19.	GBV-SEA/SH	Contractor to develop and implement a GBV(SH &SEA (Sexual Exploitation and Abuse in workplace Sexual Harassment (SH) management plan, (including plans for prevention, response and GRM that is culturally appropriate and accessible and developed in consultation with the affected communities All workers with physical presence on site to sign employment contract including Code of Conduct The contractor to implement provisions that ensure that gender-based violence at the community level is not triggered by the Project e.g. review of specific compensation schemes Develop specific plan for mitigating these known risks, e.g. sensitization around gender equitable approaches to compensation and employment Confidential reporting & responding of incidences of GBV Use survivor centred approaches when responding & dealing with GBV issues Contractor to have referral services when responding to incidences of GBV survivors
20.	Liquid waste generation	Collect the used oils and re-use, re-sell, or dispose of appropriately using expertise from licensed waste handlers Proponent will make sure that storm water channels are maintained regularly to avoid release of the effluent into the land and water bodies Monitor effluent quality regularly to ensure that the stipulated discharge rules and standards are not violated
21.	Fire outbreaks	Ensure compliance with fire safety regulations and install all necessary fire safety equipment Conduct regular trainings on firefighting & emergency response Conduct regular inspection and maintenance to ensure that, there are; - no overloaded electrical systems; no incorrectly installed wiring; no live naked wires; and fuel store areas are continuously monitored Contractor to ensure all fittings are tight and implemented using quality materials to prevent arcing and any loose connections. Adapt effective emergency response plan
22.	Electric shock & electrocution	Premises to be wired by qualified technicians and test certificates maintained Deactivate and properly ground live wires before repair works are performed Ensure that live wire works is conducted by trained personnel Ensure that access to the power plant should only be by authorization and trained personnel Place warning signs on strategic places Conduct periodic awareness and sensitization campaigns for the neighbouring communities on electrical safety

23.	Insecurity	Liaising with area administration to enhance security Create public awareness on the need to protect public infrastructure for continued supply of electricity and to minimize exposure to electrical hazards Employing of security guards/competent security firm from the local population at the site Fencing of the installation area and whole site using a perimeter wall to ward off intruders
24.	Health & safety for workers and community members	Implement an appropriate re-vegetation programme to restore the site to its original status. Indigenous plant species should be prioritized

She said that the project beneficiaries were the Gabra, who are Indigenous people and are the only VMG residing near the sub-project area thus the sole project beneficiary.

5.0 GRIEVANCE RESOLUTION COMMITTEE (GRC)

Ms. Mate informed the Baraza on the need for constitution of a locational Grievance Resolution Committee (GRC) for purposes of resolving any grievances that may arise in the lifetime of the project as guided by project frameworks. The local GRC will be the first stop shop for resolution of project related disputes and grievances for project affected persons and interested parties. The GRM should be culturally appropriate, inclusive, accessible and developed in consultation with Forole community. Grievances which cannot be resolved by the local GRC shall be escalated to the sub-county GRC and the National GRC respectively. Any unresolved matter can then be referred for arbitration or to a court of law. World Bank's GRS is also available to stakeholders to lodge their grievances. The GRC should constitute representation from all genders, youth and vulnerable persons.

Existing Grievance Redress Mechanism

In case of a dispute the aggrieved party firstly informs the offender of the offence. If they cannot come into agreement then he/her will take it up with the clan Men (YAROLE) who then summon the parties to state their cases. The Men' degree decree is deemed binding.

The summary of the comments/remarks from the community in the meeting held at Forole

QUESTION/COMMENTS	ANSWER/REMARKS
Daniel Dokata Galgallo Tuliskia kwa chief hii solar inasaidia light mpaka borehole lakini madam itasaidia light peke yake . Is the solar unable to assist the people at boreholes About youth training about Rural Electrification	If the borehole is situated more than 1.5 kilometres from project site it may not benefit The project doesn't have a component for training
Jillo Golja Are any technician can help our generation at boreholes since there are breakdown now	The project cannot provide that

3. 6.0 FOCUS GROUP DISCUSSIONS

After the main meeting women, men and youth convened for separate discussions (FGDs) where they could freely converse amongst themselves and express their insights (hopes, fears, aspirations and expectations in relation to the mini grid and the land question).

FGD-MEN

The main objective of this discussion was to get gather and document how men thought/felt about the issues discussed during the main meeting including; environmental and social screening of the project site, land requirements and community rights/ entitlements, connection requirements, potential environmental/social risks and impacts, mitigation and grievance redress mechanism. The FGD would also provide them an opportunity to air their issues/give their opinions on the project.

Kioko told them the FGD was a good avenue for them to express their opinions and freely ask any questions they might not have been unable to ask in front of the youth and women, He said that at the end of the FGD discussion the group should come into consensus on issues discussed in the earlier meeting and select representatives to the GRC. Matters agreed on and selected representatives would then be presented to the main meeting for adoption.

During the meeting the Men agreed to provide land, and elected the following representatives to the GRC;

Name	ID number	Telephone number
Yattani Dokata Chachu	21728013	0700391637
Mamo Sharamo Demo	22958779	0790261419

The Men said they had fully understood the project and did not have any questions

FGD-WOMEN

The group was led by Dorothy who was able to explain why a separate discussion was put up in order for them to have the opportunity to freely express themselves.

She explained the agenda of the visit by the officers from National government and county government was to undertake an environmental and social screening of the proposed site to check suitability in terms of environmental, technical, social and health requirements.

The second objective was to undertake community engagement to sensitize the community on the project and the third objective was about land acquisition for the project and the need for a project grievance redress mechanism.
She gave a summary of the project in terms of its positive and negative impacts and their mitigation measures, the safety precautions and the land acquisition process. She also explained the need for the women to select a representative to the project committee who would represent their views/issues to the committee for redress.
She ensured all the women had understood their rights, roles and benefits concerning the project. Further the women were educated on how they can take up economic opportunities that will raise during project implementation. They were also given opportunity to air their issues/ questions and or /give suggestions to make the project implementation process better.
The discussions went further to bring out issues on how the women can take advantage of the project benefits rather than taking a back seat. She explained to them that they would benefit more from the electricity because they will be able to use clean energy to cook and also benefit from access to information through use of radios and TV that are powered by electricity enabling them to make informed choices on different issues such as nutrition, health, and farming among others. They were also set to benefit if they could set up small businesses like salons, cold drink kiosks, cooling milk because it spoils easily, children will have time to study and enhanced security due to the fact that the area will be well lit among other benefits. Gender based violence issues were also discussed including; forms of GBV, rationale for addressing GBV, ways in which a project can worsen existing GBV risks or create new risks, the need to report and document any complaints against workers, report incidences of GBV while ensuring survivor centred approach (respect for the choices, wishes, rights and dignity of the survivor). The women were told to be more vigilant to ensure young girls do not fall prey to GBV incidences. The women were requested to keep talking to the girls on GBV risks and the need to raise alarm in case of risks factors early enough.
All the women were in agreement for the project to be brought to their area. They did not ask any questions

After the discussions in the FGD for women, Dorothy requested that they elect 2 women to the GRC.
The women elected were:

Name	ID number	Telephone number
Doke Roba	-	0746740117
Jillo Adano Kivo	-	0705566223

FGD YOUTH

The main aim of the discussion was to know if the youth understood the project and its requirements and to give them a chance to give their opinions and ask questions they had about the project. James Chege (CREO) explained to the youth that it was important to hold a separate discussion with them so that they have opportunity to freely express themselves as this may have not been possible in the main Baraza. The FGD meeting was to clarify any issues about the project on environmental and social issues as well as request for land from the community. He explained further that there was need for land for construction of a solar mini-grid. The youth were allowed to ask questions, seek clarifications and give suggestions.
The youth did not ask any questions, and proceeded to select the following as members of the grievance redress committee;

Name	ID number	Telephone number
Aboi Sora Wario	33542962	0797593407
Galgallo Bagasa Sharamo	38810341	0794692875

7.0 REVIEW OF FEEDBACK FROM FGD's BY ALL COMMUNITY MEMBERS

After the FGDs the participants convened back to the main meeting to review the respective resolutions from the FGDs.

They resolved to provide land for the project, validated the nominees to the GRC and elected officials to lead the identification of project land and sign the land forms on their behalf.

They also proposed the following as a their preferred projects for compensation

4. Fencing – extension of fence at the dispensary
5. Construction of sound hall
6. Construction of teachers quarter at Forole Primary School

The community nominated the following as members of the GRC:

No	Name	Category	1D No.	Mobile No.
1.	Doke Roba	Women	-	0746740117
2.	Jillo Adano Kivo	Women	-	0705566223
3.	Aboi Sora Wario	Youth	33542962	0797593407
4.	Galgallo Bagasa Sharamo	Youth	38810341	0794692875
5.	Yattani Dokata Chachu	Men	21728013	0700391637
6.	Mamo Sharamo Demo	Men	22958779	0790261419

Photo of Community Baraza on land acquisition in Forole

Appendix 3: Lists of Attendance for the Land Acquisition Meeting

REPUBLIC OF KENYA

MINISTRY OF ENERGY

KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP).
ENVIRONMENTAL, SOCIAL SCREENING AND LAND ACQUISITION FOR PROPOSED SOLAR MINI-GRID FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS.

SITE: FOROLE

MEETING VENUE: FOROLE B/HOLE

DATE: 24/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	ABDULLAHI HUKA Jillo	24850040	0722999912	M	NLC	
2.	Osman MOHAMED	25749064	0727431554	M	CGM-LANDS	
3.	IRENE MATE	26961056	0729081220	F	KEREC	
4.	AZNG GACHOKI	11599322	0722583869	F	Rerec	
5.	James Chege	24790566	0728959945	M	Rerec	

	NAME	ID. NO	MOBILE	GENDER	VILLAGE	SIGN
6.	KIOKO MAITHYA	10924866	0722176597	M		
7.	Mohamed Gula	0634591	0713994958	M	Forole	
8.	Tuva Galgallo	0202109	—	M	Forole	
9.	Molu Budha	—	0706008519	M	Forole	
10.	Abudho Tuye	11387493	—	M	Forole	
11.	Gono Jalla		0715387568	M	Forole	
12.	Abudo Ali	—	07	M	Forole	
13.	Gufa Adano	11387386		M	Forole	
14.	Guyo Gonicha			M	Forole	
15.	Bajaja Sharamo		0708244861	M	Forole	
16.	Yattani Galgallo		0721987059	M	Forole	
17.	Babello Dabasso	22805391		M	Fobolle	
18.	Bagaja Wasio		0769050416	M	Fobolle	
19.	Edema Umuso	12432741	0798678283	M	Fobolle	

	NAME	ID. NO	MOBILE	GENDER	VILLAGE	SIGN
20.	Qusi Qomo	—	0707625457	M	Forole	
21.	Haro Bosa	21085220	—	M	Forole	
22.	Kalfelo Haro	—	0700832315	M	Forole	
23.	Galgallo Dido	221475995	0790618397	M	Forole	
24.	Dongo Abudo	27559694	0790587780	M	Forole	
25.	Roba Guyo	—	0745014829	M	Forole	
26.	Yattani Ithesa	21483824	0792356709	M	Forole	
27.	Okilo Yara		0701238876	M	Forole	—
28.	Wario Gomo	—	0757399958	M	Forole	—
29.	Daniel Dokaba	27795206	0797378921	M	Forole	
30.	Gaigallo Bagaja	38810341	0794692575	M	Forole	
31.	Godana Sora		0791892646	M	Fasolle	
32.	Mamo Shasamo		0790261419	M	Fasolle	
33.	Basille Dasso	28034939	0748753454	M	Forole	

	NAME		I.D. NO	MOBILE	GENDER	VILLAGE	SIGN
34.	Adano	Basako	30884304	0792080551	M	Fosolle	
35.	Hattani	Haso		0714142591	M	Fosolle	
36.	Tuya	Hussa	28028704	0768176157	M	Fosolle	
37.	Dalach	Gusacha		0792009263	M	Fosolle	
38.	Talaso	Hattani		0726483636	F	Fosolle	
39.	Gumato	Dallu		0742034950	F	Fosolle	
40.	Tunne	Roba		0757610475	F	Fosolle	
41.	Adho	Molu		07	F	Fosolle	
42.	Jillo	Adano		0705566223	F	Fosolle.	
43.	Chula	Mamo		0721838133	F	Fosolle	
44.	Qaballe	Guyo			F	Fosolle	
45.	Jillo	Guyo			F	Fosolle	
46.	Hattani	Ali			M	Fosolle	
47.	Molu	Huqa	22952152	0701175300	M	Fosolle	

	NAME	ID.NO	MOBILE	GENDER	VILLAGE	SIGN
48.	Qusi Ramata		0703896961	M	Fosolle	
49.	Gusach Kosi		0713007627	M	Fosolle	
50.	Adano Abudho	3H613487	0743910319	M	Fosolle	Adano
51.	Jillo Umuro	36552758	0741958859	M	Fosolle	
52.	Galgallo Dokata		07	M	Fosolle	
53.	Bonaya Umuro	248947327	0723392669	M	Fosolle	
54.	Katello shama	21333872	0707545598	M	Fosolle	
55.	Dorothy Kagweria					
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	NAME	ID. NO	MOBILE	GENDER	VILLAGE	SIGN
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REPUBLIC OF KENYA

MINISTRY OF ENERGY

KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP).
ENVIRONMENTAL, SOCIAL SCREENING AND LAND ACQUISITION FOR PROPOSED SOLAR MINI-GRID FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS.

SITE ..... FOROLE .....

MEETING VENUE..... FOROLE .....

DATE.26/.1/.2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD MEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	KIOKO MAITHYA	10924688	0722176597	M	RERE	
2.	Mohamed Guyo	26315940	0726[illegible]	M	Forole	
3.	Tura Godgello	0202109	—	M	Forole	
4.	Molu Budha	-	0706008514	M	Forole	
5.	Gono Jalla		0715387568	m	Forole	

	NAME	ID. NO	MOBILE	GENDER	VILLAGE	SIGN
6.	Abudo Ali	—	0703506667	M	Forole	
7.	Gufu Adano	11387386	—	M	Forole	
8.	Gugo Goricha	—	0711304442	M	Forole	
9.	Bagaja Sharamo	~~0705244861~~	0705244861	M	Forole	
10.	Yattani Galgallo		0721987059	M	Forole	
11.	Dabelo Dabaso	22805391	0~~7~~0~~8~~8~~4~~8~~3~~	M	Forole	
12.	Bagaja Wario		0769050416	M	Forole	
13.	Hema Umaro	12~~8~~32741	0798678283	M	Forole	
14.	Sales Ranchosa		0702793684	M	Fosolle	
15.	Sosa Guyo		0792085493	M	Fosolle	
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REPUBLIC OF KENYA

MINISTRY OF ENERGY

KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP).
ENVIRONMENTAL, SOCIAL SCREENING AND LAND ACQUISITION FOR PROPOSED SOLAR MINI-GRID FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS.

SITE ..... FOROLE .....

MEETING VENUE... FOROLE BIHOLE

DATE..24/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD WOMEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	Agnes Gacholi	11599322	0725838[illegible]	F		
2.	LOKho Hurso			f	Woyam	
3.	TUNE ROBA		0757610475	f	Woyam	
4.	Gumalu Dalu		0742034950	f	woyam	
5.	Jillo Guyo					

6.	Doko Mamo Boru		07	F	Qurqur	
7.	Qatu Sora			F	Qurqur	
8.	UQo Guyo			F	Qurqur	
9.	Gumato Ali Sora			F	Qurqur	
10.	Atho Hassan Jamaa			F	Qurqur	
11.	Qabale Guyo Jillo			F	Woyam	
12.	Jillo Adan Khiro		0705568223	F	Qurqur	
13.	DoKE Roba Guyo		0746740117	F	Qurqur	
14.	~~Adan~~ DIQo ~~AG~~ Adan AG		0745567471	F	Woyam	
15.	~~Gan~~ Talaso Yattani		0726483636	F	Woyam	
16.	Sabdio Yara		0705468516	F	Qurqur	
17.	Wato Gufu Wato		0745950354	F	Qurqur	
18.	Chula Mamo		0721638133	F	Woyam	
19.	Shuke Atkiya		0726993759	F	Qurqur	

20.	Dorothy Kagwenia					
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REPUBLIC OF KENYA

MINISTRY OF ENERGY

KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP).
ENVIRONMENTAL, SOCIAL SCREENING AND LAND ACQUISITION FOR PROPOSED SOLAR MINI-GRID FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS.

SITE ..... FOROLE .....

MEETING VENUE ..... FOROLE BOREHOLE .....

DATE 24/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD YOUTH

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	Abdullahi Hucs Jilo	24855040	0722996912	M	NLE	
2.	Osman Mohamed	25749064	0721431554	M	GM-LMDS	
3.	IRENE MATE	26961056	0729081220	F	REREC	
4.	James Chege	24790566	0728905945	M	Rerec	
5.	Godana Gosa	-	0791892646	M	Forole	

	NAME	ID. NO	MOBILE	GENDER	VILLAGE	SIGN
6.	ABDUB SHAMO MOLI	33389485	0742379076	M	FOROLLE	
7.	Sales Basako	34196175	0790568575	M	Fosolle	
8.	Golgallo Olla	30558639	0712495515	M	Forolle	
9.	Wasio Sora	34116243	0740558897	M		
10.	Wato Gufu		0715950354	F	Fosolle	
11.	Shukhe Hatkiya	22957309	0726993759	F	Forolle Qurqur	
12.	Gumato Dallu		0742034950	F	Fosolle Qurqur	
13.	Chula Mamo		0721838133	F	Fosolle Woyam	
14.	Gumato Ali		0795417074	F	Fosolle Qurqur	
15.	Dido Adam		0745567471			
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Appendix 4: Summary of Community Consultation meeting during ESIA Public Participation

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MINUTES OF EIA CONSULTATION HELD AT ..FOLLORE VILLAGE CENTRE.....

Date: 20/01/2022	**Time:** 1130HRS
Venue: FOLLORE VILLAGE CENTRE	

PRESENT

List is attached

AGENDA

1. Introduction
2. Opening Remarks
3. Remarks by the consultant
4. Concerns/ Issues from participants
5. Responses given by the consultant
6. Project Acceptance/Rejection of the proposed project
7. Adjournment

Mathew [illegible]
CHIEF FOLORE I
P. O. Box 128[illegible]
MARSABIT

Item No	Description	Action by
Min 1/22	**Introduction**	
	^Chief requested opening prayer by one of elders ^Welcomed Local team (Consultants – Centric Africa and REREC, County Rep – energy department	
Min 2/22	**Opening Remarks**	
	Chief Area – Follore i) Community is grateful for the rains since there was hear along period of ii) Chief confirmed that the community is well understand the project, and that they are grateful to the ministry – for considering the Community for the project 3) REREC Rep (Irene – She confirmed that there was previous site visit in october on the KOSAP project, which is under project being implemented by REREC – Marsabit is among counties that are marginalized – They are identified 16 Stations and Follore falls under the ~~Kenya~~ (power) st – The plant shall constitute Solar panels, backup batteries and a stand by genset. – Capacity of power to be generated shall be adequate to run the communities needs – industrial	REREC ASP IREN G

Min 3/22	Remarks by the Consultant	
	REREC Rep (Irene) - Power connection shall require each household to pay 1000/= - Every household shall be expected to ensure wiring is done by competent electrician - There shall be a monthly payment of power use, inform of tokens. - The community was requested to explore avenues of community projects in return of compensation for allowing the project * It was discussed and the community leadership agreed on: i) Need for install fence around dispensary ii) Construction of community social hall. iii) Construction of teachers houses at Falore primary school. - The ministry agreed and settled on only one of the above (budget cost - 1000,000/=) CENTRIC AFRICA ESIA Lead Community informed the members that Centric Africa Ltd was consulted and tasked to conduct the ESIA for purpose of: 1) Informing community about the project, nature and related impacts: - Environmental impacts - Social - economic impact - Occupational safety and health impacts 2) ESIA is based on requirement of EMCA 1999 which is being implemented and monitored through NEMA. 3) Impacts of project - During preparation - Construction - Operation How all these activities shall interact with community (environment / household) 4) We are also going to undertake assessment of the community through use of physical checklist. The scope shall cover - Women - Youth - Men - Social Amenity service provider * School * Hospital / Health centre * Trader / Business. 5) Contractor shall be expected to ensure: - Compliance to NEMA provisions regarding deforestation, Waste management and related environmental degradation. - Comply with provisions of OSH Act 2007 on employee welfare, safety and health. - Advised to consider local for all non-skilled tasks - Proper maintenance of all construction equipment/ machineries in good condition to reduce chances of accidental spillage, air pollution and use to be used by workers without risk to safety and Health. - Restore all disturbed ecosystems by tree planting, planting grass and creating proper pathways.	IRENE (REREC) WANJIKU

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Min 4/22	Concerns / Issues from participants	
	– Contractor shall be requested to explore better option as relates to use of resources such as water energy x Contractor to buy water / drill aborehole so as to reduce pressure on existing sources of water. x Provide portable latrines to reduce chances of pressure on existing facilities x Purchase materials and food locally to help community make a living during the period of project construction phase. x Contractor shall be responsible for any accident / injuries during construction period. Therefore to minimize chances of identified risks contractor shall provide workers / visitors with x Protective gear (helmet, safety shoes, hand gloves, and high visibility jacket). x Ensure all workers are covered under WIBA for any medical emergency / situation. x Identify nearest medical facility to attend to any sustained injuries by workers / visitors at the site. x Contractor shall not be subjective during employment based on gender, vulnerability / disability.	CENTRIC AFRICA LTD BLANTIRU.
MIN 5/22	CONCERNS / ISSUES FROM PARTICIPANTS-	
	1) Kala Buta (Community member) * Will the proposed project (supply of power) be able to also help in pumping water from our community borehole. x What controls shall be inplace to protect access to project site (plant) to reduce chances of damage to the plant. 2) Eleng Need clarification of payments required 100 Ltr – Installation Tokens – Monthly consumption 3) Solomon – What factors would be considered during installation based on nature of labourers (unskilled / permanent / semi) – Will the locals be considered in regard to employment x If they dont get considered because of lack of specific competencies / skills will the ministry consider training them rather than getting outsiders for the opportunity	

4) Abdub – Possible accident or fire outbreak (is household insured) due to power.
– Training / sensitization – waste materials shall not be [illegible]

- Has it been confirmed whether specifics on total No of pannels if they

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Min 5/22	Responses given by the consultant	
	REDEC REP *The plant shall be installed adequate to prohibit unsafe access in and out of the plant/substation. x A team of experts and engineers shall assess the site and determine the extend of fencing as well and material to be used so as to prevent unauthorized access by animals and without risk to the animals x for borehole water pumping that is another project of borehole solarisation x Contractor shall be expected to install aproper boarding to protect site and animals from accessing the site. REDEC REP (IREP QUIZ(3) 1) Only competant person shall be expected to carryout wiring, and this shall be determined by Engineer. - Nature of boarding shall not limit access to power. Proper assessment shall be conducted and determined on how power shall be supplied in the temporary mechatter houses 2) All opportunities shall be shared through the chief and determined whether the community shall be ~~selected~~ be considered. All unskilled labour shall be given for the locals Quiz 4 Community shall be expected to ensure that all wiring is carryout by competant person - Should there be investigation by KPLC team should there be fire resulting into property damage, in order to determine the route cause so as to understand the cause of fire. - Should it be that its power surge or KPLC faulty the owners of household shall be compensated based on damage caused. - The total watts / No. of pannels and accessories has already been determined by engineers, and should there be excess, it shall be the responsibility of the contractor.	I have I have. REDEC. related

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Min 6/22	**Acceptance/Rejection of the project**	
	ALL MEMBERS PRESENT ACCEPTED THE PROPOSED DEVELOPMENT. Mathew m. Gonicha CHIEF [illegible] P.O. BOX 12 [illegible] MARSABIT	
Min 7/22	**Adjournment**	
	MEETING WAS ADJOURNED AT 1500HRS	

Minutes Prepared by: DICKSON ALUBALA Date: 20/01/2022

Position: ENVIRONMENTAL EXPERT

Signature: .....

Minutes Confirmed by: Mathew M. Gonicha Date: 20/1/2022

Position: Chief

Signature: ..... Mathew M. Gonicha CHIEF [illegible] P.O. BOX [illegible] MARSABIT

Chief: Question

1) Clarification of compensation ~~project~~ (given that community proposed the three) who makes decision among the three.
2) The installation fee of 1000/= is it a once off payment. what if one has more than one house.
3) What factors were considered during selection of the proposed project site (No of households in proximity to project site - 3km)
4) The identified Committee member - how long shall the Committee stay before adjournment and is there any form of compensation/allowance given to them.
   → It voluntary to help address community needs and dissatisfaction.
5) Contractor shall be requested to only use Specified source of water within the area - No anywhere/No un authorized.
6)

6. Selection of project site/area
- What factors were considered
- What makes the location viable.

A team of experts assessed proposed site and based on projects specifications the land was found to be viable.
— (REREC Rep Irene)

GOANA.
- Will the proposed project, be able to power Street lights within our area
x That shall be enough project to light up all the identified public utilities (schools, dispensaries, hospitals, markets
(Response by REREC Rep Irene.))

MAIH.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: Forole Date: 20th January 2022

Time: 12:00 noon

CHIEF FOROLE P.O. Box 128 MARSABIT

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	BARAKO KATELLO	FOROLE	0700713657	
2.	CHIEF MAMO GONICHA	FOROLE	0701 411 278	
3.	MW Abdub HIYESA	FOROLE	0725778597	
4.	ABDUB UMURO	FOROLE	0741839252	
5.	HAPKANO ELEMA	FOROLE	0701013849	
6.	Elema Golgallo	Forole	0790137886	
7.	Roba Ibrae	Forole	0102626438	
8.	GALGALLO KOSI	Forole	0707962347	
9.	Talaso adano	Forole	0794661034	
10.	HADIJA MOHAMED	Forole	01124890 64	

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M – BARAZA

REREC

Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: Forole

Date: 22nd January 2022

Time: 12:00pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	YATTANE ELEMA	Forole	0742403707	
2.	ADHO DIDO	Forole	0704737956	
3.	LOKHO GUYO	Forole	0792381255	
4.	UMAR GODANA	FOROLE	0745908707	
5.	GONAYA ADISSO	FOROLE	0706505628	
6.	DABECO DUBA	FOROLE	0743876807	
7.	ROBA KAFO	FOROLE	0790056354	
8.	DIQO ADAN	FOROLE	0745567471	
9.	Eloma I-IA EREDTH	FOROLE	0746319741	
10.	KAME KOSI	FOROLE	0712588425	

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REREC

M BARAZA

Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: ....Forole.....

Date: ....20th January 2022

Time: ....12:10 pm

Mathew M. Gonjobo
CHIEF FORole LOCATION
MARSABIT

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	SABDIO DABALA	FOROLE	0710352652	
2.	BOKATO DULACHA	FOROLE	0758407722	
3.	BOKATO GUTO	FOROLE	0714806534	
4.	Taiaio Jabo	forole	0712812210	
5.	SHUKE ATIKIYA	Forole	0726993759	
6.	DUKE ROBA	Forole	0746740117	
7.	SHUKE SORA	FOROLE	0791200094	
8.	CHIRI BARACO	FOROLE	0791023851	
9.	SALO ABUDITO	FOROLE	0792906182	
10.	WARE ABUDHO	FOROLE	0742034950	

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REREC

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: Forole Date: 20th January 2022

Time: 12:00 Pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	MARICO ELEMA	FOROLE	0758959803	
2.	JILLO GUYO	FOROLE	0704767361	
3.	TUNE ROBA	FOROLE	0757610475	
4.	GUMATO WARIO DUB	FOROLE	0769807828	
5.	TATTANI DOKATA	FOROLE	0700391637	
6.	QURI BALALI	FOROLE	0725573868	
7.	Baruko Guracha	Forole	0725364711	
8.	Dogo GUFU	Forole	0706585628	
9.	ABUDITO ALI	FOROLE	0703506667	
10.	SOLOMON SORA	FOROLE	0725674798	

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M.. BARAZA

REREC

Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: Forole

Date: 20th January 2022

Time: 12:00 PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	ADANO DUBA	FOROLE	0700832324	
2.	GARGALO BAGAZA	FOROLE	0794692875	
3.	HASSAN ABDI BORU	County Energy Officer	0725095166	
4.	BIGNESS KALUBALA	CENTRIC AFRICA	0713641741	
5.	IRENE MATE	S. ENVIRONMENTALIST REREC	0729081220	
6.	Lucy Bii	Centric Africa Ltd	0725131519	
7.	Said Luba	Env. & Consultant	0729377370	
8.	HOTTENSIA W. KABOLI	CENTRIC AFRICA LTD.	0720826705	
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REREC

Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: FOROLE FGD - GRC

Date: 20/01/2022

Time: 14:15HR

CHIEF FOROLE
P.O. Box 125
MARSABIT

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Galgallo Bagaja Sharamo	FOROLE	0794692875	
2.	Yattani Dokata	FOROLE	0700391637	
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REREC Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: Forole location Male FGD

Date: 20/01/2022

Time: 1300hrs

#	Name	Position/Institution/ Location/Village	Phone No.	Sign
1.	Paul Mwinzi	OC Forole P/Stn	0720845976	
2.	ABDUB · H · GODANA	HEADTEACHER FOROLE PRY. SCHOOL	0725778597	
3.	Solomon SORA WARIO	TEACHER	0725674798	
4.	Baruko Gurucha	Elder	0725364711	
5.	Galgallo Kosi	Elder	0707963347	
6.	Yatani Dokata	Committee	0700391637	
7.	Yattani Halako	Elder	0711853243	
8.	Diba Bonaja	Elder	0769050416	
9.	Boru Baville	Elder	0716329746	
10.	Abudha Afi	Committee	0703586667	

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: Forole Location

Date: 20/01/2022

Time: 13:00 Hrs

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Qusi Balali	Committee	0715387568	
2.	Baroka Katello	Elder	0700713657	
3.	Guyo Afi	Elder	0724424799	
4.	Adano Duba	Elder	0700832324	
5.	Roba Kaffo	Elder	0790056354	
6.	Said Luba	Env. H. Practitioner	0749377370	
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Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: ...Forole... Date: ...20th January 2022...

FGD ~~Mtg~~ Female. Time: .....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Jane Kame	foRole	0712588425	
2.	Takso Jaso	forole	0712812210	
3.	Bokayo Guyo	Forole	0714806532	
4.	Lokho Guyo	Forole	0746740115	
5.	Bokayo Racha	Forole	0758407722	
6.	Shukhe Sora	forole	0791200094	SHUKE
7.	Chiri umuro	forele	0791023851	
8.	ware Abudo	forole	0742034950	
9.	Iro Roba	forole	0757610475	
10.	Luci Bii	forole	0725131519	

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Youth FGD List

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: FOROLLE — FGD – YOUTH

Date: 20/01/2022

Time: 1415HR

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	ABDUB UMURO ADANO	FOROLE	0741839252	[signature]
2.	Elema Jila HEREDI	FOROLE	074631974	[signature]
3.	Roba Ibrae Konchora	Forole	0702626438	[signature]
4.	BONAYA DOSSO URSA	FOROLE	0706505628	[signature]
5.	GALGALLO BAGASA SHARAMO	FOROLE	0794692875	[signature]
6.	Haikano Elema Galgallo	Forole	0701013839	[signature]
7.	Qurai GALGALLO BORU	FOROLE	0790137886	[signature]
8.	HADIJA MOHAMED GURRA	FOROLE	0112489064	[signature]
9.	TUME GOLO OKOTU	FOROLE	0742403707	[signature]
10.	ADHO DIDO DUBA	FOROLE	0704737956	[signature]

Mathew M. Gonicha ... MARSABIT

REREC

Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: FOROLLE FGD-YOUTH

Date: 20/01/2022

Time: 1415HR

CHIEF FOROLE LOCATION
P.O Box 126
MARSABIT

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	TALASO ADANO GODANA	FOROLE	0794661084	
2.	DABELO DUBA O	FOROLE	0743976809	
3.				
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Appendix 6: Lead Expert's Practicing Licence

FORM 7 (r.18(3))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/18263

Application Reference No: NEMA/EIA/EL/23329

M/S **Norken International Limited**
(individual or firm) of address
P.O. Box 9863 - 00100 NAIROBI

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts** registration number **0181**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: 12/30/2022 Expiry Date: **12/31/2023**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified

FORM 7 (r.19(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/EEPL/10270

Application Reference No: NEMA/EIA/EL/23981

M/S **Isaiah Kegora**
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is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert General**

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in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **12/30/2022** Expiry Date: **12/31/2023**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.