MINISTRY OF ENERGY AND PETROLEUM
Nairobi
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 GAS OFF-GRID SOLAR PROJECT AT COORDINATES 3°3'51.26"N 36°49'24.63" E

2023

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 Operational Procedures OP, 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 Gas, 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 to the best of our knowledge.

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Disclaimer:

This ESIA report is strictly confidential to MoE (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.

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
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 & Lighting Company
LEP	Labour and Employment Plan
LGRCs	Local Grievance Redress committee
MGs	Mini Grids
MOEP	Ministry of Energy and Petroleum
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 (KPLC) 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 KPLC, 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 Gas 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 Gas 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 Gas 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 Loiyangalani ward, Marsabit County, exhibits a semi-arid climate with irregular rainfall patterns and scarce natural resources. The area is located in ecological zone VI and the area extends to other parts of the county which includes all the hills and plains below 700m above sea level. The area is of an altitude of 470m above sea level. The typical vegetation is dwarf-shrub grassland or a very dry form of bushy grassland. The area has extremely short grazing season, mostly lasting not more than two months after the rain seasons. In extreme period of rainfall failure, the only vegetation available in this area is dwarf-shrub, which mainly supports goats and camels.

The project site is characterized by very few trees and shrubs. The area is dominated by acacia tree species. The project site is covered by sandy soils with open bare land. The temperature ranges from a low of 15°C to a high of 35°C. 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.

E-6 Project Description

The Gas Mini Grid project aims to provide electricity to approximately 122 residential and 4 nonresidential consumers in Gas Village at Loiyangalani ward, North Horr subcounty in Marsabit County. The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity. A Low Voltage Power Distribution Network will be established to distribute the power to customers. The estimated cost of the project is around USD 358,233.63, although this amount may change as more detailed plans are developed.

The project utilizes solar panels with a total minimum 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 minimum of 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. 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, PV Inverter: 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 proposed mini grid site has a circuit distribution length of 9.61km.

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 Mini Grid, approximately 0.6734 hectares of land will be compulsorily acquired by NLC. This land is part of the community's designated public purposes area. The Proponent engaged with the community during the land acquisition process, and there were no objections to transferring 0.6734 hectares of land to REREC for the management of the solar mini-grid. In accordance with the World Bank's Operation Procedure 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 the project report.

E-7 Project Alternatives

Solar energy is identified as a non-polluting and site-specific option, and the proposed site for Gas 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 favored 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.

During the ESIA stakeholder engagement public meeting, which took place on January 19, 2022, a total of 50 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.

The land acquired from the community will be compensated in kind. The main key area for development activities identified by the community in Gas included; water treatment plant, borehole repair and provision of fresh water.

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.

Tables 0-2 to 0-5 below present summaries of anticipated impacts and their corresponding levels of significance, both pre- and post-mitigation.

Table 0-1: 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

Table 0-2: Summary of Construction and Decommissioning Phases Impacts

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

Table 0-3: Summary of Operation Phase Impacts

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, kerosene 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 REREC and KPLC 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 Ministry of Energy (MOEP) 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, 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 of about 75,000 per sq. km with the lowest being 46,000 per sq. km to 105,000 per sq. km. 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 and Petroleum (MOEP) 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 MOEP 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 measuring approximately 0.6734hectares in Gas, Loiyangalani Ward, North Horr Subcounty, Marsabit County at GPS coordinates of Latitude 3° 3'51.26"N and Longitude 36°49'24.63"E and at about 40km north of Loiyangalani and 150km north west of Marsabit town.

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 the proposed clusters and institutions.

1.3 Purpose and Scope of Work

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 Methodology

1.4.1 Screening and Scoping

1.4.1.1 Screening Methodology

Evaluation of ESIA procedure has been undertaken as a fundamental procedure to implementation of the solar power mini-grid development project which is systematically mainstreamed into the project's Cycle. World Banks Social safeguards underpin and demonstrate this commitment. 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.

1.4.1.2 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 5th August, 2021 and 15th September, 2021. 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.

1.4.1.3 Desk based review and baseline assessment

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.

1.4.2 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

1.4.3 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.

1.4.4 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 Gas 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.

1.4.5 Environmental and Social Management Plan (ESMP)

The ESMP 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, monitor-able indicators, timeframe, responsibilities, and budget implications.

The ESMP 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 4 is a summary of the methodology the firm will adopt in undertaking environmental and social impacts assessment for the proposed KOSAP project

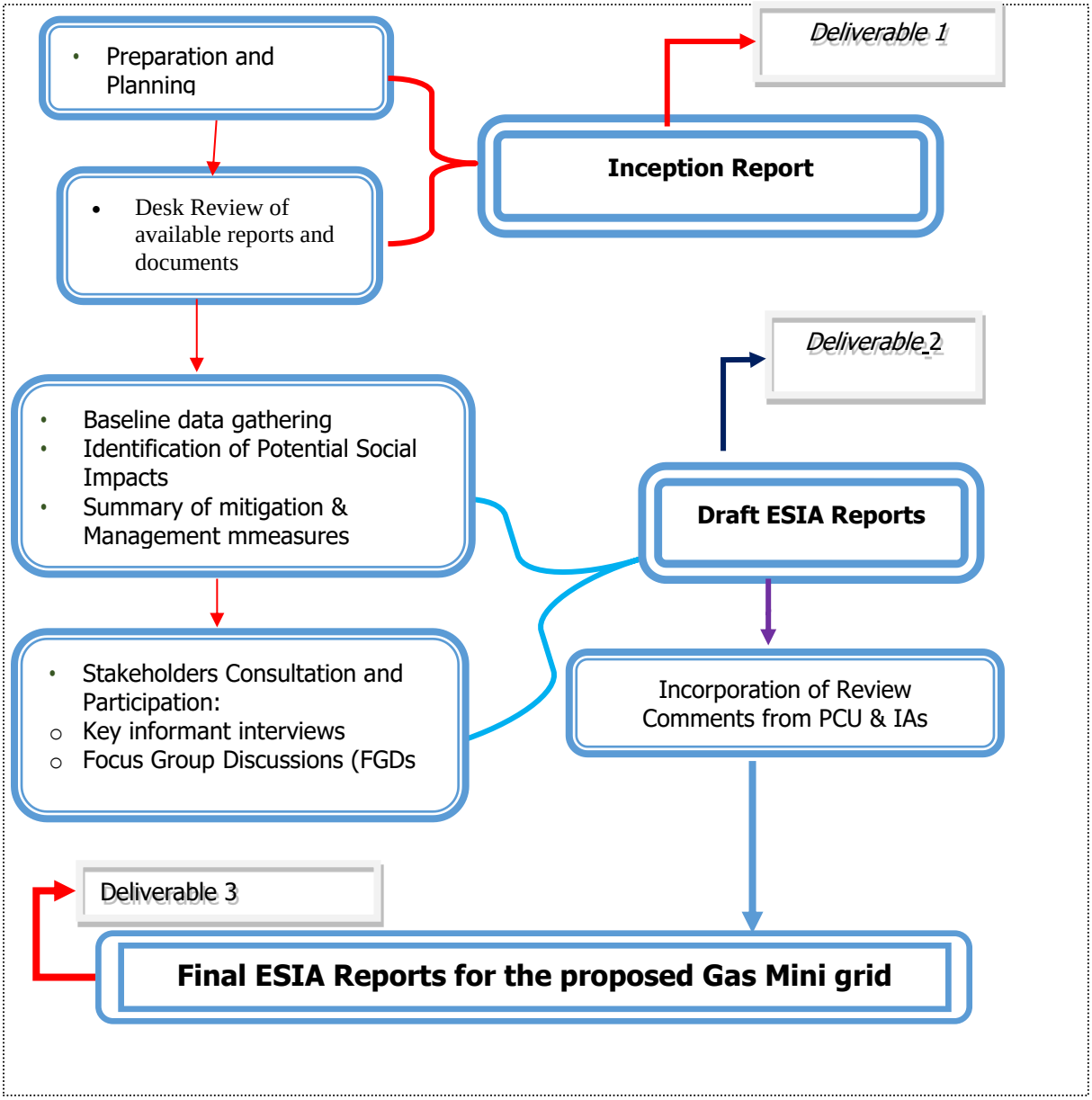

Figure 2. Summary of Environmental and Social Impact Assessment Methodology

1.5 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.

1.6 Study Team

NAME	INSTITUTION	POSITION
Bubicha Mohamed	Centric Africa Ltd	Environmentalist
Mathew Mutua	Centric Africa Ltd	Environmentalist
Daniel Chumo	Centric Africa Ltd	Environmentalist
Hottensia Kabuki	Centric Africa Ltd	Sociologist
CLIENT REPRESENTATIVES		
Peter Maneno	Ministry of Energy	Engineer E&S Specialist
Jalle Gesille	Marsabit County Government	CREO

1.7 Layout of the Report

Table 4. 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	Applicable Legal and Regulatory 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 4	Environmental, Ecology and Social Baseline	Outlines Environmental, Ecology and Social Baseline status in the study area of the Project
Section 5	Stakeholder Engagement and Grievance Redress	Provides an overview of the stakeholder engagement activities undertaken during the ESIA, stakeholder categorization and profiling Additionally, it details the provision of Grievance Redress Mechanism for the project
Section 6	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 7	Environmental and Social Management Plan	Outline of the ESMP considering identified impacts and planned mitigation measures and monitoring requirements.
Section 8	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.

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

Table 5. Component of the proposed Solar Mini-grid

S/NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project is located in Gas, Loiyangalani Ward in North Horr sub county in Marsabit County on 0.6734hectares of unregistered community land set aside for public use. Geographically, the site is is located on Latitude 3° 3'51.26"N and Longitude 36°49'24.63"E, at altitude of 470 metres above the sea level.
2.	Land Size/Tenure	The proposed solar mini grid will be located on a 0.6734-hectare piece of land next to Gas primary school to the immediate east. The land is an unregistered community land set aside for public use.
3.	Distribution line	LV Circuit of 9.61km
4.	Target Consumers	371 (367 Residential and 4 Non-Residential)
5.	Climatic condition	The project site is characterized by very few trees and shrubs. The area is dominated by acacia tree species. The project site is covered by sandy soils with open bare land. The temperature ranges from a low of 15°C to a high of 35°C. 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 which is close to Gas experience 800mm.
6.	Site Conditions	The project site is located at an altitude of 470m above sea level. The area is rocky and characterized by sandy soils scarce dwarf shrubs and trees species. Majority of the tree vegetation are acacia species.
7.	Road Accessibility	Gravel, Earth and dirt Road to Loiyangalani and North Horr.
8.	Nearest Airport	Gas Airstrip at about 50km south of the site.
9.	River/canal/nallah/ pond present in project footprint	None
10.	Protected areas (National Park/ Sanctuary)/ Forest land within 10 kms	None

2.2 Project Location

The project site is located in Gas village next to Gas Primary School at 100m to the east, a bare land with scattered trees to the north and settlement areas to the far north and east of the site. The site is administratively located in Gas village, Loiyangalani Ward, North Horr subcounty in Marsabit County at coordinates of Latitude 3°3'51.26"N and Longitude 36°49'24.63"E. The proposed power mini grid will be constructed on approximately 0.6734Ha.

The site is primary covered by sandy soils.

Figure 3: Proposed site for the Gas Solar Mini-grid project with scarce vegetation

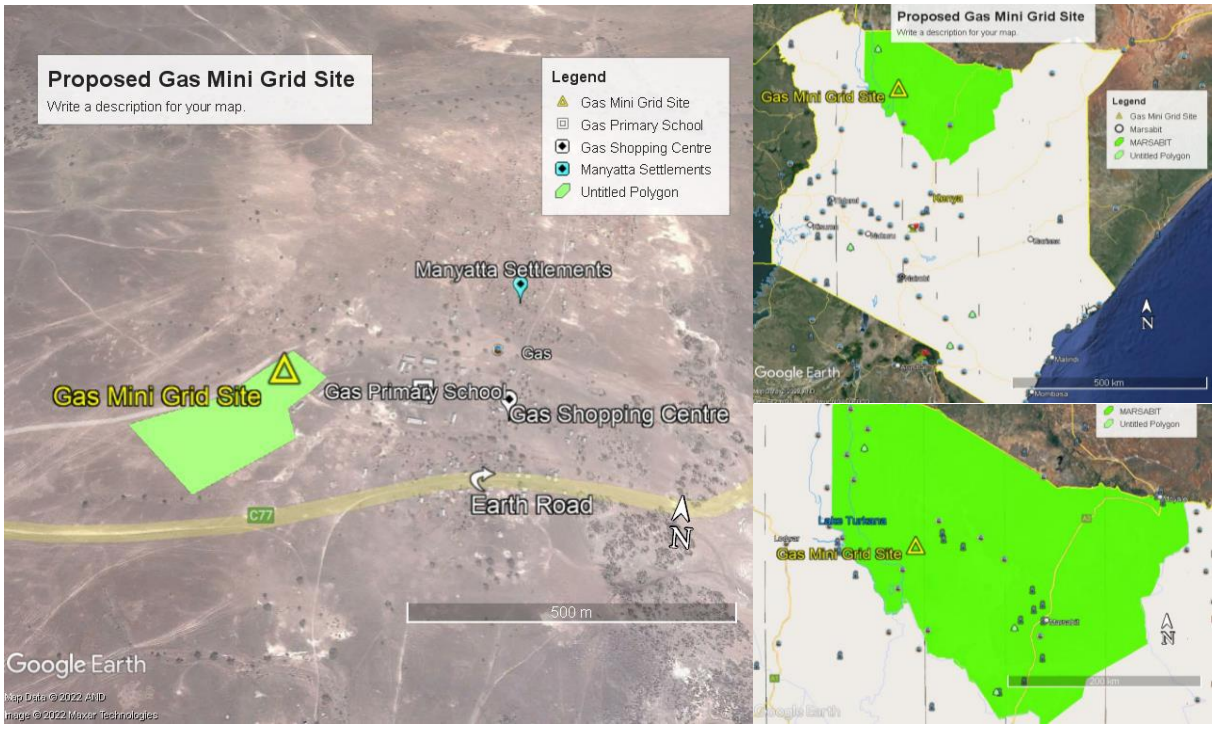

Figure 4: Project location

2.2.1 Project site setting

The proposed Gas mini grid is in Marsabit County. It falls under cluster 3 with a total of 48 mini grids and lot 2 which has a total of 35 mini-grids. Geographically, Gas site falls on coordinates Latitude 3°3'51.26"N and Longitude 36°49'24.63"E.

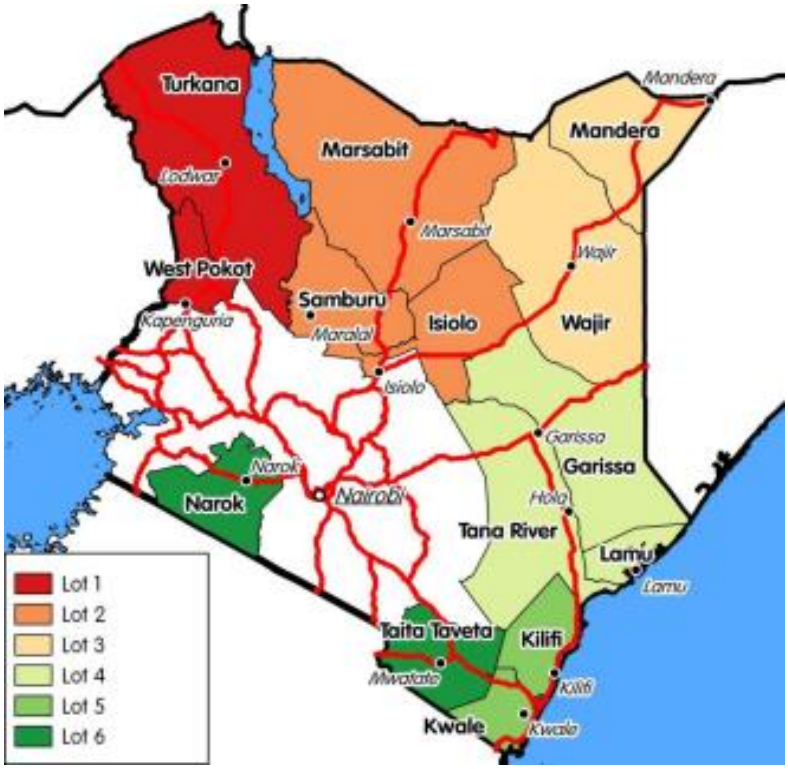

Figure 5: Map Showing the KOSAP Counties with Lot classification

2.3 Description of Project Facilities, Components and Activities

2.3.1 Project Components

2.3.1.1 Solar PV modules

The project will use PV Array (DC-kW) 90 polycrystalline silicon module 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.

2.3.1.2 Battery Energy Storage System

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.

2.3.1.3 Battery Inverters/ Chargers

The Inverters/charges shall be designed for nominal voltage of 415 Vac which will be continuous, reliable power supply as per specification and shall have internal protection arrangement against any sustained fault in the feeder line and against lightning strikes in the feeder line. The inverters shall be capable of complete automatic operation including wake-up, synchronization & shut down independently & automatically. The inverter shall be 3-phase multi-mode (DC to AC and AC to DC), bi-directional, four-quadrant capability.

2.3.1.4 Distribution lines

The 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 REREC 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 REREC requirements/specifications.

Residential Users (No.)	367
Non-Residential Users (No.)	4
Minimum PV Capacity (kWp)	100
Minimum Usable Batter(kWh)	250
Minimum PV Inverter (kW)	100
Generator Capacity (kVA)	60
Fuel Tank for diesel generator (Litres)	2,000
LV Network (km)	9.61

Key Components of the Project:

Power Generation Sources:

Solar Photovoltaic Panels: The project utilizes solar panels with a minimum PV 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 minimum usable Battery of 250kWh Battery Energy Storage System is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or night-time 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:

Minimum 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 9.61-kilometer Low Voltage (LV) power distribution network is established to distribute the generated electricity to the residential and non-residential consumers. The LV network is designed to efficiently transmit power while minimizing losses, ensuring a stable supply to the customers.

Project Metrics:

Daily Energy Demand: The average daily energy demand is approximately 298 kWh, ensuring a consistent supply for the consumers.

Peak Demand: The peak demand of the system is 55 kW, which is the maximum power requirement during any given moment.

Minimum PV Capacity: The solar photovoltaic panels have a total capacity of 100 kWp.

2.3.2 Architecture and Basic Design Specifications

This hybrid power generation site is projected to generate 100 (kWp) and is meant to serve approximately 375 households (customers). 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 of with a capacity of 100 (kWp) and minimum battery house with 60 kW. The solar panels will have a connection to the batteries through underground cables. The standby generator will also be connected to the system as a backup.

This generator will be a capacity of 60 kVA capacity with a fuel tank. 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 power will be distributed to the customers by overhead lines. The project site is expected to serve clients within a radius of 6km 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 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 plant is configured such that a significant portion of daytime loads is fed directly from the solar generator (grid-tie inverter) without intermediate battery storage usage. The solar PV power plant is also equipped with a Diesel Generator, which is normally used as reserve power. The diesel generator switches on automatically whenever the battery state of charge reaches a certain defined DOD (Depth of Discharge). The diesel generator comprises of 60 kVA unit in three-phase operation and it's equipped with automatic startup function controlled by the battery inverter charger.

2.3.3 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 mini grid.

2.3.3.1 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, and 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.

2.3.3.2 Land Tenure

The proposed site is on unregistered communal land. The community has since offered the land to the project proponent for establishment of the proposed project.

2.3.3.3 Compensation Details

Compensation for the land for the proposed project will be in kind; the community proposed a total of three projects in their order of priority for the client to choose. The identified project will be undertaken for the community by the project contractor.

2.3.3.4 Proposed Project Cost

The estimated cost of the project is around USD 358,233.63, although this amount may change as more detailed plans are developed.

2.3.4 Operational Activities

The Solar Mini-grid will be operated and maintained by the 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, REREC and KPLC shall adhere to all requirements of National Environmental Management Authority (NEMA) and any other applicable legislation regarding environmental and socio – economic impacts.

2.3.5 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.

2.4 Resource Requirement

2.4.1 Workforce Requirement

Approximately 40 skilled, semi-skilled and unskilled Laborers will be required at the construction stage. During the operation phase, the following personnel will be required; one operations and maintenance head, 2 engineers and 5 technicians.

Approximately 5 unskilled workers will be involved during operation phase of the project for grass cutting and module cleaning. Also, two trained security guards will be engaged at the operations phase.

2.4.2 Water Requirement and Source

2.4.2.1 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 area has shallow wells within 3 km to 4km from the site.

2.4.2.2 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.

Approximately, 10 employees (direct and contractual) will be working during operation phase. For this workforce, approximately between 5,000 Liters of water will be required weekly for domestic consumption.

2.4.3 Raw Material Requirement

2.4.3.1 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.

2.4.3.2 Operation Phase

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

2.4.4 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.

2.4.5 Fire Safety and Security

2.4.5.1 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, 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.

2.4.5.2 Operation Phase

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.

2.5 Pollution Streams during Construction Phase

2.5.1 Solid Waste Generation

2.5.1.1 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 county dumpsite.

2.5.1.2 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 county dumpsite.

2.5.2 Air Emissions

2.5.2.1 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.

2.5.2.2 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.

2.5.3 Waste Generation

2.5.3.1 Construction Phase

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

2.5.3.2 Operation Phase

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

2.5.4 Noise Emissions

2.5.4.1 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.

2.5.4.2 Operation Phase

Under normal operations, none of the activities of solar mini grid 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.

2.6 Land Requirement and Procurement Process

2.6.1 Land Requirement

The land on which the proposed Gas mini-grid will be constructed covers a total 0.6734hectares in size.

2.6.1.1 Land Tenure

In Gas, the site falls on Unregistered Communal land set aside for public use.

2.6.1.2 Compensation Details

Compensation will be done in kind. The main key area for development activities identified by the community in Gas included; water treatment plant, borehole repair and provision of fresh water.

3 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.

3.1 Site Selection

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

The proponent identified one location for the proposed solar project which located to the immediate west part of Gas primary school. The site was identified based on the location of settlement areas, commercial/ public facilities in Gas. The site is within 1km to the shopping center and at an accessible central location to the settlement areas within Gas.

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 grass and located near school and community settlement area;

The proposed project site has the following location advantages:

- The land is unoccupied and is not located in any ecological sensitive receptor;
- No cultural property of archeological importance within 5 km radius.

3.2 Power Scenario at Gas

Gas Sub-location has an estimate of 8,000 number of people with approximately 1000 households within the area. The proposed solar off grid project is estimated to cover a majority of residential and non-residential consumers within the Gas.

The existing sources of energy at Gas include solar powered appliances supplied by private enterprises such as D-light. 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 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 in which some have been tapped through wind and solar energy. The tapped energy from close location of Loiyangalani has been transmitted to the national grid. The area therefore has a chance of producing power and channeling power to productive sectors as well as export to other close locations.

Failure to construct and operate the mini grid in Gas 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.

3.2.1 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.

3.3 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

3.3.1 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:

Mini grid 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 of squatters, encroachers or other claims to the land
5.The Size of the Mini grid to be constructed and the optimal coverage of a Mini grid 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 Mini grid construction.

3.3.2 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 Gas residents is technically and financially challenging, expensive to install, dependent on wind pattern (not strong in Gas). 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 Gas). Besides coal and petroleum products used in thermal power processing are not readily available within Gas 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 Gas. 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 Gas on environmental as well as economic grounds
- Fossil fuel

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.

3.3.3 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 Gas area and 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 economic status of the local people would remain unchanged.
- Employment opportunities will not be created.
- Increased poverty in the area.

From the analysis above, it becomes apparent that the No Project alternative is no alternative to the local people, Kenyan Government, and Investors.

3.3.4 Analysis of Alternative Construction Materials and Technology

The proposed project will be constructed using modern, locally, and internationally accepted materials to achieve public health, safety, security, and environmental aesthetic requirements. These may not be desirable from a cost and durability perspective. The technology to be adopted will be the most economical and one sensitive to the environment.

3.3.5 Conclusion

The proposed project should be upheld to support the local community based on the need and location suitability.

4 APPLICABLE AND REGULATORY FRAMEWORK

4.1 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. S relevant to this Project are presented.

4.2 Kenya Policy Provisions

4.2.1 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.

Table 6. Kenya power stakeholders and their roles

Stakeholders	Role
Kenya Power & Lighting 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.

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

4.2.2 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.

4.2.3 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.

4.2.4 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.

4.3 National Legal Framework

4.3.1 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 7. 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.*
PCC	EMCA has also established a Public 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 **Public 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.*

4.4 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 8. National Policy 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 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.
3	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.
4	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
5	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.

6	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
7	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 Gas 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.
	NATIONAL LEGAL FRAMEWORK		
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.
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 by NEMA (under the EMCA) and the National Construction Authority, NCA (under the NCA Act, 2011)	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. ✓ Construction License as per the NCA Act, 2011 and subsidiary regulations.
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 ensure 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).	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.

		• 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.	
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. - 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.	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. iii. Developing an emergency plan should a fire occur which includes evacuation procedures etc.
13	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.
14	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
15	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.
16	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	- The proposed project site falls on community land and the land belongs to the Gabbra community in Gas. The community has since offered to the land in kind for project use. The

		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 concept of community land has been defined broadly enough to include VMGs. Women, children, old people, and future generations have been thought of as beneficiaries and thus their rights secured in this Act	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
17	The Physical and Land Use Planning Act, 2019 and other County Government regulatory frameworks under the County Government Act, 2012)	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. The County Government of Marsabit shall also issue appropriate business permits and licenses.
18	The Employment	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

	Act No 11 of 2007		
19	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.
20	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

4.5 National Administrative Requirements

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

Table 9: 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.

4.6 International Safeguard Requirements

The table below shows the applicability of World Bank Operational Safeguards as it applies to the proposed project in Gas site.

Table 10. World Bank Safeguards

OP	TITLE	APPLICABILITY	COMMENTS
4.01	Environmental Applicable	Applicable	The proposed project is likely to have potential environmental and social impacts. The objective of OP 4.01 is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate environmental and social screening, analysis of actions and mitigation of their likely environmental and social impacts and monitoring. The consultants have identified that the overwhelming majority of project beneficiaries in Gas area are considered vulnerable and marginalized. Therefore, OP 4.01 is applicable, and in line with this operational policy, the environmental and social screening process for the mini-grid project.
4.04	Natural Habitats Applicable	Applicable	The proposed project may be in or close to areas with natural unique flora and fauna though the component is unlikely to have significant negative impacts on natural habitat. Works will nevertheless be implemented in an area in Gas that may not negatively affect diverse flora, fauna, and avifauna. The area is dependent on pastoralism.
4.12	Involuntary Resettlement Applicable	Applicable	The proposed project will involve land take for construction purposes including, solar panels; generator rooms and distribution lines, as well as contractor yard and workers camp site

4.10	Indigenous People	Applicable	The proposed project will be implemented in Gas area. The community living within the area are the Gabra people who are considered to be indigenous. The project is directly targeted at them. The public consultation process incorporated opinions and assessment of positive and negative effects of the project to the indigenous community.

5 BASELINE SETTINGS- ENVIRONMENT, ECOLOGY AND SOCIAL

5.1 Study Area

The project site is located in Gas village, Loiyangalani 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.

5.2 Environment Baseline

5.2.1 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.

5.2.2 Topography

Marsabit County is extensively plain and lies between 300 meters and 900 meters above sea level. The site lies on a flat rockly plain with surrounding hilly areas to the west and northern areas. The site is at about 470m above sea level (asl). The county also has several other topographical features that includes Ol Donyo Ranges (2,066m asl), Mt. Marsabit (1,865m asl) in the central part of the county, Hurri Hills in the north eastern part of the county (1,685m above sea level), Mt. Kulal in the north west (2,235m asl) and the Sololo-Moyale escarpment in the north east (up to 1,400m asl).

The general slope of the surrounding areas slopes downwards in varied uniformity in all directions. The project site is at Latitude 3°3'51.26"N and Longitude 36°49'24.63"E. The county is prone to seasonal flooding during the rainy seasons which makes roads impassable.

5.2.3 Hydrogeology and Drainage

Marsabit County has no permanent river, but has four drainage systems, covering an area of 948 sq. km. Chalbi Desert is the largest of these systems and it receives run-off from the surrounding lava and basement surfaces of Mt. Marsabit, Hurri Hills, Mt. Kulal and the Ethiopian plateau. In the south, the seasonal rivers of Milgis and Merille flows 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 25km westwards into Lake Turkana through seasonal rivers from Kulal and Nyiru mountains drains to. The county has three dryland forests, namely Mt. Marsabit, Hurri hills and Mt. Kulal where the project area is located.

5.2.4 Ground Water Development

The ground water resources were majorly identified during the site assessment by means of observation and selected data hydrological model of the area. The surrounding area to the site has about 15 shallow wells and 2 boreholes located within 4km to the site.

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). In these areas, the ground water table varies greatly.

5.3 Ecological Conditions

Marsabit County lies in four main ecological zones, namely, sub-humid, semi-arid (mainly woodlands), arid (predominantly bushlands) and very arid (scrubland). The area is located in ecological zone VI and the area extends to other parts of the county which includes all the hills and plains below 700m above sea level. The area is of an altitude of 470m above sea level. The typical vegetation is dwarf-shrub grassland or a very dry form of bushy grassland. The area has extremely short grazing season, mostly lasting not more than two months after the rain seasons.

Gas has various tree species; the main species are Acacia spps. In extreme period of rainfall failure, the only vegetation available in this area is dwarf-shrub, which mainly supports goats and camels. The scarcity of wildlife in the project area is primarily caused by a rising human population, leading to increased poaching activities, particularly targeting large game species such as Elephants *(Loxodonta africana)* and black rhinoceroses *(Diceros bicornis).* Historical records show abundant populations of these species in Gas area until they were eradicated in late 20th century due to poaching. Other wildlife species like Greater kudu *(Tragelaphus strepsiceros),* Oryx (*Oryx beisa)*, Gerenuk *(Litocranius walleri),* Grant's gazelle *(Gazella granti),* Giraffe *(Giraffa camelopardalis)*, and Grevy's zebra (*Equus grevyi)* used to inhabit the middle and upper slopes of Mt. Kulal. Buffaloes *(Syncerus caffer)* were last observed in the higher montane forest levels in 1976 and are presumed extinct in Mt. Kulal.

Fauna species found in the area includes gerenuk, striped hyena, jackal, and ostrich were observed between the project area and Marsabit, indicating severely reduced wildlife populations, especially mega fauna, within the project area.

Plate 1. View of site locality with some of the acacia tree species present

5.4 Climatic Conditions

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 project site is characterized by very few trees and shrubs. The area is dominated by acacia tree species. The project site is covered by sandy soils with open bare land. The temperature ranges from a low of 15°C to a high of 35°C. 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.

5.5 Socio-economic Environment

5.5.1 Community Profile

Gas village is in Loiyangalani ward, North Horr subcounty in Marsabit County. It is located 40 km north of Loiyangalani town. The top community development priority the provision of a reliable water source with clean and potable water. Houses in the community mainly composed of thatched and/or polythene covered manyattas with a few that are roofed by iron sheet mainly used for businesses and housing community service providers. The community present within this area is the Gabbra who are considered marginalized from the whole country. The African Traditional Religion (ATR), Christianity and Islam are the dominant religions. Below is a summary of demographic profile of Gas.

Attribute	**Magnitude/Number**
Approx. population	8,000
Households	1000
Gender.	Male – 40% Female – 60%
Ave. No. per household	8 per household
Indigenous	Indigenous- 99% Settlers – 1%
Dominant ethnic group	Gabra
Primary religion	ATR Christianity Muslim
Other groups	None
Employment (formal/Informal)	Formal – Less than 5% Informal – 95%

Table 11. Demographic profile of Gas

Plate 2. Manyatta household at the far north of the site

5.5.2 Socio-economic status of Study Area

5.5.2.1 Demographic Profile

The information shared on community profile by the area chief (Gas location) showed that Gas area has a population of approximately 8,000, and with an estimated number of households to be 1000 with an average of 8 people per household. Gas has a gender ration that is currently estimated to be about 40% male and 60% female.

5.5.2.2 Educational Infrastructure

The village has only one primary school - Gas Primary School located at the immediate south of the site. The school serves Galas area which extends to about 10km radius from the institution. Marsabit County in general has a total of 231 primary schools, 43 secondary schools, three constituent colleges in the county - Kenyatta University, University of Nairobi and Maasai Mara in Saku Sub-county.

5.5.2.3 Occupation and Livelihood Profile

Gas community mainly keep livestock and small-scale farming. Major livestock kept are cattle, sheep, goats and local chicken. The people in the community mainly move with their livestock to more than 150 kilometers from the settlement areas. The markets include; North Horr and Oltorot market centres. Livestock is transported to these markets by foot, motorcycles and donkeys.

5.5.2.4 Land Use

Land in the community is mainly communal. The land is used for homesteads, and livestock grazing. Livestock are reared communally in the available grazing land at Gas.

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.

5.5.2.5 Health facilities

Gas has only one public dispensary located within the settlement area. The facility has two (2) nurses, one (1) public health officer (PHO), two (2) community health assistants (CHAs), three (3) support staffs. It was indicated that the staff and personnel provided are not enough. Main services provided maternity, ANC services, laboratory services, curative services, preventive services and nutrition services. The facility and despensary's equipment provided are in good condition; however, the lighting and water shortage are the main challenges faced at the facility.

5.5.2.6 Social and Physical Infrastructure

Water: Water utilized in Gas is sourced from available shallow wells that are about fifteen (15) in number. The wells are located within the settlement areas and Gas shopping Centre. The area also has two (2) boreholes but are malfunctioned.
Water is collected from the specific shallow wells and supplied to individual homesteads by women and children.

Plate 3. Community water point with water storage tank

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

Road Network: Road connectivity to major townships of Loiyangalani and North Horr are in good condition. However, the connectivity to the rural areas within are poor and not regularly maintained. The main forms of transport within the area are four wheeled vehicles, motor bikes and donkeys as alternative modes of transport. The project area is located has gravel graded roads and dirt roads within the area.

Mobile Network Coverage: Network coverage within the village for Safaricom network provider is good.

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

6 STAKEHOLDER ENGAGEMENT

This section profiles the key stakeholders for the Gas site solar project 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 Stakeholder Consultation and Disclosure Requirement for the Project

The World Bank Environmental Social OPs 10 emphasizes on engagement in meaningful consultations with all stakeholders. The stakeholders with timely, relevant, understandable, and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination, and intimidation.

A documented record of stakeholder engagement, including a description of the stakeholders consulted, a summary of the feedback received, and a brief explanation of how the feedback was considered is in place.

The respective minutes and list of participants for the public consultation undertaken at Gas baraza park is enclosed under appendices of this report. Further, an initial communication was shared with the county commissioner Marsabit and Chief for Gas location on 5th January 2022, two (2) weeks prior to the public participation meeting held on 19th January 2022 at Gas baraza park. Background information document (BID) was share with the chief and posted at main public facilities at Gas.

6.2 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.

- **Primary Stakeholders**- Stakeholders who have a direct impact on or are directly impacted by the project.
- **Secondary Stakeholders**- 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 Gas the stakeholders have been identified and listed in the table given below.

Table 12. Identified Stakeholders

Stakeholder Groups	Primary Stakeholders
Community	Local Laborers Land sellers VMG's Local Community
Institutions	Community & Faith Based Organizations Education & Healthcare institutions
Government Bodies	NEMA County Government District and local administration

6.2.1 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 13: 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

6.3 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.

6.4 FINDINGS OF THE STAKEHOLDER CONSULTATION PROCESS DURING SCREENING

6.4.1 Land requirements for the project

The project team informed the community about their purpose for visiting, which was to assess the land/site identified by the community for the project. They explained that an environmental and social screening would be conducted jointly with the community to determine the suitability of the land for the proposed solar mini-grid project. The team emphasized certain factors to consider when identifying the land, including its relatively flat terrain, absence of residential households, ability to receive ample sunlight, absence of conflicts, and centrality to residents and public facilities to maximize the project's reach. It was mentioned that approximately 0.6734hectare of land would be needed for the project.

The IA highlighted that the Government of Kenya had secured a loan from the World Bank, their development partners, to implement the KOSAP project. The team explained that the government sought a partnership with the community, where the community would identify the land for the solar mini-grid, while the government would provide the necessary funding for its establishment.

The team further explained the different land ownership categories in Kenya, namely private land, public land, and community land. They specifically stated that the land in the area fell under the category of community land and was governed by the Community Land Act of 2016. Compensation options for the land were discussed, including cash payment, land-for-land compensation, and compensation in the form of a community project. Rebecca clarified that the government proposed the third option, wherein the community would identify a project to be implemented alongside the solar mini-grid as compensation for the land.

The community in Gas unanimously 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.

6.4.1.1 Survey of the land and request for advance possession.

The team noted that the process of land surveying and land transfers and registration are long and requested the community for advance possession of the land. This meant that the community would allow construction works to take place as the process of land registration is being progressed. The community agreed to the advance possession request. They explained to the community members that the surveyor will need to pick exact GPS points of the agreed identified portion of land for the solar mini-grid so that the process of land registration may be progressed. They explained to the community that the rationale and importance of sharing all that information was to facilitate the community in making informed decisions about the project.

6.4.2 Plenary session

Rebecca then invited the community members to a plenary session for the community members to ask questions or seek clarifications on the information shared. The questions raised are presented in the table below.

	Name	Questions/suggestions	Response	Response by agency on how feedback will be used or acted upon
1	Roba Godana	We have heard about this issue of power before is this project linked to the wind power	No, this is separate from the wind power. In this project the power will be generated from sun rays hence the name solar project and then distributed to the customers using low voltage lines	-
2	Roba	We have a place (land where to set the Mini-grid) and sometimes our livestock come near the homesteads can the Mini-grid affect them	The Mini-grid site will be fenced off to keep of the public and other animals from access. The low voltage lines for the distribution are at a height above the ground supported by posts.	-
3	Adano	After we pay the one thousand shillings to be connected, what else is needed?	The customer will be required to pay for power consumed and we shall use prepaid meters whereby a customer buys power before using the way we buy credit for the mobile phones	
4	Adano	Can we cook with that power	Yes, you can cook with it only that you will have to buy a cooker and also be ready to pay a little bit more for the power	

Detailed minutes has been attached at the end if this report.

6.5 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.

A detailed CPP and community engagement for Gas Solar Mini Grid was held in Gas village, at Gas Baraza park on 19th January 2022 chaired by the area chief.

The general stakeholder consultation/public meeting (Baraza) organized at Gas community baraza point was attended by 32 males, 14 women and 14 youth were in attendance. The meeting was chaired by the area ward administrator assisted by the chief and the "Nyumba Kumi" leaders. The feedback received during the stakeholder consultation process have been summarized below.

No	NAME	Organization/ Designation	Issues/comments discussed

1.	Roba Godana	Elders – Gas	Mr. Sammy and Lentawa enquired on clarity on the exact charges to be effected during installation and the subsequent electricity consumption on use. Mr. Daniel enquired on the price per unit use for consumed power supplied from the proposed mini grid. The MoEP representative, Mr. Peter Maneno responded by indicating that the electricity distribution will be done within a radius of approximately 2km from the source and a connection fee of 1000 shillings will be required for each household and structure connected. The County Renewable Energy Officer (CREO), Mr. Jalle added that the electricity consumed will be charged in accordance with the national and regional charging rates set out by the regulator.
2.	Sabdio Barako Roba	Woman – Gas	Ms. Sabdio on whether the project would be an health hazard either during construction or operation phase. The environmental expert and consultant's representative, Mr. Daniel Chumo, indicated that various possible negative health effects from the project will be identified and relevant mitigation measures provided. He indicated further that conditions that pose health risks such as air pollution through possible emissions from the generator will be very minimal as the generator will be utilised only as a backup during limited electricity supply and unfavourable weather conditions. He further informed the members present that the generator design conditions will ensure that very minimal emissions are discharged.
3.	Moses Maingi	Nurse – Gas Dispensary	Mr. Moses enquired on provision for induction for the local users safe use and handling of electrical equipment and appliances. Mr. Peter Maneno informed the meeting that the project implementing agency will take to educate the users on electrical usage before operationalising the project. He further informed them there will be frequent public education on safe use of electricity.
4.	Tura Ndege	Youth – Gas	Tura indicated that the community has qualified youth amongst them with different skills such as wiring and other technical capabilities. He enquired on whether the project will ensure that the qualified local youth are employed and involved in the project. Mr. Daniel, the consultant representative informed that that the contractor will be advised to utilise the local personnel in implementing and maintaining the mini grid facilities.

6.5.1 Positive Comments about the Project from the Participants

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

- ✓ Learning will improve due to availability of lighting
- ✓ Business opportunities will improve since farmers will be able to cool their milk, welding business will arise
- ✓ Employment opportunities will increase for the youth due to increase in business opportunities
- ✓ Security will improve due to availability of lighting

- ✓ Medical services will improve due to availability of refrigeration services
- ✓ The electricity will assist in pumping of water from the boreholes

6.5.2 The identified negative impacts of the project

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

- ✓ **Accidents**: some of the members raised concerns of possible accidents from falling poles, electrocution especially the children as well as possible accidents from falling of the electric poles. The community suggested extra care when, protection of appliances and reinforcement of electric poles to mitigate these accidents.
- ✓ **Employment Disputes:** There was a concern over the possibility of disputes arising between the local communities with people of different cultures in the construction sites. The community suggested that proponent should consider employing local construction workers.
- ✓ **Dust Generation:** The participants expressed concern over possibility of generation of large amounts of dust within the project site and surrounding areas because of demolition, excavation works and transportation of building materials.
  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.
- ✓ **Environmental Aesthetics** It was seen that the aesthetics of the area would be affected negatively during construction. It was suggested that the proponent should ensure landscaping is conducted after construction.
- ✓ **Noise Pollution**: The neighbouring school and neighbors will be affected by possible noise and exhaust fumes from the site.

  Other concerns
  - Some of the members asked whether they be required to pay the cost of connection or only the daily usage
  - Questions were also raised on whether the labor and raw materials will be sourced from the community.
  - A youth felt that the proposed site was an individual's plot and suggested that an alternative site be considered

6.5.3 Additional Responses from the Consultant

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

- ✓ Every 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
- ✓ The contractor will be advised to source all non-skilled labor from the Gas Community
- ✓ He assured the community that the project will commence soon after ESIA
- ✓ That noise form the Machinery will be minimized.

6.5.4 Consent

The Community members present agreed unanimously and accepted the Project Proposal.

6.5.5 Community Presentation

6.5.5.1 Adult to youth Representation

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

6.5.5.2 Gender Representation

Table 14. The consultative meeting had a wide representation

Category	Male	Female
Youth	16	3
Adult	32	10
TOTAL	**42**	**17**

6.5.5.3 Heads of Households

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

6.5.6 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.

FGDs are important when gauging with a particular group of stakeholder on issues related to the project activities. It is used to understand the needs, perceptions and concerns of the group. The discussion will give space for the members to voice their concerns and suggestions.

Focus group discussions for the assessment phase were carried out with the men, women and youth. The FGDs were carried out immediately after the community public participation meeting was concluded. Structured questionnaires/guides were used to undertake the focus group discussions to elicit their expectations and suggestions for the proposed 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 FGD consultative meeting had a wide representation

Category	Male	Female	Youth
Number	14	13	16
Venue	Gas Baraza Point	Gas Baraza Point	Gas Baraza Point

Plate 4. Youth and Female FGD

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

Plate 5. Public Participation

6.5.7 Grievance Redress Mechanism

a) Overview

One of the key roles of the Grievance Redress Committees will be 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.

The Land Acquisition Tribunal has the jurisdiction to hear and determine appeals from the decision of the NLC on the process of compulsory land acquisition of land. However, if a party is dissatisfied by the decision of the tribunal, they may appeal to the Environment and Land Court. 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. ADR 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. The affected persons and other stakeholders also have a right to access the World Bank Redress Service (GRS) and the World Bank Inspection Panel at no cost.

b) Grievance Redress Principles

The principles of grievance mechanism management that need to be observed include;

- All complaints and grievances are resolved as quickly as possible.
- That the resolution of complaints and grievances should be at the lowest possible level for resolution.

- All complaints that can be resolved, should be resolved immediately on the site. The focus of the GRM is to resolve issues in a customarily appropriate fashion at community level and record details of the complaint, the complainant and the resolution.

c) Grievance Redress Committee Capacity Building

A grievance redress mechanism and a committee were established in a culturally appropriate manner in consultation with the community during the consultations for ESIA and will be utilized post ESIA. The GRM committee will have the following roles; log the grievances, maintain records of the GRC meetings and grievances, resolve the grievances to the extent possible.

d) Grievance Procedures

a) Registration - Community members can inform the contractor about concerns directly and if necessary, through third parties. Once a complaint has been received, it will be recorded in a complaints log or data system. The log will be kept in hardcopy or electronic form. All reported grievances will be categorized, assigned priority, and routed as appropriate.

Grievance Log: The grievance logbook will ensure that each complaint has an individual reference number, and is appropriately tracked and recorded actions are completed. The information to be recorded will include:

- Name, age, gender of complainant;
- Date the complaint was reported;
- Date the grievance logged;
- Action taken;
- Date information on proposed corrective action sent to complainant (if appropriate);
- The date the complaint was closed; and
- Date response was sent to complainant.

b) Sorting and Processing - This step determines whether a complaint is eligible for the grievance mechanism and its seriousness and complexity. The complaint will be screened however; this will not involve judging the substantive merit of the complaint.

The following guide will be used to determine whether a complaint is eligible or not:

Eligible complaints may include those where:

- The complaint pertains to the mini Off-grid project.
- The issues raised in the complaint fall within the scope of issues the grievance mechanism is authorized to address.

Ineligible complaints may include those where:

- The complaint is clearly not mini Off-grid project -related.
- The nature of the issue is outside the mandate of the grievance mechanism.
- The complainant has no standing to file.
- Other project or organizational procedures are more appropriate to address the issue.
- Closing Out and Escalation: Project-related grievances will be addressed and closed out as appropriate. The GRM will provide a channel for escalation e.g., through legal redress.

The proponent KPLC will monitor the activities of the stakeholder engagement and grievance management activities.

The three tiers if the GRM are as described below:

1. 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 (CGRC)
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.

2. 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.

3. Locational Grievance Redress Committee (LGRC)

Since counties are large, further decentralized Grievance Redress Committee will be formed at the location of the sub-project. Subsequently, Locational Grievance Redress Committees (LGRC's), based at each location of a sub-projects, will be established. The LGRC's will be constituted by implementing agencies and representatives of CGRCs through consultation with the PAPs and will act as the voice of the PAPs.

The LGRCs will work under guidance and coordination of CGRC and the implementing agencies. Their membership will comprise 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 Chiefs, 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, will represent youth related concerns in the LGRCs
5. Male representatives elected by the members of the PAPs
6. Vulnerable person's representative will deal and represent vulnerable person's issues in the LGRCs.
7. CBO representatives

Membership of LGRCs will be elected by each category of PAPs except the locational Chief and assistant chiefs who will be automatic members of the team by virtue of their positions. Each of LGRCs will elect their own chairperson and a secretary among themselves.

The roles of LRCCs will include among others the following:

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

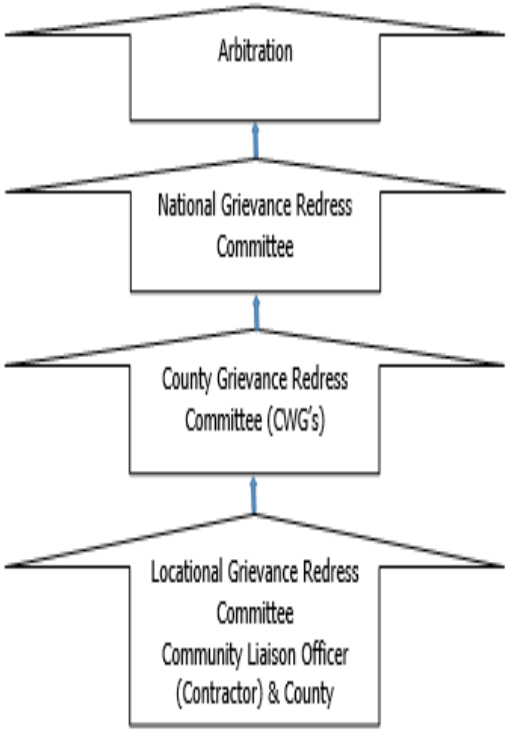

Figure 8-1: KOSAP Grievance Redress Mechanism

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 and since most disputes arise during the Construction and operation period, the contractor's Environmental and Social Safeguard team specifically the Community Liaison Officer will work closely with the community to be able to resolve disputes.
Responsibilities of the Community Liaison Officer include:

- Monitor day to day Implementation of the Project
- Address grievances as they arise on the project
- A member of the Locational and County Grievances Redress Management Committee to respond on issues that may have been brought to the attention of the committee before escalating to the National Grievance Redress Committee
- Escalate grievances internally to get a lasting solution

e) Existence of a Local Grievance Redress Mechanism in Gas

The Gas Grievance Redress Committee (GRC) was formed in 2021 through community consensus. The committee has 7 members, including a chairperson, secretary, and 3 other members. To date, the GRC has not held any meetings to address any grievances.
Contractor will prepare an effective Grievance Redress Mechanisms (GRM) to address and respond to grievances from both the community, the workers and any other stakeholder.
A Grievance Redress Mechanism (GRM) provides access to remedy and identifies procedures to effectively address grievances arising from project implementation. GRM provides an avenue where people can formally lodge their complaints and grievances and have them properly considered and addressed.
The mitigation measures shall include:

- Prepare a project level time bound GRM in consultation with relevant stakeholders

- Ensure the project GRM incorporates existing local dispute resolution mechanisms at the lowest tier and allows access to administrative and judicial processes as well as to other redress mechanisms such as meditation/arbitration and the World Banks grievance redress service (GRS) and the Inspection Panel
- Have a subproject level GRM Focal Point to be responsible for receiving, logging/registering, submitting to the responsible tier for resolution and responding to and updating complainants on resolution status
- Sensitize all stakeholder categories on the GRM and encourage them to make use of it
- Ensure the GRM is functional, culturally appropriate, and accessible to all stakeholders without any cost to them and without fear of retribution or reprisal
- Ensure adequate and proportionate representation of VMGs and vulnerable individuals in the local grievances handling committee.
- Prepare a time bound Contractor's GRM and sensitize community members and project workers its processes
- Ensure all reported grievances are logged, dated, processed, resolved and closed out in a timely manner, or escalated to other levels.
- Ensure the GRM provides for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity for those who wish to report anonymously.

f) World Bank Grievances Redress Mechanism

The World Bank has established 2 grievance redress mechanisms that provide avenues for individuals and communities to submit complaints directly if there is belief that they have been, or are likely to be, adversely affected by a World Bank-funded project. In this project PAPs and other stakeholders have the right to know and access at no cost these GRMs as described below.

g) World Bank Grievances Redress Service

The Grievance Redress Service (GRS) is an avenue for individuals and communities to submit complaints directly to the World Bank if they believe that a World Bank-supported project has or is likely to have adverse effects on them, their community, or their environment. The GRS enhances the World Bank's responsiveness and accountability to project-affected communities by ensuring that grievances are promptly reviewed and addressed. Complaints must be in writing, addressed to the GRS, and sent through the following methods namely:

Those aggrieved or their representatives can report their complaints through the following mediums; (i) Online by accessing the online form; (ii) Sending an Email to grievance@worldbank.org; or (iii) Submitting a letter to the World Bank Headquarters in Washington D.C., United States or World Bank Kenya County Office.

h) World Bank Inspection Panel

The Inspection Panel is an independent complaints mechanism for people and communities who believe that they have been, or are likely to be, adversely affected by a World Bank-funded project. The Panel is an impartial fact-finding body, independent from the World Bank management and staff, reporting directly to the Board. The Inspection Panel process aims to promote accountability at the World Bank, give affected people a greater voice in activities supported by the World Bank that affect their rights and interests, and foster redress when warranted. In September 2020, the Board updated the resolution that created the Panel and added to the Panel functions. At the same time, the Board approved a resolution establishing the World Bank Accountability Mechanism (AM). The new AM began operations in early 2021 and houses the Panel to carry out compliance reviews and a new Dispute Resolution Service (DRS), which will give complainants another way to have their concerns addressed. Contacts for registration of complaints to the IP are; (i) Tel: +1 202 458 5200: and (ii) Email: ipanel@worldbank.org.

i) Government Management of Land Acquisition Disputes

The Environment and Land Court, established under the Environment and Land Court Act 2011, is a superior court (with offices across the country) that hears and determines disputes relating to land and the environment. Likewise, the Land Acquisition Tribunal established under the Land Act 2012; (PART VIIIA 133A) has jurisdiction to hear and determine appeals from the decision of the NLC on the process of compulsory acquisition of land. Therefore, in the first instance, such appeals are referred to the Tribunal. However, a party dissatisfied with the decision of the Tribunal may appeal to the Environment and Land Court on a question of law only. The regulations to set the Land Acquisition Tribunal established under the Land Value (Amendment) Act of 2019 are underway. Besides, the Judicial Service Commission will chair the Land Acquisition Tribunal once operational.

7 PROPOSED MITIGATION MEASURES.

7.1 Introduction

This section provides an assessment of potential environmental and social impacts from the proposed Projects as well as the proposed mitigation measures to avoid, reduce, remediate or compensate for potential negative impacts and to enhance positive impacts. A description of the assessment methodology used to assess the significance of potential impacts, taking into account impact magnitude and sensitivity of receptors and resources affected, is provided below. To facilitate the reading of the ESIA, the same heading structure in terms of environmental indicators, receptors or resources affected by the project activities were considered as the ones used in the baseline. All the mitigation measures identified in this chapter have been collated into the Environmental and Social Management and Monitoring Plan ('ESMMP') matrix, including Occupational Health and Safety.

7.2 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:

7.3 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.

7.4 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.** below based on five levels;

Table 7-1: 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 7-2: Overall Significance Criteria for Environmental Impacts

Receptor sensitivity (or resource value)	**Impact Magnitude**		
	Low	**Medium**	**High**
Low	Minor	Minor	Medium
Medium	Minor	Medium	Major
High	Medium	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 licence to operate.

7.5 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).

7.6 Sensitivity of Resources and Receptors

Sensitivities are defined as aspects of the natural or social environment which support and sustain people and nature. 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.

7.7 Likelihood

Terms used to define likelihood of occurrence of an impact are explained in **Error! Reference source not found.** below.

Table 7-3: 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 life style)	As far as possibly recurring impacts are concerned, such as accident or unplanned events (e.g., traffic accident, fire)

7.8 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., waste water 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 minimise potential impacts through the design and management of the Project rather than on reinstatement and compensation measures.

7.9 Assessing residual impacts

Impact prediction takes into account any mitigation, control and operational management measures that are part of the project design and project plan. A residual impact is the impact that is predicted to remain once mitigation measures have been designed into the intended activity. The residual impacts are described in terms of their significance in accordance with the categories identified in **Error! Reference source not found.** and **Error! Reference source not found.** above.

Social, economic and biophysical impacts are inherently and inextricably interconnected. Change in any of these domains will lead to changes in the other domains.

7.10 Positive impacts - Pre-Construction

- Employment opportunities arising from recruitment of workers
- Skill acquisition and enhancements to locals and future workforce
- Improvement in quality of life for from the in-kind compensation agreed by the community member

7.11 Negative Impacts – Pre-Construction Phase

7.11.1 Land Acquisition

The proposed project will entail the acquisition of 5 Ha develop contractor facilities, worker's camps and other ancillary facilities e.g., storage and sanitary facilities. Loss of land used by the communities for livestock grazing and farming may trigger land disputes. New settlements may arise due to migration of people to the centres near the mini-grid disrupting the existing community settlement patterns. The project proponents will use existing access roads to set up the low-voltage power distribution lines and will seek access from beneficiaries and clients in whose property they will undertake electricity connection to the power grid.
During the consultation, it was also reported that the community is not entirely dependent on the land for income. The land has minimal vegetation cover. After implementing the embedded controls, the impact magnitude is assessed to be minor.

7.11.1.1 Source of Impact and Overview of Baseline Conditions

- Additional employment opportunities may also be created for the local youth by the contractor.

7.11.1.2 Embedded/In-built Controls

Enabling the community to benefit from the project by supporting local projects e.g., healthcare access, schools and local water need.

7.11.1.2.1 Significance of Impact

The impact significance for communal land uptake is assessed minor considering the community willfully gave the land for project use.

7.11.1.3 Additional Mitigation Measures

The following additional measures may be recommended to minimise this impact:

- Providing skills-based training interventions, especially for self-employment to the young and unemployed. This will enhance their employability and create potential for income generation through self-employment;
- Procuring resources from the local sources so as to induce more employment in the supply chain.
- Community compensation in kind. The community identifying projects admissible in Water, Health and Education sector within a radius of 10 km.

7.11.2 Acquisition of Way leaves

The project proponent will use existing access roads to set up the power distribution lines and will seek access from beneficiaries and clients in whose property they will undertake electricity

connection to the power grid. Supply of electricity will involve passing of low voltage (LV) lines to connect the customers to power.

7.11.2.1 Embedded/In-built Controls

The LV lines will be constructed mainly along the road reserve and along the boundaries to supply power.

7.11.2.1.1 Significance of Impact

The impact significance is assessed minor considering no acquisition of land is anticipated.

7.11.2.2 Mitigation measures

- Consultations with the community during construction of the low voltage lines to agree on the mode of compensation of the affected areas
- Any damage that will occur to structures,crops,trees,community facilities and other assets as a result of the acquisition of way leaves should be compensated in line with the RPF provisions.

7.11.3 Impact Related to Stakeholder identification and consultations

These impacts are associated with these risks:

1. *Inexhaustive stakeholder identification, stakeholder mapping and stakeholder information needs basis.*

Mitigation measures

- Prior to construction works, identify and map all primary and secondary stakeholders (the various segments of the subproject area community – men, women, PWDs, elders, religious leaders, etc., community level CSOs, sub-county level CSOs with interest in the subproject, county level CSOs with interest in the subproject etc.).
- Assess the interest of each stakeholder category in the subproject
- Assess each stakeholder category's subproject information needs at the various subproject phases

2. *Risks related to disclosure of appropriate information in line with the subproject phase*

Mitigation Measures

- In consultation with the identified stakeholders, prepare a stakeholder engagement plan (SEP) that is based on their locations (maps) and their information needs at the various subproject phases
- Undertake timely and prior disclosure of relevant project information to the various stakeholder categories in line with their information needs and the project phase
- Carry out robust consultations with all identified community level (primary) stakeholders in a gender, intergenerational and culturally sensitive manner, using appropriate participatory consultative techniques
- Consult with other relevant (secondary) stakeholders (as appropriate) based on their information needs, project phase and the SEP
- Document the information disclosure and stakeholder consultation processes (including venues, dates, minutes of discussions detailing consultation agenda, issues/concerns raised for each agenda item, and responses by the implementing agency)

3. *Risks related to inadequate consultations with all segments of the community and exclusion of VMGs and vulnerable individuals and households in subproject activities and implementation structures*

Mitigation measures

- Ensure adequate consultations prior to construction, and throughout the project cycle with all segments of the community and other relevant stakeholders. This should be based on the SEP, using appropriate consultation techniques
- Ensure all concerns or grievances raised are responded to in a timely manner.

4. *Risks related to establishment of subproject governance structures, e.g., selecting individuals into management or GRM committees who have not been elected by all segments of the community, or imposing people who are not trustworthy into community level leadership positions*

Mitigation measures

- Consult with all segments of the community and agree on the criteria to be used to elect leaders into the subproject governance structures
- Facilitate each segment of the community to elect their representatives to the various governance structures based on the agreed criteria
- Train members of the various governance structures on their roles and responsibilities

5. *Risks related to exclusion of some stakeholder categories (VMGs, minority clans, disadvantaged individuals, women, youth, PWDs) from the consultation processes and the established subproject implementation structures*

Mitigation measures

- Facilitate the various stakeholder groups to establish representative and proportionate subproject implementation structures (implementation committee, GRM Committee etc.) composed of people of integrity who have the interest of their stakeholder category at heart, while ensuring that there is no conflict of interest, e.g., one person should not represent the stakeholder category in more than one structure)
- Train the members of the implementation structures in their respective roles and responsibilities
- Sensitise the various stakeholder categories on the existence, roles and responsibilities of the various implementation structures

7.11.3.1 Embedded/In-built Controls

Stakeholder engagements regarding the project to get their views and consent done prior to construction works. The consultations include public barazas, focus group discussions and key informant interviews.

7.11.3.1.1 Significance of Impact

The impact significance would be major, however, if the mitigation measures are used the residue impact is minor.

7.12 Positive Impacts- construction Phase

7.12.1 Impact on Employment

The construction of the mini-grid will provide employment opportunities for skilled and unskilled labour. Receptors in the Social area of Interest that may be able to make the most of the direct and indirect employment opportunities in the project are those who have some level of

experience in formal employment, as well as those who have gained a basic education. This will be a source of income for the labourers.
Thus, anticipated benefits of the Project include Direct employment opportunities mainly during construction of the mini-grids The local community is likely to benefit from the opportunities to be created from the following:

- Civil works during construction phase including, construction of solar PV module mounting area, transformer yard, inverter room, internal roads, laydown areas, labour camp, distribution line; and
- Skill transfer from the contractors to the locals that will be given opportunities during the implementation of the project.

The area is characterised by major unemployment. This has affected the community members including the youths, men and woman as reported during Focused group discussion sessions. Thus, the contractor should develop and implement an employment management plan to promote local content. This will ultimately resolve conflict which can be arise if the community feels left out in employment opportunities.

7.12.1.1 Impact Significance

The impact significance will be moderate due to the high impact magnitude and the low receptor sensitivity. Due to expected limited job opportunities, a few locals will get jobs at the site that will impact their lives substantially.

7.12.1.2 Enhancement Measures

A significant segment of labour requirement during the construction phase will be sourced locally. While, the significance of the impact on employment opportunities during the construction phase is understood to be positive, the following measures should be put in place to ensure that the local community receives maximum benefit from the presence of the project;

- Preference should be provided to local labour; and
- Preference should be provided to the vulnerable population in the Study Area.

7.12.2 Impact on Local Trade

Where possible, construction materials will be sourced locally in order to promote local businesses.
Thus, anticipated benefits of the Project include indirect employment generated by the procurement of goods and services for the Project; induced employment related to jobs ensuing from the expenditure of incomes. The local community is likely to benefit from the economic opportunities to be created from the following:

- Self- employment options for individuals possessing vocational or technical training skills like electricians, welders, fitters etc.
- Contracting opportunities for local's residents including men, women and youths. During the public meeting the community insisted that all the unskilled labour force must be given to the locals; and
- Creation of indirect employment for local community through establishing small shops like tea stalls, supply of intermediate raw materials, repair outlets, hardware stores etc. However, these are likely to be temporary.

7.12.2.1 Impact Significance

The impact significance will be moderate due to the high impact magnitude and the low receptor sensitivity. Due to expected limited job opportunities, a few locals will get jobs at the site that will impact their lives substantially.

7.12.2.2 Enhancement Measures

- Preference should be provided to local sub-contractors or suppliers to pass on maximum economic benefit locally; and
- The project proponent will establish a mechanism to audit sub-contractors and suppliers with respect to compliance of utilizing local labour and resources.

7.13 Negative Impacts – Construction phase

7.13.1 Change in Land Use

The study area consists of communal land with patches of open scrubland. The internal distributions lines will be laid by Kenya Power. The land procured for the project site was uncultivated, and undeveloped. During consultation, it was established that the land belongs to the Mansa community. The community has since allocated the land in kind for project use. The establishment of the mini-grid will convert communal land to industrial use for long term. For the purpose of assessment of impacts on land use of the area, the following project activities leading to an alteration in land use of the area during construction phase have been considered:

- Installation of PV modules;
- Establishment and operation of temporary structures such as temporary site office and store yard.

The land use receptor sensitivity criteria will be low. This is due to the fact that there will be visual change upon installation of the mini-grid. There is no major dependency for grazing or agriculture on the land offered for the project. The magnitude criteria of this impact will be medium because there will be noticeable of change over the restricted site area. The change may be medium to long term and is reversible.

7.13.1.1 Embedded/In-built Control

- 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.
- The existing earth roads at Mansa will be used for access to the project site.

7.13.1.2 Significance of Impact

The overall impact significance on land use will be Moderate. This is the case due to the fact that the receptor sensitivity is medium and the impact magnitude is medium.

7.13.1.3 Additional Mitigation Measures

- On completion of construction activities, land used for temporary facilities such as store yard should be restored to the extent possible;
- The land use in and around permanent project facilities should not be disturbed.
- Construction activities should be restricted to the designated area.

7.13.2 Impact on Topography

The topography of the project site is an open area with gentle slope of about 1.7% and mild undulations. There are no water bodies that pass though directly the proposed project site. Typically, solar power projects do not undertake levelling of topography and since the proposed project, along with the access road, is mostly on a flat terrain the receptor sensitivity has been assessed to be low.

Due to undulating topography, study area may exhibit presence of micro drainage channels. Therefore, the impact magnitude has therefore been assessed as minor.

7.13.2.1 Embedded/In built Control

The contractor will be instructed to avoid any unnecessary changes in the topography.

7.13.2.2 Significance of Impact

The overall impact significance will be Minor. This because the impact magnitude is low and there will be no major changes to the topography and the receptor sensitivity is low.

7.13.2.3 Additional Mitigation Measures

- Appropriate number of cross drainage channels should be provided during construction to maintain flow in existing natural channels.
- Disruption/alteration of micro-watershed drainage pattern should be minimized to the extent possible.

7.13.3 Impact on Soil

The project activities that may impact the environment are described below:

- Vegetation clearance and top soil removal;
- Storage of oil and lubricants onsite;
- Storage of construction materials; and
- Disposal of different type of waste generated from the temporary project site.
- Storage of oil and lubricants onsite;
- Disposal of municipal solid waste and waste water from site office; and
- Storage of waste materials onsite.
- Removal of PV modules;
- Removal of associated infrastructure including battery and generators.

7.13.3.1 Significance of Impacts

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

7.13.3.2 Additional Mitigations

- Vehicles will utilize the existing roads to access the site;
- No unauthorized dumping of used oil and other hazardous waste should be undertaken at site;
- All waste should be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels;
- Solid waste should be segregated in color coded waste receptacles.
- In case of accidental/unintended spillage on small area, the contaminated soil should be immediately collected and stored as hazardous waste;
- Compacting of loose soil in excavated areas.
- Enclose the construction site and protect the soil to prevent the waste soils and other debris from being washed away by surface runoff and wind.

- All dug up soil that is not needed on-site to be removed promptly and disposed of to appropriate areas.
- Re-use the dug-up soil in backfilling and landscaping.
- Any soil potentially contaminated by chemicals, oils, fuels to be collected and disposed of by a NEMA authorized waste

7.13.4 Impact on Air Quality

The assessment with respect to air quality of the study area has been done for the following project activities:

- Fugitive emissions from site clearing, excavation work, material handling etc.;
- Fugitive emission from traffic movement;
- Exhaust emission from operation of machineries like pile drivers, vehicles; and
- Point source emission from diesel generator.

7.13.4.1 Embedded/in-built control

Vehicle engines need to be properly maintained to ensure minimization in vehicular emissions.

7.13.4.2 Significance of Impact

There are few Receptors (settlements) within 500 m of the project site, that include the community borehole and some residential homes, and the impact magnitude will be moderate and sensitivity medium hence the impact significance will be moderate.

Sensitive receptors of air and emissions were identified by observation during field visit to project site. They were noted to be mainly residential and commercial in nature. 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.

7.13.4.3 Additional Mitigation Measures

- Spraying water on soil before excavation and periodic access road wetting to reduce nuisance dust levels.
- Visual inspection of dust pollution from roads and the construction site and appropriate intervention if dust levels are high.
- Speed restriction of construction vehicles to a speed of 10-15km/h or less on the site and on the access roads to the site.
- Maintenance and servicing of machines and engines off-site.
- Grievance procedure for dust complaints.
- The use of appropriate Personal Protective Equipment (PPE) such as dust masks, in particular, for construction workers.
- All construction materials will be transported in designated trucks which will be covered.

7.13.5 Impact on Ambient Noise

As most of the noise generating activities will be performed within the site area, construction activities will likely have a small to insignificant incremental impact on the existing noise levels. The sources of noise in the construction phase include construction activities, operation of generator sets and movement of vehicles. There will also be increased noise levels because of increased anthropogenic movement in the area.

There are some residents within the 500m from the site and will most likely be affected by increasing noise levels. The receptor sensitivity is therefore considered as medium. Impact magnitude is considered to be minor to medium considering the construction period of the project that will last for not more than 12 months.

7.13.5.1 Assessment Criteria for Impact on Ambient Noise

The assessment with respect to ambient noise quality of the study area has been done for the following project activities:

- Construction activities including site preparation, piling work, construction of ancillary facilities;
- Transportation of construction materials, machinery and personnel; and
- Operation of generator sets.

The ambient noise levels have been assessed with respect to Noise Pollution (Regulation and Control) Rules, 2000 and WHO Guidelines.

7.13.5.2 Embedded/in-built control

Normal working hours of the contractor to be defined (preferable 0800hrs to 1700hrs). If work needs to be undertaken outside these hours, it should be limited to activities which do not generate noise.

7.13.5.3 Significance of Impact

The impact significance has therefore been assessed moderate. This due to the fact that the impact magnitude is low and the receptor sensitivity is medium.

7.13.5.4 Additional Mitigation Measures

- Only well-maintained equipment should be operated on-site;
- If it is noticed that any particular equipment is generating too much noise then lubricating moving parts, tightening loose parts and replacing worn out components should be carried out to bring down the noise and placing such machinery far away from the households as possible;
- Machinery and construction equipment that may be in intermittent use should be shut down or throttled down during non-work periods; and
- Minimal use of vehicle horns and heavy engine breaking in the area needs to be encouraged.
- Construction machineries should be maintained regularly to reduce noise resulting from friction;
- Normal working hours of the contractor to be defined (preferable 8 am to 5pm). If work needs to be undertaken outside these hours, it should be limited to activities which do not generate noise;
- Sensitize construction truck drivers to switch off vehicle engines while offloading materials.

7.13.6 Visual Intrusions and Changes in Landscape Impact

The project site is located on plain terrain with slight undulation. There will be no significant change to visual quality of the area resulting from development or change in land use that will alter the landscape. Changes in the visual landscape will range from construction phase to commissioning of the mini-grid and associated structures and further during operations. This Project is the first major solar power Project in the vicinity of project area and the new development will have impact on the surrounding area.

The project area is primarily a rural area and with agriculture as a primary activity. Although the solar panels, inverter and associated components would be manufactured off site and the construction phase would be relatively short-term in duration (less than one year), it would still require large number of equipment or infrastructure when being erected such as dumpers and transportation vehicles on site. Additionally, the presence of bare soil along the access roads would increase the potential visual impact. The significance of the visual impacts will reduce at increasing distance from the development.

The construction of the mini-grid sites may involve the site clearance of vegetation (minimal vegetation at the site) and other natural attributes. The erection of the solar PV panels and the resulting glare from the sun will make it a standout feature from the natural surroundings and this would the lower the visual appeal of the area.
Even though the Mini grid facilities will be small, the solar panels may have minimal visual impact. However, being visible is not necessarily the same as being intrusive. Aesthetic issues are by their nature highly subjective.

7.13.6.1 Embedded/In-built Control

Proper siting decisions can help to avoid aesthetic impacts to the landscape. The project site is located in open area with minimal settlement around besides the dispensary and residential homes.

7.13.6.2 Significance of Impact

Construction activities will mainly be inside the site footprint and will have moderate impact on the present visual environment. The sensitive receptors include the residents near the site. The impact magnitude will however be low hence the visual change during construction phase will be assessed as minor.

7.13.6.3 Additional Mitigation Measures

The following mitigation measures will have to be implemented to minimise potential visual impacts during the construction phase:

- The extent of the labour camp and storage area should be limited in area to only that which is essential;
- Minimize presence of ancillary structures on the site and minimize roads disturbance;
- Upon completion of construction work, areas utilized for labour camp, storage area to be restored to original form.

7.13.7 Impacts on Waste Generation and Soil Contamination

General construction waste generated onsite will comprise of concrete, steel cuttings/filings, packaging paper or plastic etc. solid wastes consisting of food waste, plastic, glass and waste paper will also be generated by the construction workforce. A small proportion of the waste generated during construction phase will be hazardous and will include waste fuel, grease and waste oil containing rags. Used transformer oil which is also categorized as hazardous waste will be generated from the plant. If improperly managed, solid waste could create impacts on soil quality. Therefore, the receptor sensitivity has been assessed as medium.

The impact magnitude has been assessed as low since the proponent has managed other solar power projects as well and has effective management systems for waste and hazardous substances being generated or utilized during the project life cycle as part of their Environmental and Social Management Framework.

7.13.7.1.1 Embedded/in-built control

Hazardous material and waste should be properly labelled, stored onsite at a location provided with impervious surface and in a secondary containment system.

7.13.7.1.2 Significance of Impact

The impact significance for waste generation and soil contamination has been assessed as minor. Given the low sensitivity of the surrounding areas and the medium magnitude of the potential consequences of soil contamination, the potential impact significance is rated as minor.

7.13.7.1.3 Additional Mitigation Measures

- Contractor should ensure that no unauthorized dumping of used oil and other hazardous waste is undertaken at the site;
- Designated areas should be provided for Solid Waste and daily collection and period disposal should be ensured;
- Construction and Demolition Waste should be stored separately and be periodically collected by an authorized treatment and storage facility;
- All waste should be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels;
- A log book should be maintained for quantity and type of hazardous waste generated; and
- In case of accidental/unintended spillage, the contaminated soil should be immediately collected and stored as hazardous waste.

7.13.8 Impacts on 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.

7.13.8.1.1 Significance of Impact

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.

7.13.8.1.2 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.

7.13.9 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.

7.13.9.1.1 Significance of Impact

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.

7.13.9.1.2 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

7.13.10 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.

7.13.10.1.1 Significance of Impact

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.

7.13.10.1.2 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.

7.13.11 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.

7.13.11.1.1 Significance of Impact

The significance of this impact will be moderate due to high sensitivity and low magnitude.

7.13.11.1.2 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.

7.13.12 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.

7.13.12.1.1 Significance of Impact

This impact will be negligible owing to the size of the project that will require very few trucks during the construction phase.

7.13.12.1.2 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.

7.13.13 Impact on Occupational Health and Safety

The construction activities include site preparation, infrastructure utilities installation, building structures. As a result, will be potential impacts on workers' health and safety due to exposure to risks through construction activities that lead to accidents causing injuries and death. The most probable risks cause of accidental death and injury are:

- Safety risks such as: tripping; falling due to working at heights; potential fire due to hot work, smoking, failure in electrical installations; electric shocks.
- Health risks: Injuries such as: lifting, lowering, pushing, pulling and carrying; temporary or hearing loss which usually comes from noise generated from machinery used for excavation or piling work and from compressors and concrete mixers etc.; heat stress and working during high temperatures
- Occupational hazards due to dust and noise pollution from operating of heavy machinery and vehicular movement in the project sites.
- Safety risk due to working at heights during installation of power lines
- Risks of road accidents during the transportation of material and equipment to the project sites owing to the poor road network leading to Mansa.

7.13.13.1 Embedded/in-built control

- All construction activities will be carried out during daytime hours and vigilance should be maintained for any potential accidents;
- Personal Protective Equipment (PPEs) including safety shoes, helmet, goggles, ear muffs and face masks;
- Cranes and other lifting equipment are operated by trained and authorised persons;
- Training of the workers on climbing techniques, and rescue of fall-arrested workers; and
- Excavated areas should be temporarily fenced to avoid access to outsiders and animals.

7.13.13.2 Significance of Impacts

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.

7.13.13.3 Additional mitigation measures

- All workers (regular and contracted) should be provided with training on Health and Safety management system of the contractor during construction stage;
- Obtain and check safety method statements from contractors;
- Monitor health and safety performance and have an operating audit system; and
- Permitting system should be implemented to ensure that cranes and lifting equipment is operated by trained and authorized persons only;
- Appropriate safety harnesses and lowering/raising tools should be used for working at heights;
- All equipment should be turned off and checked when not in use; and
- A safety or emergency management plan should be in place to account for natural disasters, accidents and any emergency situations.

7.13.14 Community Health and Safety

The receptors for impacts on community health and safety include project site workers, settlements in the close proximity of the project which will be exposed to health impacts from the project activities. The construction phase activities such as installation of solar panels, construction of distribution lines and substations and movement of material and personnel may result in impacts on the health and safety of the community.

Construction activities will involve the use of machinery and installation of distribution power lines. Furthermore, the movement of material and personnel via the access roads may result in damage to human life or livestock due to accidents. The major community health and safety risks include structural failure of project infrastructure e.g., power line, fire safety and management of emergency situations.

7.13.14.1 Embedded/in-built control

Consultations with the proponent team and policy review indicated that the following embedded/in built control measures will be put in place during the construction phase;

- The excavated areas will be properly fenced for safety and sign boards in local languages will be put up;
- No hazardous waste or any waste be stored within the site for long periods of time and be in contact with the soil in order to prevent against ground water contamination
- The truck drivers carrying construction machinery and materials will be instructed to drive within speed limits with careful consideration for village traffic;
- Movement of heavy equipment and construction materials will be regulated during peak hours (0900hrs to 0500hrs).

7.13.14.2 Significance of Impact

Impact significate is rated as moderate considering the high impact magnitude and low receptor sensitivity.

7.13.14.3 Additional Mitigation Measures

The following risk mitigation measures are suggested to minimize the risks/ hazards of construction activities onsite;

- Developing an onsite ESMS and EHS Policy by the developer;

- Ensuring that the sub-contractor agreements that the developer enters into require all contractors to possess an EHS plan with provisions for monitoring of the EHS performance of contractors and their workers;
- As part of the stakeholder engagement and information disclosure process, providing an understanding to the community concerning the activities proposed to be undertaken and the precautions being adopted for safety; and
- Implementing the existing grievance redress mechanism.

7.13.15 Child labour

Implementation of the Mansa project could lead to increased opportunities for the host communities to sell goods and services to the incoming workers. This can lead to child labour to produce and deliver these goods and services, which in turn can lead to increased cases of school truancy and dropout.

7.13.15.1 Significance of Impact

The impact is rated minor. This is based on low sensitivity of the receptor and medium magnitude of the impact.

7.13.15.2 Mitigation measures

- The contractor should develop a code of conduct to ensure children are protected from any negative impact from the construction works.
- The contractor should strictly hire people who are above 18yrs and ensure they provide their Identity Cards.
- The contractor shall ensure every worker under their jurisdiction signs a document committing themselves to the protection of the area children.

7.13.16 Impacts on Cultural Heritage

Cultural and paleontological artefacts and cultural landscapes may be disturbed by the construction of the mini grid facilities. These could include community burial sites, sacred shrines. It is expected that a number of workers will be on-site during project construction of the project including skilled, semi-skilled, and unskilled personnel. During the consultation and field survey, no cultural artefact was established at the proposed project site.

7.13.16.1 Significance of Impact

Based on the analysis provided above, impacts on cultural heritage during the construction phase will be Minor considering low sensitivity of the receptor and low magnitude of the impact.

7.13.16.2 Additional Mitigation measures (Execution of a Chance Find Procedure)

In order to minimize the potential for impact to sub-surface cultural archaeological material, the proponent should establish a Chance Find Programme which includes the following provisions:

- ✓ A chance find can be reported by any member of the Project. Accordingly, if a chance find is encountered, the first course of action is to stop work in the vicinity of the find. Then the following steps will be undertaken:
  - Inform site supervisor/foreman.
  - Install temporary site protection measures (warning tape and keep off signs).
  - Inform all personnel of the Chance Find if access to any part of the work area is restricted.
  - Establish a localized no-go area needed to protect the Chance Find.
  - The National Museum of Kenya will be contacted to perform a preliminary evaluation to determine whether the Chance Find is cultural heritage and if so, whether it is an isolate or part of a larger site or feature.

- Artefacts will be left in place when possible; if materials are collected, they will be placed in bags and labelled by an archaeologist and handed over to the National Museum of Kenya; no Project personnel are permitted to take or keep artefacts as personal possessions.
- Document find through photography, notes, GPS coordinates, and maps (collect spatial data) as appropriate.
- If the Chance Find proves to be an isolated find or not cultural heritage, the specialists brought in from the National Museum of Kenya will authorize the removal of site protection measures and activity in the vicinity of the site can resume.
- If the archaeological specialists from National Museum of Kenya confirm the Chance Find is a cultural heritage site, they will inform the project team and initiate discussions with the latter about treatment.
- Prepare and retain archaeological monitoring records including all initial reports whether they are later confirmed or not.
- Develop and implement treatment plans for confirmed finds using the services of qualified cultural heritage experts.
- If a Chance Find is a verified cultural heritage site, prepare a final Chance Finds report once treatment has been completed.
- While investigation is on-going, co-ordinate with on-site personnel keeping them informed as to status and schedule of investigations, and informing them when the construction may resume.
- If mitigation is required, then expedient rescue excavations will be undertaken by the National Museum of Kenya specialist, except in the case that the chance find is of international importance (i.e., Critical Cultural Heritage). If an archaeological site of international importance is encountered special care will be taken and archaeologists with the appropriate expertise in addressing the find will be appointed.

7.13.17 Gender Based Violence, SEA & SH

Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) may be committed against the communities by the construction workers and by staff during the operation and maintenance of the mini-grids. Incidences of Sexual Harassment (SH) may occur among the staff during construction phases of the project. This may be experienced while the women are searching for jobs and those giving the jobs may ask for sexual favours.

7.13.17.1 Significance of Impact

GBV 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.

7.13.17.2 Mitigation measures

- Prepare an Awareness Raising Strategy, which describes how workers and local communities will be sensitized to GBV risks, and the worker's responsibilities;
- Identify GBV Services Providers to which GBV survivors will be referred, and the services which will be available;
- Elaborate GBV Allegation Procedures i.e. how the project will provide information to employees and the community on how to report cases of GBV breaches to the grievance committee.
- An Accountability and Response Framework, to be finalized with input from the contractor, should include at minimum:

- GBV Allegation Procedures to report GBV issues to service providers, and internally for case accountability procedures which should clearly lay out confidentiality requirements for dealing with cases; and,
- A Response Framework which has:
- Mechanisms to hold accountable alleged perpetrators associated to the project;
- The GM process for capturing disclosure of GBV;
- A referral pathway to refer survivors to appropriate support services.

7.13.18 Exclusion of VMGs, Vulnerable Individuals and Households

A significant risk associated with this project is the potential for the exclusion of Vulnerable and Marginalized Groups (VMGs), vulnerable individuals and households including the elderly, PLWDs, widows, widowers, orphan-led households, minority clans/sub-clans from participating and or benefiting from the mini-grids project. VMGs participation and inclusion could be disadvantaged based on social identity, which may be across dimensions of gender, age, location, occupation, race, ethnicity, disability, sexual orientation and religion. There is potential risk of lack of intentional actions by the mini-grids contractor(s) and implementing agencies for the inclusion of VMGs in the project activities and benefits. This potentially leads to the exclusion of VMGS from the benefits and opportunities derived from the proposed mini-grid facilities.

The activities of component 1 envisages upon completion of the MG, that the relevant Implementing Agencies will connect customers from community facilities, enterprises and households to the electricity grid on a commercial basis under a market driven approach. There is a high likelihood that the targeted beneficiaries of the new electricity connections to the mini-grids network will be dominated by the local elites. This may lead to the exclusion of those without the financial resources to connect to the mini-grid electricity distribution network. This could result in a situation where a majority persons or households with adequate financial resources in the project area will be able to take advantage of the provision to connect to the electricity grid. This will negate a key objective of the project of overcoming energy poverty.

During the ESIA study the community identified the people and households considered vulnerable in the community as:

- Women headed households
- Orphans
- Persons Living with Disabilities - Albinos
- The elderly (80 years and above)

7.13.18.1 Significance of Impact

Considering the high sensitivity of the VMGs and the vulnerable individuals and households identified in the project and high magnitude, the impact significance is considered to be major. However, it is important to put into account the project site inhabitants are predominantly the Somali community.

7.13.18.2 Mitigation measures

- Participation will be through meetings with the different groups of the vulnerable people identified primarily to ensure that;
- The VMGs and the vulnerable individuals and households are aware of the project and its impacts
- The VMGs and the vulnerable individuals and households are Aware of any restrictions and negative impacts

- Provide support to VMG and the vulnerable individuals and households participation arrangements in the project
- Confer with the VMGs and the vulnerable individuals and households at the outset on how they wish to be engaged
- Understand and respect local entry protocols as they relate to permission to enter a community and access traditional lands
- Commit to open and transparent communication and engagement from the beginning and have a considered approach in place
- Ensure that all representatives of the contractor and Proponent staff carrying out the specific sub project investment including third party subcontractors and agents are well briefed on local customs, history and legal status, and understand the need for cultural sensitivity
- Regularly monitor performance in engagement
- Enlist the services of reputable advisers with good local knowledge
- Implement the existing grievance redress mechanism

7.13.19 Risk of Communicable Diseases

The mini-grids will lead to increased migration of labour into the mini-grid sites. Local communities can be exposed to increased risk of communicable diseases such as HIV/AIDS, STIs and COVID-19 through risky behaviours involving job seekers and people employed on the project.

7.13.19.1 Significance of Impact

Based on the fact that the receptor sensitivity will be medium and the impact magnitude low, the impact significance will be Moderate pre-mitigation.

7.13.19.2 Mitigation measures

- The Contractor should develop and implement pre-employment screening measures for workers, which should include communicable diseases. Individuals found to be suffering from these diseases will need to be sensitized on prevention of transmission to others and management of the disease prior to mobilisation to site.
- The Contractor should develop and implement a Communicable Diseases Policy and an information document for all workers directly related to the Project. The document should address factual health issues as well as behaviour change issues around the transmission and infection of diseases.
- The Contractor will make condoms available to employees and communities neighbouring the site office during construction.
- All project personnel should be inducted on a Code of Conduct that gives guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.
- If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary action including dismissal from duty.
- Sensitize all community segments and project workers on Covid 19 and precautionary measures that need to be observed;
- Restrict site access to only Authorised persons; and
- Continuously adhere to the MoH, WHO and World Bank guidelines on Covid-19 management.

7.13.20 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.

7.13.20.1 Significance of Impact

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.

7.13.20.2 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.

7.13.21 Forced Labor

During construction of the mini-grid the risk of forced labour could occur and precaution is need to safe guard the community from being subjected to forced labour.

7.13.21.1 Significance of Impact

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

7.13.21.2 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).

7.14 Positive Impacts- Operation Phase

NOTE: According to the MOE the proposed project will be constructed by a third party (contractor) who 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 the responsibility of the contractor after which KPLC will take over.

7.14.1 Impact on Economy and Employment

Community consultations and observations made during the site visit suggest that the existing scenario of the agriculture in the study area is not capable enough to meet requirements of the people who are solely dependent upon it; especially due to limited water availability and growing population.

During the operations phase, the requirement for unskilled and semi-skilled labour is expected to reduce to 5 and 15 respectively. The locally procured services will include maintenance work of the facility, 24-hour security, bush and undergrowth cleaning and housekeeping activities.

In addition to this, the community will improve their livelihood and businesses by using the electricity from the project.

7.14.1.1 Significance of Impact

The overall impact significance of the impact on economy and employment during the operations phase is Major, the receptor sensitivity will be medium and the impact magnitude will be high.

7.14.1.2 Enhancement Measures

While, the significance of the impact on economy and employment opportunities during the operations phase is understood to be positive, the following measures should be put in place to ensure that the local community receives maximum benefit from the presence of the project:

- Priority should be provided to local labour or suppliers to pass on maximum economic benefit locally;
- Opportunities should be provided to the vulnerable population in the Study Area

7.14.2 Quality, Reliable Power Supply

There is no electricity in Mansa. 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 in the area will greatly benefit from the stable power supply.

7.14.2.1 Significance of Impact

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

7.14.2.2 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

7.14.3 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.

7.14.3.1 Significance of Impact

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

7.14.3.2 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

7.14.4 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.

7.14.4.1 Significance of Impact

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

7.14.4.2 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

7.14.5 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.'

7.14.5.1 Significance of Impact

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

7.14.5.2 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

7.14.6 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 near-sightedness 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.

7.14.6.1 Enhancement Measures

- Educate the consumers on the benefits of lighting with electricity as opposed to the other sources of lighting

7.14.7 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.

7.14.7.1 Enhancement Measures

- Educate the consumers on the uses of electricity to improve their lifestyles

7.14.8 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.

7.14.8.1 Enhancement Measures

- KPLC should consider partnering with the county government in providing street lighting to improve security of the area.

7.14.9 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.

7.14.9.1 Enhancement Measures

- Ensure that the power supply is reliable.

7.15 Negative impacts – Operation phase

7.15.1 Impact on Soil

7.15.1.1 Soil compaction and Erosion

In the operation phase, soil compaction and erosion may occur due to vehicle movement, which only happens during the occasional maintenance activities. Soil compaction for the operation phase has therefore been considered to be infrequent and low. Since the chances of soil compaction and erosion during the O&M phase are less, the impact magnitude is assessed to be small.

7.15.1.1.1 Embedded/in-built control

Vehicles will utilise the existing access road to undertake maintenance activities at the solar plant.

7.15.1.1.2 Significance of Impact

The overall impact significance on soil erosion and compaction has been assessed as negligible. Both the receptor sensitivity and the impact magnitude will be low.

7.15.1.1.3 Additional Mitigation Measures

No further mitigation measures are suggested as embedded/in-built control will be sufficient to reduce the impact on soil environment.

7.15.2 Waste Generation and management

During operation phase, the waste generated from project includes domestic solid waste building and hazardous waste like waste oil and lubricants and oil containing jutes and rags will be generated during maintenance activities.

The quantity of hazardous and non-hazardous waste generated will be much lesser quantity than during the construction phase. Thus, the receptor sensitivity Impact magnitude has been assessed too small.

7.15.2.1 Embedded/in-built control

The waste generated will be disposed of through approved NEMA waste handlers.
The hazardous wastes will be stored onsite at separate designated covered area provided with impervious flooring and disposed through NEMA approved hazardous waste handler.

During operation phase, the quantity of municipal waste and hazardous waste generated is less and probability of the hazardous waste generation is only during plant maintenance and therefore occasional. The waste generated would be routed through proper collection and containment.

7.15.2.1.1 Additional Mitigation measures

- The Contractor shall develop a Solid Waste Management Plan in accordance with the guidelines.
- All Project staff will be trained on this plan and attendance will be recorded.
- Preparation and implementation of a Waste Management Plan (WMP) will be done.
- Fuel shall be stored on site in temporary above ground storage tanks.
- Adhere to Kenyan laws and regulations applicable to waste management and the MSDS.
- Proper waste segregation and colour coding of the waste receptacles.
- Provision of temporary ablution facilities and ensure treatment and/or removal of sewage wastes off site.
- Hazardous wastes such as damaged solar panels and batteries that contain heavy metals shall be collected and stored prior to disposal offshore at a licensed facility as per the requirements of the solid waste management plan. This will be done by a Licenced NEMA Waste Handler.
- Any Solar Panel or batteries removed from the array for disposal will first be collected and stored in the covered 10ft container before being disposed off.
- Hazardous waste shall be shipped offshore to a facility licensed by NEMA to handle hazardous waste.
- Maintain all waste tracking documents (Transportation, treatment and disposal)
- Solid Waste Management Code of Practice will be integrated into SOP

7.15.2.2 Significance of Impact

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.

7.15.2.3 Additional Mitigation Measures

- Municipal domestic waste generated at site to be segregated onsite;
- Ensure hazardous waste containers are properly labelled and stored onsite provided with impervious surface, shed and secondary containment system;
- Ensure routinely disposal of hazardous waste through NEMA approved waste Handlers and records are properly documented; and
- Maintain all the waste tracking documents (Transport, treatment and disposal)
- The overall impact significance on land due to waste disposal during O&M phase has been assessed as minor.
- Disposal of hazardous wastes shall be done strictly as per the conditions of authorisation granted by NEMA.
- Ensure hazardous waste is properly labelled, stored onsite at a location provided with impervious surface, shed and secondary containment system.

7.15.3 Impact on Water Quality and Scarcity

Water is required during operation phase to meet domestic requirements of O&M staff and for cleaning solar panels. For that purpose, the water requirement will most likely be sourced from existing local water vendors in the nearby area. During operation phase, there will be no wastewater generation from the power generation process.

Discussions with the residents in Mansa confirmed that water is one of the major concerns in the area. As noted earlier, the local community rely on ground water sources; borehole, with no feasible alternative. Therefore, the receptor (water resource) sensitive is assessed as high. Since the project is likely to generate very little or negligible amount of wastewater during the O&M phase, the impact on water resources will be negligible as there will be no perceptible or readily measurable change from baseline conditions.

7.15.3.1 Embedded/in-built control

Planning of toilets and waste collection areas should be away from natural drainage channels.

7.15.3.2 Significance of Impact

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.

7.15.3.3 Additional Mitigation Measures

- The workforce will be given training towards proactive use of designated areas/bins for waste disposal and encouraged to use toilets. Open defecation and random disposal of sewage shall be strictly restricted;
- Workers to be sensitised about water conservation and encouraged use of water optimally;
- Recycling/reusing water to the extent possible.
- 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.

7.15.4 Landscape and Visual Impacts

The solar panels will be spread over a horizontal form with a maximum height of 2m above the ground level. The current use of land surrounding site is grazing, mixed commercial and residential. The permanent change of current landscape to area spread with solar panels will have potential visual impact for nearest habitations and passers.

7.15.4.1 Significance of Impacts

It is important to note that whether the visual impact is seen as positive or negative is highly subjective, and people's attitude towards and perception of the visual impacts associated with the any project including solar power project. 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.

7.15.4.2 Suggested mitigation measures

The following mitigation measures are proposed to reduce the visual impacts on the surroundings during operational phase:

- Signage related to the mini-grid must be discrete and confined to entrance gates.
- The footprint of the operations and maintenance facilities, as well as parking and vehicular circulation, should be clearly defined, and not be allowed to spill over into other areas of the site;
- Construction of fencing or compound wall around the project boundary;
- Landscaping area around the site with the participation of the local community.

7.15.5 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.

7.15.5.1 Significance of Impact

The impact will be of minor significance.

7.15.5.2 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.

7.15.6 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.

7.15.6.1 Significance of Impact

The impact will be of minor significance.

7.15.6.2 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

7.15.7 Fire Outbreaks

Carelessness and negligence both at the solar mini-grid and by the beneficiaries of electricity may cause fires.

7.15.7.1 Significance of Impact

With the mitigation measures in place the impact is evaluated to be of moderate significance due to high sensitivity and low magnitude.

7.15.7.2 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

7.15.8 Sanitation

Although there are few people who will be running the Mini-grid during operation phase provision for disposal of waste must be put in place through septic tanks.

7.15.8.1 Significance of Impact

The impact is assessed to be negligible due to very low magnitude of the impact.

7.15.8.2 Mitigation Measures

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

7.15.9 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.

7.15.9.1 Significance of Impact

The impact is assessed to be negligible due to very low magnitude of the impact.

7.15.9.2 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

7.15.10 Noise and Vibration

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

7.15.10.1 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.

7.15.11 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.

7.15.12 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.

7.15.12.1 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

7.15.13 Vehicle exhaust emissions

Exhaust emissions are likely to be generated by the vehicles coming to the facility though on a low risk.

7.15.13.1 Significance of Impact

Due to the low magnitude of the impact and the low sensitivity, the significance will be minor.

7.15.13.2 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

7.15.14 Collision and Electrical hazards from Distribution Infrastructure

A number of birds' species were identified during the impact assessment. These include Speckled Pigeon, Purple-crested Turaco, Common Swift, Black-headed Heron, Speckled Mousebird, European Roller, Cardinal Woodpecker, Black-crowned Tchagra, Red-backed Shrike, Hunter's Sunbird among others.
The distribution lines and poles can potentially constitute an electrocution and collision hazard to birds. Some birds also utilize the distribution towers for nesting.

7.15.14.1 Embedded/ in-built Control

There are no embedded controls to prevent birds from roosting/nesting on distribution poles and colliding with distribution wires.

7.15.14.2 Significance of Impacts

The receptor sensitivity is low and the impact magnitude will be medium hence the minor impact significance.

7.15.14.3 Additional Mitigation Measures

The following mitigation measures will further reduce the impact significance on avifaunal species:

- Design of distribution towers should be such so as to minimize the risks of electrocution of birds;
- The distribution poles should be raised with suspended insulators in order to reduce the electrocution of bird species; and
- Marking overhead cables using bird-flight deterrents and avoiding use in areas of high bird concentrations of species vulnerable to collision.

7.15.15 Impact on Occupational Safety and Health

During the operation phase, maintenance and repair will be done on the site. Therefore, there will be potential impacts on workers' health and safety due to exposure to risks through such activities that lead to accidents causing injuries and death. The most probable risks cause of accidental death and injury are:

- Safety risks such as: tripping; falling due to working at heights; potential fire due to hot work, smoking, failure in electrical installations; electric shocks.
- Health risks: Injuries such as: lifting, lowering, pushing, pulling and carrying; heat stress and working during high temperatures
- Safety risk due to working at heights during installation of power lines
- Exposure of workers to electro-magnetic field (EMF) during operation and maintenance of the mini-grids

7.15.15.1 Embedded/in-built control

- All maintenance activities will be carried out during daytime hours and vigilance should be maintained for any potential accidents;
- Personal Protective Equipment (PPEs) including safety shoes, helmet, goggles, ear muffs and face masks;
- Lifting equipment should be operated by trained and authorized persons;
- Training of the workers on climbing techniques, and rescue of fall-arrested workers;

7.15.15.2 Significance of Impacts

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.

7.15.15.3 Additional mitigation measures

- All workers (regular and contracted) should be provided with training on Health and Safety management system of the contractor during construction stage and EHS policies and procedures during the operation stage;
- Obtain and check safety method statements from contractors;
- Monitor health and safety performance and have an operating audit system; and
- Permitting system should be implemented to ensure that the lifting equipment is operated by trained and authorized persons only;
- Appropriate safety harnesses and lowering/raising tools should be used for working at heights;
- All equipment should be turned off and checked when not in use; and
- A safety or emergency management plan should be in place to account for natural disasters, accidents and any emergency situations.

7.15.16 Impact on Community Safety and Health

The receptors for impacts on community health and safety include settlements in the close proximity of the project which will be exposed to health impacts from the project activities. The operation phase activities that involve maintenance of the mini-grid components may result in impacts on the health and safety of the community.

The major community health and safety risks include electrocution, structural failure of project infrastructure e.g., power line, fire safety and management of emergency situations.

7.15.16.1 Embedded/in-built control

Consultations with the proponent team and policy review indicated that the following embedded/in built control measures will be put in place during the construction phase;

- The mini-grid site will be properly fenced for safety and sign boards in local languages will be put up;

7.15.16.2 Significance of Impact

Impact significate is rated as moderate considering the high impact magnitude and low receptor sensitivity.

7.15.16.3 Additional Mitigation Measures

The following risk mitigation measures are suggested to minimize the risks/ hazards of operation activities;

- Implementing the existing grievance redress mechanism
- The local community recommended that a technical operator should be stationed within or near the site in order to handle emergencies in the event that they occur

7.15.17 Gender Based Violence, SEA & SH

Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) may be committed against the communities by the staff during the operation and maintenance of the mini-grids. Incidences of Sexual Harassment (SH) may occur among the staff during operation and phase of the project. This may be experienced while the women are searching for jobs and those giving the jobs may ask for sexual favours.

7.15.17.1 Significance of Impact

GBV 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.

7.15.17.2 Mitigation measures

- Prepare an Awareness Raising Strategy, which describes how the staff and local communities will be sensitized to GBV risks, and the staff's responsibilities;
- Identify GBV Services Providers to which GBV survivors will be referred, and the services which will be available;
- Elaborate GBV Allegation Procedures i.e. How the project will provide information to employees and the community on how to report cases of GBV breaches to the grievance committee.
- An Accountability and Response Framework, to be finalized with input from the contractor, should include at minimum:
- GBV Allegation Procedures to report GBV issues to service providers, and internally for case accountability procedures which should clearly lay out confidentiality requirements for dealing with cases; and,
- A Response Framework which has:
- Mechanisms to hold accountable alleged perpetrators associated to the project;
- The GM process for capturing disclosure of GBV;
- A referral pathway to refer survivors to appropriate support services.

7.15.18 Exclusion of VMGs, Vulnerable Individuals and Households

A significant risk associated with this project is the potential for the exclusion of Vulnerable and Marginalized Groups (VMGs), vulnerable individuals and households including the elderly, PLWDs, widows, widowers, orphan-led households, minority clans/sub-clans from participating and or benefiting from the mini-grids project. VMGs participation and inclusion could be disadvantaged based on social identity, which may be across dimensions such as age, location, occupation, race, ethnicity, disability, sexual orientation and religion. There is potential risk of lack of intentional actions by the mini-grids contractor(s) and implementing agencies for the inclusion of VMGs in the project activities and benefits. This potentially leads to the exclusion of VMGS from the benefits and opportunities derived from the proposed mini-grid facilities.

There is a high likelihood that the targeted beneficiaries of the new electricity connections to the mini-grids network will be dominated by the local elites. This may lead to the exclusion of those without the financial resources to connect to the mini-grid electricity distribution network. This could result in a situation where a majority persons or households with adequate financial resources in the project area will be able to take advantage of the provision to connect to the electricity grid. This will negate a key objective of the project of overcoming energy poverty.

7.15.18.1 Significance of Impact

Considering the high sensitivity of the VMGs identified in the project and high magnitude, the impact significance is considered to be major. However, it is important to put into account the project site inhabitants are predominantly the Somali community.

7.15.18.2 Mitigation measures

- Participation will be through meetings with the different groups of the vulnerable people identified primarily to ensure that;
- The VMGs are aware of the project and its impacts
- The VMGs are Aware of any restrictions and negative impacts

- Provide support to VMG participation arrangements in the project
- Commit to open and transparent communication and engagement from the beginning and have a considered approach in place
- Ensure that all representatives of the contractor and Proponent staff carrying out the specific sub project investment including third party subcontractors and agents are well briefed on local customs, history and legal status, and understand the need for cultural sensitivity
- Regularly monitor performance in engagement
- Enlist the services of reputable advisers with good local knowledge
- Implement the existing grievance redress mechanism

7.15.19 Risk of Communicable Diseases

The operation and maintenance phase of the mini-grids will lead to increased migration of labour into the mini-grid sites. Local communities can be exposed to increased risk of communicable diseases such as HIV/AIDS, STIs and COVID-19 through risky behaviours involving job seekers and people employed on the project.

7.15.19.1 Significance of Impact

Based on the fact that the receptor sensitivity will be medium and the impact magnitude low, the impact significance will be Moderate pre-mitigation.

7.15.19.2 Mitigation measures

- The Contractor should develop and implement pre-employment screening measures for workers, which should include communicable diseases. Individuals found to be suffering from these diseases will need to be sensitized on prevention of transmission to others and management of the disease prior to mobilisation to site.
- The Contractor should develop and implement a Communicable Diseases Policy and an information document for all workers directly related to the Project. The document should address factual health issues as well as behaviour change issues around the transmission and infection of diseases.
- The Contractor will make condoms available to employees
- All project personnel should be inducted on a Code of Conduct that gives guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.
- If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary action including dismissal from duty.
- Sensitize all community segments and project workers on Covid 19 and precautionary measures that need to be observed;
- Restrict site access to only Authorised persons; and
- Continuously adhere to the MoH, WHO and World Bank guidelines on Covid-19 management.

7.15.20 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.

7.15.20.1 Significance of Impact

The Impact is rated as moderate considering the high impact magnitude and low receptor sensitivity.

7.15.20.2 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

7.15.21 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.

7.15.21.1 Significance of Impact

With the implementation of the mitigation measures the impact significance is minor to negligible.

7.15.21.2 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

7.16 Decommissioning Phase

7.16.1 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 Governments of Marsabit to obtain approval for implementation.
- ❖ Implement the decommissioning plan including backfilling, revegetation, disposal of waste material, recycling of recyclable material among others

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

7.16.2 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.

7.16.2.1 Significance of Impact

Impact magnitude is considered to be small considering the decommissioning period to last for a short duration. The overall impact significance is envisaged to be Minor due to low sensitivity and medium magnitude.

7.16.2.2 Enhancement Measures

- Notify the GRC, Local leadership, the County Government reps of the specific jobs and the skills required for the work
- Prioritize the employment of unskilled labour from the local communities.
- Prioritize the procurement of goods and services from within Marsabit County.
- Develop and implement a fair and transparent employment and procurement policy.
- Advertise all jobs and tenders. (The jobs can be advised through local administrative offices, GRC meetings)
- Ensure gender mainstreaming during employment
- The contractor shall inform the workers and local community about the duration of work; and
- Reduction of worker will be done phase wise and corresponding to completion of each activity.

7.16.3 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.

7.17 Negative impacts – Decommissioning Phase

7.17.1 Impact on Soil

The project activities that may impact the environment during the decommissioning phase are described include: removal of PV modules, and removal of associated infrastructure including battery and generators.

7.17.1.1 Significance of Impacts

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

7.17.1.2 Additional Mitigations

- Vehicles will utilize the existing roads to access the site;
- No unauthorized dumping of used oil and other hazardous waste should be undertaken at site;
- All waste should be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels;

- Solid waste should be segregated in color coded waste receptacles.
- In case of accidental/unintended spillage on small area, the contaminated soil should be immediately collected and stored as hazardous waste;
- Compacting of loose soil in excavated areas.
- Enclose the demolition site and protect the soil to prevent the waste soils and other debris from being washed away by surface runoff and wind.
- Any soil potentially contaminated by chemicals, oils, fuels to be collected and disposed of by a NEMA authorized waste handler

7.17.2 Impact on Air Quality

The assessment with respect to air quality of the study area has been done for the following project activities:

- Fugitive emissions from site demolitions and demolition waste handling etc.;
- Fugitive emission from traffic movement;
- Exhaust emission from operation of machineries like pile drivers, vehicles; and
- Point source emission from diesel generator.

7.17.2.1 Embedded/in-built control

Vehicle engines need to be properly maintained to ensure minimization in vehicular emissions.

7.17.2.2 Significance of Impact

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.

7.17.2.3 Additional Mitigation Measures

- Periodic access road wetting to reduce nuisance dust levels.
- Visual inspection of dust pollution from roads and the demolition site and appropriate intervention if dust levels are high.
- Speed restriction of the vehicles to a speed of 10-15km/h or less on the site and on the access roads to the site.
- Maintenance and servicing of machines and engines off-site.
- Grievance procedure for dust complaints.
- The use of appropriate Personal Protective Equipment (PPE) such as dust masks, in particular, for the site workers.
- All demolition wastes will be transported in designated trucks which will be covered.

7.17.3 Impact on Ambient Noise

The sources of noise in the decommissioning phase include demolition activities, operation of generator sets and movement of vehicles. There will also be increased noise levels because of increased anthropogenic movement in the area.

7.17.3.1 Assessment Criteria for Impact on Ambient Noise

The assessment with respect to ambient noise quality of the study area has been done for the following project activities:

- Demolition activities;
- Transportation of demolition wastes materials, machinery and personnel;
- Operation of generator sets; and

7.17.3.2 Embedded/in-built control

Normal working hours of the contractor to be defined (preferable 0800hrs to 1700hrs). If work needs to be undertaken outside these hours, it should be limited to activities which do not generate noise.

7.17.3.3 Significance of Impact

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.

7.17.3.4 Additional Mitigation Measures

- Only well-maintained equipment should be operated on-site;
- If it is noticed that any particular equipment is generating too much noise then lubricating moving parts, tightening loose parts and replacing worn out components should be carried out to bring down the noise and placing such machinery far away from the households as possible;
- Machinery and equipment that may be in intermittent use should be shut down or throttled down during non-work periods; and
- Minimal use of vehicle horns and heavy engine breaking in the area needs to be encouraged.
- The machineries should be maintained regularly to reduce noise resulting from friction;
- Normal working hours of the contractor to be defined (preferable 8 am to 5pm). If work needs to be undertaken outside these hours, it should be limited to activities which do not generate noise;
- Sensitize the truck drivers to switch off vehicle engines while loading materials.

7.17.4 Impacts on Waste Generation and Soil Contamination

General demolition waste generated onsite will comprise of concrete, steel cuttings/filings, packaging paper or plastic etc. solid wastes consisting of food waste, plastic, glass and waste paper will also be generated by the workforce. A small proportion of the waste generated during construction phase will be hazardous and will include waste fuel, grease and waste oil containing rags. Therefore, the receptor sensitivity has been assessed as medium.

7.17.4.1.1 Embedded/in-built control

Hazardous material and waste should be properly labelled, stored onsite at a location provided with impervious surface and in a secondary containment system.

7.17.4.1.2 Significance of Impact

The impact significance for waste generation and soil contamination has been assessed as minor. Given the low sensitivity of the surrounding areas and the medium magnitude of the potential consequences of soil contamination, the potential impact significance is rated as minor.

7.17.4.1.3 Additional Mitigation Measures

- Contractor should ensure that no unauthorized dumping of used oil and other hazardous waste is undertaken at the site;
- Demolition Waste should be stored separately and be periodically collected by an authorized treatment and storage facility;
- All waste should be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels;
- A log book should be maintained for quantity and type of hazardous waste generated; and
- In case of accidental/unintended spillage, the contaminated soil should be immediately collected and stored as hazardous waste.

7.17.5 Impact on Economy and Employment

The major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, including their families. However, the impacts are likely to be limited due to relatively small number of permanent employees (mainly security guards) who will be affected.
Impact magnitude is considered to be small considering the decommissioning period to last for a short duration.

7.17.5.1 Significance of Impact

The overall impact significance is envisaged to be Minor due to low sensitivity and medium magnitude.

7.17.5.2 Additional Mitigation Measures

The decommissioning phase will require removal of machinery, workers and other temporary structures. The mitigation measures for decommissioning shall include the following:

- Notify the GRC, Local leadership, the County Government reps of the specific jobs and the skills required for the Project
- Prioritize the employment of unskilled labour from the local communities.
- Prioritize the procurement of goods and services from within Marsabit County.
- Develop and implement a fair and transparent employment and procurement policy.
- Advertise all jobs and tenders. (The jobs can be advised through local administrative offices, GRC meetings)
- Ensure gender mainstreaming during employment
- The contractor shall inform the workers and local community about the duration of work; and
- Reduction of worker will be done phase wise and corresponding to completion of each activity.

7.17.6 Impact on Occupational Health and Safety

There will be potential impacts on workers' health and safety due to exposure to risks through demolition activities that lead to accidents causing injuries and death. The most probable risks cause of accidental death and injury are:

- Safety risks such as: tripping; falling due to working at heights; potential fire due to hot work, smoking, failure in electrical installations; electric shocks.
- Health risks: Injuries such as: lifting, lowering, pushing, pulling and carrying; temporary or hearing loss which usually comes from noise generated from machinery used for demolition; heat stress and working during high temperatures
- Occupational hazards due to dust and noise pollution from operating of heavy machinery and vehicular movement in the project sites.
- Risks of road accidents during the transportation of material and equipment to and from the project sites.

7.17.6.1 Embedded/in-built control

- All demolition activities will be carried out during daytime hours and vigilance should be maintained for any potential accidents;
- Personal Protective Equipment (PPEs) including safety shoes, helmet, goggles, ear muffs and face masks;

7.17.6.2 Significance of Impacts

The impact on occupational health and safety during the decommissioning 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.

7.17.6.3 Additional mitigation measures

- All workers (regular and contracted) should be provided with training on Health and Safety management system of the contractor during decommissioning stage and EHS policies and procedures during the operation stage;
- Obtain and check safety method statements from contractors;
- Monitor health and safety performance and have an operating audit system; and
- Permitting system should be implemented to ensure that lifting equipment are operated by trained and authorized persons only;
- Appropriate safety harnesses and lowering/raising tools should be used for working at heights;
- All equipment should be turned off and checked when not in use; and
- A safety or emergency management plan should be in place to account for natural disasters, accidents and any emergency situations.

7.17.7 Gender Based Violence, SEA & SH

Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) may be committed against the communities by the workers. Incidences of Sexual Harassment (SH) may occur among the staff during decommissioning phases of the project. This may be experienced while the women are searching for jobs and those giving the jobs may ask for sexual favours.

7.17.7.1 Significance of Impact

The significance of this impact is considered to be Minor considering low sensitivity of the receptor and low magnitude of the impact.

7.17.7.2 Mitigation measures

- Prepare an Awareness Raising Strategy, which describes how workers and local communities will be sensitized to GBV risks, and the worker's responsibilities;
- Identify GBV Services Providers to which GBV survivors will be referred, and the services which will be available;
- Elaborate GBV Allegation Procedures i.e. how the project will provide information to employees and the community on how to report cases of GBV breaches to the grievance committee.
- An Accountability and Response Framework, to be finalized with input from the contractor, should include at minimum:
- GBV Allegation Procedures to report GBV issues to service providers, and internally for case accountability procedures which should clearly lay out confidentiality requirements for dealing with cases; and,
- A Response Framework which has:
- Mechanisms to hold accountable alleged perpetrators associated to the project;
- The GM process for capturing disclosure of GBV;
- A referral pathway to refer survivors to appropriate support services.

7.17.8 Exclusion of VMGs, Vulnerable Individuals and Households

A significant risk associated with this project is the potential for the exclusion of Vulnerable and Marginalized Groups (VMGs), vulnerable individuals and households including the elderly, PLWDs, widows, widowers, orphan-led households, minority clans/sub-clans from participating and or benefiting from the mini-grids project. VMGs participation and inclusion could be disadvantaged based on social identity, which may be across dimensions of gender, age, location, occupation, race, ethnicity, disability, sexual orientation and religion. There is potential risk of lack of intentional actions by the mini-grids contractor(s) and implementing agencies for the inclusion of VMGs in the project activities and benefits. This potentially leads to the exclusion of VMGS from the benefits and opportunities during the decommissioning phase.

7.17.8.1 Significance of Impact

Considering the high sensitivity of the VMGs identified in the project and high magnitude, the impact significance is considered to be major. However, it is important to put into account the project site inhabitants are predominantly the Somali community.

7.17.8.2 Mitigation measures

- Participation will be through meetings with the different groups of the vulnerable people identified primarily to ensure that;
- The VMGs are Aware of any restrictions and negative impacts
- Provide support to VMG participation arrangements in the project
- Commit to open and transparent communication and engagement from the beginning and have a considered approach in place
- Ensure that all representatives of the contractor and Proponent staff carrying out the specific sub project investment including third party subcontractors and agents are well briefed on local customs, history and legal status, and understand the need for cultural sensitivity
- Monitor performance in engagement
- Enlist the services of reputable advisers with good local knowledge
- Implement the existing grievance redress mechanism

7.17.9 Risk of Communicable Diseases

The decommissioning of the mini-grid may lead to increased migration of labour into the mini-grid site. Local communities can be exposed to increased risk of communicable diseases such as HIV/AIDS, STIs and COVID-19 through risky behaviours involving job seekers and people employed on the decommissioning of the project.

7.17.9.1 Significance of Impact

Based on the fact that the receptor sensitivity will be medium and the impact magnitude low, the impact significance will be Moderate pre-mitigation.

7.17.9.2 Mitigation measures

- The Contractor should develop and implement pre-employment screening measures for workers, which should include communicable diseases. Individuals found to be suffering from these diseases will need to be sensitized on prevention of transmission to others and management of the disease prior to mobilisation to site.
- The Contractor should develop and implement a Communicable Diseases Policy and an information document for all workers directly related to the Project. The document should address factual health issues as well as behaviour change issues around the transmission and infection of diseases.
- The Contractor will make condoms available to employees and communities neighbouring the site during decommissioning.
- All project personnel should be inducted on a Code of Conduct that gives guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.
- If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary action including dismissal from duty.
- Sensitize all community segments and project workers on Covid 19 and precautionary measures that need to be observed;
- Restrict site access to only Authorised persons; and

- Continuously adhere to the MoH, WHO and World Bank guidelines on Covid-19 management.

7.17.10 Child labour

Decommissioning of the Mansa project could lead to increased opportunities for the host communities to sell goods and services to the incoming workers. This can lead to child labour to produce and deliver these goods and services, which in turn can lead to increased cases of school truancy and dropout.

7.17.10.1 Significance of Impact

The impact is rated minor. This is based on low sensitivity of the receptor and medium magnitude of the impact.

7.17.10.2 Mitigation measures

- The contractor should develop a code of conduct to ensure children are protected from any negative impact during the decommissioning activities.
- The contractor should strictly hire people who are above 18yrs and ensure they provide their Identity Cards.
- The contractor shall ensure every worker under their jurisdiction signs a document committing themselves to the protection of the area children.

7.17.11 Forced Labour

During decommissioning of the mini-grid the risk of forced labour could occur and precaution is need to safe guard the community from being subjected to forced labour.

7.17.11.1 Significance of Impact

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

7.17.11.2 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).

7.18 Cumulative Impacts

7.18.1 Cumulative Impact Assessment

It was observed during the site survey that there are no other similar solar projects within the projects site. Therefore, it is assumed that there will be no cumulative impacts from the above mentioned projects on the local soil, water, land, air and ambient noise environments section provides an assessment of potential environmental and social impacts from the proposed Projects as well as the proposed mitigation measures to avoid, reduce, remediate or compensate for potential negative impacts and to enhance positive impacts. A description of the assessment methodology used to assess the significance of potential impacts, taking into account impact magnitude and sensitivity of receptors and resources affected, is provided below. To facilitate the reading of the ESIA, the same heading structure in terms of environmental indicators, receptors or resources affected by the project activities were considered as the ones used in the baseline. All the mitigation measures identified in this

chapter have been collated into the Environmental and Social Management and Monitoring Plan ('ESMMP') matrix, including Occupational Health and Safety

8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

8.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

A detailed Environmental and social management and monitoring plan for pre-construction, construction, operation and decommissioning phase is well illustrated in the table below:

Table 8-1: Environmental and Social Management Plan for Pre-Construction, Construction, Operations and Maintenance and Decommissioning Phase

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	Construction contractor Operations & maintenance contractor REREC/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	-Number and types of businesses sourced from, businesses owned and operated by vulnerable individuals, types and quantities of materials etc.	Quarterly	No additional cost

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	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

	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. -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	Construction Decommissioning	Proponent, Contractor	-Records of employees/updated employee register. -Number of local community	Quarterly	50,000.00

	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 to community members.			employees and external employees/ updated employee register.		

	-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	Construction Decommissioning	Contractor, Proponent	-Updated employment register indicating locals employed, their ages, national identification	Quarterly	20,000.00

	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.			numbers etc. -Grievances raised, aggrieved persons and status on resolution etc.		
GBV- SEA and SH	-Prepare an SEA/SH Prevention and Response 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.	Construction Operations Decommissioning	Construction contractor Operations & maintenance contractor REREC/KPLC	-Minutes of awareness creation sessions for the 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	Quarterly	50,000.00

				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 Proponent	-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. -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	Construction Operations Decommissioning	Construction contractor Operations & maintenance contractor REREC/KPLC	-Availability of and implementation of the Stakeholder Engagement Plan. -# of stakeholder consultations held -Record of stakeholder consultations held (minutes of meetings and list of participants). -Information disclosed, to whom it was disclosed	Quarterly	30,000.00

	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.			(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 and responses given.		
Exclusion of VMGs and vulnerable individuals and households	In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following. • Early identification and inclusion of VMGs and disadvantaged groups.	Preconstruction Construction Operations Decommissioning	Construction contractor Operations & maintenance contractor REREC/KPLC	Minutes of consultative meetings with all community segments including VMGs and vulnerable individuals and households,	Quarterly	No additional cost

	• 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.			grievances raised and status on resolution etc.		
Inaccessibility of project benefits to VMGs and other vulnerable individuals due to	-Consult VMGs and Vulnerable individuals and households on charges for sub project services, and put in place specific	Operations	Operations & maintenance contractor KPLC	-Interventions to enable those vulnerable access project benefits. -Number of	Quarterly	No additional cost

affordability challenges	interventions to ensure the vulnerable equally access project benefits.			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		
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	Construction	Contractor	Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00

	NEMA approved waste handler					
Sanitary waste	**1.** Construct/ install pit latrines for both genders clearly labelled	Construction	Contractor	Presence of separate and clean washrooms for both the gents and ladies	Quarterly	300,000.00
Increased oil Consumption	1. Efficient energy consumption 2. Install an energy-efficient lighting system	Operations	Operations & maintenance contractor KPLC	Energy consumption records	Quarterly	No additional cost
Risks related to poor or inadequate stakeholder engagement (Conflict)	• 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	Operations	Operations & maintenance contractor KPLC	Grievance records	Quarterly	20,000.00

	at the earliest time possible • Ensure all grievances are logged and closed • 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	Operations & maintenance contractor KPLC	-SEA/SH Prevention and Response Action Plan -Grievance records	Quarterly	20,000.00
Gender Based Violence –SEA and SH	To manage GBV risks, the contractor will prepare a SEA/SH Prevention and	Operations	Operations & Maintenance contractor	-SEA/SH Prevention and Response Action	Quarterly	20,000.00

	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		KPLC	Plan -Grievance records		
Public Health Impacts – HIV/AIDs	• 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 • Provision of condoms to workers Allowing migrant workers time to be with their families	Operations	Operations & Maintenance contractor KPLC	Number of awareness creation sessions conducted. -Availability of and distribution of condoms		20,000.00
Public health Impacts -Covid 19 disease	• Social distance must be observed • Provision of hand wash facilities before access • Temperature check and monitoring of the	Operations	Operations & Maintenance contractor KPLC	Availability of hand washing facilities Utilization of hand washing facilities Number of Covid-	Quarterly	30,000.00

	temperature of workers and any other person coming to site • Enforce wearing of masks • Make provision for testing and treating especially of workers • 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			19 cases reported		
Dust Emission	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	Operations	Operations & Maintenance contractor KPLC	Visual inspection	Quarterly	50,000.00

Public Health Impacts – HIV/AIDs	• 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 • Provision of condoms to workers Allowing migrant workers time to be with their families	Operations	Operations & Maintenance contractor KPLC	Number of awareness creation sessions conducted. -Availability of and distribution of condoms		20,000.00
	Total					4,520,000.00

8.2 Institutional Implementation Arrangements for the Proposed Project

This section present roles and responsibilities of the Proponent, implementing agency, supervision consultant and contractor. The project is jointly implemented by the Ministry of Energy and Kenya Power. Specific roles are presented below:

Table 8-2: Institutional Framework and Compliance/Implementation of the ESIA/ESMMP

No	Institution	Role/Function
1	The National Environment Management Authority (NEMA)	NEMA: • Approves the ESIA Report; • Issues EIA License for project implementation; and • Carries out independent Audit to determine compliance with ESMMP.
2	Directorate of Occupational Safety and Health Services (DOSHS)	DOSHS: • Provides OSH permits for workplaces of the project including campsites and quarries; and • Conducts 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.); and • Monitors water use in the region and provide guidance water use.
4	National Land Commission (NLC)	NLC: • Verifies the identified land for the purposes of ascertaining land ownership; and • 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; and • 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; and • 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 ESMMPs and other plans; • Day to day supervision of Contractor implementation of the ESMMPs and other plans; • Regular reporting on the ESMMP implementation; and • Has full time Environmental, Health and Safety and Social Specialists
8	Contractor	Contractor: • Will engage the following dedicated full-time safeguards staff; ✓ Environmental Safeguards Specialist ✓ Social Safeguards Specialist ✓ Registered Occupational Health and Safety (OHS) Expert ✓ Community Liaison officer to act as link between the community and contractor and to support the social specialist. • Will Prepare the C-ESMPs informed by the proponent's ESMMP and other plans before commencing construction; • Will Operationalize and implement the C-ESMPs; • Carries out day to day management of ES, H& S risks; and • Reports on incidents and accidents to the Resident Engineer and regulators.

9 IMPACT SUMMARY AND CONCLUSION

9.1 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 Gas Village, Loiyangalani ward, North Horr sub county 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.

9.2 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.

9.3 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 Gas 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 Gas 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 Gas 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

9.4 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.

10 APPENDICES

Summary of Appendices	
Appendix 1:	Summary of Community Consultation Meeting Leading to Land Identification and GRC Constitution
Appendix 2:	Summary of Community Consultation meeting during ESIA Public Participation
Appendix 3:	Project Design
Appendix 4:	Land Acquisition Form for the proposed Gas Solar Mini off-grid project
Appendix 5:	Abbreviated Resettlement Action Plan (A-RAP)
Appendix 6:	Environmental and social screening form for the proposed project
Appendix 7:	Lead Expert's Practicing License

Appendix 1: Minutes for ESIA Public Participation

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MINUTES OF EIA CONSULTATION HELD AT ..... GAS .....

Date: 20/1/2022	**Time:** 9:45 am.
Venue: GAS	

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

Item No	Description	Action by
Min 1/22	**Introduction**	
	- The Meeting was called to order by the area Chief at 9:45 am. - The area chief introduced the Consultant team together with the Representatives of Ministry of Energy & CREO Marsabit County. - The Chief welcomed Members to the Meeting.	Mr Raphael Asst-Chief
Min 2/22	**Opening Remarks**	
	- Mr Jalle (CREO) welcomed the Members to the Meeting and thanked the attendees. - Mr Jalle gave a ~~brief~~ brief description on the Proposed project and the agenda of the Meeting. - The project involves installation of a Mini grid which will be Solar powered. - Electricity will be distributed at a radius of 2km from the Source - Connection Charges from the pole will be 1000/= per household / Structure	Mr Jalle. CREO Marsabit

Min 3/22	Remarks by the Consultant	
	Mr Daniel informed the Members about the Proposed project its Sub Components & the Scope of the project. - He clearly explained the ESIA process to the Members and how it relates to the project. - As Stipulated under the Environment Impact Assessment & Audit) Regulation 2003, the Members were informed that a public Consultation should be done before Commencing any Proposed project. - Mr Daniel gave a Presentation of the anticipated impacts as a result of the proposed project. Positive Impacts - Improved Security - Improved livelihood. - Job opportunities - Business opportunities - Improved learning Experience at Schools Negative Impacts - Cultural Changes - Health & Safety Concerns - Air pollution from the back up generator - Increase in waste generation - Mr Daniel further gave a clear description of all the Mitigation Measures to be followed during the project Cycle. - The Contractor Shall be expected to Conform to the relevant environment rules & regulations that govern Environmental Management. - A grievance redress Committee will be in place to address any issues / Concerns that might arise from the projects activities. - An Environmental Management Plan will guide the Contractor into achieving Sustainable implementation of the project and Protection of the environment from adverse impacts.	Mr Daniel Environmentalist Centric Africa.

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Min 4/22	Concerns / Issues from participants	
Q1 -	Enquired about the payment charges required for installation and the use of electricity	Mr. Roba Godana
Q2. -	How will the electricity be distributed from the Mini grid.	
Comments & Suggestions	The Centre is not resource-full enough in regards to fire wood accessibility therefore there is urgent need of Energy saving jikos that will help enhance Cooking experiences	

Min 5/22	Responses given by the consultant	
	Electric Supply from the Source will be done within a radius of 2 Km using electric poles and electric power lines - Households and facilities will have to pay an installation charge 1000/= for them to access energy. - That owners of these households and facilities will be responsible for their own inhouse wiring. - It is advised that an Electric specialist is engaged for such wiring activities to avoid accidents such as electrocution & flames. - Charges incurred during Electric Consumptions will depend on the Consumer rate. Charges will Stand at 19/= per Kwh.	CREO Marsabit County Mr Jalle.

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Min 6/22	**Acceptance/Rejection of the project**	
	All Members demonstrated acceptance of the project	
Min 7/22	**Adjournment**	
	The Meeting was adjourned at 11:30 am	

Minutes Prepared by: ..Mathew Kaswa Mutua..... Date..25/1/22....

Position .....Environmentalist - Centric Africa.

Signature .....

Minutes Confirmed by: ..Raphael N. Chawe..... Date.....25/1/2022

Position .....Assistant chief.....

Signature .....

KAJIADO COUNTY GOVERNMENT
CHIEF
DATE

REREC

Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: GALAS

Date: 20/01/2022

Time: 10:00am

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Raphael A. Gonne	Ass. chief Galas	0700192315	
2.	ALI WARIO GODANA	GALAS	0723822548	ALI WARIO
3.	GODANA Gonche Duffu	GALAS	0790588283	
4.	Molu Kungte Godana	GALAS	–	
5.	Gonicha Roba Doyo	GALAS	–	
6.	DOTI ELEMA TASI	GALAS	–	
7.	BARILLE ALI	GALAS	0702626489	
8.	LUKA DENGE WARIO	GALAS	0792911157	
9.	Boru DABELLO ADANO	GALAS	0704915785	
10.	BAICAYE Guyo GECHA	GALAS	0705258432	

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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: ..... GAS .....

Date: ... 20/01/2022 .....

Time: ..... 10:00 AM .....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	DAUDI DIDA	GALAS	- -	DaudiDi
2.	Gonole GALGALLO	GALAS	- -	
3.	BOYA KOSSO	GALAS	-	
4.	KONCHORO JILLO	GALAS	0726581631	
5.	BARAICO ELEMA	GALAS	- -	
6.	BORU ABIO ABANE	GALAS	- -	
7.	SHAMO SOLE	GALAS	0714024843	
8.	ELEMA ARERO GATHE	GALAS	0718203518	
9.	ISAKO DAMBALA	GALAS	0713084804	
10.	Barille Katelo Galgallo	GALAS	0745489308	

REREC

Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: GAS

Date: 20/01/2022

Time: 10:00 Am

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Isacko Shama Ushu	Galas	0799494118	
2.	ROBA MAMO ARANKESA	Galas		
3.	Jillo Kofo Galgallo	Galas	0759814402	
4.	ROBA GUDANA	GALAS	074641013	
5.	BATI GUDANA	GALAS	0792663968	
6.	DARO Dida	GALAS	0707463709	
7.	Hugo Konchura	GALAS	-	
8.	SIMPIRE DIKA	Galag	0748352008	
9.	ARBe Sharamo	Galag	0713389341	
10.	BULKE WARIO	GALAS	0792665632	

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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: GAS

Date: 20/01/2022

Time: 12:00pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	GUMATO YATTANI	GALAS	-	
2.	ADHO HUKA CHEPE	GALAS	0791070067	
3.	GODANA DUBA GORA	GALAS	- - -	
4.	SABDIO BARALLO ROBA	GALAS	0740216972	
5.	GUMATO MOLU GUYO	GALAS	0792663961	
6.	Mata Gon Galgallo	Galas	0700142215	
7.	Daro Dida.	Galas	0748149433	
8.	Halkano Dida	Galas	0727790188	
9.				
10.				

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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: GAS

Date: 20/01/2022

Time: 2:00

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	TURA DUB BANJURA	Youth	0712866629	
2.	KATELLO SADO TANDA	Youth	0703879775	
3.	LUKA DENGE WARIO	Youth	0792911157	
4.	WARIO ROBA GODANA	Youth	0715352848	
5.	ALI Korchora Ruchi	Youth	0746093698	
6.	Abudho ALI Molu	Youth	0712403932	
7.	BORU SHARAKA ALI	Youth	0115101038	
8.	Yaxa Elema	Youth	0798593582	
9.	Ambrose Mamo	Youth	0793593502	
10.	Ambrose Umuro Duba	Youth	0796142278	

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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: GAS

Date: 20/01/2022

Time: 10:00 AM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	KONCHORO DAMBALLA	GALAS	0768444322	
2.	GUYO BORU ABIO	GALAS	0790587421	
3.	BACHO JARSO BORU	GALAS	0706241767	
4.	BORU MAMO YARA	GALAS	0701456340	
5.	ABUDBA SHAMA BORU	GALAS	0707278739	
6.	GUYO SHAMA	GALAS	0710139428	
7.	ADANO GUYO	GALAS	0706775727	
8.	HALKANO ABIO	GALAS	0748149433	
9.	HALKANO DIDA	GALAS	0727790188	
10.	GUYO SORA	GALAS	—	

Appendix 3: Minutes for Community Consultation Meeting Leading to Land Identification and GRC Constitution

Minutes of Community Consultation meeting leading to Land Identification and Grievance Redress Committee Constitution

Project: Proposed Gas Solar Mini-grid

Venue of meeting: Gas village, Gas sub location in Galasa location of Marsabit County

Date: 23/10/2021

Agendas

1. Preliminaries
2. Project description
3. Technical aspects of the project
4. Positive Impacts of the project –Solar Mini-grid
5. Negative Impacts of the project and mitigations measures
6. Need for land for the project
7. Grievance Redress Mechanism for the project
8. Plenary session
9. Focus Group discussions
10. Environmental and social screening of the site

Minute 1/KOSAP/2021: Preliminaries

The Chief called the meeting to order at 10.00 a.m. The meeting began with a word of prayer. The chief spoke in Kiswahili and translation to the local dialect was done by one of the community members. The chief welcomed the visitors and the community for the meeting. He told the community to be keen during the engagements so that they can engage fruitfully.

He called the CREO (County Renewable Energy Officer) to welcome the project team to carry on with the meeting. The officer greeted the people and notified them that the KOSAP project was still on course. He noted that the national government is the one funding the project through a loan facility and the county government is also a key stake holder in the implementation. He told them that he had brought the KOSAP team who would share more in-depth information on the project.

He then welcomed the Director (Lands and Energy) to proceed with the meeting. He introduced the project officers briefly and the team is as shown below.

KOSAP Project Team

S/No	Names	Position
1	Ramat Ibrae	Director Lands- Marsabit
2	Rebecca Muniu	Communications officer- Ministry of Energy
3	Samuel Mbugua	Environmentalist-KPLC
4	Suleyman Gavawahle	Physical Planner - Marsabit
5	Gideon Jalle	County Renewable Energy Officer-Marsabit
6	Jacob Chepkwony	Engineer -MOE
7	Roseline Njeru	Socio Economist-KPLC

The Director noted that the County Government of Marsabit is in support of the project as it is key in speeding up development in the County. The director noted that most of the land in the area is community land and much of it is not registered nor adjudicated. The director noted that land in the area falls under the category of community land and its use and management is governed by the Community Land Act 2016. The community was told that land under this Act is owned by the community but is held in trust for

them by the County Government of Marsabit because the community is not registered. He added that the ministry of lands and planning in the county will assist in the necessary processes in regard to land to ensure the project complies with the relevant requirements once the communities make a decision on the project.
He said the county government of Marsabit is ready to support the MOE in the KOSAP project to ensure land identified for the project will comply with the requirements of the community land Act and other relevant laws and especially that land identified for the Solar Mini-grid will be used for public purpose only i.e. to supply power to the community. He said that the team had come to create more awareness on the project to the community.

Minute 2/KOSAP/2021: Project Background Information.
Samuel (KPLC) explained that the national government is implementing KOSAP in partnership with County Government in 14 Counties in areas that are far away from the national electricity grid. She said the proposed project called KOSAP-(Kenya Off-grid Solar Access Project) or ''Umeme Mashinani'' is being implemented jointly by the Ministry of Energy, the Kenya Power and Lighting Company (KPLC) and the Rural Electrification and Renewable Energy Corporation (REREC) in partnership with the World Bank as a development partner, County Government as a partner and the communities in Off-grid areas being the beneficiaries. He noted that Off-grid areas are those areas where the national electricity grid has not reached, and whose electricity access has been very low. The reason for choosing solar energy was because the area is far away from the national grid and the fact that the area is well endowed with natural sunlight with high temperatures.
He further expounded that the proposed Solar Mini-grid is part of the government's effort towards universal access to power. He said the proposed Gas solar Mini-grid is one of the sixteen Solar Mini-grids to be funded through KOSAP in Marsabit County. He told the community that the project was in the preliminary implementation stages which requires public participation of various stakeholders.
He outlined the agenda of the visit was to;

- Undertake community engagement to sensitize the community on the project, need to identify land for the project and sensitize the community on their rights in regard to the project so that they can make informed decisions.
- Undertake an environmental and social screening of the identified site to check suitability in terms of environmental, technical, social, safety and health requirements.
- Explain the need to set up Grievance Redress Mechanism for the project, guide the community in electing Grievance Redress Mechanism committee members and sensitize the members of their role during project implementation

Minute 3/KOSAP/2021: Technical aspects of the project
Jacob (engineer) explained that the technical aspects of the Mini grids will entail; the installation of solar PV panels, battery, and thermal diesel backup unit (generator) to support solar and street lights. He explained to them that once constructed the Solar mini-grid will be operated by the implementing agency REREC and the beneficiaries/those interested will be expected to pay for connection of electricity (one thousand shillings) and do wiring in their houses. He told them that connection of power will involve passing of electrical lines along the roads in order to reach their houses, business premises and public facilities and the route for passing the lines is called way leave. He noted that once the designs are done, the community will be notified of the exact routes during future consultations and that they will be required to give way leave consent (allowing the service lines to pass through their land boundaries. He noted that the project will not compensate for way leaves due to budget constraints so that they can make an informed decision.

He added that distribution or supply lines will cover a radius of 1-1.5km from the mini-grid for quality supply.
He told them that once connected, the beneficiaries will be expected to pay for electricity consumed and that the tariff employed will be the same as what other Kenya Power customers pay.

Minute 4/KOSAP/2021: Positive Impacts/Benefits of the Project
Samuel (KPLC) explained that, every project has both positive impacts and negative impacts. Our assignment is to explain to you the impacts of the project so that you understand how the project will benefit you and the community at large and also explain to you the negative impacts of the project and their mitigation measures. The project benefit both direct and indirect positive impacts discussed are as follows:

1. Better source of lighting- replacement of Kerosene lamp and small de-lite lamps with electricity lighting which is clean energy and has better lighting
2. Benefits to education- provide source of lighting which enables pupils and students to take advantage of longer hours of preps/study in school and at homes. Electricity will be useful in availing power needed to enable use of radio and television sets therefore pupils can access electronic educational information
3. Business opportunities-Power provides energy needed to power some gadgets that are difficult and expensive to power with generators. Access to electricity will therefore allow the community to take advantage of new business opportunities and enhance the existing ones e.g. Barber shops, salons, posho/maize mills, welding, photo copying, printing, fuel stations, milk coolers and fridges to preserve meat, milk among others. He asked the community to take advantage and set up such businesses
4. Employment and wealth creation- community members will get opportunities to provide non-skilled and skilled labor during construction and operation phases of the project
5. Local material supplies and other requirements- the proposed project provides opportunities to supply materials that are locally available
6. Up Scaling Electricity Access to the off-grid areas- this area is far away from the grid and so the proposed project helps to reach this area faster and in a cost effective manner as opposed to grid connections.
7. Impact on health education-due to availability of power, communities can purchase communication equipment like radios and televisions which in turn provides access to information on various issues such as health topics on HIV/AIDs, nutrition and the current Covid-19 pandemic among other information
8. Health benefits of the project- health benefits of the project are linked to replacement/elimination of use of kerosene lamps and candles, no need to use fuel generators which emits smoke causing respiratory diseases, the dispensary will also benefit from power that can be used to preserve drugs and vaccines alongside powering other medical equipment.
9. Improved standard of living- Living standards of the community is bound to improve as they take advantage of small house hold appliances like e.g. TV, Fridges, radios, blenders, iron boxes e.t.c.
10. Security- Enhanced security due to improvement in lighting up of the area through the street lights. Improved security also means more hours of business. The place will also be safe as lighting puts off opportunistic criminals who take advantage of darkness.
11. Communications- improved communication due to availability of electricity to charge phones, opportunities to set up information communication and technology related business-like cyber cafes, access to E-government services among others.
12. Presence of electricity will also attract other business investors to invest in the area

Minute 5/KOSAP/2021: Negative impacts of the project

Having discussed the benefits of the project, Samuel explained that projects also have negative impacts. He explained that the most important thing is to be able to mitigate the negative impacts so that they do not affect the community adversely. He said ''the proposed solar Mini-grid will have some environmental and occupational and social negative impacts and presented them alongside their mitigation measures most of which will be implemented mainly by the contractor.

1.	**Negative impact**	**Mitigation measures to be implemented by contractor**
2.	Vegetation clearance	• Clear only the areas that are needed to put up the mini-grid according to designs • After construction, do landscaping with grass to areas that have no electrical installation as opposed to living areas bare • Re-vegetation by planting of trees
3.	Air pollution linked to dust from construction activities	• Water active areas to suppress dust • Fence off construction site • Use of masks by workers • Limit vehicle speed to minimum possible when passing residential areas and the centre
4.	Air pollution from vehicle emissions	• Maintain and service vehicles • No idling of vehicle's engines
5.	Solid waste	• Clear all solid waste and dispose in line with NEMA guidelines
6.	Land. As you had been briefed before, the site identified should; -must not result in displacement of community members - We must avoid land that is currently settled or which has squatters.	• The MOE is going to give compensation in kind for the land identified for the project.
7.	Occupation safety and health hazards e.g. accidents, fall from heights, pricks by sharp objects	❖ Use of proper personal protective equipment like gloves, overalls, helmet, safety shoes ❖ Allocating work according to skills ❖ Toolbox talks to workers to identify hazards and risky activities and putting mitigation measures ❖ Close supervision of work
8.	Labor influx. The nature of the project will require technical skills that are not all available in this community. This will require movement of construction workers (labour influx) into this community. There are some risks that are involved with labor influx and we need to mitigate them as follows to avoid negative impacts on our community.	❖ Reduction of labor influx by recruitment of local workforce to the extent possible especially unskilled and semi-skilled jobs by the contractor as much as possible.

9.	Risk of social conflict due to competition for resources and opportunities	❖ We shall establishment and operationalize an effective Grievance Redress Mechanism accessible to community members where your grievances can be sorted ❖ Awareness-raising among local community and workers on the need to have a good /cordial working relation ❖ Consultations with and involvement of local communities in project planning ❖ Provision of cultural sensitization awareness for 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 and conflicts e.g. water ❖ Working closely between contractor and the project grievance redress committee to address complains on time.
10.	Increased illicit behavior and crime (including prostitution, theft and substance abuse)	❖ Sensitization campaigns both for workers and local communities against such social evils (like we are doing) ❖ Enforcement of sanctions (e.g., dismissal) for workers involved in criminal activities
11.	Spread of diseases (including STDs and HIV/AIDS)	❖ Education/awareness about transmission of diseases ❖ Awareness creation on STDs among the workers and local community on ethics, morals, general good behavior and the need for the project to co-exist with the neighbours during the community and worker engagement forums. ❖ Provide condoms to employees
12.	Public health issues such as spread of diseases like Covid 19	❖ Adherence to ministry of health protocols issued ❖ Avail hand washing facilities –water and soap ❖ Keeping social distance to the extent possible ❖ Use of face masks ❖ Encourage workers to be vaccinated
13.	Gender-based violence i.e. sexual exploitation and abuse of the community members by workers	❖ Information and awareness raising campaigns to you community members and specifically women and girls on need to be on the look-out and raise such issues/complaints ❖ Mandatory awareness creation for workers by contractor on required lawful conduct in the community and legal consequences for failure to comply with laws ❖ Requirement of contractor to have code of conduct for the workers and to implement them ❖ Working closely with chiefs and local law enforcement to act on community complaints on time
14.	Gender-based violence i.e. sexual harassment among workers	❖ Requirement of contractor to have code of conduct for the workers and to implement them ❖ Inclusion of GBV specific mitigation measures in the environmental and social management plan of contractor
15.	Child labour	• Ensuring that children and minors are not employed directly or indirectly on the project. • Enforcement of Employment Act that requires contractor to adhere to minimum age • Allowing your children to be employed is illegal and

		punishable by law because it interferes with the children's right to education • Report any case to the chief's office
16.	Demand for Material/resources e.g water, sand, ballast	Contractor to consult with elders before using scarce resources in the community like the water to avoid conflicts.
17.	Storm water and erosion	• Contractor to put measures to harvest rainwater and control erosion during construction
18.	Wastewater/ effluent	Contractor will provide sanitation facilities for workers
19.	Noise resulting from excavation machinery, vehicles and workers	• Contractor to work only during the day • In case of blasting contractor to give notice to community through the village elders, grievance committee and chiefs office
20.	Visual and Aesthetic Landscape Impacts	• The visual negative impacts can be mitigated through putting up a wall round the facility to keep off/screen the project stacks, poles, panels • Proper siting decisions can help to avoid aesthetic impacts to the landscape.
21.	Fuel storage on site	• Contractor will undertake proper installation of the fuel storage tanks for the back-up generator. • Have a budded wall 1.5 times the fuel stored to allow controlled collection in case of a spill. • During operation implementing agency will ensure proper maintenance of the solar panels
22.	Public safety –potential risk of shocks and electrocution	As explained below in details

Public safety in regards to electricity

Samuel educated the community by highlighting the importance of using electricity safely. She said electricity is good but failure to take safety precautions while interacting with power infrastructure can result in electric shocks, fires and even electrocution/death. He emphasized the following precaution/preventive measures to observe in order to prevent risk of electric shocks, fires and electrocutions.

- ✓ Engage a certified technician to do wiring in your premises
- ✓ Use quality materials while wiring
- ✓ Do not engage in individual illegal extensions of power lines to other houses
- ✓ Don't touch sockets and switches with wet hands or wipe with wet cloths
- ✓ Do not tie your livestock on electric poles
- ✓ Do not cut earth wires that run along some electric poles
- ✓ Do not touch or go near any electric wire if you find it fallen on the ground
- ✓ Report any incident regarding electricity at the local office –staff in charge of operating the Mini-grid
- ✓ Vet all new people coming to the village by checking whether they have registered their presence with the office of the chief especially those purporting to be technicians
- ✓ In case of a black out/no power supply do not open sockets or switches

Minute 6/KOSAP/2021: Land requirements for the project

Rebbeca told the community that one of the agendas of the project team's visit was to check the land/site that the community had or would identify for the project. The project team together with the community would undertake an environmental and social screening to determine whether it is appropriate for the

proposed solar Mini-grid project. She then emphasized the aspects to consider while identifying the land for the project. She explained to the public forum that the land identified need to meet certain criteria to ensure it is suitable for the Mini-grid. She listed the criteria as follows; the land needs to be relatively flat, not resided by families, ability to receive maximum sunlight, land which has no conflicts and one that is central to residents and public facilities so that it will be possible to supply more people in the target community. He added that the project needs about 0.6734hectare of land.

Rebecca emphasized that the Government of Kenya had secured a loan from its development partners i.e. World Bank to implement the KOSAP project. She explained that the government was seeking partnership with the community in the KOSAP project where by the community would identify land for setting up the solar mini-grid while the government would provide the money for setting up the solar mini-grid.

She added that there are three main land ownership categories in Kenya which are private land, public land and community land. She informed the community that land in the area falls under community land and is governed by Community Land Act 2016. She added that compensation for land in Kenya includes; cash payment -which would involve all community members being identified and registered and then open an account where the fund would be deposited and the community would draw the funds. The second option is compensation of land for land which involves identifying another piece of land to be purchased. The third option is compensation in kind e.g. getting a project in exchange for the land identified for the project. Rebecca explained that the government proposes the third option which is compensation in kind i.e. through a community project to be identified by the community and the project would be implemented/constructed alongside the solar Mini-grid.

Rebbeca educated the community on the following issues;

- That in the Community Land Act, the County government of Marsabit only holds the land in trust for them and that they are the owners of the land
- Importance of public participation by key stakeholders including community members during the planning and operation phase of the project.
- That they have a right to give their views, opinions or fears on the proposed project
- The ownership of the land will be transferred to REREC and that the project will be managed by REREC
- The community will choose about 3 projects as payment in kind in three main sectors namely health, education and water and one of their (priority) would be implemented subject to a total amount of Kenya shillings one million. The community would be given a chance to deliberate on these projects

She told them that once the community agrees to identify a piece of land for the project there was a form which the leaders of the community would sign as a form of commitment and that it would be forwarded to the county government for information and for progressing other processes needed in the land registration.

Survey of the land and request for advance possession.

Rebecca noted that the process of land surveying and land transfers and registration are long and requested the community for advance possession of the land. This meant that the community would allow construction works to take place as the process of land registration is being progressed. The community agreed to the advance possession request. She explained to the community members that the surveyor will need to pick exact GPS points of the agreed identified portion of land for the solar mini-grid so that the process of land

registration may be progressed. She explained to the community that the rationale and importance of sharing all that information was to facilitate the community in making informed decisions about the project.

Selection of the community projects

The community was given time to deliberate on land for the solar Mini-grid and also on the community project as payment in kind. The community identified a piece of land that was to be screened for suitability and also choose one community project which is

1. Repair and servicing of water desalination system and piping of the water to different points in Gas village.

Minute 7/KOSAP/2021: Plenary session

Rebecca then invited the community members to a plenary session for the community members to ask questions or seek clarifications on the information shared. The questions raised are presented in the table below.

	Name	**Questions/suggestions**	**Response**	**Response by agency on how feedback will be used or acted upon**
1	Roba Godana	We have heard about this issue of power before is this project linked to the wind power	No, this is separate from the wind power. In this project the power will be generated from sun rays hence the name solar project and then distributed to the customers using low voltage lines	-
2	Roba	We have a place (land where to set the Mini-grid) and sometimes our livestock come near the homesteads can the Mini-grid affect them	The Mini-grid site will be fenced off to keep of the public and other animals from access. The low voltage lines for the distribution are at a height above the ground supported by posts.	-
3	Adano	After we pay the one thousand shillings to be connected, what else is needed?	The customer will be required to pay for power consumed and we shall use prepaid meters whereby a customer buys power before using the way we buy credit for the mobile phones	
4	Adano	Can we cook with that power	Yes, you can cook with it only that you will have to buy a cooker and also be ready to pay a little bit more for the power	

Photo of the community Meeting at Gas

Minute 8/KOSAP/2021: Grievance Redress Mechanism (GRM)

Samuel explained that in a project, grievances may arise and it important to have a grievance redress mechanism that is known to all the community members and accessible with no costs to the community members. Before explaining how to set the GRM, she asked the community to explain how they deal with grievances/issues

Existing grievance redress mechanism in the village.

It was reported that the elders in the community provide leadership to the community. These elders also resolve the conflicts or grievances or any issue in the village. Any of the grievances that is difficult to resolve is referred to the office of the Chief

KOSAP Project GRM:

Samuel explained to the community that it is important to put in place a project grievance redress mechanism (GRM). He noted that the GRM to be set should borrow heavily from the existing conflict resolution structures in the community. He added that 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. He told the community that they are free to raise any complain or request information about the project. He further explained that the project will have a three-tier grievance redress mechanism as follows.

1. Locational grievance redress committee. This is the lowest level (forum) where the community will get project information and also ask questions. At this level you the community will choose project committee members who will also double as grievance redress committee. The membership will comprises; elders/men representatives, representatives from women, youth, special needs (persons with disability), and the office of the chief as Ex-officials. This will be the first stop for receiving information and raising grievances. The members to be chosen should possess leadership skills and it is hoped that most of the grievances will be resolved at this level.
2. The second level of grievance redress will be the County Grievance Redress Committee comprising members of the County working group. This committee is at the county level and will resolve complains or issues that are unable to be resolved at the locational/project level. The chairman of

the project grievance redress committee at the community will forward issues/ complains to the county grievance redress committee through CREO who will also be responsible for giving feed back to the local committee.

3. The third level will be the National grievance redress committee comprising of KOSAP Project Implementation Unit at the Ministry of Energy and the implementing agencies. Matters that not resolved at the County level will be escalated to this National GRC by the CEC-Energy
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.

He explained further that 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. He added that the composition of the committee should have representatives from all groups in the community including men, women, youth and persons with disability. The table below indicates the members of the GRC chosen by the community members.

S/No	Name	Representative of	Contacts
1	Gababa Guyo Bore	Men	0723601643
2	Elema Arero Sora	Men	0718203518
3	Mamo Dido Wako (PWD)	Special needs	0714688219
4	Arbe Wario	Women	0713608124
5	Martin Omulo Tanda	Youth	07902738894

Minute 9/KOSAP/2021: Focus Group Discussions

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. Each group was told to elect their representatives to the GRC.

a) Focus Group Discussion with the women

Roseline (KPLC) explained to the women that it was important to hold a separate discussion with them so that they have opportunity to freely express themselves. One focus group discussion was held with the women. She explained the agenda of the visit by the officers from national government and county government i.e. was to undertake an environmental and social screening of the identified 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. The third objective was to explain the land requirements for the project and the need for a project grievance redress mechanism. She then gave a summary of the project in terms of its positive and negative impacts and their mitigation measures and the requirements for identifying land for the project. 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.

The discussion went further to bring out issues on how the women can take advantage of the project benefits rather than taking a back seat. She then explained to them that women would benefit more from the electricity because there are the ones who are more exposed to unclean energy as they are the ones who take more time in the kitchen. They would 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 among others. They were also set to benefit if they could set up small businesses like salons, cold drink kiosks, 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 and emphasized because women and girls are more affected by gender-based violence due to the subordinate status of women in many societies, discrimination against them and their higher vulnerabilities to violence. She noted Gender-based violence takes many forms, including sexual, physical, and psychological abuse. Other issues discussed were the importance of addressing GBV incidences and the need to report and document any complaints against workers, 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 (sexual exploitation and abuse). The women were requested to keep talking to the girls on GBV risks and the need to raise alarm in case of risk factors to ensure prompt redress.

Plenary Session

The women were allowed time to ask questions, give suggestions and or seek clarifications regarding the proposed project.

Table 3: Question, Suggestions, feedback and response for Focus group discussion with women

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team	Response by agency on how feedback will be used or acted upon
Katero Robe	Is the connection fee to be paid annually monthly or at once	This is a once off payment	
Arbe	Thank for educating us on the project. Regarding the committee must the representative be learned	It would be better if the person is learned but if we completely cant get one who is learned then we choose a good leader from among the people	

Photo of Focus Group discussion with the women

b) Focus group discussion with the youth

The youth were also invited to a separate discussion. Chepkwony (MOE) explained to the youth that they are also key to the decisions that are made in the community and so discussion with them was necessary so that they have opportunity to express themselves. He explained the agenda of the visit by the KOSAP team 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 need to undertake community engagement to sensitize the community on the project. The third objective was to explain the land requirements for the project, rights of the community members and the need for a project grievance redress mechanism and committee. He then gave a summary of the project in terms of its positive and negative impacts and their mitigation measures and their rights and requirements for identifying land. He told the youth to select a representative to the project committee who would represent their views/issues to the committee for redress. He explained to the youth that they would benefit from the project in terms of job opportunities, ability to set up shops or enhance their businesses due to power supply, entertainment, use of ICT while those in school could benefit from better lighting and ability to access e-learning opportunities through radios, T.V and internet services.

Plenary Session

He asked the youth to feel free to air their opinions on the project. The youth said they support the project. The youth were then allowed to ask questions.

Table 4: Question, Suggestions, feedback and response for Focus group discussion with youth

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team	Response by agency on how feedback will be used or acted upon

Martin	What is the start date of the project	The project will start when we secure the relevant approvals including a license from the Environmental authority. Likely to start next year	

Photo of the Focus group discussion with the Youth

c) Elders/men discussions

Samuel explained to the men that it was important to hold separate discussion so that the community get enough opportunities to be informed of the project and be free to ask questions. He told the men that public participation in projects is crucial as it helps build consensus and enables people to make informed choices regarding projects. He repeated the agenda of the visit by the officers 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. The third objective was to explain the land requirements for the project, rights of the community in regard to the project and the need for a project grievance redress mechanism. Samuel then gave a summary of the project in terms of its positive and negative impacts and their mitigation measures and the requirements for identifying land for the project. He also explained the need for the men to select representatives to the project committee who would represent their views/issues to the committee for redress. Further, the men were educated on how they can take up economic opportunities that will raise during project implementation.

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 and report incidences of GBV. The men were told to be more vigilant to ensure young girls do not fall prey to GBV incidences. All the Men were in agreement for the project to be brought to the area

The elders said they welcome the project and that they had already agreed on the portion of land where the project would be implemented i.e. part of the land which had already been set aside by the community for public utilities. The discussion was then opened up for questions.

Plenary Session

Question, Suggestions, feedback and response for focus group discussion with Men

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team	Response by agency on how feedback will be used or acted upon
No questions were raised	-	-	-

Photo of Focus Group discussion with the Men

Minute 10 /KOSAP/2021: Environmental and social screening of the site

The project team and the community members proceeded to site for the actual screening of the identified site. The site was found suitable for the mini-grid.

CONCLUSION

1. The community welcomed the project and is in support of the project.
2. No residential houses and no economic activity or business premises were on site during the site screening
3. Land identified belong to the community and is communally owned, representatives of the community signed the land forms as a sign of commitment
4. There will be no physical or economic displacement because the site identified was already set aside for community social projects
5. In terms of consultations one public meeting was held with the residents of Gas. In addition, focus group discussions were held separately with the men, the women and the youth to enhance the stakeholder engagements. The engagements were fruitful and the community identified land for the proposed Mini-grid.

6. The need for a grievance redress mechanism (GRM) was explained to the community including the need and roles of a grievance redress committee (GRC). A GRC was chosen with representatives from the men, women and youth.
7. The need for advance possession of the land as the process of survey and registration progresses was explained to the community and the community agreed to the request.
8. It was explained to the community that it will be their responsibility to pay for connection to power, wiring of their premises and to pay for power consumed
9. The community's priority project as compensation in kind is
   - **repair and servicing of water desalination plant and piping water to other points in the village.**

The community in Gas unanimously 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 meeting ended at 12.30 p.m.

Recommendations

1. Environmental Social Impact Assessment for the identified site can be progressed.

Appendix 4: List of Attendance for Community Consultation Meeting Leading to Land Identification

Main 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 ..... GAS MINIGRID .....

MEETING VENUE..GAS.....VILLAGE.....

DATE..23/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	UMURO Roba			M	Gayo Hula	
2.	TURA MALO			M	Gayo Hula	
3.	ROBA GARBA		0721221956	M	Maito	
4.	Halkano Dida		0727749158	M	Sago Bon	
5.	Salesa Qacheya		0727458946	M		
6.	Tura Waino Adano	36420849	0702029419	M		
7.	Abudho Ali		0712403932	M		
8.	Ali Galgallo	27559282	0716265753	M		
9.	SORI Ramata.			M		
10.	Galgallo Ali Elema		0799978692	M		
11.	Abudho Ramata Isaac	21779899	0717058992 0799978692	M		
12.	Tura Gayo Bon			M		
13.	Bakayo Gayo Gecha			M		
14.	Elema Afaro		0746696660	M		
15.	Gayo Sora Galgallo			M		
16.	Ei Ibrae Jarso Isacko			M		
17.	Roba Bon Ife			M		
18.	Elema Kattelo			M		
19.	Hussein Wario Adano		0703676527	M		

20.	Barile Chaffi Galgallo	8204002	0745548938	M		Bfalto
21.	Wario Chamua			M		
22.	Barillo Ali Arfalla			M		
23.	Jarso Guyo Halake			M		
24.	Baile Ulufa Oroda			M		
25.	Roba Godana Kite			M		
26.	Shama Jarso Isacco			M		
27.	Roba Mamo Arankosa			M		
28.	Boya Koso			M		
29.	Shamo ~~Soble~~ Katelo Athalo	0065152	0714024545	M	Central	[illegible]
30.	Umuro Esgamso			M		
31.	Boya Ukura Komba			M		
32.	Dengo Koromto Adhi			M		
33.	Elema Aroro			M		

34.	Guracha Adano Dadhi			M		
35.	Umuro Bashuna Iffo			M		
36.	Boru Katello Boru			M		
37.	Bagajo Katello Ayicha			M		
38.	Bonaya Sora Galgallo			M		
39.	Elema ABio Abano			M		
40.	Huka Dabello Adano			M		
41.	Guyo Bashuna Galgallo			M		
42.	Elema Dida Elema			M		
43.	Isacco Damballa Huqa			M		
44.	Gababa Guyo Boru			M		
45.	Molu Elema Sora			M		
46.	Abkul Wario			M		
47.	Barako Elema Dadacha			M		

48.	Luka Hugha Chepe			M		
49.	Tanda Barako Tuna			M		
50.	Jillo Kofo			M		
51.	Mamo Dida Abmu			M		
52.	Shamo Boru Katello			M		
53.	Boraya Ibrae Jillo			M		
54.	Qura Adhi Golbo			M		
55.	Adano Shamamo Boru			M		
56.	Bule Elema			M		
57.	Barako Kacko			M		
58.	Galgallo Elle Docata			M		
59.	Elema Galgallo Dida			M		
60.	Hussein Wario			M		
61.	Dolo Koso Mamo		0702563	M		

62.	Kushi Sake			M		
63.	Umuro Doti Elema			M		
64.	Gur Dabello Adano			M		
65.	Leta Ibrae Gorai			M		
66.	Shae Elema Lokho			M		
67.	Boru Dabello Adano			M		
68.	Mata Sora Galgallo		0723634100	M		
69.	Roba Gonne Koso		0700142315 ~~0723634100~~	M		
70.	Boru Abio Abano			M		
71.	MARTIN UMURO GANDA	30476215	0790235894	M	GALAS	[signature]
72.	Rebecca Munia	807796	0723822283	F	MOE	[signature]
73.	GIDEON GESILE JARSO	2575891	0716894490	M	MOE	[signature]
74.	ROSELINE NJERU		0720571017	F	KPLC	[signature]
75.	Jacob Cheptkwony	22589704	0702945714	M	MoE	[signature]

76.	Sulayman Garawdile	28884008	0713563981	M	County	[illegible]
77.	Samuel Mbugua	22288101	0720958314	M	KPLC	[illegible]
78.	Rebecca Muiru	11307776	0723822570	F	Mo-	[illegible]
79.						
80.						
81.						
82.						
83.						
84.						
85.						
86.						
87.						

List of Attendance for the Men Focus Group Discussion

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 ....GAS........MINI-GRID..................

MEETING VENUE.....GAS......BARAZA...PARK

DATE...23/1/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD MEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	Adano Shaamo	11386829	0799168514	M	Kalacha Hayrda	A.S. Bora
2.	Hussein Wario	22729266	0710574586	M	"	[illegible]
3.	Baraya Ibrae	8204844	0714138140	M	Sago Boru	
4.	Luka Huka Choke	0266405	0701194853	M	[illegible]	[illegible]
5.	Guyo Wario	0631455	0701331968	M	Kalach Hayrda	[illegible]
6.	Elema Mirro Sora.	9560678	0718203518	M.	Hewrda	[illegible]
7.	Boya Ukar		0715251389	M	Sago Boru	
8.	Barile Aluta	26108916	0780219661	M	Roba Galana	[illegible]
9.	Mamo Dida		0712878840 9	M	SagoBoru	
10.	Kushi Sake	22765422	0712400008	M	Roba Godana	
11.	Mamo Dida	20814094	0714688279	M	Roba Godana	
12.	Mamo Guracha		0794057 985		Kalacha Hayrdha	
13.	Hussein Wario		0710134140	M	Kalacha Hayrda	
14.	Barako Badho			M	Kalacha Hayrda	
15.	Barako Elema			M	Dabello Adano	
16.	Gonicha Roba			M	Sago Boru	
17.	Hulla Dabello			M	Dabello Adano	
18.	Bulle Elema			M	Dabello Adano	
19.	Elema Danso			M	Sago Boru	

20.	Umuro Roba			M	Hayucha Guyo	
21.	Boru Kateto			M	Kateto Haycha	
22.	Guyo Boru			M	Kateto Haycha	
23.	Tura Mamo			M	Hayucha Guyo	
24.	Molu Hako			M	Abyatha Guyo	
25.	Ibrae Jarso			M	Sado Boru	
26.	Wanchora Udha			M	Roba Rodas	
27.	Shano Kateto	0065152		M	Sado Boru	
28.	Tura Duba	36989428	07128666 29	M	Sado Boru	
29.	Samuel Mbugua	22657101	0720883[illegible]	M	KPLC	
30.						
31.						

List of Attendance for the Women Focus Group Discussions

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 ...GAS MINIGRID.....

MEETING VENUE...GAS CENTRE...

DATE...23/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD WOMEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	Buke Wario Godana		0792665632	Female	Galesa	
2.	Sabdio Halkano		0781610794	Female	Galesa	
3.	Kuifa Ulifa Oradha			Female	Galesa	
4.	Habiba Pandya Halake	0505698	0799722694	Female	Galesa	
5.	Gumato Ibrae Roni		0715183133	Female	Galesa	
6.	Arbe Wario Koso	20320157	0713608124	Female		
7.	Gumaro Jario Isacko		0792663961	Female		
8.	Bucha Sora Shire		0729058582	Female		
9.	Gare Bashuna		0791070395	Female		
10.	Gumaro Baroko		0742870641	Female		
11.	Covie Shama Jario		0741428390	Female		
12.	Jattane Ruthi Wario		0703896925	Female		
13.	Jillo Roba Guca	21506738	0724690830	Female		
14.	Robe Dallana		0703678503	Female		
15.	Jattane Sharane Bora	26108926	0715140508	Female		
16.	Tatale Wario Dido		0713769183	Female		
17.	Boicha Dub Huka		0716275529	Female		
18.	Midira Dange Elema		0712253891	Female		
19.	Lago Damocha Ibrae		0792663962	Female		

20.	Dibo Barila Boru		0702913846	Female		
21.	Wari Gane Umuro		0742378210	Female		
22.	Jillo Barako Mamo		0717918163	Female		
23.	Talaso Barako Isacko		0742570842	Female		
24.	Adhi Boru Gonicha		0719549443	Female		
25.	Talaso Boya Boru			Female		
26.	Kame Gane Wario		0726139104	Female		
27.	Sabdia Gonicha Roba		07	Female		
28.	Daro Dulacha		0792665630	Female		
29.	Lago Barako Elema	12432413		Female		
30.	Guttu Kamotte		0707925316	Female		
31.	Chachu Roba Isacko		0799164298	Female		
32.	Badhole Dida Elema	26176200	0711159969	Female		
33.	Roba Karello Molu	30814127	0701424005	Female		
34.	Jibo Basmana		0707226295	Female		
35.	Gumato Abudho Guyo		0707933474	Female		
36.	Tattane Shama Ushu		0716856321	Female		
37.	Dabo Diba Sharamo		0701695584	Female		
38.	Talaso Ibrae Doti	12432168	0793593584	Female		
39.	Kame Karello Ibrae		0714771934	Female		
40.	Ture Sharamo Boboo	12432439	0718634866	Female		
41.	Gumato Gorme Karo		0712388908	Female		
42.	Boti Barayo Guyo	22814166	0702909009	Female		
43.	Gumato Galgallo Mamo	23837882	0722571108	Female		
44.	Talaso Jillo		0717172012	Female		
45.	Dida Dullo Dido		0704096838	Female		
46.	Dibo Halkano Aboo	22762120	0702912459	female		
47.	Talaso Jillo Adano	26125720	0717172012	female		

48.	Robe Dambala Gafana	21779288	0796178420	F	Matcha	
49.	Rosie Njeru		0725571017	F	KPLC	
50.						
51.						
52.						

List of Attendance for the Youth Focus Group Discussion

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 ....GAS MINI-GRID.....

MEETING VENUE....GAS BARAZA BRK.

DATE...23/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD YOUTH

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	WOTO WARIO KOSO	36420831	0790052486	M	Galas	
2.	MOLU WATO	32732290	0794814977	M	Galas	
3.	Abudho ALI	0066653	0712403932	M	Galas	
4.	P KATELLO SAKO	35510597	0705375[illegible]	M	Mate	
5.	GOBA ABUDHO IBRAE	28871929	0769759460	M	Galas	

6.	ELEMA KATELLO MOLU	28871895	0796590660	M	Galas	
7.	ALI GALGALLO	27559282	0716265753	M	Galas	
8.	TURA WARIO BOCHO	36420844	0722444694	M	Galas	
9.	DENGE BONAYA ADHI		0742209093	M	Galas	
10.	MARTIN UNUR CHISOA	30[illegible]6215	0790275[illegible]	M	GALAS	
11.	GIDEON GESILE JALLE	29718031	0714894[illegible]	M	MOE	
12.	Jacob Cheptumbony	29589704	0722945714	M	MoE	
13.	Rebecca Mumia	11317716	0723[illegible]	F	MoE	
14.						
15.						
16.						

Appendix 5: Abbreviated Resettlement Action Plan (A-RAP)

1. Gas Sub-project Site

The Gas sub-project site is on unregistered community land and held in trust by the County Government of Marsabit 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, utilized by the community for grazing. Consultations leading to the identification and selection of the sub-project site are captured in the Environmental and Social Screening report for Gas. *Refer to Chapter 5 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 8000 (approximately 1000 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 0.6734Hectares 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 2.6 of the ESIA for* land tenure.

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 Gas community proposed water treatment plant, borehole repair and provision of fresh water. 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 Gas 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 23rd 2021	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).	We have a place (land where to set the Mini-grid) and sometimes our livestock come near the homesteads can the Mini-grid affect them	The Mini-grid site will be fenced off to keep of the public and other animals from access. The low voltage lines for the distribution are at a height above the ground supported by posts.
January 19th 2022	Environmental and Social Impact Assessment.	Consultants MoE KPLC REREC	Land acquisition through compulsory acquisition (not voluntary land donation). Selection of three priority community	Community requested for water treatment plant, borehole repair and provision of fresh water.	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.

			projects, whereby one is to be implemented as in-kind 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 6 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 6: Firm & Lead Expert's Practicing Licence

1. Firm of 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/EAPL/18163

Application Reference No: NEMA/EIA/EL/23020

M/S **Norken International Limited**
(individual or firm) of address
P.O. Box 9883 - 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

2. Lead Expert's Practicing Licence

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/ESPL/18279
Application Reference No: NEMA/EIA/EL/23981

M/S **Isaiah Kegora**
(Individual or firm) of address
P.O. Box 860 - 20200 Kericho

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert General**

registration number **1893**

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.