THE WORLD BANK

MINISTRY OF ENERGY
Republic of Kenya

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

ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED SEREOLIPI OFF-GRID SOLAR PROJECT (GPS: 1° 7'46.14"N, 37°36'12.96"E)

2023

Norken International Limited

Centric Africa Limited.

CERTIFICATION

This ESIA project report for the proposed Sereolipi Off-Grid Solar Project was prepared in accordance with the Environmental Management and Coordination Act (EMCA), 1999 and the Environmental (Impact Assessment and Audit) regulations, 2003 and their subsequent amendments EMCA (amendments), 2015 and EIA/EA regulations (amendments), 2019, the World Bank operational procedures (OP) and Environmental Safeguards Standards (ESS) for submission to the National Environment Management Authority (NEMA). We hereby certify that to the best of our knowledge and belief, the information and particulars provided in this report are correct and true. Further, it reflects the views provided by various stakeholders and village elders at Sereolipi, Samburu County.

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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.

ACKNOWLEDGEMENT

The ESIA/Audit Experts are grateful to the project proponent for commissioning this Environment Social Impact Assessment. We would like to acknowledge with great appreciation Sereolipi community members who were involved in the public participation and consultation process, for their cooperation throughout the exercise. We further acknowledge the support, either direct or indirect, from the various parties who assisted the ESIA/EA experts' team towards the successful completion of this ESIA report. They include environmental experts from the Centric and Norken consortium**.** Finally, the consultant wishes to acknowledge and appreciate the efforts and inputs by MOEP, the Implementing Agencies (KPLC and REREC), and the World Bank Group teams in reviewing this report.

LIST OF ACRONYMS

A-RAP	Abbreviated Resettlement Action Plan
CBO	Community Based Organization
CDI	County Development Index
CGRC	County Grievance Redress Committees
CoC	Code of Conduct.
Covid 19,	Coronavirus Diseases 2019
CPR	Comprehensive Project Report
CPS	Country Partnerships Strategy
CRA	Commission on Revenue Allocation
DOSHS	Directorate of Occupational Safety and Health Services
ECD	Early Childhood Development
EHS	Environmental and Health Standards
EMCA	Environment Management Coordination Act
EPRA	Energy and Petroleum Regulatory Authority
EPT:	Energy and Petroleum Tribunal
ESI	Electricity Supply Industry
ESIA	Environmental and Social Impact Assessment
ESM	Environmental and Social Management
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FGD	Focus Group Discussions
GBV	Gender Based Violence
GDC	Geothermal Development Company
HIV/STD	Human Immune Deficiency syndromes/Sexually transmitted diseases
IA	Impact Assessment
IEC	The International Electrotechnical Commission
KETRACO	The Kenya Electricity Transmission Company
KII	Key Informant Interview
KPIs	key performance indicator
KOSAP	Kenya Off-Grid Solar Access Project
KPLC	Kenya Power and Lighting Company
LEP	Labor & Employment Plan
LGRC	Locational Grievance Redress Committees
MoEP	Ministry of Energy and Petroleum
NEMA	National Environmental management Authority
NGOs	Non-Government organizations
NGRC	National Grievances Redress Committee
NLC	National Lands commission
OP	Operation procedures
OP/BP	Operational Procedures/bank policy
PAPs	Project-Affected Persons
PLWDs	People living with disabilities
REREC	Rural Electrification and Renewable Energy Corporation
RPF	Resettlement Policy Framework
SA	Social Assessment
SEA/SH	Sexually Exploitation Activity/Sexual Harassment
TSC	Teachers Service Commission
VMGs	Vulnerable and Marginalized Groups
VMGF	Vulnerable and Marginalized Group Framework
WB	World Bank's

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EXECUTIVE SUMMARY

E.1 E-1- Introduction and Project Brief

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

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

In Samburu County, one of the target counties, the Proponent is proposing to develop 9 No. mini grid facilities including Sereolipi 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 Sereolipi 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

Sereolipi 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 is located in the Waso ward of the Samburu East subcounty of Samburu County, which has a semiarid environment, erratic rainfall patterns, and limited natural resources. Lack of water is a major problem that affects both the local populace and cattle. The vegetation is mainly made up of prickly bushes, arid-adapted grasses, and plants that can withstand drought. The environmental problems have been made worse by overgrazing and deforestation, which have caused soil erosion and land degradation. Due to a lack of fertile soils and inadequate irrigation infrastructure, agricultural activities confront challenges.

The project area's geography is varied, with wide plains, a few low-lying hills, and sporadic rocky outcrops. It is a piece of an undulating, semi-arid environment. While the hills offer some relief and shelter, the flat plains provide area for livestock to graze. The uneven topography, however, affects water runoff and drainage patterns, posing problems for agricultural and water management. The project site is essentially flat.

The Samburu are the main ethnic group in the project region. Samburu pastoralists live a semi-nomadic lifestyle. They converse in a language called Northern Maa, a member of the East Nilotic family and a close relative of Ilchamus. Most members of the Sereolipi group are nomadic pastoralists who travel with their animals in search of pasture and water. The community does not engage in farming or other agricultural activities. The hard climate and insufficient water supply in Sereolipi are the main causes of the adverse crop-growing environment.

High rates of poverty, unemployment, and restricted access to basic amenities like healthcare and education define the region. The main economic activity are livestock herding and small businesses, however there are little chances for the economy to flourish. There are still gender gaps in decision-making and economic empowerment for women. To satisfy the needs of the community, infrastructure development, including roads, electricity, and water supply, is insufficient.

E-6 Project Description

The Sereolipi Mini Grid project aims to provide electricity to approximately 699 residential and 12 nonresidential consumers in Sereolipi Village in the Waso ward of the Samburu East subcounty of Samburu 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 826,932.50, although this amount may change as more detailed plans are developed.

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 project utilizes solar panels with a total capacity of 200

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 200 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 130 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 49 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 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 Sereolipi Mini Grid approximately 1.207 hectares of land will be acquired from the community in line with the national laws and World Bank provisions. In accordance with the World Bank's Operation Policy (OP) 4.12 on Involuntary Resettlement, an abbreviated Resettlement Action Plan (A-RAP) was prepared, outlining the principles and procedures for land acquisition and compensation. This plan is annexed to this ESIA.

E-7 Project Alternatives

Solar energy is identified as a non-polluting and site-specific option, and the proposed site for Sereolipi 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 (KP). 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 February 6th, 2022, a total of 49 stakeholders attended. The meeting provided an opportunity to discuss project details, including the preliminary design, positive and negative impacts, and mitigation measures. Stakeholders were encouraged to share their views and provide feedback on the project.

Some of the requests made by stakeholders included:

- giving the locals first priorities for the anticipated job opportunities as part of the project;
- women should also be encouraged to access the opportunities and benefits from the project;
- and Continuous sensitization and education of the community members regarding the structure of the project

The study team addressed these concerns by ensuring stakeholders that their feedback will be taken into account. They also announced that extra projects for the community would be conducted as compensation, based on their priorities. Additionally, public facilities like as schools, health centers, and boreholes would be connected to the power grid.

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 02: 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 03: 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 04: 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, kerosine and wood fuel usage	Positive	Positive
Education	Positive	Positive
Health benefits	Positive	Positive
Improved standard of living	Positive	Positive
Security	Positive	Positive
Communication	Positive	Positive
Soil environment	Minor	Negligible
Waste generation and management	Minor	Negligible
Water environment	Negligible	Negligible
Landscape and visual impacts	Minor	Negligible
Increased oil consumption	Minor	Negligible
Increased storm water flow	Minor	Negligible
Fire outbreaks	Moderate	Minor
Water demand	Negligible	Negligible
Sanitary waste	Negligible	Negligible
Flooding	Negligible	Negligible
Noise and Vibration	Negligible	Negligible
Electric and magnetic fields (EMFs)	Negligible	Negligible
Dust Emission	Negligible	Negligible
Vehicle Exhaust emission	Minor	Negligible
Collision and electrical hazards from distribution infrastructure	Minor	Negligible
Occupational safety and health	Moderate	Minor
Community safety and health	Moderate	Minor
Gender based violence, SEA and SH	Minor	Negligible
Exclusion of VMGs, Vulnerable individuals and households	Major	Minor
Risk of communicable diseases	Minor	Negligible
Shocks and electrocution	Moderate	Minor
Risks related to poor and inadequate stakeholder engagement (conflict)	Minor	Negligible

E-10 Environmental and Social Management and Monitoring Plan

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

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

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

For the mitigation measures to be successful, it is imperative that the Kenya Power and Lighting Company (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 energy sector plays a critical role in the socio-economic development of a country. Kenya is committed to universal access to modern forms of energy by year 2030, as articulated in the national economic development blueprint, the Vision 2030 (the Vision). The goal of the Vision is to make Kenya a middle-income country enjoying a high quality of life by the year 2030. The objectives of the Vision have been adopted as GoK's national development objectives. Under this Vision, Kenya expects to achieve an economic growth rate of 10 % and above.

Energy is identified as a critical enabler of this vision. Currently, only 45% of the households (4.3million), have electricity access from the national grid or mini-grids. The electrification rate is planned to be increased to 70 % by 2017 and 100 % by 2030. To attain these goals, policy and regulatory frameworks have been articulated for the energy sector through energy policy (Sessional Paper No.4 of 2004) and the Energy Act of 2006. A draft Energy Bill 2013 is under consideration.

The government has strategies to accelerate access to modern energy services through public and private initiatives. The government, with support from development partners, has allocated substantial resources for development of energy infrastructure including exploitation, transmission and distribution.

The Ministry of Energy and Petroleum (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. Samburu county was identified as one of the underserved Counties and others include Mandera, Narok, Garissa, Tana River, Marsabit, Isiolo, Wajir, West Pokot, Turkana, Taita Taveta, Kwale, Kilifi and Lamu.

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

KOSAP directly promotes the achievement of these objectives by supporting the use of solar and clean cooking Solutions to drive electrification of households (including host communities), enterprises, community facilities, and water pumps in Samburu County as one of the counties in Kenya that have been defined as "marginalized areas" by the Commission on Revenue Allocation (CRA) and the Constitution of Kenya, 2010. CRA defines these as "communities that have been excluded from social and economic life of Kenya for different reasons" and "geographic location (county or sub-county) where significant populations of underserved communities live" (CRA, 2013).

The 14 underserved counties collectively represent 72 percent of the country's total land area and 20 percent of the country's population. Their population is highly dispersed; at a density four times lower than the national average. 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 a registered community land in Sereolipi village, Waso ward in Samburu East sub county of Samburu County at GPS coordinates latitude 1° 7'46.14"N and Longitude 37°36'12.96"E. The proposed project site is 35km North-East of Wamba Village and 185km from Maralal town. It can be accessed via Isiolo -Marsabit Road (A2).

The solar mini grid will contain Solar panels, batteries, invertors, perimeter fence and length of distribution line to cover a circuit of approximately 15.38 km.

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

This was the first stage when the proposed project was evaluated, guided by EMCA (1999), the EMCA (amended) Act of 2015 and the Environmental and Social Management Framework (ESMF) of 2015. Electricity development activities are listed under schedule 2 of EMCA, 1999 among projects requiring EIA before commencement. 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 Ministry of Energy on 12th July 2021 followed by subsequent online meetings and discussion on various aspects of the project up to 5th August 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 Samburu County at the mini-grid site level. This will be based on ecological surveys, key performance indicators (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. Tools used for the baseline data collection was inclusive of interviews, questionnaires, checklists and photos.

1.4.4 Impact Assessment (IA) 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 Sereolipi 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 2 is a summary of the methodology the firm will adopt in undertaking environmental and social impacts assessment for the proposed KOSAP project

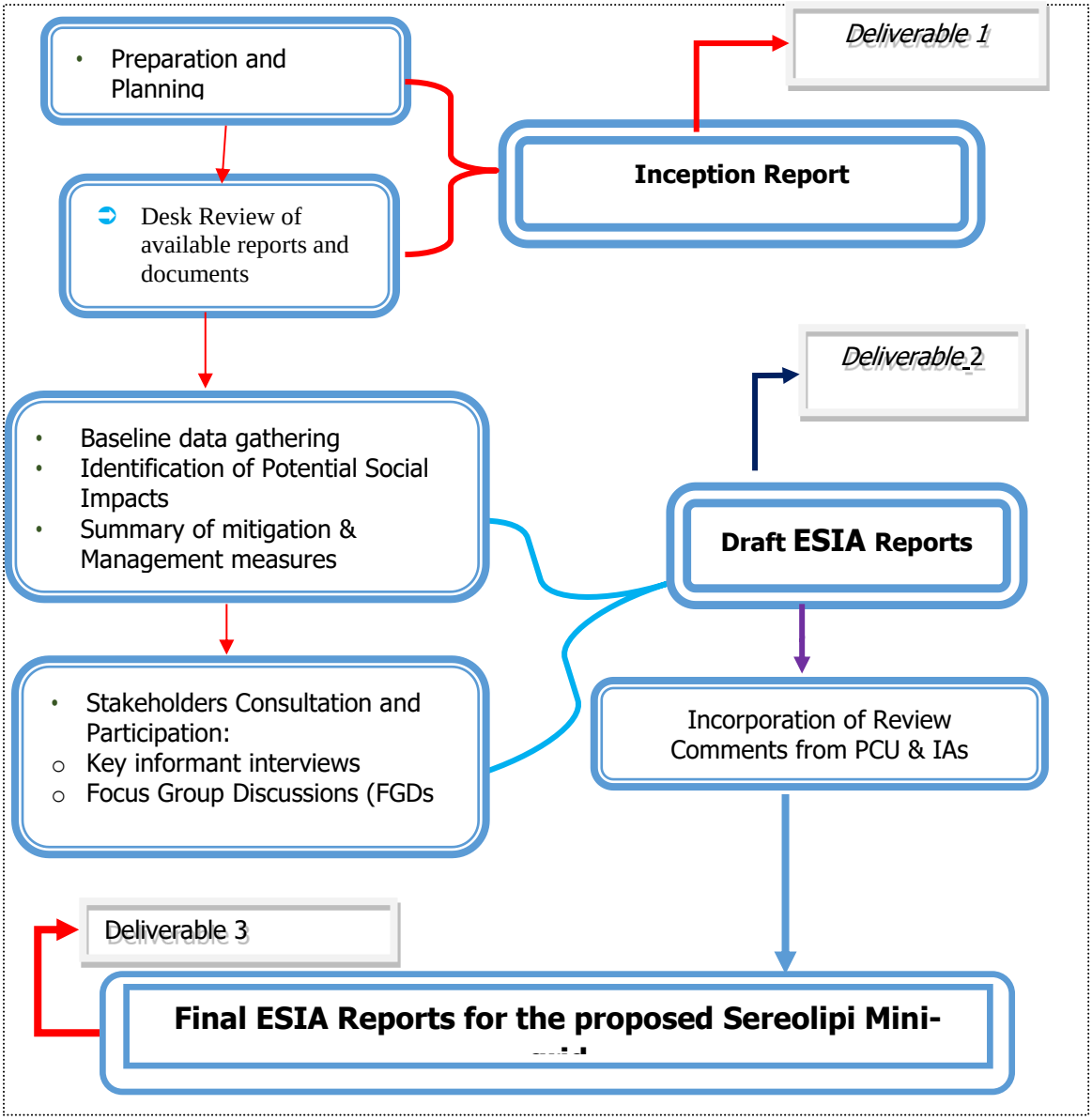

Figure 1: Summary of Environmental and Social Impact Assessment Methodology

1.5 ESIA Study Team

The ESIA study team was composed of the following team members;

Table 1: The ESIA Study Team

S/No.	Name	Designation	Organization
1.	Wyclef Ngure	CREO	KOSAP (Samburu County)
2.	Mark Oyier	Senior Superintending Engineer	MoE
3.	Samwel Olela	Environmental Specialist	REREC
4.	Allan Owino	Environmental & Social Specialist	Centric Africa Ltd
5.	Patrick Mwangi	Environmental & Social Specialist	Centric Africa Ltd
6.	Matthew Mutua	Environmental & Social Specialist	Centric Africa Ltd
7.	Umulkheir Abdi	Environmental & Social Specialist	Centric Africa Ltd

1.6 Limitations

The limitation experienced during the study are illustrated below.

- ✓ The communication barrier. It was mitigated through having a translator on the team
- ✓ Due to insecurity concerns that was being encountered at Sereolipi the public meeting was delayed in attendance. The study team however managed to conduct the public meetings successfully.

1.7 Layout of the Report

Table 2: Structure of the ESIA Report

SECTION	TITLE	DESCRIPTION
Section 1	Introduction	(*This section*) Introduction to the Project and ESIA scope and methodology adopted.
Section 2	Project Description	Technical description of the Project & related infrastructure and activities.
Section 3	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	Baseline settings-Environmental, Ecology and Social Baseline	Outlines Environmental, Ecology and Social Baseline status in the study area of the Project
Section 5	Stakeholder Engagement	Provides an overview of the stakeholder engagement activities undertaken during the ESIA, stakeholder categorization and profiling Additionally,
Section 6	Grievance Redress Mechanism	It details the provision of Grievance Redress Mechanism for the project
Section 7	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 8	Environmental and Social Management Plan	Outline of the ESMP considering identified impacts and planned mitigation measures and monitoring requirements.
Section 9	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 3: Component of the proposed Solar Mini-grid

S/NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project is located 35km North-East of Wamba Village and 185km of Maralal town at Sereolipi village, Samburu East subcounty in Samburu County at coordinates of latitude 1° 7'46.14"N and Longitude 37°36'12.96"E. The proposed solar mini grid will be located on a portion of land communally owned by the people of Sereolipi area. The solar mini grid will contain Solar panels, batteries, invertors, perimeter fence and length of distribution line.
2.	Proponent	Ministry of Energy
3.	Administrative location	Sereolipi sub location, Samburu East subcounty, Samburu County
4.	Location Coordinates	latitude 1° 7'46.14"N and Longitude 37°36'12.96"E
5.	Mini grid Capacity	- PV Capacity of 45kwp; 500kWh Battery
6	Energy Demand	Monthly energy demand of 18,780 kWh and daily energy demand of 626 kWh
7	Generator & Fuel Tank	The generator capacity of 200kV and the fuel tank for diesel generator of 2000 liters.
8.	Mini grid Power	LV Circuit of 31 km
9.	Climatic condition	The county has annual mean temperature of 29°C with the maximum range being 33°C and minimum of 24°C. It has a bi-modal rainfall pattern. The County Experiences Tropical climatic conditions. The driest months are January and February. The long rainy season falls in the months of March, April and May. Apart from South Horr and Wamba areas, short rains occur during the months of July and August, sometimes extending into September. At Wamba and South Horr areas, the short rainy season is usually delayed and occurs in October and November and sometimes extends into December. The southwest plains and the Lorroki Plateau receive between 500 mm and 700 mm of rain annually. The Nyiro and Ndoto Mountains and Matthews range receive the highest amount of rainfall between 750 mm and 1250 mm per annum. The central basin and the plains east of the Matthews Range are the driest parts of the county with annual rainfall of between 250 mm and 500mm.
8.	Average Elevation	The County falls on the northern interface between highlands and lowlands. The highest parts of the plateaus are the Kirisia Hill, rising to 2000m above sea level. South and west of Mount Nyiro are peneplains which have been eroded to plains of lower levels ranging from 1000-1,350 m above sea level.
9.	Site Conditions	The side is generally in open area with minimal *fauna* and *flora*.
10.	Road Accessibility	The project site is accessed via Isiolo-Marsabit Road (A2)
11.	Nearest Airport	Isiolo International Airport at about 101km
12.	River/canal/nallah/ pond present in project footprint	Sereolipi River approximately 500m from the trading centre. The river is seasonal.

S/NO.	PARTICULARS	DESCRIPTION
13.	Protected areas (National Park/ Sanctuary)/ Forest land within 10 kms	none

2.2 Project Location

The project site is at Sereolipi village in Waso ward, Samburu East subcounty in Samburu County at coordinates latitude 1° 7'46.14"N and Longitude 37°36'12.96"E. The proposed power plant will be constructed on a portion of a registered communal land (Sereolipi Group Ranch).

The site soil is primarily sandy within the area. The project site is approximately 35km from Wamba town, 185km East of Maralal town and 97km from Isiolo town

Plate 1. Proposed site for the Sereolipi Solar Mini-grid

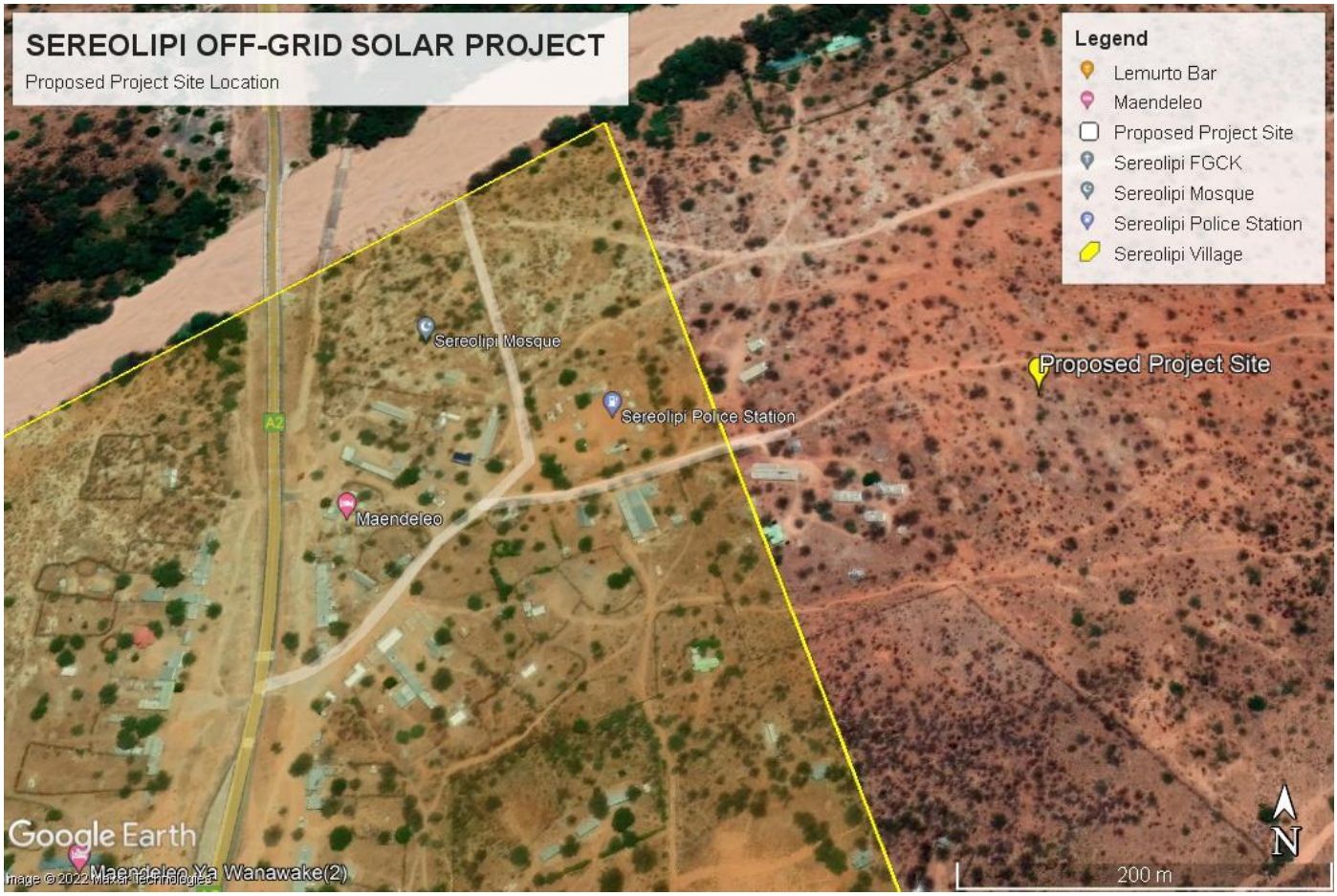

Figure 2: Project location

2.2.1 Project site setting

The proposed Sereolipi mini grid is in Samburu East Sub County, Samburu County. The project site falls under cluster 3 of LOT 2 characterized as Subproject sites in overwhelming/majority VMG counties (mostly pastoralist counties) with a unregistered community land, however Sereolipi is located on a registered community land. There is a total of 9 proposed mini grids in Samburu County. Geographically, Sereolipi proposed site falls on coordinate latitude 1° 7'46.14"N and Longitude 37°36'12.96"E.

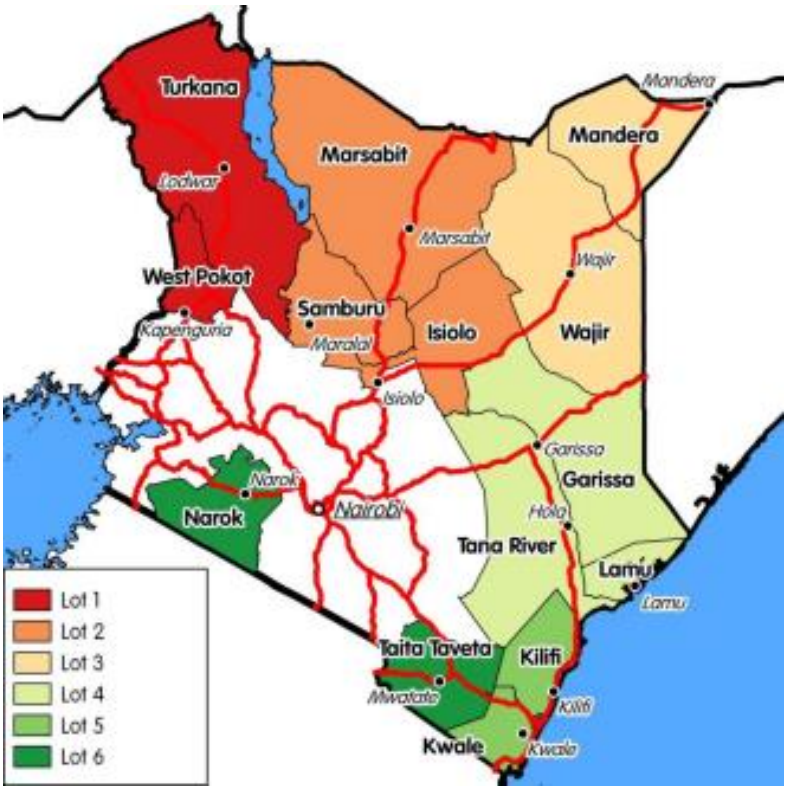

Figure 3: Map showing the KOSAP Counties Lot 2

2.3 Description of Project Facilities, Components and Activities

2.3.1 Technical aspects of Solar Mini grid

Sereolipi is among the beneficiaries of the KOSAP based on an aerial survey done in 2019 and has a potential customer base approximated at 1800 households within the Sereolipi area, and a 48 kWp solar Mini-grid to supply power to the community will be installed. 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 noise rating for the inverter and the diesel generator is 85-90dB.

2.3.2 Project Components

2.3.2.1 Transformers

The Project will use 500kWh batteries which will use step up transfers before being feed to the community grid.

2.3.2.2 Solar PV modules

The project will use PV 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.

2.3.2.3 Charge controllers

Remote monitoring system (SCADA) for synchronizing and controlling SPGP assets under a load-following will follow algorithm. Features are stated on the technical data sheet and the mini-grid controller shall be accessible and configurable both remotely and on-site

2.3.2.4 Solar batteries 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. The project will use 70kwh batteries. About 12 to 9 batteries will be used depending on the varied size of the batteries. A 500kWh Battery Capacity is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions.

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

2.3.2.5 Battery Inverters/Chargers

A 130kW battery inverter charger is employed to manage the energy flow to and from the battery storage system. The Inverters shall be designed for 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.

2.3.2.6 Distribution lines

Sereolipi site will have a distribution line circuit of km in total.

- LV circuit (km) 31
- PV Capacity 200
- Battery (kWh) 200

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

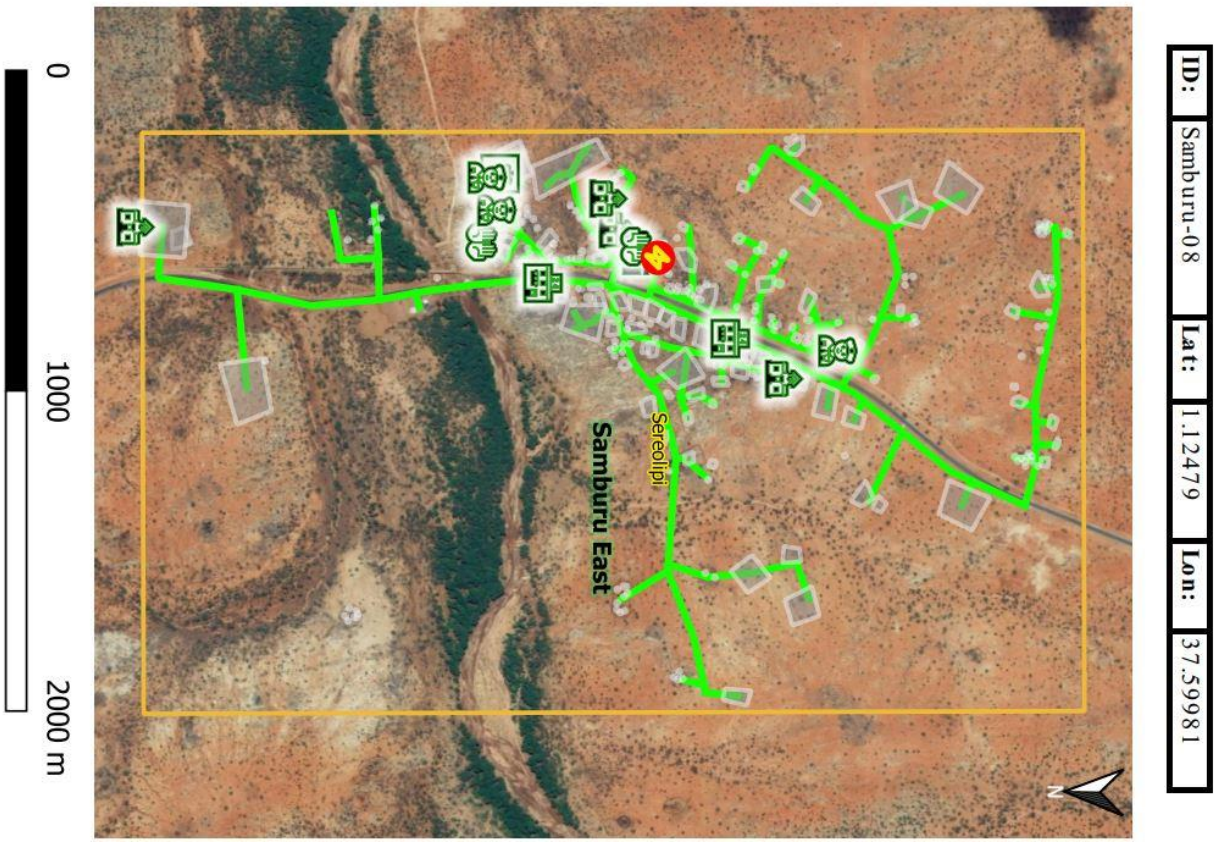

Figure 4: Powerlines Distribution Circuit in Sereolipi Area

Project Metrics:

Monthly Energy Demand: The project is expected to meet a total monthly energy demand of 18,780 kWh.

Daily Energy Demand: The average daily energy demand is approximately 626kWh, ensuring a consistent supply for the consumers.

Peak Demand: The peak demand of the system is 116 kW, which is the maximum power requirement during any given moment.

PV Capacity: The solar photovoltaic panels have a total capacity of 200kWp.

Battery Capacity: The Battery Energy Storage System has a capacity of 272kWh, providing energy storage and ensuring a continuous power supply.

Generator Capacity: The diesel generator has a capacity of 500 kVA, serving as a backup power source.

Fuel Tank Capacity: The fuel tank for the diesel generator can hold up to 2,000 liters of diesel fuel.

Estimated Project Cost:

The estimated cost of the Sereolipi Mini Grid project is approximately USD 826,932.50. It's important to note that this cost may be subject to change as more detailed plans and implementation phases are developed. The investment is expected to provide long-term benefits to the local community, improving their quality of life, economic opportunities, and access to modern amenities.

2.3.2.7 Commercial &public facility consumers

The solar mini grid will benefit business premises, Sereolipi police station, Sereolipi Health Centre, Sereolipi Mixed secondary School, Sereolipi Primary School and 699 residents and 12 nonresidents. The average consumption is estimated to be 19.9KWh/Month for North West residential and 1407.8KWh/Month for non-residentials.

2.3.2.8 Project cost

Sereolipi proposed project cost is estimated at **USD. 826,932.50**.

Sereolipi

Samburu - Samburu East

Commercial & public facility consumers			
School	3	Security	3
Religious	2	Commercial	2
Industrial	0	Medical	1
Mixed	0	Other Public Facilities	1
Commercial & public facility consumers list: Trade, General Clinic, Water Distribution, Worship, From Early Childhood Development Upto Primary Level 4, Primary Education Level, Sereolipi Ecd, Maintenance Law And Order, Maintenance Of Law And Order, Wildlife Protection			
Consumers			
Total Residential	699	Total Nonresidential	12
Average consumption in kWh/month			
AVG Residential (North West kWh/Month)	19.9	AVG Nonresidential (kWh/Month)	1407.8
Monthly kWh			
Total Residential (kWh/month)	13,910	Total Nonresidential (kWh/month)	16894
Mini-grid design characteristics			
LV circuit (km)	15.38	Demand (kVA)	120
PV Array (DC-kW)	230	Battery (kWh)	200
Generator (kVA)	140		

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 power plant.

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, 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 generator.

2.3.3.2 Land Tenure

To develop the Sereolipi Mini Grid approximately 1.01174 hectares of land will be acquired from the community in line with the national laws and World Bank provisions. Land ownership in Samburu County is mainly community land, public land and private land. The community land is further categorized as registered community land and unregistered community. The registered community land constitutes what is referred to us as Group Ranches. The site for the proposed project is on a **registered communal land (Sereolipi Group Ranch)**.

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.

2.3.3.3 Compensation Details

The process of acquiring land for the sub project is through compulsory land acquisition with just, prompt, and full payment of compensation in-kind. The value of the in-kind community project will be proportional to the value of the land taken and informed by the NLC valuation criteria.

The main key area for development activities identified by the community in Sereolipi area include;

i. Water reticulation of the water tanks, supply lines and water shops for the existing Sereolipi water project. There is need to distribute the water to three collection points with storage tanks at the trading centre and a distribution line to the watering facility for the cattle. The cattle watering facility is less than 10m from the borehole. The water project is located about 700m form the trading centre at coordinates latitude 1° 8'0.1"N and Longitude 37°36'3.3"E.

ii. The community also proposed for the entire fencing of Sereolipi Primary School as a secondary priority.

The estimated total cost of the compensation-project is 1 million shillings.

2.4 Resource Requirement

2.4.1 Workforce Requirement

A significant number of skilled, semi-skilled, and unskilled personnel will be required during the construction phase. During the operating phase, the following people will be needed: operations and maintenance chiefs, engineers, and technicians. Unskilled workers will mow the grass and clean the modules as needed during the project's operation period. Trained security guards will also be employed during the operations phase. Kenya Power Company will be responsible for conducting the operations and management through the O&M contractors for the first seven years.

2.4.2 Water Requirement and Source

2.4.2.1 Construction Phase

It has been estimated that approximately 50KL 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 supplied by a water tanker from the area water vendors.

The contractor has several options for accessing water in Sereolipi. The only sources of water in the village consist of two community boreholes which are within a radius of 1km from the center of the village. The area also has shallow wells.

2.4.2.2 Operation Phase

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

As previously stated, employees (direct and contractual) will be employed to work during the operation phase. For this workforce, approximately 10,000 Liters of water will be required monthly 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 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.

The contractor will make an effort to educate all employees about electrical safety. Increased awareness and communication about the importance of electrical safety will be emphasized throughout the workplace.

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.

Awareness and communication about the importance of electrical safety will be emphasized throughout the operation and maintenance phase.

The following fire-outbreak and electrocution preventive measures will be adopted during operation and maintenance;

- Before any electrical installation activity, the contractor will ensure that the individuals involved with it strictly follow safety measures and procedures and use proper tools and personnel protective equipment
- Keeping away from the energized or loaded circuits.
- Sources of electricity and exposed circuits will be guarded.
- Security will be provided at the site; two guards during the day and two during the night.
- A chain link fence will be installed to secure the solar mini-grid
- Neutralization Kits to be provided at all sites to manage acid spills
- Disconnecting the power source before servicing or repairing electrical equipment
- Damaged cords will be repaired or taken out of service immediately.
- Installing plastic or even steel rodent-resistant cable sleeve or rodent-proof wire cover to keep off rodents from gnawing the electrical cords
- A lightning conductor will be installed following proper guidelines and requirements of the mini-grid structure and geography of the location. The lightning protection system will need regular inspection to ensure proper functioning for effective lightning protection.
- Bypass diodes will be used on each solar panel to prevent hotspots from being formed. Regular cleaning of the solar panels will also be considered to reduce this effect.
- Firefighting equipment i.e., fire extinguishers will be provided on site to manage fire outbreaks
- Regular clearing of vegetation will be done to prevent undergrowth on site
- Damaged batteries will be temporarily stored separately at the site before proper disposal is done in Nairobi

2.4.6 Conclusion

The proposed project should be upheld to support the local community based.

2.5 Products, By-Products and Waste

The sections below provide an overview of the products, by-products and wastes to be generated by the project. Most of these will be generated during the construction phase of the project while some will be generated during the operation and decommissioning phases.

2.5.1 Construction Phase

The final product after construction phase is a modern Solar Mini-grid and its associated structures.

2.5.1.1 By-products

During the construction phase of the project no by-products is envisaged.

2.5.1.2 Waste

During construction the proposed project is anticipated to generate different waste which shall include:

2.5.1.3 Domestic Waste from the Construction Area

The workers will not be supplied with any forms of foodstuffs. They are expected to buy or carry their own food. Plastic bags and containers which the workers will use to carry their food are expected to increase within the site. Other forms of waste include sanitary waste and therefore the provision of sanitary facilities will need to be considered both for the site construction workers and any other person coming to site.

2.5.1.4 Site Construction Waste

The project will generate waste from the site construction activities which includes:

- Excavated soils and vegetation;
- Construction equipment and maintenance wastes;
- Dust and fumes;
- Scrap metals;
- Packaging materials, etc.
- Metal cuttings generated from the construction activities
- Any excess construction materials brought to the project site by the contractor which can be reused later

2.5.1.5 Dust

The construction activities that will occur particularly during the site excavation process will generate dust and other particulates particularly during dry weather conditions that will be released into the atmosphere.

2.5.1.6 Smoke Emissions

The site machinery, equipment and trucks brought in by the contractor are expected to generate smoke emissions when in operation during the construction activities. The concentration of emissions will depend on the maintenance levels of the equipment, machinery and trucks used by the contractor.

2.5.2 Operation Phase

2.5.2.1 Products

The primary product of the proposed project during the operational phase will be electricity generated from Solar Mini-grid and distributed

2.5.2.2 By-products

The by-product anticipated to be generated during operational phase is used oil.

2.5.2.3 Waste

The wastes that will be generated will include;

2.5.2.4 Domestic Waste

Some of the domestic waste to be generated at the facility include waste paper and empty cans. Other waste will include sanitary facilities effluent which will directed to septic tank.

2.5.2.5 Process Waste

Some of the waste anticipated from the process will include used/ waste oil from stand by generator which will require to be managed well by ensuring containment of any spillage and incineration oily rags used during maintenance of generators. Solid waste will include faulty or obsolete batteries and solar panels, conductor and scrap metals during replacement which takes several years before being replaced.

2.5.3 Decommissioning Phase

2.5.3.1 Products and By-products

During the decommissioning phase it is expected that there will be no product. However, the by-products during decommissioning phase will include:

- Metal generated from the decommissioning of Solar Mini-grid and associated infrastructure; and
- Foundation materials which can be donated to individuals for reuse

2.5.3.2 Waste

During the decommissioning phase of the proposed project, several waste products are expected to be generated. These shall include:

- Remains of concrete from demolition of Mini-grid foundation
- Dusts and fumes;
- Scrap metals;
- Solar Panels
- Batteries
- Generator

2.5.3.3 Dust

The activities that will occur particularly during the demolition process will generate a considerable amount of dust and other particulates that will be released into the atmosphere.

2.5.3.4 Smoke Emissions

The demolition machinery, equipment and trucks used are expected to generate smoke emissions. The concentration of emissions will depend on the maintenance levels of the equipment, machinery and trucks used by the contractor.

2.5.4 Safety of the Facility

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

2.5.4.1 Natural Disasters

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

2.5.4.2 Malicious Damage or Theft

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

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

2.5.4.3 Hazard Risk Assessment

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

- Safety regulations
- Scope of the safety emergency plan
- Notification of local authorities
- Details of the proposed project
- Aim of the safety emergency plan
- Objectives of the study emergency plan
- Emergency arrangements, procedures and plans
- Roles and responsibilities in the event of an emergency
- Evacuation of people
- The role of local communities
- Regular testing of the safety emergency plan
- The risk assessment will include as a minimum:
  - A general process of the project being investigated
  - A description of the potential major incidents associated with that type of installation and the consequences of such incidents
  - An estimation of the probability of a major incident
  - A copy of the site emergency plan
  - An estimation of the damages in the case of an explosion or fire
  - An estimation of the effects of toxic gas releases.

- The potential effect of an incident on the project or part thereof or an adjacent project or part thereof.
- The potential effect of a major incident on any other installations, members of the public and residential areas.
- Meteorological tendencies
- The suitability of existing emergency procedures for the risks identified.
- Any requirements laid down in the OSHA 2007 and EMCA 1999.
- Recommendations regarding any organizational measures

2.5.5 Conclusion

The proposed project should be upheld to support the local community based.

2.6 Land Requirement and Procurement Process

2.6.1 Land Requirement

The land on which the proposed Sereolipi mini grid will be constructed at Sereolipi village.

2.6.1.1 Land Tenure

The site for the proposed project is on a **registered communal land (Sereolipi Group Ranch)**.

2.6.1.2 Compensation Details

The process of acquiring land for the sub project is through compulsory land acquisition with just, prompt, and full payment of compensation in-kind. The value of the in-kind community project will be proportional to the value of the land taken and informed by the NLC valuation criteria.

The main key area for development activities identified by the community in Sereolipi area include;

i. Water reticulation of the water tanks, supply lines and water shops for the existing Sereolipi water project. There is need to distribute the water to three collection points with storage tanks at the trading centre and a distribution line to the watering facility for the cattle. The cattle watering facility is less than 10m from the borehole. The water project is located about 700m form the trading centre at coordinates latitude 1° 8'0.1"N and Longitude 37°36'3.3"E.

ii. The community also proposed for the entire fencing of Sereolipi Primary School as a secondary priority.

2.7 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.

2.7.1 Power Scenario in Sereolipi

The community is not connected to the national grid. The population use mainly portable solar at the household and businesses for charging mobiles and lighting. Firewood and charcoal are used for cooking in homes.

Community facilities such as Sereolipi Health center and schools in the project area lack a reliable source of electricity which impedes delivery of health services that rely on electricity. This forces patients to travel for long distance in search of further medical help.

Similarly, schools in the project area cannot progress into digital learning due to lack of a reliable power source. Learning activities are mostly limited to day time hours as a result of no lightning.

2.7.2 Present Power Supply Position

According to Samburu County Integrated Development Plan (2018-2022), the main source of energy in the County is wood fuel (firewood in rural households and charcoal in urban households). An estimated 95% of the total population uses wood fuel. The residents also utilize petroleum products such as kerosene/paraffin, Liquefied Petroleum Gas (LPG) for domestic use, and petrol and diesel fuel for running vehicles and lister engines. This 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.

There are a total of 30 Trading Centres with 13 of them connected to electricity. Some 10 health centres and 40 schools have also been connected to electricity. Approximately 5,000 Households in the main centres are connected to electricity, they include: Maralal, Suguta marmar, Kisima, Loosuk, Loibor nkare, Porro, Wamba, Archer's post, Sere-olipi, and Baragoi, (KPLC, 2016). 250 number of Schools and 1200 Households use solar lighting. The county's lowlands record about 8-9 hours of sunshine per day with about 4-6 KWh/m² daily insulation.

The county has a huge potential for renewable energy which can tapped through wind and solar energy and hence be channeled to productive sectors within the county as well as export to other counties.

2.7.3 Alternative 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:

1 Geophysical Factors-Proximity to Hills-Shade effect, Soil erosion, Drainage of the area, Flooding etc.
2 Land identified is free from any dispute on ownership or any other encumbrances
3 Proximity to public utilities-Schools, Dispensaries, Places of worship and community settlements

4 No squatters, encroachers or other claims to the land
5 The Size of the Minigrid to be constructed and the optimal coverage of a Minigrid in terms of the number of people to be reached.
6 The Land identified should be on spaces set aside for public use within the community centres.

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

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

2.7.4 Alternative Sources of Power Generation

The possible alternatives to electrical energy could be solar power, wind power, thermal power, fossil fuel and firewood. Power import from neighboring countries is another option. Wind power is also a source of clean energy.

The problems in operation of wind power are lack of time series data of wind, trained human resources to intricate design of wind power etc. In addition, providing wind power for Sereolipi residents is technically and financially challenging.

Thermal power plants are associated with serious environmental problems like air pollution, waste pollution, noise pollution, temperature pollution etc. Besides coal and petroleum products, the basic input required for the conventional thermal power plants will have to be imported. Therefore, thermal power option based on coal and petroleum products is not a viable option for Sereolipi site.

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 thermal power options evaluated above seem inappropriate for Sereolipi site on environmental as well as economic grounds.

Solar energy was a desirable option because:

- It has low energy-production costs
- Versatile installation
- It is a clean source of energy hence minimal impact on the environment air quality
- Economic savings.

2.7.5 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 Sereolipi area and Samburu East subcounty 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 and crime 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.

2.7.6 Analysis of Alternative Construction Materials

The proposed project will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. The materials will include all consumables, tools, testing instruments or any other equipment required for successful commissioning of the project. This may not be desirable from a cost and durability perspective

2.7.7 Analysis of Alternative Technology

The technology to be adopted will be the most economical and one sensitive to the environment. The technology will involve a Battery Energy Storage System (including battery Inverter and charger).

There are three main PV technologies groups available in the market today; below is a brief introduction to each of these technology groups and a summary of their current market status.

- **Crystalline Silicon**: Crystalline silicon (c-Si) technologies are mainly represented by mono-crystalline (m-Si) and multi or poly-crystalline (p-Si) technologies. The mono-crystalline cells are made from very pure monocrystalline silicon.
- **Thin Film**: In these processes, photoactive semiconductors are applied in thin layers to a low-cost substrate (in most cases glass). Among other technologies are Cadmium-Telluride (CdTe) is dominating the thin-film market.
- **Hybrid HIT Cells:** The HIT solar cell is a combination of a crystalline and a thin-film solar cell. HIT (hetero junction with intrinsic thin layer) refers to the structure of these hybrid solar cells. This structure comprises crystalline and amorphous silicon, which is bonded with an additional un-doped thin-film (intrinsic thin layer).

The technology selected for the project will be polycrystalline silicon (p-Si). The final selection of technology will however be decided based on the bids presented during the tendering process after consideration of economic as well as performance characteristics of each technology. In the past, the higher efficiencies of c-Si modules compared to thin film modules has been a decisive criterion where space is limited as they tend to yield a greater power output capacity per unit area. A better yield (kWh produced per kWp installed) can be expected from thin-film technologies at locations with low irradiation conditions (high diffuse component of the GHI) or in areas of high ambient temperatures.

The main difference between mono crystalline silicon (mono c-Si) and poly crystalline silicon (poly c-Si) cells is the manufacturing process, their specific technical characteristics and price. Mono c-Si ingots grow uniformly from an initial crystal (seed), leading to an almost perfect crystalline structure. Poly c-Si is manufactured from the discharge of molten silicon into a module; this means that the crystalline structure is not uniform and the electrical conversion or efficiency of poly c-Si cells is typically lower than that of mono c-Si cells what explains its difference in price.

The proposed project will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. The materials will include all consumables, tools, testing instruments or any other equipment required for successful commissioning of the project.

2.7.8 Solid Waste Management Alternatives

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

2.7.9 Conclusion

The implementation of the subproject at Sereolipi village is the best alternative. It will support the use of solar and clean cooking solutions to drive electrification of households, enterprises, community facilities, and water pumps. This will help alleviate poverty and improve the community standards of living.

3 BASELINE SETTINGS- ENVIRONMENT, ECOLOGY AND SOCIAL

3.1 Study Area

Based on the secondary information of the region, the following baseline information on environment, ecology and social has been discussed under the sections below.

3.2 Environment Baseline

3.2.1 Geology and Soil

In the western parts of Samburu County, the soil is mostly Sandy loam soils. Kirisia area has sandy loam and sandy clay soils, which are lithosol (shallow stony soils) and cambisols. In the northern part of the County consisting of Baragoi and Nyiro areas, the predominant soil covers are bouldery cambisols and lithosol. The soils are particularly more stoney and rocky on the southern slopes of Mt Nyiro and Ndoto mountains. On the eastern side that include Wamba and Waso areas, is significantly covered by weakly developed soils, mostly sandy and low in organic matter and in some places in Waso Ward the soils are saline and sodic (mostly cambisols and solonetz).

3.2.2 Topography

The County falls on the northern interface between highlands and lowlands. To extreme west is Suguta Valley which is bounded on both sides by fault escarpments and floored by red clays, boulders and gravel fans. In the East of Suguta Valley, the County is characterized by repeated extensive high-level plateaus which have been built by repeated floods of lava from the Rift valley. The highest parts of these plateaus are the Kirisia Hill, rising to 2000m above sea level. In the North of Baragoi - Tuum and South –Horr axis, the area rises to Mount Nyiro tapers northwards and falls steeply southwards. South and west of Mount Nyiro are peneplains which have been eroded to plains of lower levels ranging from 1000-1,350 m above sea level. These are noticeable at Kawap and the area between Lodungokwe and Wamba continuing eastwards and southwards. These plains are covered by red soils and sands derived from the adjacent slopes by sheet erosion. East of the central plains are the Mathew Ranges and the Ndoto mountains forming discontinuous ranges tending towards north-south of the eastern side of the county. Apart from the Lorroki plateau and the mountain ranges of Nyiro and Mathews, the rest of the County is a continuous basin which slopes northwards to Lake Turkana and east of Mathew Ranges. The high altitude of the plateau and the mountain ranges has resulted in indigenous forests which are all gazetted and preserved for rain catchments.

3.2.3 Hydrogeology and Drainage

The physiography of the region influences the drainage pattern. The County fall in drainage areas number two (Kerio Valley) and number five (Ewaso Nyiro). Main water sources in the county constitute surface and ground water. The Ewaso Ng'iro River flows northwards about 30 km, then changes the direction to flow eastwards. After turning sharply east through the gap between the Mukogodo hills in the south and the Karissa hills in the north, the river flows through a 70m deep gorge for about 60 km in Barselinga. There are seasonal riverbeds or "laggas" in the project area which during rainy seasons are filled with runoff water, making roads impassable and often leaving the area cut-off from the rest of the county.

3.2.4 Ground Water Development

Ground water resources were majorly identified during the site assessment by means of observation and selected data hydrological model of the area. Sereolipi has a borehole water project which is solar powered, located about 700m form the trading centre at coordinates latitude 1° 8'0.1"N and Longitude 37°36'3.3"E. Borehole water is slightly salty and mostly used for household needs. The community also source their water for livestock from hand dug wells along the seasonal riverbeds or "laggas".

Plate 2: Sereolipi Water project

3.3 Ecological Conditions

Samburu County has diverse agro-ecological zones that include Upper Highland Zones (UH), Lower Highland Zones (LH), Upper Midlands Zones (UM), Lower Midland Zones (LM) and Inner Low Land Zones (IL).

Upper Highland zone covers an altitude of between 2,150 m to 2,600 m above sea level and receives an annual average rainfall of 900 mm to 1,000 mm. Temperatures range from 15.5°C to 19°C. The zone is suitable for Sheep, dairy cattle rearing as well as wheat and barley and forestry farming.

UH 2 m I vs/s are suitable for wheat and pyrethrum production. However, most of this zone is very small, steep and found in forest reserve. The areas hosting such zone include Amaya in Suguta Marmar, parts of Losuuk, Poro and foot of mountain ranges in the County. This zone covers an altitude of 1,800 m to 1,980 m above sea level and receives an annual average rainfall of 750 mm. Temperature varies between14.8°C and 17.5°C. The dominant land use practices are agriculture and the dormant crops are maize and sorghum cultivation and also livestock keeping. LH 3, LH 4 and LH 5 which are wheat-maize-barley, cattle-sheep-barley and Lower Highland Ranching zone are found in Losuuk/Poro, Poro/Maralal and Maralal/Lodokejek wards respectively.

Lower midlands cover an altitude of below 1,300 m above sea level and have an annual rainfall of 720 mm and annual mean temperatures ranging from 22°C to 27°C. Sorghum, millet, and livestock farming is supported. LM 6 and LM 7 are lower midland ranching zones manifest itself in wards such as Nachola, Baawa, Wamba, Elbarta and in the foot of Mathew, Ndoto and Nyiro Ranges.

Low land zones comprise of an altitude of 600 m and 1,450 m above sea levels and an annual rainfall of below 700 mm with annual mean temperatures of between 30°C and 33°C. The zone is mainly used as

grazing fields for wildlife and livestock. IL7 are mostly evident in the Lake Turkana Basin and Eastern part that consists of Kauro and **Sereolipi**.

3.4 Climatic Conditions

The project location has annual mean temperature of 29°C with the maximum range being 33°C and minimum of 24°C. It has a bi-modal rainfall pattern. The County Experiences Tropical climatic conditions. The driest months are January and February. The long rainy season falls in the months of March, April and May. Apart from South Horr and Wamba areas, short rains occur during the months of July and August, sometimes extending into September. At Wamba and South Horr areas, the short rainy season is usually delayed and occurs in October and November and sometimes extends into December. The southwest plains and the Lorroki Plateau receive between 500 mm and 700 mm of rain annually. The Nyiro and Ndoto Mountains and Matthews range receive the highest amount of rainfall between 750 mm and 1250 mm per annum. The central basin and the plains east of the Matthews Range are the driest parts of the county with annual rainfall of between 250 mm and 500mm.

3.5 Socio-economic Environment

3.5.1 Community Profile

Sereolipi village is in Sereolipi Sublocation, Waso Ward, Samburu East subcounty in Samburu County. It is located 97km from Isiolo town, 35km North-East of Wamba and 185km from Maralal town.

The primary ethnic group in the project area is the Samburu. The Samburu are semi-nomadic pastoralists. They speak the Northern Maa language, which belongs to the East Nilotic language and is very similar to that spoken by the Ilchamus. A Samburu village is made up of 5 to 8 families living together in somewhat temporary huts made of plastered cowpat or hides and grass mats stretched over a frame of poles. A fence of thorns surrounds each family's cattle yard and huts. They will generally move on to new pastures every five weeks. Other ethnic groups in the project area include the Rendile, Meru, Kikuyu and Borana.

The land is mainly communal and used for grazing. Land is inherited through kinship. The main activity among Sereolipi community members is livestock keeping. The community is organized from Area Chief-Elders-Committees-Group representatives. According to the area chief Sereolipi village has been in existence since 1968.

3.5.2 Socio-economic status of Study Area

3.5.2.1 Demographic Profile

Sereolipi location has a population of approximately 7,000 and with about 1800 households with an average of 5 people. The gender ration is currently estimated to be about 30% male and 70% female. Below is a summary of demographic profile of Sereolipi. It was noted population within Sereolipi has increased mainly attributed to increased birth rates and surfing pastoralist.

Table 4: Demographic profile of Sereolipi Location

Attribute	Magnitude/Number
Approx. population	7,000
Households	1800
Gender.	Male – 30% Female – 70%
Ave. No. per household	5 per household
Inhabitants	Indigenous- 50% Settlers – 50%
Vulnerable classes	Elderly, PLWDs, Orphans, divorcees
Dominant ethnic group	Samburu
Primary religion	Christianity and Islam
Other groups	Rendile, Meru, Kikuyu and Borana
Employment (formal/Informal)	Formal – 5% Informal – 95%

3.5.2.2 Educational Infrastructure

The village has the following educational facilities;

- Sereolipi Primary School 500m from the village trading Centre.
- Sereolipi Mixed Day School Ikm from the trading centre. It has a total of 94 students (71 Boys and 23 Girls) with 9 teachers.
- Imani primary Academy school within the village trading centre

Based on an interview with the head teacher, Sereolipi Mixed Day School the school has a total of 94 pupils (71 Boys and 23 Girls) with 6 teachers.

The main constraint to accessing education in the project area is mainly due to illiteracy among the parents, distance covered to access the school and poverty. Learners walk an average distance of 6km to get to school. The furthest pupil walks for about 15km to reach the school.

The school performance of boys is generally better than girls according to the headteacher. This due to the fact that girls are usually preoccupied by social responsibilities and also as a result of cultural practices i.e., early marriages. About 40% of boys attend school compared to only 30% girls. Less than 35% of the learners get to access higher education.

Other challenges faced by the school are as follows;

- ✓ The school lacks a reliable electricity power supply
- ✓ The school lacks enough sanitary facilities
- ✓ There is need for additional structures at the school such as laboratory, library and classes.
- ✓ A dormitory was recommended to help learners traveling long distances easily access the school
- ✓ There are no government initiatives or NGOs in support of the school
- ✓ There are no meals offered for the learners at the schools

Plate 3: Sereolipi Primary School

3.5.2.3 Occupation and Livelihood Profile

Sereolipi community are mainly nomadic pastoralists moving with livestock in search of pasture and water. Major livestock kept are camel, cattle, sheep, goats, and local chicken. The community relies on livestock products for food at the household level and for income generation. Formal employment is 5%. Other sources of income in the society include small businesses. The community does not engage in agricultural practices i.e., Farming. The lack of sufficient water and harsh climatic conditions at Sereolipi mainly contribute to the unfavorable conditions for crop production. Some members of the community sell firewood and burn charcoal for sale.

Sera conservancy which is located approximately 25km from the village trading centre also attracts tourism activities in the project area. The Sera Wildlife Conservancy is part of the Sera Community Conservancy, and is home to Sera Rhino Sanctuary, East Africa's first community-owned rhino conservancy, and to the community-owned Saruni Samburu and Saruni Rhino wildlife lodge.

3.5.2.4 Land Use

Land in the community is mainly communal. The land is used for homesteads and mainly for livestock grazing. Underground water is also harnessed from the land. Some of the land-based activities carried out by men are community land division, boundary settling and overseeing security matters. Sereolipi main challenges are drought and sporadic rainfall resulting loss of habitat and food insecurity. The community obtain natural resources such as wild fruits, herbs, firewood and trees for subsistence and domestic use from the area and its environs.

Sera conservancy is located in the middle of Losesia and Sereolipi rangelands (the Sera Community Conservancy), and covers an area of approximately 340,000 hectares, of which 51,740 hectares are given over to the conservation area. key wildlife includes Elephants, Reticulated Giraffes, Beisa Oryx, Lions, Grevy's Zebras, Elands, Lesser and Greater Kudus, Leopard, Cheetah among others, and a diversity of bird species including sandgrouse which gather in large concentrations at water points in the dry season. Sereolipi is considered a Human-wild life conflict zone where elephants tend to traverse Sereolipi village frequently. Few cases of human deaths have been reported as a result.

3.5.2.5 Health facilities

Sereolipi has only one public health centre with 3 nurses, 1 clinical officer and 1 nutritionist. Main service provided is Out-patient services. Sereolipi Health Centre serves at least 3124 people living up to a 20km radius. The facility provides outreach and educational services in relation to health i.e., immunization, nutrition, antenatal Care and counselling and all services are free. The most common health problems were noted to be respiratory infections, UTI and diarrhea. Prevalence rates for malnutrition is high due to food insecurity and lack of supplementary foods.

The health centre infrastructure was noted to be moderate conditioned and lacks a source of electricity. Furthermore, the facility faces inadequate medical supply and lacks sufficient medical staff.

Plate 4: Sereolipi health centre

3.5.2.6 Social and Physical Infrastructure

Water: The only sources of water in the village consist of two community boreholes which are within a radius of 1km from the center of the village. The water has been piped to Sereolipi Centre for ease of access at a water shop. The water from borehole is however salty and require treatment. Water for drinking, cooking, washing and bathing are sourced from the borehole while livestock drink from hand dug shallow wells.

Sanitation: there are ventilated pit latrines in some household, school and health center however Open defecation (OP) is still practiced in the interior parts of Sereolipi Sublocation. Waste management is poor with community members preferring to burn waste.

Plate 5: Waste management conditions at Sereolipi and a Pit latrine at the health centre

Road Network: The main Isiolo-Moyale (A2) tarmac road passes through Sereolipi Village. All other roads are murram/earth roads which are sometimes impassible during rains, particularly at lugga crossings. The main forms of transport within the area are vehicles, Motor bikes and while donkeys and camels also provide alternative modes of transport.

Mobile Network Coverage: There is no telecommunication service provider at Sereolipi village; Network connectivity and coverage is poor at the project area.

Power/electricity: The community is not connected to the national grid. The population use mainly portable solar at the household and businesses for charging mobiles and lighting. Firewood and charcoal are used for cooking in homes.

Plate 6: Means of cooking at Sereolipi

3.5.2.7 Vulnerable groups

According to the World Bank Document-Vulnerability: A View from Different disciplines by Jeffry Alwang and Paul B. Siegel, a vulnerable group is a population that has some specific characteristics that make it at higher risk of falling into poverty than the others.

The projects area is a cosmopolitan of culture which constitutes the Samburu, Rendille and Borana as the vulnerable and marginalized communities. The Samburu are the majority while the Rendille and Borana are the minorities. Based on VMG Focus group discussions held at Sereolipi, the village VMGs consist of the orphans, the elderly, people living with disabilities, widows and widowers. Vulnerable households consist of children headed households and women headed households. During the assessment, the area chief reported that the female headed households were about 100; child headed households were about 50; the elderlies are about 78 and about 20 PLWD.

The main challenges encountered by the VMGs at Sereolipi mainly include food insecurity and poverty. The vulnerable households can hardly access the basic needs and most of them really on well-wisher within the community. The project should consider such households for electricity connection. Most of them cannot afford the one thousand shillings' connection fees.

There are organizations that support and address the challenges of VMGs at Sereolipi which include; Food and Agriculture Organization (FAO), World Vision and The Pastoralist Community Initiative and Development Assistance (*PACIDA*).

3.5.2.8 Gender based vulnerability

The patriarchal family structure characterizes the society in the project area. Early marriages and child marriages, minimal participation in home or economic decision-making, limited economic freedom, and limited opportunities to mingle with other females in the village continue to be embedded in traditional social norms. Men had more influence over home resources such as land, assets, and equipment, according to the Female Focus Group Discussion. In a typical household, the eldest male member is the head of the household, and the man has decision-making authority. Furthermore, men are accountable for securing the family's financial security. Women, on the other hand, are in charge of social responsibilities such as home tasks including fetching water, cooking, cleaning, and caring for children. Female literacy was reported to be low among women over the age of 18 and higher among the younger girls.

3.5.2.9 Gender Based Violence

Based on the Focus Group Discussion with women at Sereolipi, intimate partner violence is not common in the area.

3.5.2.10 HIV/AIDs prevalence

The HIV prevalence in Samburu is below the national rate at 2.2 % (Kenya HIV estimates 2015). The HIV prevalence among women in the county is higher (3.1%) than that of men (1.8 %) indicating that women are more vulnerable to HIV infection than men in the county. Drivers of HIV in the county can be attributed to a number of social, economic and cultural factors related to marriage, circumcision, poverty and insecurity.

HIV/AIDS infections in Sereolipi were confirmed to be very low by the Nurse in charge at Sereolipi Health Centre.

3.5.2.11 Culture and heritage

No cultural site of significance was reported/observed within the project area. Sereolipi is predominantly made up of the Samburu community. The communities value keeping livestock including cattle, camel, sheep and goats. The Samburu community in the project area are a patriarchal society; men typically speak for women and make decisions in the family. The community practices polygamy and encourages early marriages for young girls.

The project area is made up of other ethnic groups including the Rendile, Meru, Kikuyu and Borana. Samburu County boarders Marsabit County to the North and Isiolo County to the South approximately 50Km from Sereolipi. The integration of other ethnic groups at the project area is mainly attributed by the nearby border lines and mainly driven by business activities at Sereolipi.

3.5.2.12 Religion in the project area

The community members confirmed that their culture is strong and mainly form part of the Christian and Islamic religion.

4 POLICY, LEGAL 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 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 7. Stakeholders and their roles

Stakeholders	Role
Kenya Power Company	Responsible for distribution and retail supply of electrical energy to end users. Kenya Power purchases power in bulk from the Kenya Electricity Generating Company Limited (KenGen) and the Independent Power Producers (IPPs) through bilateral contracts or Power Purchase Agreements (PPAs) approved by the Energy Regulatory Commission (ERC) (1).
The Energy and Petroleum Regulatory Authority (EPRA)	Established by the Energy Act of 2019. The EPRA's mandate extends beyond electricity and includes natural gas (including petroleum), renewables and all other forms of energy. The generation, transmission, distribution, supply, import and export of electricity can only be carried out by parties in possession of a license, or a permit issued by the EPRA. If the capacity involved is for own use and less than 1 MW, authorization is not required. Although the generated electricity is expected to be less than 1 MW (0.3 – 1 MW), the fact that the generated electricity is intended for use in a factory and there is a possibility for connection to the national grid and sale of excess power to the government, The project requires a license from the EPRA 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. REREC will be mandated to ensure all environmental issues and concerns under this report as well as those that come up during the project phases
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 5. 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 6. National Laws and Policies Framework

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
	NATIONAL LAWS & POLICIES 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 Constitution of Kenya 2010	Article 42 of the Constitution states that every person has the right to a clean and healthy environment, which includes the right: to have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and to have obligations relating to the environment fulfilled under Article 70. Article 69(2) states that every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources. Article 70 (1) states that If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.	In an effort to comply with the Constitutional requirements, the project Proponent commissioned this ESIA study. The Constitution requires the Proponent to uphold other people's rights and entitlements by putting in place measures to protect the environment throughout the project life (pre-construction; construction; operation and decommissioning phases).
3.	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.
4	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	• 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

		and the conservation of natural resources forms an integral part of societal decision-making.	NEAP. The project will be reviewed by NEMA for approval before implementation.
5	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
6	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.
7	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
8	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 Sereolipi 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 LAWS			

9	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.
10	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.
11	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.
12	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.
13	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 generated to be managed in accordance with these regulations.
14	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.
15	Licenses and Permits Required Under The EMCA	The subsidiary legislations under the EMCA are partially monitored using permits and licenses. Subsequently all licenses and permits required during the construction phase shall be the responsibility of the individual contractors and their agents. During the operational phase, all permits,	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

		and licenses required to operate the project will be the responsibility of the proponent.	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.
16	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.
17	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
18	L.N. 24: Medical Examination Rules, 2005	These rules provide for Occupiers to mandatorily undertake pre-employment, periodic, and termination medical evaluations of workers whose occupations are stipulated in the Eighth Schedule to the OSHA and the First Schedule to this Rules. Workers that fall under the above two schedules are required to undergo medical evaluations by a registered medical health practitioner duly registered by the DOSHS.	The contractor should that the workers exposed to hazards and or accidents undergo requisite medical examinations as required by these rules
19	L.N. 25: Noise Prevention and Control Rules, 2005	The rules set the permissible level for occupational noise in any workplace (which includes construction sites) The Proponent is to ensure that • any equipment brought to the site for use shall be designed or have built-in noise reduction devices that do not exceed 90 dB(A). • those employees that may be exposed to continuous noise levels of 85 dB(A) are medically examined as indicated in Regulation 16. If found unfit, the occupational hearing loss to the worker will be compensated as an occupational disease.	The contractor to ensure that equipment is serviced properly and/or use equipment that complies with the threshold noise values provided in the act. Alternatively, each contractor will be required to develop and implement a written hearing conservation programme during the construction phase.
20	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	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.

		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.	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
21	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.
22	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
23	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.
24	The National Land Commission Act, 2012	The National Land Commission of Kenya is an independent government commission whose establishment was provided for by the Constitution of Kenya to, amongst other things, manage public land on behalf of the national and county governments, initiate investigations into present or historical land injustices and recommend appropriate redress, and monitor and have oversight responsibilities over land use planning	- Where there shall be any land acquisition, the proponent shall involve the commission including settling any land dispute related to the proposed project.

		throughout the country. It was officially established under The National Land Commission Act, 2012.	
25	The Land Act, 2012	Part VIII the Act deals with compulsory acquisition of interests in land. Under section 107 (1); whenever the National or County Government is satisfied that it may be necessary to acquire some particular land under section 110, the respective Cabinet Secretary or the County Executive Committee Member shall submit a request for acquisition of public land to the Commission to acquire the land on its behalf. Section 107 (1) of the Act deals with the compensation issues for any land to be acquired; either by the National or County Governments, especially under section 110. Section 111 of the Act calls for prompt and full payment of just compensation to all persons whose interests in the land to be acquired have been determined.	- The proponent is expected to comply with this law. The law on compulsory acquisition of land shall be followed in the event that it will occur. The proponent is required to get necessary authorizations from the National Land Commission as well as following the necessary provisions under Article 40 (3) of the Constitution and enabling laws.
26	Land Registration Act, 2012	The Act principally concerns the registration of interests in land. This Act shall apply to: (a) registration of interests in all public land as declared by Article 62 of the Constitution; (b) registration of interests in all private land as declared by Article 64 of the Constitution; and (c) registration and recording of community interests in land.	- The proponent is required to follow the requirements of this Law as it is where any easement may be required during land acquisition.
27	Community Land Act, 2016	This Act is critical for the proposed project is within community land. Section 6(1) of the Act provides that 'county governments shall hold in trust all unregistered community land on behalf of the communities for which it is held'. Furthermore, Section 6(2) maintains that 'the respective county government shall hold in trust for a community any monies payable as compensation for compulsory acquisition of any unregistered community land'. Section 30(1) states that 'Every member of the community has a right to equal benefit from community land'. Section 26(1) provides that 'a community may set aside part of the unregistered 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	- The proposed project site falls on a registered community land and the land belongs to the Sereolipi community ranch in Sereolipi. The process of acquiring land for the sub project is through compulsory land acquisition with just, prompt, and full payment of compensation in-kind. The establishment of the mini grid will convert communal land to generation and distribution of electric energy". 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

		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	
28	The Physical and Land Use Planning Act, 2019	This Act of Parliament makes provision for the planning, use, regulation, and development of land and for connected purposes.	The proposed site is not in contravention of any Zoning regulations. The project site is within a registered 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 – Samburu County.
29	Sexual Offences Act 2006	The Act aims to address sexual offences and make ways for prevention and protection of all persons from illegal sexual acts.	This Act shall provide guidance to the project proponent and contractor in mitigating the risk of GBV-SEA/SH foreseen especially during the construction and decommissioning phases of the proposed project.
30	Persons With Disabilities Act No. 14 Of 2003	This Act aims at upholding the dignity of every Person with Disability in the society and prevent any form of discrimination. The act also facilitates full acceptance of people with disability and ensures full participation and inclusion of such persons in the society.	The Proponent and Contractor will ensure inclusivity of Person with Disability in decision making, employment opportunity and access to the energy generated from the Mini-Grid, and mitigate social risks i.e., discriminations
31	The Employment Act No 11 of 2007	This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the energy sector. Section 4 of the Act prohibits all forms of forced or compulsory labour. A person who contravenes the provisions of this section commits an	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

		offence and shall, on conviction be liable to a fine of at least 500,000 shillings or to imprisonment for a term of at least two years or both. The law under the Act defines a child in Kenya as a person below the age of 18 years. The Employment Act, Part VII provides for protection of children including protection from the worst forms of child labour	
32	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.
33	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 table below.

Table 7: 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 (RERC)	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 RERC is mandated under the Energy 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 Project Permit and License Requirements

The table below shows the relevant permits and licenses that the project proponent will require for the proposed project.

Table 8: Project Permit and License Requirements

No.	Relevant activity	Statute	Permit and License Requirement	Competent Authority	Responsible Agency for Obtaining Clearance	Date of Acquisition	Duration
Pre-Construction phase							
1	Construction and operation of the solar mini grid	Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018	Need to submit ESIA report to obtain EIA license	NEMA	Proponent	Upon approval of ESIA report	Max 90 Days from date of submission of ESIA Report
2	Construction activities	Occupational Safety and Health Act (OSHA), 2007	Need to apply registration of premises	DOSHS	Contractor	Before commencement of construction	1 – 4 weeks
3	Setting up of construction camp sites	Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018	Need to submit Project report for the Camp Sites to obtain EIA License	NEMA	Contractor	Before commencement of construction	1– 1.5 months
4	Storage, transport and disposal of ordinary domestic and office waste	Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018	Need to obtain waste license through submission of Waste Management Plan	NEMA	Contractor	Before commencement of construction	1 – 1.5 months
5	Storage, transport and	Environmental Management	Need to obtain hazardous	NEMA	Contractor	Before commenceme	1 – 1.5 months

No.	Relevant activity	Statute	Permit and License Requirement	Competent Authority	Responsible Agency for Obtaining Clearance	Date of Acquisition	Duration
	disposal of hazardous waste	and Coordination Act (EMCA) Cap 387, Rev 2018	waste license through submission of Waste Management Plan			nt of construction	
Construction phase							
1	Food handling in the campsite	Public Health Act	Obtain Food Handler Certificate	County Government	Contractor	Before handling of food in the campsite	6 months
2	Workplace registration	Occupational Safety and Health Act, 2007	Apply for Registration of a Workplace	DOSHS	Contractor	Before utilizing the campsite	Annual

4.7 World Bank Environment and Social Safeguards Policies

Like in any project financed by, or with financial participation of, the World Bank, the environmental and social safeguards as defined in the Bank's Operational Procedures (OPs) will be adhered to during the project implementation. WB classifies its projects into four Environmental and Social Assessment categories according to the likely impacts on the environment and community they will have. This classification is as summarized below:

Category A: A proposed project is classified as Category A if it is likely to have significant adverse environmental and social impacts.

Category B: A proposed project is classified as Category B if it's potential adverse environmental and social impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects.

Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental and social impacts. Beyond screening, no further environmental assessment action is required for a Category C project.

Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental and social impacts.

The proposed project was screened by the World Bank and assigned an Environmental Category B Partial Assessment, "since the anticipated impacts were not expected to be sensitive, irreversible and unprecedented; and were likely to be localized, not cumulative and easily manageable". Further, based on

the assumption that no major civil works will be funded and no major physical or economic displacement will take place. The project will apply the following World Bank's environmental and social safeguard policies;

- OP/BP 4.01: Environmental Assessment,
- OP/BP 4.04: Natural Habitats,
- OP/BP 4.10: Indigenous Peoples,
- OP/BP 4.12: Involuntary Resettlement,

The following documents have been prepared for KOSAP: (i) an Environmental and Social Management Framework; (ii) a Resettlement Policy Framework (RPF); (iii) Vulnerable and Marginalized Group Frameworks (VMGFs) and (iii) Social Assessment (SA). The objective of the ESMF is to outline the mandatory procedures to be applied to the World Bank- financed Project investments to ensure the effective management of associated environmental and social issues. It seeks to both enhance environmental and social development benefits of the project and mitigate any adverse impacts, in line with GoK and World Bank policies and guidelines on management of environmental and social issues. Both the World Bank safeguards policies and GoK laws are generally aligned in principle and objective:

- Both require screening of sub project investments in order to determine if further environmental assessments (ESIAs) is needed.
- Both require ESIA before project design and implementation (which also includes an assessment of social impacts).
- Both require public disclosure of ESIA reports.
- EMCA recognizes other sectoral laws while WB has safeguards for specific interests.
- The Bank requires that stakeholder consultations be undertaken during planning, implementation and operation phases of the project, which is equivalent to the EMCA requirements.
- Additionally, statutory annual environmental audits are required by EMCA.

The national provisions for the management of resettlement related issues are not as fully developed and therefore not at par with the World Bank safeguard policy requirements. Thus, it is expected that the WB OP 4.12 will be mostly applied under KOSAP and a separate document to guide the process, i.e., a Resettlement Policy Framework (RPF) document has been prepared as a standalone report to support the social management and acceptability of the projects. In Kenya, it is a mandatory requirement under EMCA 1999 for all proposed development projects to be preceded by an ESIA study. However, prior to developing an ESIA, a project proponent is required to prepare a project report to aid NEMA in making a determination whether a full scale ESIA is necessary or not. Thus, under the laws of Kenya, environmental assessment is fully mainstreamed in all development process and starts with a screening process, which is consistent with World Bank safeguard policies on EA that calls for mandatory screening as well to determine the rating category and the required follow up actions. Project reports will be prepared for all the sub project investments under the KOSAP to determine if they require a full scale ESIA. Further, in order to fully insure against triggers to WB safeguard policies, individual investments will be screened against each policy as part of the EA process.

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

Table 9: World Bank safeguards

S.No.	Safeguard Policies	Objective	Applicability
1.	Environmental Assessment (**OP/BP 4.01**)	The objective of this policy is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is considered to be the umbrella policy for the Bank's environmental 'safeguard policies.	The project is assigned as a Category B Partial Assessment, assigned to projects that are likely to have limited and reversible environmental impacts, that can readily be mitigated. There are no significant and /or irreversible adverse environmental issues anticipated from the project subcomponents to be financed under the project.
2.	Indigenous People (**OP/BP 4.10**)	The objective of this policy is to (i) ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; (ii) ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and (iii) ensure that indigenous peoples receive culturally appropriate, gender and inter-generationally inclusive social and economic benefits.	The 14 counties targeted by this project are considered as marginalized areas in Kenya. Therefore, the Borrower prepared an SA report to identify and avert any potentially adverse effects from project interventions on VMGs and to ensure that project benefits that are culturally appropriate reach these groups in an equitable manner. The final versions of SA and VGMF was disclosed in March 2017. The consultants have identified that the overwhelming majority of PAPs in Sereolipi area are the Samburu and are considered vulnerable and marginalized. Other groups in the area that will benefit from the project include; Rendile, Meru, Kikuyu and Borana. The proponent will continue to engage the PAPs in a culturally appropriate way and allow for decision making in a free, prior and informed consent manner throughout the phases of the project
3.	Involuntary Resettlement (**OP/BP 4.12**)	The objective of this policy is to (i) avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; (ii) assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them; (iii) encourage community participation in planning and implementing resettlement; and (iv) provide assistance to affected people regardless of the legality of land tenure	The project does not envisage major physical or economic displacement of people. However, it is likely that the project might acquire land for the construction and installation of mini-grids that may result in either displacement of people or have impacts on trees or grazing/farming land. The RPF prepared for KOSAP establishes the resettlement objectives and principles, organizational arrangements and funding mechanisms for any resettlement associated with the World Bank-financed Project. The consultant has described land tenure and implications for the project such as what the preferred nature of

S.No.	Safeguard Policies	Objective	Applicability
			compensation.
4.	Natural Habitats (**OP/BP 4.04**)	This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal, and marine ecosystems. They include areas lightly modified by human activities but retaining their ecological functions and most native species.	The proposed project will not significantly affect natural habitats due to its area of coverage. Additionally, caution will be taken to ensure minimum disruptions to habitats as guided by the ESMMP.

4.7.1 Safeguards Instruments

Environmental and Social Management Framework (ESMF)

A range of instruments are available that satisfy the OP/BP 4.01 including: Environmental and Social Impact Assessment (ESIA) or Environmental Impact Assessment (EIA); strategic environmental and social assessment (SESA); Environmental Audit (EA); hazard or risk assessment; environmental and social management plan (ESMP) Resettlement Action Plan and Resettlement Policy framework (RAP/RPF) and the environmental and social management framework (ESMF).

The development of an Environmental and Social Management Framework (ESMF) is a way to comply with the World Bank safeguard policy on Environmental Assessment (EA) (OP/BP 4.01) in a case when the project specific locations and activities are not defined prior to project appraisal. EA integrates environmental and social aspects in project implementation with project and in country considerations and conditions to the extent that the World Bank will not fund any project or activity that is not in line with overall policy framework; national legislation, international treaties and agreements or even institutional capabilities in managing potential environment and social issues.

In compliance to this, an Environmental and Social Management Framework was developed by the MoEP, informed by national laws and the applicable World Bank policies, to guide the implementation of specific environment and social aspects on the proposed project. As such, the ESIA process was informed by the ESMF disclosed in March 2017.

Vulnerable and Marginalized Group Frameworks (VMGFs) and Social Assessment (SA)
This Vulnerable and Marginalized Groups Framework (VMGF) and Social Assessment (SA) disclosed in March 2017, were prepared for use by the Ministry of Energy and Petroleum (MOEP), Kenya Power and Lighting Company (KPLC) and Rural Electrification Authority (REA) as implementing agencies under the Kenya Off Grid Solar Access Project (K-OSAP) because the project applies for OP/BP 4.10. The VMGF has provided guidance to the implementing agencies on the procedures and processes to be followed in the development of Social Assessment (SA), Vulnerable and Marginalised Groups Plans (VMGPs), Grievance Redress Mechanism (GRM) as well as this ESIA study.

In regards to the Solar Mini-grid in Sereolipi, the main inhabitants of Sereolipi - the Samburu community - are classified as VMGs in Kenya. The ESIA did not identify any adverse impact on the Samburu community therefore, a Vulnerable and Marginalized Group Plan (VMGP) will not be required. However, elements of the VGMP such as inclusion of VMGs in the stakeholder engagement process and representation on the locational grievance redress committee will be captured in the ESMP, to ensure that the Samburu access culturally appropriate project benefits and opportunities, in a gender sensitive and intergenerationally inclusive manner.

Resettlement Policy Framework (RPF)
KOSAP does not intend to undertake any subprojects that will displace people. Therefore, as precautionary measure, the project prepared and disclosed a resettlement policy framework (RFP) prior to appraisal to address any issues which might arise from economic displacement and/or restriction of access to communal natural resources under the Project. During implementation, special attention will be given to community participation, grievance redress and benefit sharing mechanisms, socio-cultural systems/physical characteristics that are specific to the project sites and surroundings to ensure that those affected by implementation of the project, positively or negatively, have a voice and a mechanism of influencing project outcomes in line with World Bank safeguard policies.

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

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

World Bank Safeguard Policies	Kenyan Laws	Comparison	Recommendation
O.P 4.01 requires screening to determine level of environmental and social assessment to be done An ESIA is prepared before project implementation	EMCA requires screening of project to determine level of environmental and social assessment to be done An ESIA is required once determination is done	**Similar**-both require screening	Screening has been done and the project is established as medium risk which requires and ESIA

ESIA is needed once determination has been established and should be prepared identifying all environmental and social impacts and mitigation measures proposed to address the impacts	ESIA is needed once determination has been established and should be prepared identifying all environmental and social impacts and mitigation measures proposed to address the impacts	**Similar**-both require ESIA depending on the project impacts	ESIA is prepared in line with EMCA /EIA regulations and refers to WB safeguard policies
O.P 4.12 Land Acquisition and Involuntary resettlement should be avoided wherever possible or minimized and exploring all alternatives	The Government and any other organization shall prevent internal displacement linked to development projects to the extent possible by exploring other alternatives.	**Similar-** displacement in projects should be avoided to the extent possible by exploring alternatives.	WB policy is more elaborate than the Kenyan Law
O.P 4.10 on indigenous people seeks to promote the inclusions of these groups in development projects and especially through consultation to ensure they also share in the project benefits and ensure negative impacts do not disproportionately fall on them. The policy requires these groups to be consulted separately to enhance their participation.	The COK 2010, article 56 provides for the right of marginalized communities and the importance of their input in decision making that regards them. National Gender and Equality Act and the Children's Act and Persons with Disability Act seeks to promote the inclusion of these persons in all issues as they are often overlooked and left out. Emphasis is also on consulting with them.	**Similar-**both seek to promote inclusion of these group so that they can share the project benefits and ensure that negative impacts of the project do not fall on them disproportionately	WB policy is more elaborate and the two are being used to complement each other.
Project Affected Persons (PAPs) should be meaningfully consulted and be given opportunities to participate in planning and implementing of projects especially where there is resettlement	EMCA requires that the project owner seeks the views of the people who are affected and explain the project information to them especially the impacts of the project and also obtain their opinions or comments.	Both are similar	Consultation has been done and will be progressed in line with the two WB policy and Kenya legislation
O.P 4.04 is a comprehensive set of standards that aim to	Under EMCA, an ESIA must be conducted before the	Similar-Both focus on protection of natural habitats and the	The World Bank policy is more detailed, and the two

promote sustainable development and protect the environment and communities from the adverse impacts of development projects. The ESIA must consider the impacts of the project on natural habitats, including wetlands, forests, and other sensitive ecosystems, as well as the impacts on biodiversity and wildlife.	implementation of any development project that is likely to have significant adverse impacts on the environment.	assessment impacts of development projects on these habitats. However, OP/BP 4.04 provides more detailed guidance on the specific steps and considerations that must be taken into account when conducting an ESIA, while EMCA provides the legal framework for ESIA in Kenya	are used in a complementary manner

5 STAKEHOLDER ENGAGEMENT

This section profiles the key stakeholders for the Sereolipi 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

5.1 Legal Requirements

The overall objective of the Government is to involve communities in policy formulation and implementation at the local level. More specifically, the Community Action Planning Programme objective is to put in place a durable system of intra-community co-operation through collective action, which creates communal discussion forums for the implementation of development activities.

Within Kenya, EMCA requires a project proponent to seek the views of persons/communities that may be affected by the project through participatory consultation; at least explain project potential impacts and obtain oral/written comments, which will be included in the ESIA for implementation by the proponent.

Projects affecting the vulnerable and marginalized groups that meet the OP 4.10 criteria, whether adversely or positively, need to be prepared with care and with the participation of affected communities. The policy requires that the implementing agencies engages in a process of free, prior, and informed consultation with the affected vulnerable and marginalized communities at every stage of the project in order to fully identify their views concerning the potential impacts of the project on them and to obtain their broad community support for the project. Similarly, the development of project-specific measures to avoid adverse impacts and enhance culturally appropriate benefits should be in consultation with the VMGs.

Additionally, the World Bank through OP/BP 4.01 requires adequate consultation on environment and social aspects with affected groups and local NGOs, and demonstrate to the extent to which the views of such groups are considered in the ESIA.

5.2 Stakeholder Consultation and Disclosure Requirement for the Project

The World Bank OP 4.01 - Environmental Assessment and Environmental Social Safeguards 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 public participation was conducted in the form of:

- Meeting with the client
- Consultation with the county commissioner and the county officials

- Key stakeholder interviews with the county officials
- Public meeting in Sereolipi
- Focus Group Discussions

5.3 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 Sereolipi area, the stakeholders have been identified and listed in the table given below.

Table 10: Identified Stakeholders

Stakeholder Groups	Primary Stakeholders	Secondary Stakeholders
Community/Individuals	VMG's Pastoralists Local Community (Elders, Men, Women & Youth)	Interested parties
Institutions	Faith Based Organizations Education institutions Health Facilities Community Based organizations	
Government Bodies	NEMA County Government District and local administration	

5.3.1 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 11: 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

The consultants identified and mapped stakeholders in the project area. These included

i. Community members of Sereolipi village;
ii. County officials including County Commissioner, Deputy County Commissioners, Chiefs;
iii. CREO representative of Ministry of Energy in Samburu and other government departments in the county;
iv. Persons affected by the project (physical, economic, social);
v. Women, men, youth, elders and people living with disability in the area.

5.4 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.

5.5 Summary Of Community Consultation Meeting During the Environmental and Social Screening of the Proposed Site and Land Acquisition Process

On December 14th, 2021, the area chief presided over a comprehensive CPP and community engagement session for Sereolipi Solar Mini Grid at Sereolipi Trading Centre/village, Waso ward Samburu East Sub County, Samburu County.

Representatives from the Ministry of Energy, Kenya Power and the County government of Mandera were present to provide information to the public as well as receive and respond to comments.

Local Administrative Officers, Village Elders, and community members including the elderly, men, women, youth, and the physically challenged were also present. As an appendix to the report, a list of attendees and minutes is included.

Through verbal discussions, the community was presented with information on:

- About project details and its implementation / execution.
- Information on perceived project benefits or positive impacts of the proposed project.
- Information of perceived losses from the proposed sub-project during execution or negative impacts of the proposed project.
- Occupational health and safety
- Land acquisition process
- Grievance redress mechanism

5.5.1 Project Presentation and Remarks

The local Chief assembled the community people at the market center after mobilizing them. The chief welcomed the project team and also members of Sereolipi Market and thanked all for attending the meeting. He invited Mr. Benson Director from the Ministry of Energy Samburu County to lead the team in speaking to the community. Mr. Benson gave a brief introduction of the KOSAP projects and introduced the team. He then welcomed Wilfred from KPLC to expound in the project description.

Mr. Wilfred informed the community that the -KOSAP project is being implemented collaboratively by the Ministry of Energy, the Kenya Power and Lighting Company (KPLC), and the Rural Electrification and Renewable Energy Corporation (REREC) with the World Bank as a development partner, County Government, and communities in off-grid areas as beneficiaries. Off-grid locations are those where the national electrical system has not reached and where access to electricity is extremely limited. The current initiative is being carried out in fourteen (14) Kenyan counties. When the communities make a decision on the project, it corresponds to the relevant requirements. He went on to say that the mini grids will include the installation of solar PV, battery storage, and thermal diesel units with capacities ranging from 20 to 300 kilowatts (KW). He explained to them that once built, the Solar mini-grid will be operated by the implementing agency, either KPLC or REREC, and that the community will be expected to pay for energy connection (one thousand shillings) and wiring in their homes. He went on to say that once connected, the beneficiaries will be expected to pay for the electricity they use.

Mr. Ngure from the County Government of Samburu further informed members that because the site is adjacent to the market center, residential areas, and schools, all of them will benefit from the project's implementation because it will be installed within a 3km radius of the Mini-grid. He also advised members that once completed, all applicants for electricity connections would be eligible, and the connection price

would be one thousand Kenya shillings regardless of distance from the Mini-grid within a three-kilometer radius.

Mr. Muriuki (Wayleave Officer) noted that the planned project will seek land donation to help minimize project implementation costs. The donated piece will be turned to public land for the sake of project implementation. He informed members that, notwithstanding the modifications, it is still necessary to obtain community approval before undertaking any project on their land. He notified members that the land was given voluntarily and that no compensation would be provided. This is because the electrification project is heavily financed for the community's benefit.

Kenya Power's Jediel Muriuki highlighted to the public forum that the proposed project will require an average of 2 acres of land. He inquired about the form of land ownership in the area, and they responded that it is communal, with the community having one title deed but no individual title deeds. They also stated that the land is not properly subdivided (implying that it has not been adjudicated). He informed them that, based on their explanation of land ownership, their land falls under the category of community land, and its use and administration are governed by the Community Land Act 2016.

Mr. Koech from Kenya Power was invited to speak about the project's anticipated environmental and social impacts, as well as mitigation strategies. He went on to outline the project's potential risks and informed the conference that it will necessitate the establishment of a Grievance Redress Mechanism for the duration of the project. This tool will be used to manage any complaints or concerns that arise throughout the course of the project. He claimed that members of the project/grievance redress committee will be chosen by the community people themselves. The chosen committee will be in charge of informing the community about the project and serve as a point of contact for reporting project-related problems or grievances. He went on to suggest that the group should be made up of people from various areas of life, including men, women, youth, and those with disabilities.

Mr. Korir from Kenya Power explained to the community why it was vital to give this information to the community because they are entitled to compensation. He went on to explain to the audience their rights and options. The first point was that while the community may be prepared to contribute the land, they are also entitled to remuneration for it. The County, on their behalf, would hold the Compensation funds in an escrow account, and the funds, plus accrued interest, would be given to them upon registration. Another compensation option presented to the community was that the community may be reimbursed in kind. The community might request in-kind compensation in the form of a well, classrooms, or any other item that will benefit the community. Another alternative would be land for land compensation. The community may request that the government purchase a comparable piece of land for the community. To pay for land donated for the mini grid's construction. He advised the meeting that they were free to consider the options presented and make an informed decision.

Kenya Power's Mr. Jidie later informed neighbourhood residents about the project's land requirements. He discussed the project's land acquisition process, compensation options for the proposed location, and the procedures that will be put in place.

Mr Korir (Land Surveyor) stated that the process of land surveying, land transfers, and registration is time-consuming, and he requested that the community give him custody of the land sooner. This meant that the community would allow construction to begin while the land registration process was finished. The request for advance possession was granted by the community. He explained to the inhabitants that in order for the land acquisition procedure to commence, the surveyor will need to identify correct GPS locations of the agreed-upon allocated area of land for the solar mini-grid.

Following the consultants' presentation on the proposed project, community members were given the opportunity to comment and share their thoughts on the project. Respondents were able to comment on the project, highlight potential positive and negative impacts, and indicate whether they support or oppose the project.

During the CPP, all substantive issues raised with the Consultants/Proponent were noted and addressed. The issues were then documented and recorded.

5.5.2 Land for the Project

The community members, led by the elders and their leadership, were ready to provide all types of support during the sub-project's execution. As a result, the community agreed to donate the requested land for the project. There was no dissent, and the Chief spoke on behalf of the community, confirming that no one had a claim to the land.

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.

5.5.3 Plenary Session

During the consultative forum, there were no issues and comments raised by the participants:

5.5.4 Focus group Discussion

A focus group discussion was called for 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.

Focus Group Discussion with the women

The major goal of this discussion was to see if the women understood the project and its criteria, as well as to offer them a chance to voice their concerns/opinions about the initiative. Dorothy provided a recap of the project and its requirements only to keep them up to date on the topics mentioned in the public forum. She then asked the women whether they agreed to donate community land to the project. The women stated that they favor the donation of land for the project.

Focus group discussion with the youth

There was also a separate conversation with the youth. Mr. Koech summarized the proposal and detailed the parameters for land donation during this meeting. He encouraged the students to express their thoughts on the initiative. The kids have stated their support for the proposal. He also asked them if they agreed to the donation of land for the project, and they answered they did.

Plate 7: ESS Stakeholder Engagement meeting at Sereolipi

5.6 FINDINGS OF THE STAKEHOLDER CONSULTATION PROCESS

A Consultative Public Participation (CPPs) session was conducted to provide project information and facts to the local community and other stakeholders; the participants included the local government administration, Ward administrator, local community with VMGs, PLWD and elderly well represented. The platform gave the participants chance to express their appreciation, concerns and fears as well as contribute ideas and opinions towards the project sustainability.

The CPP and community engagement for Sereolipi Solar Mini Grid was held at Sereolipi village on 6th February 2022 chaired by the area assistant chief Mr. Daniel Sadala. At that time, 49 members attended the meeting.

During the consultative forum, there were remarks from various key personnel, the findings from the exercise are as presented in the table below.

5.6.1 Project Presentation and Remarks

The MoEP delegate, who was accompanied by a CREO Samburu County representative, detailed the KOSAP project, stating that its purpose was to electrify Sereolipi, which is not connected to the national grid. They also informed the community that they would be able to obtain power at a lower cost, as well as that public facilities such as schools, hospitals, and public boreholes would be connected at the same cost (one thousand shillings). The environmental and social professionals discussed the ESIA process with the community, as well as the project's potential implications and mitigation approaches to mitigate the severity of the negative impacts.

It was also mentioned that compensation for the community-identified land for the planned project would be done in-kind, as a community initiative selected from the education, health, or water sectors. The Ministry of Energy, through its implementing agency (KPLC), would execute a community project in the water, health, or education sectors up to the worth of the land taken and guided by the NLC valuation criteria. The community was to select a project from one of the three sectors.

5.6.2 Positive Comments about the Project from the Participants

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

- ✓ Creation of employment opportunities among the locals throughout the project implementation
- ✓ Community development and growth
- ✓ Improved security in the region
- ✓ Improved learning experience through lighting up the education institution. Learners can study at night and their digital devices charged
- ✓ Improved medical services due to availability of equipment such as refrigerators, incubators and sterilizers

5.6.3 The identified negative impacts of the project

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

- ✓ **Accidents and Injuries**: Some members raised a concern on possible risks associated with the development processes, citing the workers on the project site will need medical covers.
- ✓ **Gender biasness**: a member cited that female are vulnerable at the project area and risk of discrimination are anticipated during job recruitment processes. The member requested the need to accord the women of the community with the same opportunities and benefits as men

5.6.4 Plenary Session

During the consultative forum, the following were the issues and comments raised by the participants:

Table 12: Issues /Comments Raised by the stakeholders

	Name	Questions/comments	Response by agency on how feedback will be used or acted upon
1.	Mr. Ramponi Lekulal	sought to understand the role of the Grievance Redress Committee.	A Grievance Redress Committee is established to address grievances raised by the affected community and support in finding resolutions for disputes that may arise as a result of implementation of the subproject
2.	Mr. Naipido Leupane	- Appreciative of the project and hoped the community will accrue all the benefits from the project - All non-skilled labor should be sourced from the Sereolipi Community and not from outside	Noted

5.6.5 Consultant's Comments on the Issues Raised During the Public Meeting

In view of the consultation findings, the Consultant recommend that the project should put the following into consideration:

- Continuous sensitization and frequent dialogue between the Proponent (MoEP), contractor and local communities should be done to address technical questions in regards to the project.
- The contractor and the team should conduct themselves properly with respect to the community's cultural norms for the success of the project
- The local community should be given priority for the unskilled labor. Fairness and equity should be observed in allocation of jobs so as to obtain unanimous support from the public.
- When sourcing for raw materials, priority should be given to local communities to provide them.
- Health and Safety of the community to be considered throughout the project including educating them on occupational safety and health.

5.6.6 Consent

The Community members present unanimously accepted the Project Proposal with great appreciation and anticipation.

Plate 8: ESIA Stakeholder's engagement process

5.6.7 Focused Group Discussions analysis

The in-depth interviews were used as a tool for stakeholder identification and mobilization as well as collection of baseline data to enable identification of the likely project impacts. In addition, it provided an opportunity to the participants to raise their fears and concerns as well as make recommendation as pertains to the project. During the discussions, information was gathered different roles, livelihood, health issues, challenges, perception of quality of life, education options for children, health care and project perception. The consultative meeting had a wide representation as follows:

Table 13: FGD dates and attendance

Group	Date	Attendance	Venue
Men	6th February 2022	6	Sereolipi Village
Women	6th February 2022	8	Sereolipi Village
Youth	6th February 2022	12	Sereolipi Village
VMG	6th February 2022	3	Sereolipi Village

The target groups of the FGD were Males, Females and the Youths. Key Informant Interviews were also conducted targeting the health sector, education sectors and VMGs. The following KIIs were interviewed;

Table 14: KIIs Interviewed

KII	Date	Venue
Mr. Ricky Lenemeria - Head teacher Sereolipi Mixed Day school	6th February 2022	Sereolipi Village
Ms. Pauline Lenamunye - Nurse in charge at Sereolipi Health centre,	6th February 2022	Sereolipi Health centre

All the respondents supported the proposed project implementation. This is attributed to the fact that the project will:

- ✓ Create employment opportunities among the locals throughout the project implementation
- ✓ Increase business opportunities tied to the project e.g., barber shop, butchery etc.
- ✓ Improve security in the area
- ✓ Improve teaching and learning experience for teachers and students in schools
- ✓ Improve health service at Sereolipi health centre
- ✓ Improve standards of living in the village

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6 IMPACT ASSESSMENT AND MITIGATION MEASURES

6.1 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.

6.2 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:

6.3 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.

6.4 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 15*: Categories of Significance*

tegory	**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 16: 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.

6.5 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).

6.6 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.

6.7 Likelihood

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

Table 17: 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)

6.8 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.

6.9 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.

6.10 Positive Impacts- construction Phase

6.10.1 Creation of Employment Opportunities

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.

6.10.1.1 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.

6.10.1.2 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;
- Contractor should ensure that job opportunities are not discriminatory
- Equal opportunities should be given to both men and women
- Preference should be provided to the vulnerable population in the Study Area.

6.10.2 Improving local economy

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.

6.10.2.1 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.

6.10.2.2 Enhancement Measures

- Preference should be provided to local sub-contractors or suppliers to pass on maximum economic benefit locally;
- Prioritize local purchases over imports.
- Remit taxes on behalf of employees
- Contractor should prioritize local purchases over imports;
- Contractor should give preference to local labor which increases the local's ability to spend.

6.11 POSITIVE IMPACTS- OPERATION PHASE

6.11.1 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.

6.11.1.1 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.

6.11.1.2 Additional Mitigation 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

6.11.2 Quality, Reliable Power Supply

There is no electricity in Sereolipi village. 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.

6.11.2.1 Significance of Impact

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

6.11.2.2 Enhancement Measures

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

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

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

6.11.3.1 Significance of Impact

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

6.11.3.2 Enhancement Measures

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

6.11.4 Improvement of Local and National Economy

The mini-grid project will ensure supply of a stable power that will reduce damage to the electronics and this will result in promotion of businesses both in the formal and informal sectors. Availability of power will enable businessmen to scale up their businesses while making it is possible to set up businesses such as salons, barber shops, photocopying machines, cyber cafes, welding, refrigeration of drinks among others. This will result in income improvements at the individual level and for the national economy. More customers will be connected and retail of reliable electricity by the power utility firm will attract increased tax revenues to the government.

6.11.4.1 Significance of Impact

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

6.11.4.2 Enhancement Measures

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

6.11.5 Education

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

6.11.5.1 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

6.11.5.2 Enhancement Measures

- REREC should consider having the transmission lines are closer to schools for them to benefit from the power supply;
- REREC 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

6.11.6 Health Benefits of the Project

Solar energy for lighting is better than kerosene lamps that are in use currently. This is because kerosene lamps emit particles that cause air pollution. The health risks posed by this indoor air pollution mainly include acute lower respiratory infections. Additionally, insufficient illumination (low light) conditions can cause some degree of eye strain and reading in these conditions over long periods of time may have the potential to increase the development of 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.

6.11.6.1 Enhancement Measures

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

6.11.7 Improved Standard of Living

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

6.11.7.1 Enhancement Measures

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

6.11.8 Security

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

6.11.8.1 Enhancement Measures

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

6.11.9 Communications

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

6.11.9.1 Enhancement Measures

- Ensure that the power supply is reliable.

6.12 Positive Impact - Decommissioning Phase

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 Samburu 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;

6.12.1 Employment Opportunities

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

6.12.1.1 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.

6.12.1.2 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 Samburu 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.

6.12.2 Site Rehabilitation

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

6.13 Negative Impacts – PRE-Construction Phase

6.13.1 Land Acquisition

The proposed project will entail the acquisition of a 1.21664 hectares land parcel for setting up the mini-grid. The land acquired may also be used to 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 PAPs 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.

6.13.1.1 Source of Impact and Overview of Baseline Conditions

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

6.13.1.2 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.

6.13.1.2.1 Significance of Impact

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

6.13.1.3 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.
    - The community requested for Water reticulation of the village water tanks, and water shops for the existing Sereolipi water project. There is need to distribute the water to three fetching points with storage tanks at the trading centre and a distribution line to the watering facility for the cattle. The cattle watering facility is less than 10m from the borehole.
    - The community also proposed for the entire fencing of Sereolipi Primary School as a secondary priority.
- A-RAPs will be prepared and implemented in sub-project sites on the community land

6.13.2 Acquisition of Way leaves

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

6.13.2.1 Embedded/In-built Controls

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

6.13.2.1.1 Significance of Impact

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

6.13.2.2 Mitigation measures

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

6.13.3 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

6.13.3.1 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.

6.13.3.1.1 Significance of Impact

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

6.14 Negative Impacts – Construction phase

6.14.1 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 community in Sereolipi Location. 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.

6.14.1.1 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 Sereolipi will be used for access to the project site.

6.14.1.2 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.

6.14.1.3 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.

6.14.2 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.

6.14.2.1 Embedded/In built Control

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

6.14.2.2 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.

6.14.2.3 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.

6.14.3 Impact on Soil

6.14.3.1 Project Phases and Associated Activities

For impact assessment, the following phases of the project cycles were considered for potential impacts on the soil environment. The phase wise project activities that may impact the environment are described below:

Construction Phase

- 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.

Operation and Maintenance Phase

- Storage of oil and lubricants onsite;
- Disposal of municipal solid waste and waste water from site office; and
- Storage of waste materials onsite.

Decommissioning Phase

- Removal of PV modules;
- Removal of associated infrastructure including battery and generators.

6.14.3.2 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.

6.14.3.3 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

6.14.4 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.

6.14.4.1 Embedded/in-built control

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

6.14.4.2 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.

6.14.4.3 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.

6.14.5 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.

6.14.5.1 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.

6.14.5.2 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.

6.14.5.3 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.

6.14.5.4 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.

6.14.6 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, Transformers 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.

6.14.6.1 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.

6.14.6.2 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.

6.14.6.3 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.

6.14.7 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.

6.14.7.1.1 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.

6.14.7.1.2 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.

6.14.7.1.3 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.

6.14.8 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.

6.14.8.1.1 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.

6.14.8.1.2 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.

6.14.9 Impacts from Hazardous Materials

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

6.14.9.1.1 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.

6.14.9.1.2 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

6.14.10 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.

6.14.10.1.1 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.

6.14.10.1.2 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.

6.14.11 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.

6.14.11.1.1 Significance of Impact

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

6.14.11.1.2 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.

6.14.12 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.

6.14.12.1.1 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.

6.14.12.1.2 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.

6.14.13 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 Sereoilipi village.

6.14.13.1 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.

6.14.13.2 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.

6.14.13.3 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.

6.14.14 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.

6.14.14.1 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).

6.14.14.2 Significance of Impact

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

6.14.14.3 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.

6.14.15 Child labour

Implementation of the Sereolipi 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.

6.14.15.1 Significance of Impact

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

6.14.15.2 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.

6.14.16 Impacts on Cultural Heritage

Cultural and paleontological artifacts 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.

6.14.16.1 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.

6.14.16.2 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.

6.14.17 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.

6.14.17.1 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.

6.14.17.2 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.

6.14.18 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)

6.14.18.1 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 Samburu community.

6.14.18.2 Mitigation measures

In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following.

- Early identification and inclusion of VMGs and disadvantaged groups.
- Meaningful consultation to effectively participate in the project.

- Timely and prior disclosure of relevant project information to VMGs and disadvantaged groups.
- Adequate and ongoing consultations with VMGs and disadvantaged groups in line with the SEP.
- All concerns or grievances raised are fully resolved in a timely manner.
- Access to culturally appropriate project benefits and opportunities.
- 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

6.14.19 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.

6.14.19.1 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.

6.14.19.2 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.

6.14.20 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.

6.14.20.1 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.

6.14.20.2 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.

6.14.21 Forced Labor

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

6.14.21.1 Significance of Impact

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

6.14.21.2 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).

6.15 Negative impacts – Operation phase

6.15.1 Impact on Soil

6.15.1.1 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.

6.15.1.1.1 Embedded/in-built control

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

6.15.1.1.2 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.

6.15.1.1.3 Additional Mitigation Measures

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

6.15.2 Waste Generation and management

During operation phase, the waste generated from project includes domestic solid waste building and substation 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.

6.15.2.1 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.

6.15.2.1.1 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

6.15.2.2 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.

6.15.2.3 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.

6.15.3 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 Sereolipi confirmed that water is a major concern 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.

6.15.3.1 Embedded/in-built control

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

6.15.3.2 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.

6.15.3.3 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.

6.15.4 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.

6.15.4.1 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.

6.15.4.2 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.

6.15.5 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.

6.15.5.1 Significance of Impact

The impact will be of minor significance.

6.15.5.2 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.

6.15.6 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.

6.15.6.1 Significance of Impact

The impact will be of minor significance.

6.15.6.2 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

6.15.7 Fire Outbreaks

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

6.15.7.1 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.

6.15.7.2 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

6.15.8 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.

6.15.8.1 Significance of Impact

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

6.15.8.2 Mitigation Measures

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

6.15.9 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.

6.15.9.1 Significance of Impact

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

6.15.9.2 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

6.15.10 Noise and Vibration

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

6.15.10.1 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.

6.15.11 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.

6.15.12 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.

6.15.12.1 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

6.15.13 Vehicle exhaust emissions

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

6.15.13.1 Significance of Impact

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

6.15.13.2 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

6.15.14 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.

6.15.14.1 Embedded/ in-built Control

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

6.15.14.2 Significance of Impacts

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

6.15.14.3 Additional Mitigation Measures

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

- Design of distribution towers and transformers 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.

6.15.15 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

6.15.15.1 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;

6.15.15.2 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.

6.15.15.3 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.

6.15.16 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.

6.15.16.1 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;

6.15.16.2 Significance of Impact

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

6.15.16.3 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

6.15.17 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.

6.15.17.1 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.

6.15.17.2 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.

6.15.18 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 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.

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.

6.15.18.1 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 Samburu community.

6.15.18.2 Mitigation measures

In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following.

- Early identification and inclusion of VMGs and disadvantaged groups.
- Meaningful consultation to effectively participate in the project.
- Timely and prior disclosure of relevant project information to VMGs and disadvantaged groups.
- Adequate and ongoing consultations with VMGs and disadvantaged groups in line with the SEP.
- All concerns or grievances raised are fully resolved in a timely manner.
- Access to culturally appropriate project benefits and opportunities.
- 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

6.15.19 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.

6.15.19.1 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.

6.15.19.2 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.

6.15.20 Shocks and electrocutions

Majority of the PAPs 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.

6.15.20.1 Significance of Impact

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

6.15.20.2 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

6.15.21 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.

6.15.21.1 Significance of Impact

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

6.15.21.2 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

6.16 Negative impacts – Decommissioning Phase

6.16.1 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.

6.16.1.1 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.

6.16.1.2 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

6.16.2 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.

6.16.2.1 Embedded/in-built control

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

6.16.2.2 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.

6.16.2.3 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.

6.16.3 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.

6.16.3.1 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

6.16.3.2 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.

6.16.3.3 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.

6.16.3.4 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.

6.16.4 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.

6.16.4.1.1 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.

6.16.4.1.2 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.

6.16.4.1.3 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.

6.16.5 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.

6.16.5.1 Significance of Impact

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

6.16.5.2 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 Samburu 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.

6.16.6 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.

6.16.6.1 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;

6.16.6.2 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.

6.16.6.3 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.

6.16.7 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.

6.16.7.1 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.

6.16.7.2 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.

6.16.8 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.

6.16.8.1 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 Samburu community.

6.16.8.2 Mitigation measures

In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following.

- Early identification and inclusion of VMGs and disadvantaged groups.
- Meaningful consultation to effectively participate in the project.

- Timely and prior disclosure of relevant project information to VMGs and disadvantaged groups.
- Adequate and ongoing consultations with VMGs and disadvantaged groups in line with the SEP.
- All concerns or grievances raised are fully resolved in a timely manner.
- Access to culturally appropriate project benefits and opportunities.
- 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

6.16.9 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.

6.16.9.1 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.

6.16.9.2 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.

6.16.10 Child labour

Decommissioning of the Sereolipi minigrid 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.

6.16.10.1 Significance of Impact

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

6.16.10.2 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.

6.16.11 Forced Labor

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

6.16.11.1 Significance of Impact

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

6.16.11.2 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).

6.17 Cumulative Impacts

6.17.1 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 environment

7 ENVIRONMENTAL AND SOCIAL MITIGATION AND MANAGEMENT PLAN (ESMMP) FOR THE PROPOSED PROJECT

7.1 Introduction

ESMMP for developing projects is used to provide a logical framework within which identified negative environmental impacts can be avoided, mitigated and monitored. In addition, the ESMMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done. The ESMMP is a vital output of an Environmental and Social Impact Assessment as it provides a checklist for project monitoring and evaluation. The ESMMP outlined below will address the identified potential negative impacts and mitigation measures of the project.

By design, the project's potential positive impacts can be easily optimized, while the majority of the project's negative environmental and social impacts are mostly limited to the planning and construction phases, with the negative impacts experienced during the project's operation phase mitigated by continuous system maintenance. These are classified as negligible, minor to moderate, reversible and short-term, and manageable through well-defined mitigation and monitoring strategies.

7.2 Monitoring

Monitoring denotes a systematic process of collecting, analyzing and using information to track the progress of implementation of the ESMMP including coming up with measures to address any emerging issues. Monitoring of the ESMMP will involve recording information to track performance and recommendations to keep implementation of ESMMP on track. Reporting is a key component of the monitoring exercise.

The proposed ESMMP will be subjected to monitoring. Monitoring will have two elements: routine monitoring against standards or performance criteria; and periodic review or evaluation. Monitoring will often focus on the effectiveness and impact of the ESMMP as a whole.

During the construction phase, the Implementing agency (KPLC) shall monitor the contractor's activities in order to verify that the management measures/procedures/specifications are implemented as contained in the ESMMP. Compliance will mean that the contractor is fulfilling their contractual obligation.
During the operation phase, KPLC will monitor the facility's operations to ensure compliance with management measures in the ESMMP and operation procedures. As part of this monitoring, the KPLC will undertake or statutory initial environmental audit as required by the ESIA/EA Regulations, 2003 and subsequent annual environmental audits.

7.3 Plan Monitoring

All of the management plans make provision for monitoring and evaluation. Special attention should be given to the monitoring arrangements relating to biophysical impacts, occupational health and safety, social risks, facility operational and emergency response.

During the construction phase of the project, the contractor's Environmental Health and Safety Officer (EHSO) shall report on the implementation of the ESMMP i.e., all environmental, safety and health impacts as well as accidents and incidents to the implementing agency. The social specialist of the contractor will report on implementation of the social measures as spelt out in the ESMMP.

The reported impacts and incidents will be captured on a database to ascertain trends and track progress in the implementation of preventive and corrective actions, and benchmarking against other, similar operations.

During operation, the implementing agency – KPLC will monitor the health and safety of personnel and contractors, in compliance with legislative requirements. Emergency incidents should be reported to the relevant authorities. The reported impacts and incidents will be captured on a database to identify weakness in the emergency response plan and track progress in the implementation of preventative and corrective and benchmarking against other similar operations.

The Environmental and Social Management and Monitoring Plan (*ESMMP*) will provide the basis for monitoring of potential Environmental, social and health Impacts associated with the project. The ESMMP provides effective observation and documentation of monitorable parameters that will help in analyzing the effectiveness of the proposed mitigation measures with the advantages of improving operational efficiency, promoting competitive advantage, improving risk management, reducing liabilities and improving business performance. The ESMMP has been provided in **Table18** below.

7.4 Environmental and Social Monitoring by Contractors

KPLC will require that contractors monitor, keep records and report on the following environmental, health and social issues of the proposed project.

1. *Safety*: hours worked, recordable incidents and corresponding root cause analysis (lost time incidents, medical treatment cases), first aid cases, high potential near misses, and remedial and preventive activities required (for example, revised job safety analysis, new or different equipment, skills training, and so forth).
2. *Environmental incidents and near misses*: environmental incidents and high potential near misses and how they have been addressed, what is outstanding, and lessons learned.
3. *Major works*: those undertaken and completed, progress against project schedule, and key work fronts (work areas).
4. *E&S requirements*: noncompliance incidents with permits and national law (legal noncompliance), project commitments, or other E&S requirements.
5. *E&S inspections and audits*: to include date, inspector or auditor name, and records reviewed, major findings, and actions recommended and implemented.

6. *Workers*: number of workers, indication of origin (expatriate, local, nonlocal nationals), gender, age and skill level (unskilled, skilled, supervisory, professional, management).
7. *Training on E&S issues*: including dates, number of trainees, and topics.
8. *Footprint management*: details of any work outside boundaries or major off-site impacts caused by ongoing construction—to include date, location, impacts, and actions taken.
9. *External stakeholder engagement*: highlights, including number of formal and informal meetings, and information disclosure and dissemination—to include a breakdown of women and men consulted and themes coming from various stakeholder groups, including vulnerable groups (e.g., disabled, elderly, children, etc.).
10. *Details of any security risks*: details of risks the contractor may be exposed to while performing its work—the threats may come from third parties external to the project.
11. *Worker grievances*: details including occurrence date, grievance, and date submitted; actions taken and dates; resolution (if any) and date; and follow-up yet to be taken—grievances listed should include those received since the preceding report and those that were unresolved at the time of that report.
12. *External stakeholder e.g., community grievances*: grievance and date submitted, action(s) taken and date(s), resolution (if any) and date, and follow-up yet to be taken—grievances listed should include those received since the preceding report and those that were unresolved at the time of that report. Grievance data should be age and gender-disaggregated.
13. Major changes to contractor's environmental and social practices.
14. *Deficiency and performance management*: actions taken in response to previous notices of deficiency or observations regarding E&S performance and/or plans for actions to be taken—these should continue to be reported until KPLC determines the issue is resolved satisfactorily.

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

Table 18: Environmental and social management plan ESMP

Social Impacts

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
Local employment	-Prioritize hire of locals for all unskilled labour. -Implement a local recruitment plan that is fair and transparent (including recruitment processes that ensure inclusivity of both men and women, vulnerable individuals, minority clans, ethnic groups and VMGs. -Adhere to labour laws, and labour management practices (timely renumeration, equitable compensation for both genders for equal work etc.) -Create awareness to workers and the community on worker and project grievance redress mechanisms.	Construction Operations Decommissioning	Contractor Proponent	-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	Construction Decommissioning	Contractor	-Number and types of businesses sourced from, businesses owned and operated by	Quarterly	No additional cost

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	vulnerable individuals.			vulnerable individuals, types and quantities of materials etc.		
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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.					
Labour Influx and related impacts (SEA/SH, HIV/AIDs and other STIs)	-Tap into the local workforce to the extent possible to reduce labour influx. -Recruit local workforce to the extent possible especially for unskilled and semi-skilled jobs. -Consult with and involve local community in project planning and other phases of the project.	Construction Decommissioning	Proponent, Contractor	-Records of employees/updated employee register. -Number of local community employees and external employees/ updated employee register.	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-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. -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.					

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	-Prompt payment of workers as per the contractual agreements/terms.					
Child labour	-Employ workers who are 18 years and above, and with a valid national ID at the time of hire. -Implement and monitor the employment register regularly. Compliance with the national labor laws and labour management practices. -Put visible signage on site "**No Jobs for children**" -Do not allow children at the project site.	Construction Decommissioning	Contractor, Proponent	-Updated employment register indicating locals employed, their ages, national identification numbers etc. -Grievances raised, aggrieved persons and status on resolution etc.	Quarterly	20,000.00
GBV- SEA and SH	-Prepare an SEA/SH Prevention and Response 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	Construction Operations Decommissioning	Contractor Proponent	-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	Quarterly	50,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	and a GRM that ensures confidential reporting of GBV cases. -Implement a code of conduct signed by all those with physical presence on site.			confidentiality of GBV cases in place. Documented referral services for survivors. -Grievances raised, aggrieved persons and status on resolution etc		
Forced Labour	-Adhere to the Employment Act which outlaws any form of forced labour. -Report any form of forced labour 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 labour.	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,	Construction Operations Decommissioning	Contractor	-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).	Quarterly	30,000.00

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

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	• 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.			households, grievances raised and status on resolution etc.		
Inaccessibility of project benefits to VMGs and other vulnerable individuals due to affordability challenges	-Consult VMGs and Vulnerable individuals and households on charges for sub project services, and put in place specific interventions to ensure the vulnerable equally access project benefits.	Operations	Proponent	-Interventions to enable those vulnerable access project benefits. -Number of complaints raised by VMGs/vulnerable individuals regarding access to project services. -GRM that is culturally appropriate and accessible.	Quarterly	No additional cost

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
				Grievances raised and status on resolution etc		
Inadequate grievances management	-Constitute a Local Grievances Committee is in consultation with all community segments, and incorporates the existing local dispute resolution mechanism. -Implement a workers grievances mechanism. -Awareness on the culturally appropriate and accessible GRM to all community segments including VMGs, vulnerable individuals and households and CSOs -All reported grievances are logged, dated, processed, resolved and closed out in a timely manner. -Proportionate representation of VMGs and vulnerable individuals in the local grievances committee. -GRM provides for confidential reporting of particularly	Construction Operations Decommissioning	Contractor Proponent	-Local Grievances Committee in place, composition of committee, awareness of community and workers on project and worker GRMs, updated GRM logs, types of grievances -Availability of grievance redress process -Number of grievances reported -Number of grievances resolved in a timely manner -Number of grievances escalated to national courts and the World Bank Grievances Redress Service and Inspection Panel.	Quarterly	No additional cost

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	sensitive social aspects such as GBV, as well as anonymity.					
Environmental Impacts						
Vegetation clearance	1. Clear only the necessary areas 2. Ensure proper demarcation and delineation of the project area to be affected by construction works. 3. Specify locations for vehicles and equipment, and areas of the site which should be kept free of traffic, equipment, and storage. 4. Designate access routes and parking areas ***5.*** Re-vegetation including planting of trees around the plant/facility	Construction	Contractor	-Number of trees cleared -Planted trees	Once off	50,000.00
Soil erosion	1. Avoid ground-breaking during the seasons of high rainfall to avoid erosion.	Construction	Contractor	Assess size of rills or Gulley forming from accelerated run off	Quarterly	Part of contractor's fee

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	2. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled. 3. Construction related impacts like erosion and cut slope destabilizing should be addressed through landscaping and grassing, carting away and proper disposal of construction materials 4. Use silt traps where necessary 5. Cover soil stock piles 6. Landscaping with grass on areas without electrical installation (lower areas) 7. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled.			from compacted areas		

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
Contamination of soil from fossil fuels	1. Ensure waste water generated is discharged or drained into approved drainage facilities 2. Construction vehicles must be maintained in good state and proper servicing to ensure no oils are likely to leak 3. Care must be exercised not to spill any fossil fuels 4. Any contaminated soil shall be scooped and disposed-off appropriately. 5. No servicing vehicles on site	Construction	Contractor	Records of any leakages from construction equipment/ vehicles.	Quarterly	50,000.00
Dust emissions	1. The construction area should be fenced off to reduce dust to the public 2. Suppress dust during dry periods by use of water sprays; **3.** Stockpiles of excavated soil should be enclosed/covered/watered during dry or windy conditions to reduce dust emissions.	Construction	Contractor	-Visual Observation of dust -Provision of PPEs especially masks	Daily	100,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	4. Burning of woody debris & construction waste to be prohibited **5.** Use of personnel protective equipment (PPE) -masks should be provided to all personnel in areas prone to dust emissions 6. Restrict speed on loose surface roads during dry or dusty conditions 7. Keep stockpiles and exposed soils compacted and re-vegetate as soon as possible. 8. Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas 9. Plant short trees to break speed of wind					
Vehicle exhaust and emissions	1. Drivers of construction vehicles must be sensitized so that they do not leave vehicles idling so	Construction	Contractor	-Engine maintenance records - inspection of stacks	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
from Generator	that exhaust emissions are lowered. 2. Maintain all machinery and equipment in good working order to ensure minimum emissions of carbon monoxide, NO_X, SO_X and suspended particulate matter 3. Maintain equipment in good running condition – no vehicles to be used that generate excessive black smoke 4. Use of diesel which is Sulphur- free to run the power producing generators to be encouraged 5. The stack chimney of the generators will be increased from its normal height of 3 meters to 6 meters					
Solid waste generation	1. Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during	Construction	Contractor	Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	landscaping and then rehabilitation, in the correct order which they were removed that is top soil last; 2. Segregate waste 3. Provide litter collection facilities such as bins 4. Contractor to put in place and comply with a site waste management plan 5. The contractor should comply with the requirement of OSHA ACT 2007 and Building rules on storage of construction materials 6. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time 7. Recovery of materials remains and return to stores 8. Re-use of materials where possible 9. Proper budgeting to avoid waste generation					

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	10. Proper disposal of waste in line with solid waste regulation 6. Construction wastes to be managed in accordance with construction standards in Kenya					
Impacts on Water Resources and Water Quality	1. Clear the necessary areas only. 2. Appropriate remedial measures shall be implemented by the contractor in the event of erosion. 3. Infrastructure shall be designed to ensure that contaminated run-off does not reach water source i.e., earth dam. 4. Contractor to develop an oil-spill containment plan as part of the emergency response plan. In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect.	Construction	Contractor	-Oil spill containment plan. -Provision of fuel/oil drip and spill trays	Quarterly	150,000

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	5. No vehicle maintenance and service shall be done at project site 7. Ensure that potential sources of petrol-chemical pollution are handled in such a way to reduce chances of spills and leaks.					

Noise & vibration	1. Construction activities to avoid any unchanneled flow of water at the site 2. Storage areas that contain hazardous substances should be bunded with an approved impermeable liner and provision for a pit to be made in case of oil spill. 3. The excavation and use of rubbish pits during construction should be strictly prohibited. 4. A waste disposal area should be designated within the active construction area and this should be equipped with suitable containers i.e., skips or bins of sufficient capacity and designed to contain and prevent refuse from being blown by wind, 11. Areas contaminated by spilled concrete and/or fuels and oils leaking from vehicles and machinery should be cleaned immediately	Construction	Contractor	Noise levels-Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Quarterly	150,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
Impacts from Hazardous materials -	1. Maintenance of construction vehicles will not be done on site 2. All hazardous products and waste should be labelled and handled properly to avoid contact with the ground 3. Dispose hazardous waste through a NEMA approved waste handler	Construction	Contractor	Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00
Accidental Oil Spills or Leaks	1. In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately. 2. Refuelling and maintenance of vehicles will not take place at the construction site. 3. Create awareness for the employees on site on procedures of dealing with spills and leaks 4. Vehicles and equipment must be serviced regularly and kept in good state to avoid leaks. 5. In case of spillage the contractor should isolate	Construction	Contractor	Records of all accidental spills and number of litres	Quarterly	150,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	the source of oil spill and contain the spillage using sandbags, sawdust, absorbent materials and/or other materials approved by materials. 6. All chemicals should be stored within the bunded areas and clearly labelled detailing the nature and quantity of chemicals within individual containers.					
Fire Hazards	1. Create awareness to the construction workers on potential fire hazards 2. Provision of firefighting equipment on site during construction. 3. No smoking shall be done on construction site 4. 'No smoking' signs shall be posted at the construction site 5. A fire risk assessment and evacuation plan should be prepared and must be posted in various points of	Construction	Contractor	-Records of any Fire incidences -Fire equipment and evacuation plan	Quarterly	100,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	the construction site including procedures to take when a fire is reported. 6. Designate an assembly point					
Impacts of construction material sourcing (e.g., quarrying)	1. Source all building materials such as stone, sand, ballast and hard core from NEMA approved sites. 2. Ensure accurate budgeting and estimation of actual construction materials to avoid wastage. 3. Reuse of construction materials where possible.	Construction	Contractor	Sources of raw materials (from local community)	Quarterly	Part of contractor's cost
Increased water demand	1. Prudent use of available water 2. Consultations with the project local committee on use of water in the community to avoid conflicts with the community 3. Source and utilize a sustainable and reliable	Construction	Contractor	Water usage records	Quarterly	Part of contractor's cost

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	water supply for both construction and operation phase.					
Energy Consumption	1. Ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used. 2. Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. 3. Complementary to these measures, they monitor energy use during construction and set targets for reduction of energy use.	Construction	Contractor	Energy consumption records	Quarterly	No additional cost
Occupational Health and safety Impacts	1. Use skilled personnel for activities which demand skills/technical tasks	Construction	Contractor	Records of any near misses, incident, and accidents.	Quarterly	1,000,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	2. Awareness creation/Tool box talks on safety to workers while at construction site 3. Workers coming to the site should be knowledgeable on safety precautions to take 4. Appropriate PPE (helmet, safety harness, boots, masks, climbing irons) 5. Proper general house keeping 6. Close supervision of workers 7. Risk assessment by contractor of the construction activities and implement mitigation measures appropriately 8. Adherence to occupational Safety and Health Act 2007 9. Availability of equipped first aid box on site 10. Provide safe drinking water for workers			Records of corrective actions implemented if there was an accident.		

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	11. Engagement of trained first aider on site 12. Ensure the WIBA cover is taken for the staff 13. Establish safety committees					
Community safety –access	1. Proper barricading 2. Hazard communication. 3. Controlled access to the site by designated personnel 4. Maintain records of any person who comes to site	Construction	Contractor	Presence of a controlled access and records of every person accessing the site	Daily	20,000.00
Public Health Impacts	1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training, awareness campaigns and community *Barazas.* 2. Awareness creation and consultations with local communities prior and during construction on the dangers of these diseases	Construction	Contractor	Number of awareness creation sessions conducted. -Availability of and distribution of condoms	Quarterly	20,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	3. Informing workers on local cultural values and health matters. 4. Provision of condoms to workers 5. Allowing migrant workers time to be with their families 6. The contractor is impressed upon not to set a construction camp on site. 7. The contractor will provide public education/information about HIV/AIDS transmission and prevention measures. 8. Ensure equal treatment of workers 9. Provide all appropriate COVID-19 preventive measures including campaign to maintain individual measures at the workplace.					
Sanitary waste	**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

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
Solid Waste Generation	1. Provide waste handling facilities such as labelled waste bins 2. Emphasis on prudent waste generation and give priority to reduction at source 3. Solid waste management awareness to operators 4. Operator to contract a NEMA licensed waste handler to collect and dispose solid waste	Operation	O&M Contractor	Presence of well-maintained receptacles and centralized collection points	Quarterly	50,000.00
Liquid Waste/Oils Generation	*1.* Proper storage of the oil is required to ensure no leakages 2. Frequent inspection and maintenance of the generator to minimize leakages. 3. No vehicles should be serviced or maintained at the Mini-grid area. 4. The waste oil or used oil must be disposed-off appropriately. 5. Proper training for the handling and use of fuels for the operators of the Mini-grid.	Operation	O&M Contractor	-Engine maintenance records -Oil spill containment plan	Quarterly	200,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	6. In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately.					
Increased oil Consumption	1. Efficient energy consumption 2. Install an energy-efficient lighting system	Operation	O&M Contractor	Energy consumption records	Quarterly	No additional cost
Increased storm water flow	1. Construct the drainage system in a way to follow natural drain of the water 2. Concrete only the required area and leave the rest of the land with vegetation like grass 3. Construct rain water harvesting system on the control buildings/office and harness into storage tanks for use	Operation	O&M Contractor	Provision of a drainage system and a rain water harvesting system	Quarterly inspections	200,000.00
Fire Outbreaks	1. The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points	Operation	O&M Contractor	-Provision of serviced fire equipment, evacuation plan and safety signages -Records of fire safety training	Quarterly	50,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	2. Detection/alarm systems that can detect fire should be and installed 3. A fire evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported. 4. Workers especially operators of the plant must be trained on fire management 5. 'No smoking' signs shall be posted within the Mini-grid area 6. A fire Assembly point should be identified and marked					
Visual Impacts	1. Fence round the solar Mini-grid to keep off/screen the solar panels.	Operation	O&M Contractor	Presence of a perimeter fence	Quarterly inspections	No additional cost
Water demand	1. Ensure prudent use of water. 2. Install water-conserving automatic taps. 3. Any water leaks through damaged pipes and faulty	Operation	O&M Contractor	Water usage records	Quarterly	20,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	taps should be fixed promptly.					
Sanitary waste	1. Provide sanitary waste facilities for both genders clearly marked 2. Disposal of waste through septic tanks	Operation	O&M Contractor	Presence of separate and clean washrooms for both the gents and ladies	Quarterly	No additional cost
Flooding	1. Ensure drainage channels are free of any obstruction at all times i.e., not blocked 2. Construct more channels and or expand existing ones 3. Raise foundations of the solar panels and ensure a proper and from concrete base 4. Create flooding diversions and or spill ways to divert water from getting into the solar power facility	Operation	O&M Contractor	-Provision of drainage system -Raised foundations for the structures	Quarterly	100,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
Occupation health and Safety	1. Ensure only qualified staff are employed to work in the facility 2. All workers operating the Mini-grid must be equipped with appropriate and adequate person protective equipment (PPE) such as; safety footwear, helmet among others. 3. Operators must be skilled on firefighting management 4. Annual environmental audits should be done 5. WIBA cover for staff is mandatory	Operation	O&M Contractor	-Provision of PPEs and WIBA cover -Environmental audit reports	Quarterly	100,000.00
Hazardous waste-damaged panels	1. Segregation from other waste streams 2. Proper disposal through a NEMA approved/licensed handler	Operation	O&M Contractor	Presence of well-maintained receptacles and centralized collection	Quarterly	200,000.00
Noise and Vibration	1. Generator room should be sound proof to ensure no noise of a nuisance level will be produced. 2. Monitor noise levels	Operation	O&M Contractor	Noise levels-Records of noise measurements done by contractor within the project area and at distances of 30m	Quarterly	Part of contractor's cost

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
				from the Solar mini-grid		
Shocks and electrocutions	1. Inspect the wiring of the houses before connecting power 2. Safety awareness campaigns to the community before connection of power on 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	Operation	O&M Contractor, Consumer	-Records of awareness sessions conducted -Incidences report	Quarterly	No additional cost

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	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					
Community Safety- Access to site by general public	1. Fencing off the facility to keep of community members, children and livestock from entering into the facility 2. Controlled access to the site only with prior approval 3. Maintain records of any person who comes to site	Operation	O&M Contractor	Presence of a controlled access and records of every person accessing the site	Daily	Part of contractor's cost

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
Risks related to poor or inadequate stakeholder engagement (Conflict)	1. Employ from the community to the extent possible 2. Engage the community members and other stakeholders in a timely manner 3. Work closely with the GRM committee members in solving the conflicts 4. Solve all conflicts/grievances at the earliest time possible 5. Ensure all grievances are logged and closed 6. Monitoring the pattern of grievances to come up will long term measures	Operation	O&M Contractor, Proponent	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 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	Operation	O&M Contractor	-SEA/SH Prevention and Response Action Plan -Grievance records	Quarterly	20,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
Public Health Impacts – HIV/AIDs	1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff awareness and awareness campaigns for the community 2. Provision of condoms to workers 3. Allowing migrant workers time to be with their families	Operation	O&M Contractor	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 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	Operation	O&M Contractor	Availability of hand washing facilities Utilization of hand washing facilities Number of Covid-19 cases reported	Quarterly	30,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	health which may be issued from time to time					
Dust Emission	**1.** Trees can be planted around the plant/facility provided they do not cast shadows to the solar panels to act as wind breakers and hence decrease dust pollution 2. Ensure planting of grass around and within the facility compound	Operation	O&M Contractor	Visual inspection	Quarterly	50,000.00
Vehicle Exhaust Emissions	1. Drivers of the vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered. 2. Company vehicles should be well maintained	Operation	O&M Contractor	Engine maintenance records	Quarterly	No additional cost
Noise and Vibration	1. Install portable barriers to shield compressors and other small stationary	Decommissioning	Contractor	Noise levels-Records of noise measurements done by contractor within	Once off	20,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	equipment where necessary. 2. Use quiet equipment (i.e., equipment designed with noise control elements). 3. Co-ordinate with relevant agencies in case the noise produced will require a license. 4. Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible. 5. Demolish mainly during the day when most of the neighbours are out working.			the project area and at distances of 30m from the Solar mini-grid		
Solid Waste Generation	1. Demolition contractor to adhere to the various manufacturer's guidelines and requirements regarding demolition and disposal 2. Segregation of waste in order to separate hazardous waste from	Decommissioning	Contractor	Presence of well-maintained receptacles and centralized collection points	Daily	700,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	non-hazardous waste and other streams of waste 3. Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements 4. Adequate collection and storage of waste on site 5. Safe transportation to the disposal sites / designated area 6. Hazardous waste must be disposed by NEMA approved waste handler					
Dust Emissions	1. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard	Decommissioning	Contractor	Visual inspection	Daily	20,000.00
Public Health-HIV/AIDS	The project will sensitize workers and the surrounding communities on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training and awareness campaigns/ to the community.	Decommissioning	Contractor	Records of awareness creation sessions conducted. -Availability of and distribution of condoms	Once off	20,000.00

Potential Impacts	**Recommended Mitigation Measures**	**Project phase**	**Responsibility**	**Monitoring Indicator**	**Frequency**	**Estimated Cost (Ksh)**
	Total					4,380,000.00

7.5 Approach to Environmental Impact Management

The proposed ESMMP will be the responsibility of the proponent/KPLC and the contractor as outlined. This section presents the range of approaches that will be used to manage potential impacts of the proposed project.

7.6 Possible Enhancement Measures

The following are some examples of potentially positive impact enhancement measures:

- Construction should follow best design practices that make efficient and cost-effective use of locally available resources such as materials, expertise, and labor;
- The project should be run in accordance with the operations and maintenance specifications produced in conjunction with the design;
- Ascertain that the project under GRM will provide for the underprivileged and other vulnerable groups in the project area;
- Ensure that social services provide instruction on acceptable hygienic conditions, taking gender-specific duties and responsibilities into account.

7.7 Management Plan during Construction Phase

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

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

7.7.1 Construction Management Plan

The construction management plan for the proposed project shall include the following:

a) Management of Fuels and other Hazardous Materials

- The Contractor shall comply with all applicable laws, regulations, permit and approval conditions and requirements relevant to the storage, use, and proper disposal of hazardous materials.

b) Management of the Construction Site

- The contractor shall prevent littering and the random discard of any solid waste on or around the construction site

- The contractor shall manage other solid and liquid waste

c) Fire Prevention and Management

- The Contractor shall take all necessary precautions to prevent fires caused either deliberately or accidentally during construction process.
- The Contractor shall prepare a fire prevention and fire emergency plan as a part of the plans to be submitted to KPLC.

d) Management of Air Quality

- The Contractor shall institute appropriate measures to minimize or avoid air quality impacts. This can be achieved through formulation of air quality management plan.

e) Neighboring Land Owner and Occupier Relations

- The Contractor shall respect the property and rights of neighboring landowners and occupiers at all times and shall treat all persons with deliberate courtesy.
- The contractor shall respect any special agreements between REREC and the neighbors e.g., the wayleaves agreements signed between Kenya power and landowners will need to be respected by the contractors.

f) Complaints Register

The contractor shall establish and maintain a register for periodic review by REREC that logs all the complaints raised by the neighbors or the general public about construction activities. The register shall be regularly updated, and records maintained including the name of the complainant, his/her domicile and contact details, the nature of the complaint and any action taken to rectify the problem.

g) Construction Control

The construction control for the proposed project shall cover the following:

Control of Access

The contractor shall ensure that the construction site is accessed by authorized persons only and up-to-date records kept

Control of material supply and burrow areas

- The contractor shall, as far as possible, source all material needed to construct the proposed project from the licensed quarries
- In instances where materials are to be obtained from a new burrow area; the contractor shall comply with relevant legislations.
- The contractor shall prepare a method statement including plans, detailing the expected quantity of excavation, temporary and permanent drainage control, the final contouring of the burrow pit and the proposed method of rehabilitation.

7.7.2 Rehabilitation and Site Closure Plan

- After completion of construction activities, the contractor shall clear the site of construction materials and dispose wastes in appropriate disposal sites.
- The contractor shall remove all temporary works on the construction site and grow grass on areas that are not covered by the installations to control erosion.

7.7.3 Local Recruitment Plan

The contractor will prepare a local recruitment plan to guide on recruitment of locals. The plan shall pay attention or adhere to Employment Act.
In designing the local recruitment plan contractor shall:

- Comply with the provisions of Employment Act, 2007
- Wherever possible, give priority to qualified local people when hiring employees.

The mitigation measure is:

- Prepare a local recruitment strategy that is fair and transparent to ensure all community segments - men, women, vulnerable individuals, minority clans, and VMGs who meet OP 4.10 criteria) - can access subproject benefits during construction and that prioritizes hire of locals for skilled, semi-skilled and unskilled labour.

7.7.4 Workplace Health and Safety Plan

The workplace health and safety plan to be implemented by the contractor and REREC shall include the following key measures:

- The contractor shall comply with all relevant legislative requirements governing worker health and safety at the work place (e.g., OSHA 2007 and its subsidiary legislations).
- The contractor shall prepare and implement measures to minimize diseases likely to be contracted by the construction workers as a result of the proposed project such as HIV &AIDs and other communicable diseases
- The contractor shall have obligations of managing the safety of its employees by;
    - Provision of appropriate PPEs to employee
    - Training employees on competence
    - Employing competence and qualified staff
    - Provision of First Aid Kits onsite
    - Should have a trained first aider
    - Document and create awareness on safe work procedures and work instruction
- The contractor will manage accidents by having an emergence response plan which will include contacts for emergency service providers e.g., ambulances, fire brigade and nearest hospitals
- Health and safety performance will be continuously monitored, and procedures reviewed with the aim of eliminating risk as far as reasonably practicable.

7.7.5 Community Health and Safety Plan

The community health and safety plan to be implemented by the contractor shall include:

- Adherence to OSHA 2007 Act and its subsidiary legislations to ensure that health and safety of immediate neighbors and the public is not threatened.
- The contractor to ensure that construction work is undertaken in manner not likely pose risks to community health and safety.

- The contractor shall undertake an independent risk assessment prior to construction. The findings of this assessment will inform the development of a community safety plan and create awareness to the community on the same.

7.7.6 Emergency Preparedness Plan

The Contractor shall develop an emergency plan that will enable rapid and effective response to all types of environmental emergencies in accordance with recognized national and international standards.
The emergency plan shall include establishment of a network of communication between the Contractor and emergency services including police, ambulance services, and fire brigades among others.

7.7.7 SEA/SH Prevention and Response Action Plan

The contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a Grievance Mechanism (GM) that ensures confidentiality. The plan should have an Accountability and Response Framework. The plan will include the necessary measures for prevention and response of GBV impacts.
The mitigation measures shall include:

- Ensure that local employment opportunities are equitably accessible to all segments of the community,
- Ensure equal pay for equal work
- Prepare and implement GBV (SEA/SH management) plan that includes sensitisation of community members and subproject workers on the potential of the subproject giving rise to, exacerbating and/or mitigating SEA and SH, and the appropriate mitigation measures
- Map all GBV service providers and document referral services for survivors, and, sensitize community members and subproject workers on the referral pathways.
- Prepare and implementing a functional and accessible contractor GBV GM for use by workers and community members (as appropriate).
- The GBV GM should allow for anonymous incident reporting and should be GBV survivor-centric
- Sensitize community members and workers on contractor GM
- Prepare and sensitise Code of Conduct (CoC) for SEA and SH, and their responsibilities for the same, to demystify the stigma associated with SEA and SH

7.7.8 Stakeholder Engagement Plan

A Stakeholder Engagement Plan is a formal approach to communicate with project stakeholders to achieve their support for the project. The plan prepared shall specifies the frequency and type of communications, media, contact persons, and locations of communication events. The SEP is a useful tool for managing communications between the contractor and other stakeholder. The plan should meet the following objective of a SEP.

- To help improve project design and implementation

- To inform third parties about changes that affect them
- To take their views into account in the implementation of projects
- To identify adverse impacts and mechanisms to enhance project benefits
- To identify risks from and to a project
- To increase project ownership and sustainability
- To comply with Bank policies that require consultations

The plan shall put this measure in to consideration:

- 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

7.7.9 Labor Influx Management Plan

The purpose of this plan is to provide a clear set of actions and responsibilities for the control of impacts linked to in-migration within the Project's area of influence. This plan will be regularly reviewed and updated to reflect revised Project design, socio-economic changes and learning experienced during its implementation.

The objectives of this plan are as follows:

- Monitor the scale of project induced in-migration into the project area and specific in-migration 'hotspots';
- Support local government and communities to manage both internal and external immigration into the project area; and
- Mitigate and manage any negative impacts and enhance and promote any positive impact related to labor influx.

The plan shall consider these measures:

❖ Prepare and Implement a Labour Management Plan (LMP) with policies and measures for ensuring that:

- Subproject managers and workers are sensitised on:
  - ✓ County/National Labour laws
  - ✓ County/National Child Labour laws
  - ✓ National/International Forced Labour laws
- Enforce:
  - ✓ The Code of conduct
  - ✓ County/National Labour laws
  - ✓ County/National Child Labour laws
  - ✓ National/International Forced Labour laws

7.8 Grievance Redress Mechanism

7.8.1 Introduction

For a long time, the northern part of Kenya has been a major staging area for a variety of low-intensity conflicts, some of which are linked to wider cross-border and regional conflicts. The causes of these disputes vary, but economic and social marginalization has long been a factor. Increased resource competition, reduced access to land, water, and other natural resources, and limited access to credit, markets, and extension services all lead to poverty and, as a result, increased conflict. Cattle rustling, ethnic violence, displacements, massacres, and revenge assaults are all common forms of conflict and violence.

Samburu society is a gerontocracy with elders being the decision makers at the camp level, the clan level and the phratry level where the assembly serves as a mobile judicial, administrative and spiritual centre. The majority of issues are resolved outside of the formal judicial system by a group of village elders known as lamal. The lamal is a respected body made up of village elders who play an important role in the local communities. They are tasked with resolving issues involving land, natural resources, such as pasture, and interclan rivalries, among other things.

The grievance procedure was adapted from the Social Assessment (SA), Vulnerable and Marginalized Group Framework (VMGF) and discussions with relevant stakeholders occurred during the ESIA consultations. The project will notify stakeholders of multiple points for making a complaint (if any), and the RE will collect and record complaints from these places on a regular basis. The grievances are then addressed by coordinating with the parties involved. The RE will oversee the grievance operations at the stakeholder level in order to address the grievances and will serve as the point of contact in this regard.

The proposed mini-grid project may lead to some grievances. A Grievance Redress Mechanism (GRM) provides access to remedy and identifies procedures to effectively address grievances arising from project implementation. Persons affected by the project must have an avenue where they can formally lodge their complaints and grievances and have them properly considered and addressed. Potential sources of grievances and conflicts as a result of administration of the mini-grid project include:

- Inadequate or lack of consultation;
- Concern over exclusion in decision-making;
- Poor communication and facilitation;
- Dissatisfaction with levels of representation in the various project committees.
- Discontentment regarding performance of mitigation measures (e.g., support from alternative livelihoods);
- Lack of transparency and accountability through the citizen engagement.

7.8.2 Possible Sources of Grievances

The following are some of the project anticipated grievances that could lead to dispute in the implementation of the project included:

- Land-related disputes and grievances
- Complaints about compensation (spouse and family)
- Compensation delay
- Inadequate land and other asset appraisal
- Community security and well-being (electrocution and fire accidents, tension with workers)

- Project-related accidents and incidents
- Cultural and religious problems as a result of in-migration
- Working conditions and wages
- A lack of participation in the decision-making process on proposed interventions (public facilities and households to be connected to power, cost of connection).
- Competition for resource usage (water, pasture etc.).
- An influx of in-migration.
- Gender-based and sexual violence.
- Ineffective construction methods.
- The Contractor's employees' improper behavior.
- Getting access to people's homes and businesses.

7.8.3 Parties and Committees Involved in the Grievance Redress Process and the Management Process

An effective mechanism to redress grievances will require:

- That grievances do not become contentious issues between project authorities and the affected community, resulting in project opposition.
- PAPs and the community at large appreciate the project authorities' efforts to reach out and listen to concerns, as well as to proactively address and resolve difficulties; and
- PAPs have shown a strong desire to support and benefit from the implementation of recommended mitigation measures.

Essentials in Grievance Redress

- Acknowledge that the displacement caused by a development would result in grievances, rather than ignoring or dismissing them.
- Effective listening: Paying attention to elicit information about the grievance will aid in accurately defining the problem.
- Separate fact from fiction by requesting facts and keeping a record of them. If the person is illiterate, assist them as needed.
- Rapid turnaround: Take as much time as you need to analyze, determine, and decide, and then convey your decision to the PAP. If there are any delays, keep in touch with project affected households.
- Follow-up: If a decision necessitates a follow-up action, do so as soon as possible to give the PAP confidence in the grievance procedures and process.

Grievance Redress Mechanism Players "The Key Players in the Grievance Redress Process are:

- VMGs and affected parties living in the project area
- Influential persons in the project affected village
- County Government
- National Government

The Grievance Mechanism gives impacted parties a way to express any concerns or problems they may have with the project implementation process in a cost-free and non-retaliatory manner. Affected parties will also have the option of taking their case to the Kenyan courts, as provided by Kenyan law. A grievance procedure is outlined to ensure that the basic rights and interests of project impacted persons are respected, that their concerns are effectively handled, and that entitlements are provided.

7.8.4 Grievance Procedures

Registration- Concerns can be reported directly to the mini-grid project management office or, if necessary, through third parties. A complaint will be logged in a complaints log or data system once it has been received. The log will be kept in a safe place either in paper or in electronic format All complaints will be sorted, given a priority, and investigated and routed as necessary.
Sorting and Processing- This stage evaluates whether a complaint qualifies for the grievance mechanism, as well as the severity and complexity of the complaint. The complaint will be screened, but this will not include a decision on the complaint's merits.

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-grid project.
- The issues raised in the complaint fall within the scope of issues the grievance mechanism is authorized to address.
- The complainant has standing to file.

Ineligible complaints may include those where:

- The complaint is clearly not mini-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.

7.8.5 Grievance Mechanism Process

The Process for the General Public, Stakeholders and PAPs

Appointment of Grievance Redress Committee Members.

Except for the assistant chiefs' locational chiefs, sub county administrators, county administrators, contractors, KPLC&REREC, who will be automatic members of the team due to their roles, membership to committees will be elected by the VMGs. The chairperson and secretary of each committee shall be chosen. The members of the GRCs will be chosen through an election process in which all project stakeholders will take part. The elections will be facilitated by KPLC&REREC and the local administration including national and county government.

Remuneration of Grievance Redress Committee Members

All members of the GRCs constituted at various levels will volunteer to carry out their responsibilities. Other from the costs of transportation, communication, meals, and a sitting allowance, there will be no remuneration. Members of the Grievance Committee will also need to be trained on the suggested grievance management system.

Capacity-Building for Grievance Committee

The capacities of the Grievance Committee members will also need to be built around issues of conflict identification, conflict information analysis and conflict resolution. A 5 tier/level grievance redress structure is provided for to ensure amicable review and settlement of grievances that may arise in the project.

Level 1: Lamal: The Lamal is a respected body made up of village elders who play an important role in the local communities. They are tasked with resolving issues involving land, natural resources, such as pasture, and interclan rivalries, among other things.

- ✓ The Lamal is made up of respected village elders who are well-versed in the local communities' customs and culture.
- ✓ The Lamal is made up of village elders who are not elected; instead, they are accepted onto the council if they have a good reputation in the community and are seen as neutral.
- ✓ The verdicts of the Lamal are held in high regard. If someone disobeys their decision, they will be penalized and/or banned from attending any social gatherings, such as funerals, weddings, or any other event that draws the community together. It is possible that the individual will be excommunicated from the community.

This social assessment prefers it as the first step in resolving a grievance or conflict. At all stages of the implementation process, a record of any and all grievances received and handled shall be retained. However, the use of Lamal as an alternative system of dispute and conflict resolution in solving issues of rape and other forms of gender and sexual based violence is not advocated for in this project based on the fact that the system is recognized as contributing to the rise of such cases due to the nominal compensation required from offenders. Grievances not resolved by Lamal will be taken to the second level.

Level 2: Village Grievance Redress Committees: Grievances that are not handled by the village elders, or have expressed a preference for an alternative mechanism, may be sent to the Village Grievance Redress Committees, which are made up of the following people.
Composition of the village GRC includes:

- ✓ 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
- ✓ Assistant Chiefs, who supports the locational Chief and Government in managing local community disputes in village units will form membership of the team.
- ✓ Female PAP, elected by women PAPs, will represent women and children related issues regarding the project
- ✓ Youth representative, elected by youths, will represent youth related concerns in the LGRCs
- ✓ Male representatives elected by the members of the PAPs
- ✓ Vulnerable persons representative will deal and represent vulnerable persons issues in the LGRCs.
- ✓ CBO representatives
- ✓ A project affected youth,
- ✓ Contractor representative

Level 3: Sub County Grievance Redress and Resettlement Committee: A mediation committee will be formed at the Sub County level to handle concerns that cannot be resolved by village level committees, with the following members:

- ✓ A representative of the Administration; - National Government

- ✓ A representative of County Administration; - County Government
- ✓ A representative of the contractor
- ✓ A project affected Youth
- ✓ A project affected Female
- ✓ Supervision consultant/social specialist
- ✓ NEMA representative.

Level 4: County Grievance Redress and Resettlement Committee: There will be a mediation committee at the County level to handle grievances that cannot be resolved by the sub county level committee. This will be a high-level committee constituted on a need basis. It will comprise of:

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

Level 5: Formal systems of dispute resolution: This entails using the courts of Kenya to litigate the dispute. The following are option for legal redress;

- ✓ The Environment and Land Court, established under the Environment and Land Court Act 2011, is a superior court that hears and determines disputes relating to land and the environment.
- ✓ 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.
- ✓ The World Bank's Redress Service (GRS) and Inspection Panel (IP); Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond.

Full disclosure to affected persons and other stakeholders, of all the grievance redress mechanisms available to the sub-project and information on the reporting mechanisms, is recommended.

7.8.5.1 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),

[1] Based on Annex D of the Guidance Note for IFC's Performance Standard 2.

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 persons representative will deal and represent vulnerable persons 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 LGRCs will include among others the following:

a) Conducting extensive public awareness and consultations with the affected people.
b) Help ensure that local concerns raised by PAPs as regards to the project are promptly addressed by relevant authorities.
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

[1] Based on Annex D of the Guidance Note for IFC's Performance Standard 2.

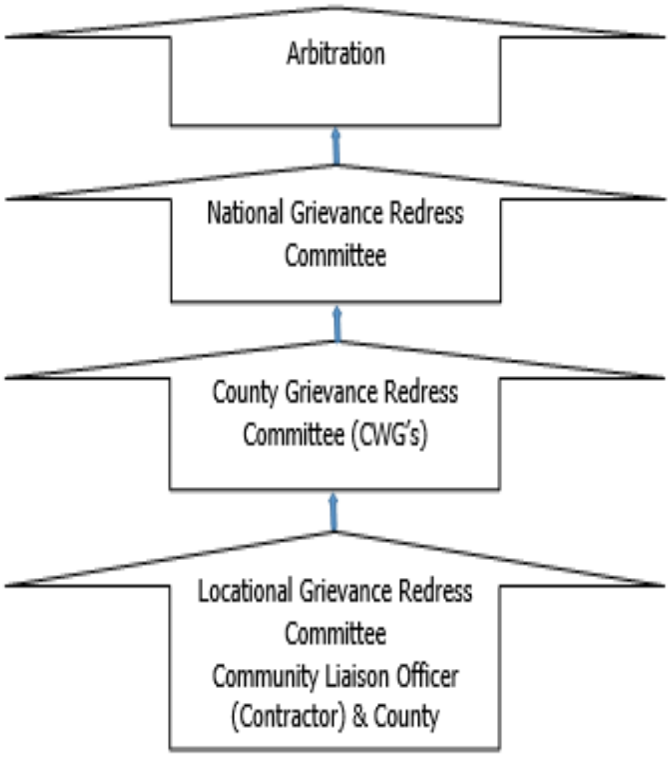

Figure 5: KOSAP Grievance Redress Mechanism

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

Existence of a Local Grievance Redress Mechanism in Sereolipi

A Local grievance redress committee was formed through a community consensus. The committee has 5 members. The LGRM was not active during the site visit. It is anticipated that the committee

[1] Based on Annex D of the Guidance Note for IFC's Performance Standard 2.

shall become active during the construction and operation phase of the project. The LGRM is composed of the following members of the project committee:

1. The area chief;
2. Youth representatives;
3. Female representatives;
4. Male representative; and
5. Vulnerable persons representative

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 timebound 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 timebound 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.

7.8.6 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.

[1] Based on Annex D of the Guidance Note for IFC's Performance Standard 2.

7.8.6.1 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 and 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.

7.8.6.2 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.

7.8.7 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.

- ✓ National/International Forced Labour laws

[1] Based on Annex D of the Guidance Note for IFC's Performance Standard 2.

7.9 Rehabilitation and Decommissioning Management Plan

The rehabilitation and decommissioning management plan include the following:

7.9.1.1 Planning for Closure

a) The implementing agency shall investigate practical options for closure of the facility at least one year before decommissioning and submit a report to relevant authorities NEMA included.
b) The REREC shall develop rehabilitation and decommissioning plan in conjunction with relevant stakeholders at least one year before the end of facility's operations.
c) The REREC shall explore options of re-use and recycling of the facility's components/structures.

7.9.1.2 Decommissioning

a) The REREC shall take into consideration the health and safety of personnel, contractors, neighbors and the public during the planning and implementation of the demolition process.
b) The REREC shall undertake a further survey to identify any contaminated areas and remediate them accordingly.

7.9.1.3 Post Closure

The REREC shall ensure that the facility's site is free of impacts associated with the closure and demolition

REREC shall develop, rollout and implement a monitoring plan that includes:

a) Monitoring of the rehabilitated site to confirm whether progress is satisfactory.
b) Outline of how land improvement and future land use will be affected by the past operations and decommissioning of the associated infrastructure.

7.10 Institutional Implementation Arrangements for the Proposed Project

This section presents roles and responsibilities of 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;

7.10.1 Proponent -Ministry of Energy and Petroleum (MoEP)

The MoEP will provide overall coordination and oversight of the project. MOE will be responsible for overall responsibility for safeguards due diligence, and compliance monitoring. The MOE will also provide funding for the project planning and implementation.

7.10.2 KOSAP Project Implementation Unit

The MOE has already put in place a Project Implementation Unit (PIU) to guide implementation of the project. The PIU is already implementing the project. In the PIU Environmental and Social issues are spearheaded by an Environmental and Social Safeguards Expert whose role is to coordinate and oversee implementation of safeguards. The PIU reports to the MOE.

7.10.3 The Implementing Agency (KPLC)

KPLC will be responsible for implementation and operation of the project on behalf of the MOE. Some of the key responsibilities include but not limited to are;

[1] Based on Annex D of the Guidance Note for IFC's Performance Standard 2.

- KPLC will supervise construction works through a supervision consultant and also directly
- Monitoring the progress of the project in terms of the safeguards and technical aspects.
- Monitoring of the ESMMP implementation
- Ensuring the project is on course in terms of timelines

Note: *The Solar Mini-grid will be installed operated and maintained by the contractor for the first ten (10) years and then handed over to KPLC engineers and operators. So, for the Seven years KPLC will be monitoring the operations of the contractor.*

7.10.4 County Government of Samburu

The County government is a key stakeholder. The roles of the county government include giving relevant approvals needed, assisting is process of allocating land for Mini-grid, solving grievances that cannot be sorted at project level, monitoring progress of the project among others.

7.10.5 National Environmental Management Authority

This authority is responsible for approval of ESIA report and licensing and is free to check progress of implementation of ESMMP

7.10.6 Roles and Responsibilities of the Supervising Consultant

- The consultant must appoint an ESHS officer who will be reporting on the ESMMP implementation supervision
- The consultant ESHS officer be required to generate various reports including production of minutes of monthly site visits and quarterly supervision reports detailing environmental, health, social and safety compliance on quarterly basis amongst other technical aspects
- Reporting on the ESMMP implementation progress and recommendations

7.10.7 Roles and Responsibilities of the Contractor

- Implementation of the contractor related aspects of the ESMMP and regularly (monthly) reporting
- The contractor on his part will have to appoint an EHS officer and a Social Specialist to coordinate and report on the ESMMP implementation respectively.
- The contractor to engage a Community Liaison Officer to act as a link between the community and the contractor and support the Social Specialist.
- The contractor will also have the obligation of managing the E&S risks related to his/her operations.
- Maintaining the required level of stakeholder engagement and communication, including providing project schedule information to the public, accepting and resolving public grievances, advertising and hiring local workers.
- Maintain a working grievance redress mechanism.
- The contractor is to comply with all regulations and by-laws at the county level and other relevant regulations and laws

[1] Based on Annex D of the Guidance Note for IFC's Performance Standard 2.

- The contractor shall refer to ESIA recommendations and the ESMMP when preparing the contractors- ESMMP and the specific plans
- The contractor shall provide water required for use in connection with the works including the work of subcontractors and shall provide temporary storage tanks, if required
- The contractor shall make his own arrangements for sanitary conveniences for his workers. Any arrangements so made shall be in conformity with the public health requirements for such facilities and the contractor shall be solely liable for any infringement of the requirements.
- The contractor shall be responsible for all the actions of any subcontractors whom he subcontracts.
- The contractor shall take all possible precautions to prevent nuisance, inconvenience or injury to the neighboring properties and to the public generally, and shall use proper precaution to ensure the safety of the community
- All work operations which may generate noise, dust, vibrations, or any other discomfort to the workers and/or visitors of the client and the local community must be undertaken with care, with all necessary safety precautions taken.
- The contractor shall take all effort to muffle the noises from his tools, equipment and workmen to not more than 70dBA
- The contractor shall upon completion of working, remove and clear away all plant, rubbish and unused materials and shall leave the whole site in a clean and tidy state to the satisfaction of the Proponent. He shall also remove from the site all waste
- No shrubs, trees, bushes or underground thicket shall be removed except with the express approval of the proponent.
- No blasting shall be permitted without the prior approval of the REREC and the local authorities.
- Borrow pits will only be allowed to be opened up on receipt of permission from the approving authorities.
- The standard of workmanship shall not be inferior to the Kenya Bureau of Standards where existing. No materials for use in the permanent incorporation into the works shall be used for any temporary works or purpose other than that for which it is provided. Similarly, no material for temporary support may be used for permanent incorporation into the works.
- Disposing of the waste generated during construction activities in accordance to the ESMMP.
- The contractor EHS officer will report on ESMMP implementation during construction period. The aspect to be reported by the contractor will include safety issues i.e. hours worked, recordable incidents and corresponding Root Cause Analysis (lost time incidents, medical treatment cases), first aid cases, incidents and accidents, potential near misses, and remedial and preventive activities required (for example, revised job safety analysis, new or different equipment, skills training etc.); Environmental incidents and near misses; noncompliance incidents with permits and national law; Training on E&S issues (dates, number of trainees, and topics); Details of any security risks; Worker & External stakeholder grievances and E&S inspections by contractor, including any authorities.

[1] Based on Annex D of the Guidance Note for IFC's Performance Standard 2.

Environmental and Social concerns need to be part of the planning and development process and not an afterthought, it is therefore advisable that all the risks and impacts of the project be prevented and mitigated at the earliest opportunity possible to ensure smooth implementation of the project. Finally, a comprehensive Environmental and Social Management and Monitoring Plan (ESMMP) has been prepared and will guide in implementation of mitigation measures.

7.11 Management of Impacts during Operation Phase

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

- Inspections
- Corrective action
- Reporting

[1] Based on Annex D of the Guidance Note for IFC's Performance Standard 2.

8 IMPACT SUMMARY AND CONCLUSION

8.1 Introduction

The Ministry of Energy of Petroleum (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 Sereolipi village in Samburu 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.

8.2 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, empty containers of paint shall be managed through collection and dumping in receptacles later transported to disposed 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.

The following social related risks and impacts were also identified; Labour influx associated risks, Impacts on Cultural Heritage, GBV & SEA/SH, Gender Biases, Exclusion Of VMGS, Vulnerable Individuals and Households, and Risk of communicable diseases (HIV/AIDS). A Grievance Redress Mechanism (GRM) informed by the project VMGF and SA will guide the mitigation procedures for the social impacts. The project shall uphold principles of gender equality and equity among the vulnerable groups through compliance on equitable distribution of the project opportunities and benefits to the community. The contractor shall develop and implement a HIV/AIDS and other STIs policy, and an information document for all workers directly related to the Project.

8.3 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.

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.

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.

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.

The implementation of the proposed mini grids project will provide possibilities for local communities to improve their livelihoods, Samburu 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 applicable 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.

9 APPENDICES

No	Appendix
APPENDIX 1	A-RAP
APPENDIX 2	Land allocation form
APPENDIX 3	List of Attendance -ESIA meeting
APPENDIX 4	Minutes of the Meeting Held During ESIA Process
APPENDIX 5	Land Identification Form
APPENDIX 6	List of Attendance-Land allocation meeting
APPENDIX 7	Minutes Of Meeting Held During Land Identification Phase
APPENDIX 8	FGD attendance list
APPENDIX 9	NEMA Firm of Experts Licence and Lead Expert License

Annex 1: ABBREVIATED RESETTLEMENT ACTION PLAN (A-RAP)

1. Sereolipi Sub-project Site

The Sereolipi sub-project site is located on Sereolipi village, Waso ward in of Samburu County. The proposed project site lies on registered community land owned land by Sereolipi Group Ranch. The proposed site has some trees, shrubs and little to no grass while the western part is characterized by shrubs with intermittent and sparse trees, it is uninhabited, has no structures, community facilities, or encumbrances. Consultations leading to the identification and selection of the sub-project site are captured in the Environmental and Social Screening report for Sereolipi. *Refer to Chapter 4 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 7000 (approximately 1800 households). The land acquisition-related impacts are loss of land, some trees/shrubs/grass. Mitigation measures include in-kind compensation for loss of land and pasture, and designing power distribution lines to avoid impacting trees, crops, structures, and community facilities. No physical displacement is anticipated, however, there is minimal loss of pasture occasioned by the acquisition of land utilized by the community for grazing. The 1.01174 hectares identified for the sub-project will be acquired compulsorily by the 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 3.3 of the ESIA for the sketch map of the site.*

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

The proponent requested the community identify three priority projects, whereby one out of the three would be provided as in-kind compensation for loss of land and pasture. The Sereolipi community requested for water reticulation from Sereolipi water project. The value of the priority community project will be proportional to or higher than the value of land under acquisition. In addition, any 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 Crops Structures	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
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 Stakeholder 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 Sereolipi Locational Grievance Redress Committee (LGRC) constituting a chairperson, secretary, and three members, was formed through community consensus. The committee comprises representation from 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
December 14th 2020	Environmental and Social Screening. Voluntary land donation (VLD). Constitution of the Locational Grievance Redress Committee (GRC).	Ministry of Energy (MoE) Kenya Power (KPLC) Rural Electrification and Renewable Energy Corporation (REREC)	Site identification and land allocation for the sub-project. Criteria for VLD. Community entitlements (forms of compensation and implications for each).	None.	None.
February 6th 2022	Environmental and Social Impact Assessment.	Consultants MoE KPLC REREC	Land acquisition through compulsory acquisition (not voluntary land donation).	water reticulation from Sereolipi water project.	The proponent has set aside KES 1 million to implement

			Selection of three priority community projects, whereby one is to be implemented as in-kind compensation for land.		the priority in-kind compensation project. The value of the project will be proportional to or greater than the value of 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 projectt

Annex 2: ESIA Stakeholder Meeting Minutes

MINUTES OF ESIA FOR THE PROPOSED KENYA OFF-GRID SOLAR MINI-GRID PROJECT IN SAMBURU COUNTY	
Date: 06/02/2022 Venue: SEREOLIPI	Time: 3:10 pm

PRESENT

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
7. Adjournment

Item No	Description	Action by
Min 1/22	**Introduction**	
1.1	The meeting begun at 3:10 pm with a word of prayer. The assistant chief introduced the village administrators.	
1.2	Mr. Nguve, the CRED introduced the KOSAP team	
Min 2/22	**Opening Remarks**	
2.1	Mr. Nguve discussed the (KOSAP) Project and its benefits. It was discussed that KOSAP is funded by World Bank and Implimented by the ministry of Energy, Kenya Power and REREC	
2.2	The members were informed on the compensation methods (compensation - in - kind) where-by they were given a chance to choose either education, Health and Water project.	

SAMBURU COUNTY GOVERNMENT
VILLAGE UNIT
Date
VILLAGE ADMINISTRATOR SEREOLIPI

Min 3/22	Remarks by the Consultant	
3.1	Mr. Alan Owino explained the RSIA processes such as stakeholder Engagement and Public Participation etc.	
3.2	He also explained the benefits that the community will accrue from KOSAP e.g Employment opportunities, productive use of energy, reduction of indoor air pollution e.t.c	
3.3	Mr. Patrick Ngari also discussed the anticipated social Impacts of KOSAP eg child labour, elite capture, labour influx etc He also explained the environmental Impacts eg Impacts of air, water & soil quality e.t.c.	
3.4	The consultants also discussed different mitigation measures for KOSAP.	
Min 4/22	**Concerns / Issues from participants**	
4.1	Mr. Ramponi Lekulal was concerned on the roles of the Grievance Redress Committee.	
4.2	Madam Naleyon Leambulee was concerned on whether women will be considered for employment. She was also concerned that women are vulnerable and that from the previous job experiences; they have noticed unequal opportunities and payment.	
4.3	Mr. John Lemalasia was concerned on the projects [illegible]	
4.4	Madam Lenairashi [illegible] Date (a nurse) in Sereolipi was concerned on the occupational health and safety of the workers at the site. She also recommended; that the	

SAMBURU COUNTY GOVERNMENT VILLAGE UNIT Date VILLAGE ADMINISTRATOR SEREOLIPI

	contractor should implement the mitigation-measures Mr. Naipido Leupane was very appreciative of the project and hopefull that the community will be able to acquire all the benefit for KOSAP. (especially enhancement of security within the area.)	
Min 5/22	**Responses given by the consultant**	
5.1	The consultants responded to the issues/concerns raised by the members	
5.2	The members were informed that; KOSAP's Grievance Redress Mechanism (GRM) provides access to remedy and identifies procedures to effectively address grievances arising from project implementation.	
5.3	KOSAP encourages the participation & empowerment of the community, regardless of gender & age, both skilled and non-skilled based opportunities will be available.	
5.4	The project is in it's initial phases and once the approval/licence from NEMA	

	is issued; advertisement and selection process is over, then the project will commence.
5-5	The workers at the site will be provided with a work Injury Benefit Act (WIBA) Insurance to cover their medical expenses incase of injuries / accidents occurence at the site.

Min 6/22	Acceptance/Rejection of the project	
6.1	All participants accepted the project.	
6.2	The members also agreed on an education project (i.e fencing of Sereolipi Primary school) as their prioritized project.	
Min 7/22	**Adjournment**	
7.1	The meeting adjourned at 5:20pm with a word of prayer from the village administrator.	

Minutes Prepared by: Umulkheir Abdi Date 6/02/2022

Position EIA Expert

Signature

Minutes Confirmed by: James Lolpuska Date 6/02/2022

Position Village Administrator.

Signature

SAMBURU COUNTY GOVERNMENT
VILLAGE UNIT
Date
VILLAGE ADMINISTRATOR SEREOLIPI

Annex 3: ESIA Stakeholder Meeting Attendance List

REREC

Kenya Power

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

Venue: ..... SEREOLPI ..... Date: ... 6/02/2022 .....

FGD MEN Time: ... 15:30 - 15:52 .....

#	Name	Position/Institution/ Location/Village	Gender M/F	Phone No/ID Number	Signature
1.	James Lolpurka	Village administration	M	0711647224 / 13047212	
2.	Dario Lemalasia	Chairman Kenya Grazz	M	0113931037/0861541	
3.	John Lemalasia.	group ranch chairman	M	0721129243 / 8732370	
4.	Andrew Leaveseru.	CHVs. Chairman	M	0706119826 / 1984255	
5.	Daniel Sadala Lenantapie	Ass-chief	M	0712411264	
6.	Ramponi Lekula!	Village elder..	M	0768456652/20417171	
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SAMBURU COUNTY GOVERNMENT VILLAGE UNIT Date . VILLAGE ADMINISTRATOR SEREOLPI

REREC Kenya Power

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

Venue: SEREOLIPI Date: 06/02/2022

Time: 15:10

#	Name	Position/Institution/ Location/Village	Gender	Phone No/ID Number	Signature
1.	Samwel Olelg	REREC	M	0734401552	
2.	Mathew Mutua	Centric Africa	M	0717061430	
3.	Nyati Patrick Mwongi	Centric Africa	M	0716404493	
4.	WYCLEF . M. NGURE	CRO	M	0725678988	
5.	ALLAN OCHINO	CENTRIC AFRICA	M	0729924873	
6.	MARK OYIER.	MOE	M	0720326091	
7.	Umulkheir Rabalia Abdi	CENTRIC AFRICA	F	0795023964	
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SAMBURU CO... GOVERNMENT VIL... Date ...VILLAGE ADMINISTRATOR

REREC | Kenya Power

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

Venue: SEREOLIPI

Date: 06/02/2022

Time: 15:10 PM

#	Name	Position/Institution/ Location/Village	Gender	Phone No/ID Number	Signature
1.	ANDREW LEARSEREU	CHVS Chairman	M	0706119826 - 984255	
2.	NAIDIDO LEUPANE	Sere-Olipi	M	0707947145 -36361157	
3.	DARIO LEMALASIA	CHAIRMAN (KOSAP) SERE	M	011393 1037	
4.	LENKAKIPEHI	Sere-Olipi	M	0707947145	
5.	RAMPOHI LEKULAL	sere-olipi	M	0768456657	
6.	JOHN LEMALASIA	CHAIRMAN COMMUNITY	M	0721129213	
7.	LENAIROSHI PARITO	Nurse - Sereve (Sereolipi)	M	0711750632 - 31862338	
8.	Nangesa Losalkapo	Sere-olipi	F	0707488213	
9.	Nawaso Lekalasimi	Sere-olipi	F	0768470895	
10.	Neuleyia Losomaja	Sere-olipi	F	0113208183	
11.	Holouwara Lokupanai	Sere-olipi	F		
12.	Felister Lekaram	Sere-olipi	F	0798370890	
13.	Ndapara Lesop	Sere-olipi	F		
14.	Naleyon Lambulee	Sere-olipi	F	0702213323	
15.	Davao Lenasalia	Sere-olipi	F	07079907145	
16.	BIKO Leportingot	Sere-olipi	M	0702213323	
17.	Marko	Sere-olipi	M		
18.	JOSHUA LEMOLOYAA	PST	M	0727051387	
19.	Lot Loruwano Lolmongoi	sere-olipi	M	0742498301	

SAMBURU COUNTY GOVERNMENT VILLAGE UNIT Date VILLAGE ADMINISTRATOR SEREOLIPI

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REREC

Kenya Power

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

Venue: .....

Date: .....

Time: .....

#	Name	Position/Institution/ Location/Village	Gender	Phone No/ID Number	Signature
1.	Raphael Mbolei Lenamunyi	chairperson Sere-olipi nyumba kumi	male	0758622977/ 35787883	
2.	LEAKEN. A ADAMSON	SERE-OLIPI CEO	M	0755750502	
3.	Moses M. Lenuyie	SERE OLIPI	M	07412867 63	
4.	Isaiah Lekanit	SEREOLIPI	M	0705 289 160	
5.	Lawrence Lekasike	Sereli Sere-olipi	m	0746573713	
6.	Letecle	Sere-olipi	m	,	
7.	Domnika Ledilia	Sere-olipi	F	071508109	
8.	Risoni Lesuuda	sere-olipi	F	0748228702	
9.	Susan Lesimerto	sere-olipi	F	0705872940	
10.	Bamako Abkula	Sere-olipi	F	0799908248	
11.	AZOIS MUSA	Sere -olipi	M	0708351075	
12.	NICHOLAS WACHIRA	Sere- olipi	M	0714778782	
13.	JONATHAN LOUNYEN	SERE-OLIPI	M	0791219554	
14.	Peter Leparmaral	Sere-OLIPI	m	0799926479	
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SAMBURU COUNTY GOVERNMENT
VILLAGE UNIT
Date
VILLAGE ADMINISTRATOR/SECRETARY

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

Venue: SERE-OLIPI Date: 06/02/2022

Time:

#	Name	Position/Institution/ Location/Village	M/F	Phone No.	Signature
1.	Mangesa lesolkapo	Sere-olipi	f	0707485213	
2.	Nowaco lekalosimi	Sere-olipi	f	0768470895	
3.	Doukeyia lesamaja	Sere-olipi	f	0113248483	
4.	Louwara lekupanai	Sere-olipi	f		
5.	Felister lekaram	Sere-olipi	f	0798370390	
6.	Ndapara lesee	Sere-olipi	f		
7.	Naleyon leambulee	Sere-olipi	f	0702213323	
8.	David lenasalia	Sere-olipi	M	0707947145	
9.	Biko lopartingat	Sere-olipi	M	0702213323	
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SAMBURU COUNTY GOVERNMENT
VILLAGE UNIT
Date
VILLAGE ADMINISTRATOR SERE OLIPI

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

Venue: Sereolipi → Youth

Date: 06/02/2022

Time: 1430hrs

#	Name	Position/Institution/ Location/Village	M/F	Phone No.	Signature
1.	BIKO LEPARTINGAT	SERE-OLIPI	M	0702213323	
2.	David Lenasalia	Sere-olipi	M	0707947145	
3.	Lenkaikipeni Lodungu	Sere-olipi	M	0725-218-896	xxx
4.	Richard lesasuyan	Sere-olipi	M	0707947145	
5.	Maipido leupare	Sere-olipi	M	0707947145	
6.	EMMANUEL LOLPUSUKIE	Sere-olipi	M	0716-022-331	
7.	Parito Lenairoshi	Nurse - sereolipi	M	0711750632	
8.	Raphael mbolei Lenamunyi	Chairperson Nyumba kumi Sere-olipi	M	0758622977	
9.	LEAKA · R · ADAMSON	SERE-OLIPI CENTER	M	0795550907	
10.	Moses M. Lemuuke	SERE OLIPI	M.	0741286963	
11.	Dom Dominika Lol Ledilia	Sere-olipi	F	07	
12.	Isaiah Lekenet	Sere olipi	M	0705 289 160	
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SAMBURU COUNTY GOVERNMENT
VILLAGE UNIT
Date
VILLAGE ADMINISTRATOR SERELOLE

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REREC FEMALE FGD: Kenya Power

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

Venue: SERE-OLIPI Date: 06/02/2022

Time: 16:00

#	Name	Position/Institution/ Location/Village	Gender M/F	Phone No/ID Number	Signature
1.	Nangesa Lesalkapo	Sereolipi	F	0707488213	
2.	Nowaso Lekalosimi	"	F	0768476895	
3.	Doukeyia Lesamaja	"	F	0113248483	
4.	Louwara Lekuparai	"	F	—	
5.	Nkapara Lesee	"	F	—	
6.	Felicter Lekaram	"	F	0798370390	
7.	Naleyon Lembukee	"	F	0702223 23	
8.	Domnika Ledilia	"	F	—	
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Minutes of Community Engagement Meeting Held In Regard To Kenya off Grid Solar Access Project (KOSAP): Proposed Solar Minigrid at Sereolipi Village.

Venue of meeting; Sereolipi Trading Centre/village.
Date: 14/12/2020

AGENDAS

1. Preliminaries
2. Project description
3. Positive Impacts of the project –solar mini-grid
4. Negative Impacts of the project and mitigations measures
5. Need for land for the project
6. Grievance redress mechanism for the project

Minute 1/KOSAP/2020: Preliminaries

The area chief called the meeting to order at 10.00 a.m. and opening prayer was done. Due to the fact that not all members of the KOSAP team could not speak the local dialect, it was necessary to have translations into the local language to ensure the information being shared was understood by all the members of the community. Translations were done by the chief.

The chief welcomed the project team and also members of Sereolipi Market and thanked all for attending the meeting. He told them ''since the main project team is here, be keen on the information they have brought to us about the project and be free to participate through questions and comments in order to make the meeting fruitful.

He welcomed Mr. Benson Director from the Ministry of Energy Samburu County to lead the team in speaking to the community.

Benson thanked the chief and the community members for turning up for the meeting. He explained that he had come with other officers to talk to the community on various issues in line with the proposed Mini-grid. He allowed the other team members to greet the people and make brief introductions. He told the community that each would be given a chance to talk on specific areas in line with the project.

KOSAP Team

No.	Name	Institution
1.	Dorothy Kagweria	Ministry of Energy
2.	Wilfred Koech	Kenya Power
3.	Benson Lengalen	County Government of Samburu
4.	Winfred Omondi	Kenya Power
5.	Gideon Lekupe	County Government of Samburu
6.	Samwel Olela	REREC

7.	Wyclef Ngure	Ministry of Energy
8.	Richard Wida	Kenya Power
9.	Joseph Korir	Kenya Power
10.	Jediel Muriuki	Kenya Power
11.	Elsie Mworia	Kenya Power

Table KOSAP Team – Samburu

Minute 2/KOSAP/2020: Project Description

Wilfred from KPLC described the proposed project i.e. solar energy mini-grid under KOSAP as follows;

He informed the community that the project called -KOSAP 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 and the communities in off-grid areas being the beneficiaries. Off-grid areas is those places where the national electricity grid has not reached, and whose electricity access has been very low. The current project is being implemented in fourteen (14) counties in Kenya.

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 on high temperatures. He explained that the government's target is to achieve universal access to electricity by 2022 using various sources and solar energy is one of the identified sources because it is also clean energy. He further explained that the proposed solar energy mini-grid will be put up and low voltage lines will also be constructed to enable connection of electricity to beneficiaries/customers.

The mini grids will entail the installation of solar PV, battery storage and thermal diesel units running with a capacity of 20-300 kilowatt (KW). He explained to them that once constructed the Solar mini-grid will be operated by the implementing agencies either KPLC or REREC and the community will be expected to pay for connection of electricity (one thousand shillings) and do wiring in their houses. He told them that once connected, the beneficiaries will be expected to pay for electricity consumed.

He told them that connection of power will involving passing of electrical lines along the roads in order to reach their house 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 consent.

The Director Environment informed members that the government through funding from World Bank intends to develop solar power Mini-grids in 14 underserved counties in Kenya and Samburu is one of them. They shall be solar Mini-grids under Kenya Off-grid Solar Access Project. He noted that KOSAP has many components which shall eventually be rolled out to community members at appropriate times, however; for this meeting the focus is consultation for acquisition of land for development of solar power Mini-grid.

Mr. Ngure then appreciated members for attending and reminded them that a team of consultants had initially visited the area to carry out a feasibility study for the proposed Mini-grid under KOSAP. Thus the

current "Baraza" is a progress from the initial one and members shall have opportunity to air out their concerns pertaining the project as well as seek clarifications where necessary. He informed members that the team having assessed the proposed development site shall equally express their views with regard to the site. The area chief informed KOSAP team that they have acknowledged the project and are in dire need of power thus they donated the land for they considered it suitable due to its centrality and proximity to market center, learning institutions and residential areas. He also noted that the proposed development site was considered well positioned as any development on the parcel of land shall not interfere with institutions expansion.

Mr. Ngure then informed members that due to the site's close proximity to the market center, residential areas and schools, all of them shall benefit from implementation from the project as it shall be installed through a radius of 3km from the Mini-grid. He also informed members that once completed, all persons who shall apply for power connection will benefit and the connection fee would be one thousand Kenya shillings irrespective of distance from the Mini-grid within a three kilometer radius.

Mr. Korir explained to the community that it was necessary that we disclosed to the community that they are entitled to compensation. He further explained to the gathering the options that they are entitled to. The first thing was that the community may be willing to donate the land but are entitled to compensation for the land. This Compensation monies would however be held on their behalf in an escrow account by the County, and the monies plus accrued interest released to them upon registration. The other option of compensation explained to the community was that the community can also be compensated in kind. The community can request for compensation in kind like a well, or classrooms to be built or any other item that will benefit the community. Another option would be compensation on land for land. The community may request the Government to buy a similar piece of land for the community. To compensate for land donated for construction of the mini grid. He informed the meeting that they are at liberty to deliberate on the options given and make an informed decision.

Mr. Muriuki (Wayleave Officer) then informed members that the proposed project seeks to pursue land donation to help reduce the cost of project implementation. The section donated shall be converted to public land for purpose of implementation of the project. He informed members that despite the changes, it is also important to seek consent from the community before implementing any project on their land. He informed members that the land is voluntarily donated and there shall be no compensation made to that effect. This is because, the electrification project is highly subsidized for the benefit of the community. He also informed members that for purposes of connectivity they shall be required to allow for use of plot boundaries as way leaves and road reserves shall also be largely used as way leaves to allow for location of poles and stringing of conductors. The community members requested Kenya Power to consider using concrete poles for durability as there are lots of termites in the area thus wooden poles would be susceptible to fast degradation.
Mr. Wida-Kenya Power County Business Manager for Samburu also informed members that once the project construction phase is completed, his office shall ensure connection of all customers who shall apply for supply. He also informed members that his office shall ensure continuous availability of stable power supply to customers.

Minute 3/KOSAP/2020: Positive Impacts of the project

Every project has both positive impacts and negative impacts. Our assignment is also to explain to you the impacts so that you understand how the project is likely to affect the community at large. The positive impacts are as follows:

- Better source of lighting- replacement of Kerosene lamp with electrical lighting which is clean
- Benefits to education- provide source lighting for preps in homes and access to electronic educational materials
- Business opportunities- opening new business (Barber shops and saloons and expanding existing businesses
- Employment and wealth creation- provide non-skilled labour during construction
- Local Material Supplies and other requirements- provide opportunities to supply some materials available locally like sand and gravel including cement and water supply.
- Up Scaling Electricity Access to the off-grid areas- no national grid in this areas hence solar will help connect locals
- Impact on HIV/AIDS- improve access to information from different electronic media
- Health benefits of the project- elimination of use fuel lamps which provide smoke which cause respiratory diseases
- Improved standard of living- Living standards will improve e.g. TV, Fridges etc
- Security- improve security due to improve lighting up of the area
- Communications- improve communication due to availability of electricity to charge phones

Minute 4/KOSAP/2020: Negative impacts of the project

Projects also have negative impacts. The proposed solar mini grid will have the following negative impacts and I will present them alongside their mitigation measures.

	Negative impact	Mitigation measures by contractor
1.	Vegetation clearance	Clear only the areas that are needed to put up the mini grid After construction, do landscaping with grass to areas that have no electrical installation as opposed to living areas bare
2.	Air pollution dust from construction activities	Fence off construction site to reduce dust going to the public Use of masks for workers
3.	Air pollution dust from construction vehicles	Limit vehicle speed to minimum possible when passing residential areas
4.	Air pollution from vehicle emissions	Maintain vehicles/service vehicles No idling of vehicles
5.	Solid waste	Clear all solid waste and dispose appropriately
6.	Land take- voluntary land donation will limit access to the land by community for grazing	Compensation for land and or seek voluntary donation To allow animal grazing (farm and wildlife), the proponent will only fence the section of the land where the plant shall be located.
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
8.	Social Risks Related to Labour Influx - With an increase in the population of the area boosted by the project employees the social set up of the area will be affected. This change may be in the form of loose morality, an increase in school drop-out due to cheap labour, child labour, and increased incidences	Conduct periodic sensitization forums for employees on ethics, morals, general good behavior and the need for the project to co-exist with the neighbours; offer guidance and counseling on HIV/AIDS and other STDs to employees; provide condoms to employees; and ensure enforcement of REA's policy on sexual harassment and abuse of office.

	of HIV/AIDS and other communicable diseases.	
9.	HIV/AIDS, communicable and sexually transmitted diseases (STDs).	HIV/AIDs awareness to community
10.	Gender-based violence These are potential impacts of a project related to labour influx or project workers	-Awareness to community -All cases should be reported to chief or the grievance redress committee members or to community elders -contractor to have code of conduct for the workers
11.	Sexual exploitation and abuse by contractors and workers	-Awareness to community -Report any incidence of sexual exploitation to the grievance redress committee members or to community elders -contractor to have code of conduct for the workers contractor to have code of conduct for the workers
12.	Unwanted pregnancies and school dropouts	Awareness on this impact to schools
13.	Child abuse	Employment of children is illegal Report any case to the chief's office
14.	Demand for Material/resources e.g water	Contractor to consult with elders before using the water resources in the community to avoid conflicts
15.	Oil Spill Hazards	Contractor not to repair vehicles or equipment on site Maintain vehicles and equipment in good state
16.	Storm water and erosion	Contractor to put measures to harvest rainwater and control erosion during construction
17.	Wastewater/ effluent	Provide sanitation facilities for workers
18.	Noise resulting from excavation machinery, vehicles and workers	Work only during the day In case of blasting contractor to give notice to community through the village elders and chiefs office
19.	Visual and Aesthetic Landscape Impacts	• The visual negative impacts can be mitigated through putting up a wall round the facility to keep off/screen the project stacks, poles, cables and transformers by the project proponent. • Proper siting decisions can help to avoid aesthetic impacts to the landscape.
20.	Hazardous materials from damaged Panels- Photovoltaic panels may contain hazardous materials, and although they are sealed under normal operating conditions, there is the potential for environmental contamination if they were damaged or improperly disposed upon decommissioning.	Proper planning and good maintenance practices can be used to minimize impacts from hazardous materials.
21.	Fuel storage on site	Proper maintenance fuel storage tanks and dispensing system Budded wall 1.5 times the fuel storage tank

Public safety in regards to electricity

Koech educated the community by highlighting the importance of using electricity safely. He said electricity is good but failure to take the precautions while interacting with it 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.

a) Engage a certified technician to do wiring in your premises
b) Use quality materials while wiring

c) Do not engage in individual illegal extensions of power lines to other houses
d) Don't touch sockets and switches with wet hands or wipe with wet cloths
e) Do not tie your livestock on electric poles
f) Do not cut earth wires that run along some electric poles
g) Do not touch any electric wire if you find it fallen on the ground
h) Report any incident regarding electricity at the local office –staff in charge of operating the Mini-grid
i) Vet all new people coming to the village by checking whether they registered their presence with the office of the chief.
j) In case of a black out do not open sockets or switches

Minute 5/KOSAP/2020: Land requirements for the project

When we (KOSAP team) arrived at Sereolipi Market, area MCA, the village chairman, the chief and a couple of elders took us to a site (land) which you/community had identified a while ago for the purpose of setting up the solar mini-grid project. The village chairman explained that a consultant came to the village sent by the Ministry of Energy from Nairobi and together with the elders they identified a piece of land where the Solar Mini-grid could be set. On assessing the identified site, it was about 3km away from the target beneficiaries. The team discussed with the elders on the technical requirements for the project i.e. need to be near the beneficiaries. The elders said they also have land which is nearer to the target beneficiaries (businesses, public facilities and residential areas) and they were ready to offer it up for the project. The chairman said that the land belongs to the community and is in an area that had set aside for public facilities. He noted that the community is free to decide on its use and said they had agreed to give land for the solar project. We visited the said land (site) and it met the technical, social, environmental requirements as explained in the screening report.

Jediel explained to the public forum that the proposed project will require an average of 2 acres of land. He asked them the nature of ownership of the land in the area and they answered that the ownership is communal where by the community has one title deed but no individual title deeds. They also noted that the land is not formally sub divided (implying not adjudicated). He explained to them that based on the ownership of land they had explained, their land falls under the category of community land and its use and management is governed by the Community Land Act 2016.

He educated the community on the following issues;

- The various forms of acquiring interest in land such as; allocation by the owner, land adjudication process, compulsory acquisition, settlement programs, transfers, donation and long term leases.
- Importance of public participation by key stakeholders including community members during the planning and operation phase of the project.
- You have a right to give your views, opinions or fears on a proposed project
- You have a right to accept or refuse the project
- You have a right to compensation for your land under the Kenya law. The various options for compensation for land include land for land, cash or in-kind compensation
- If you donate land, the ownership of the land will be transferred to KPLC and that the project will be managed by KPLC
- You have a right to choose whether to donate land or not to the project
- The community/beneficiaries of the project will pay Ksh 1000 for connection and also pay for consumption of power to KPLC

He noted that the government of Kenya had secured a loan from its development partners i.e. World Bank to implement the KOSAP project. The government through the Ministry of Energy proposes to use World Bank guidelines on voluntary land donation for the project.

He informed them that for voluntary land donation, there is a criterion which need be fulfilled to allow for voluntary donation to be acceptable. He explained the criteria as follows;

- The infrastructure must not be site specific.
- The impacts must be minor, that is, involve no more than 10 percent of the area of any holding and require no physical relocation.
- The land required to meet technical project criteria must be identified by the affected community, not by line agencies or project authorities (nonetheless, technical authorities can help ensure that the land is appropriate for project purposes and that the project will produce no health or environmental safety hazards).
- The land in question must be free of squatters, encroachers, or other claims or encumbrances.
- Verification (for example, notarized or witnessed statements) of the voluntary nature of land donations must be obtained from each person donating land.
- If any loss of income or physical displacement is envisaged, verification of voluntary acceptance of community-devised mitigatory measures must be obtained from those expected to be adversely affected.
- If community services are to be provided under the project, land title must be vested in the community, or appropriate guarantees of public access to services must be given by the private titleholder. KOSAP project proposes to have the land donated to be registered under one of the implementing agencies of the project i.e. KPLC but be assured that public access to services is guaranteed to the community members.
- We need to set up a Grievance mechanisms to help in addressing any issues/grievances that may arise in the course of the project implementation.

He noted that the team had visited the first site identified by the community and the project team had felt it was far away from the project beneficiaries. He then invited the chief to explain to the people the second site that the community elders had identified for donation to the project. The chief gave a description of the second site which the elders had identified, and the community agreed to have the Mini-grid set there.

Jediel asked the community to confirm that the land is communally owned and whether they were willing to donate land for the Mini-grid. The community members unanimously confirmed that the land belongs to the community and agreed to voluntarily donate the land for the solar Mini-grid.

Survey of the land and request for advance possession.

The surveyor (Korir) explained to the community that once agreed, the surveyor will need to pick exact GPS points of the agreed area so that the process of land acquisition may start leading to titling of the land. He noted that the process of land acquisition, land surveying and land transfers are long and requested the community for advance possession. The community agreed to the advance possession and as a sign of commitment, the community elders signed a land donation form on behalf of the community to indicate that they had agreed to donate the land voluntarily.

Korir told the community 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 in the extreme cases). He noted that the project will not compensate for way leaves due to budget constraints so that they can make an informed decision when the time comes.

	WORLD BANK VOLUNTARY LAND DONATION CRITERIA	ASSESSMENT ON FULFILMENT OF THIS CRITERIA
1	Land donations can be voluntary only if the infrastructure is not location specific.	The proposed project is not site specific
2	The impacts must be minor, that is, involve no more than 10 percent of the area of any holding and require no physical relocation.	-The land proposed by the community is part of portion of land they have set aside for public facilities. -There was no house on the land and there were no assets on the land -the elders said that the land is set aside for community public facilities and so there is no individual rights of use and use is communal –anyone in the community can graze there but they know the area is for communal use
3	The land required to meet technical project criteria must be identified by the affected community, not by line agencies or project authorities. Nonetheless, technical authorities can help ensure that the land is appropriate for project purposes and that the project will produce no health or environmental safety hazards.	-The land was identified by community. -Screening of the sites show that the land is suitable for the project as long as the mitigation measures for the negative impacts are put in place
4	The land in question must be free of squatters, encroachers, or other claims or encumbrances.	There was no squatter or encroacher on site.
5	Verification (for example, notarized or witnessed statements) of the voluntary nature of land donations must be obtained from each person donating land.	Donation was verified in the public forum where by Rachel asked whether they agree to donate the land for the project. The community unanimously agreed and lifted their hands. The same question was posed in the focus group discussion with the women and the youth and they also agreed to the donation. They also signed list of attendance as proof that they were in the meeting where the matter of donation was discussed and agreed. The elders signed the land donation form on behalf of the community
6	If any loss of income or physical displacement is envisaged, verification of voluntary acceptance of community-devised mitigatory measures must be obtained from those expected to be adversely affected.	No physical displacement is envisaged-no one was residing at the site. Land is open for anyone to graze.
7	If community services are to be provided under the project, land title must be vested in the community, or appropriate guarantees of public access to services must be given by the private titleholder.	It was explained that due to the nature of operation of the mini-grid the land will be transferred to ownership of either REREC or KPLC. The community did not object to the transfer of the site to the agencies. It was also explained that the process of transfer takes time and need for the community to give advance possession. The community agreed to allow advance possession.
8	Grievance mechanisms must be available	The community deals with grievances through council of elders. The need to set up a grievance redress mechanism was explained to the community and they elected the persons who will form the project committee/grievance redress committee.

Minute 6/KOSAP/2020: Grievance Redress Mechanism

Koech 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, accessible with no costs to the community members. Before explaining how to set the GRM, Koech asked the community to explain how they deal with grievances/issues at the village level.

Project GRM:

Koech 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 explained 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 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. She added that the composition of the committee should have representatives from all groups in the community including men, women, youth and persons with disability.

Project Committee Members/grievance redress committee.

S/No	Name	Identification No.	Telephone No.	Category
1	Sandra Lemayian	30998701	0713345749	Women
2	Eunice Lerte	28652721	0706145602	
3	Stella Chachue	28137953	0741544747	
4	Davio Lemalasia	0861541	0719706199	Men
5	Jackson Leparmarai	9532507		
6	Benjamin Lentaka	1088040	0702149780	
7	Lawrence lekosike	12871168	0710678912	Youth
8	Festus leparmarai	9053377	0705912479	

Plenary session

Koech explained to the community that community engagement and consultations will continue even in future during preparatory phases and also during operation phase. He then summarized the agenda of the meeting and the proceedings and invited the community members to a plenary session to ask questions and or make any comments.

Focus Group Discussion with the women

A focus group discussion was held with the women. The main objective of this discussion was to assess whether the women had understood the project and its requirements and to provide them an opportunity to air their issues/give their opinions on the project. Dorothy gave a summary of the project and its requirements again just to keep them abreast of the issues discussed in the public forum. She then asked the women whether they agree to the donation of community land to the project. The women said they support the donation of land for the project

Focus group discussion with the youth

A separate discussion with the youth was also held. In this discussion Koech gave a summary of the project and outlined the requirements for land donation. He asked the youth to feel free to air their opinions on the project. The youth said they support the project. He also asked them whether they agree to the donation of land for the project and they said they support the land donation for the project.

1.3 Vulnerable and Marginalized Groups

The social screening involved identification of vulnerable groups in the project area. The main tribe in Samburu County is the Samburu and few Turkana. The community according to the O.P 4.10 on indigenous and the vulnerable and marginalized groups under Kenya law are recognized as indigenous/vulnerable groups. The main concern would be to identify the vulnerable households within the community based on the following criteria; poor female headed households, orphaned headed households, heads of households with special needs such as disabilities, the very old and very poor households.

During the visit, the team was not able to identify these vulnerable households and identification can be done during the environmental impact assessment through the office of the chief and the village elders.

1.4 Grievance Redress Mechanism

A grievances redress mechanism (GRM) will be put in place and operationalized to provide a forum and opportunity for the community to lodge complaints or concerns at the earliest time possible and with no cost. During the meeting, Koech explained that the community is allowed to raise any complain or request information in regarding the project. The first point of getting information or raise complain will be the project committee which will act as the grievance redress committee. The community chose the project committee and training of the committee is important to enable operationalize the GRM. The project will have a three-tier grievance redress mechanism as follows.

1. Locational grievance redress committee. This is the community level/site specific/project committee whose members were chosen by the community during the community engagement meeting. The membership comprises; elders, representatives from women youth, special needs (persons with disability), religious leader-sheikh and the chief. This will be the first stop for receiving information and raising grievances. 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 working groups committee. This committee is at the county level and will resolve complains or issues that could not be resolved at the locational/project level. The chief will forward issues/ complains to the county renewable energy officers (CREO) who sits at the county working group committee and will also be responsible for giving feed back to the local committee.
3. The third level will be the KOSAP project implementation Unit at the ministry of energy. Matters that could not be resolved at the county level will be brought to the KOSAP PIU.
4. The last level of the GRM for the community or project affected persons will be the opportunity to seek legal redress.

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MEETING VENUE..SEREOLIPI.....CHURCH.....

DATE.....14/12/2020.....

LIST OF ATTENDANCE/PARTICIPANTS LIST

No	NAME	Identification number –ID No	Mobile No.	Village	Do you agree to donation of land Yes/no	SIGN.
1.	AMURIA LOLIMO	2114744	0716 958 914	SEREOLIPI NTARASI	YES	
2.	ISABELA LESASUYAN	38944373	0769754873	SEREOLIPI	YES	
3.	KENDI LESASUYAN	34057093	0708209147	SEREOLIPI	YES	

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4.	NKIPARIAN LEPARKERI	20174397	0741545352	SEREOLIPI	YES	
5.	MARGARET LEERE O	24009044	0705850977	SEREOLIPI	YES	
6.	LEANO LENTAKA	41869981	0713595555	SEREOLIPI	YES	
7.	MAYANAE LOBAALI	31012280	0703934766	SEREOLIPI	YES	
8.	NKIMAI CEMERKETO		0704686749	SEREOLIPI	YES	
9.	SALEKON LOLPUSKE	26415573	0718986707	SEREOLIPI	YES	
10	NOMUNGEN LESANTANYUNY		0728086878	SEREOLIPI	YES	
11	NKUNEI SAMADO		0742179964	SEREOLIPI	YES	
12	PASKALINA LEARSERE O	31057067	0748541301	SEREOLIPI	YES	
13	RASSON LENDIRA	24711051	0742929383	SEREOLIPI	YES	
14	EUNICE CERTE	28652721	0706145602	SEREOLIPI	YES	
15	SOLOMON LESIRITE	37154312	0746520086	SEREOLIPI	YES	
16	FAILIN LEKOLOTO	34017236	0740879587	SEREOLIPI	YES	
17	KAALA LEPARKIRAJ	20170438	0769776809	SEREOLIPI	YES	
18	LORUNYA LEORRE	32086723	0713073538	SEREOLIPI	YES	

2

		ID NO	PHONE	VILLAGE	AGREE	
19	JULIA LEERTE	28652698	0707144926	SEREOLIPI	YES	
20	SUSAN NANYASIN	35019597	0742929359	SEREOLIPI	YES	
21	NTARISI LENYIRONI	38512868	0746363935	SEREOLIPI	YES	
22	ELIZABETH LEPARTELEL	33917596	0714783761	SEREOLIPI	YES	
23	LMENGIS LEPOROLE	23130574	0798940609	SEREOLIPI	YES	
24	WILLY WILSON	2978359	0748752276	SEREOLIPI	YES	
25	RISONI LESUUDA	-	0748225702	SEREOLIPI	YES	
26	MIRIAM LENAIPA	31000520	0704339877	SEREOLIPI	YES	
27	MPILASIN LEPARINGAT	24720235	0719288848	SEREOLIPI	YES	
28	NAIRIAMU LETOORE	24760112	0740419314	SEREOLIPI	YES	
29	LUCY LENKOLIAI	27317242	0714975827	SEREOLIPI	YES	
30	NAITIJINGU LENURE	31286918	0795162016	SEREOLIPI	YES	
31	POROTINA LERANTILE	26624438	0743564733	SEREOLIPI	YES	
32	MANKU LEMIRIJICHAN	24721208	0711560802	SEREOLIPI	YES	
33	NTATIRAN LENGIMA	24326466	0799389812	SEREOLIPI	YES	

3

		ID	PHONE	VILLAGE	AGREE	
49	FLORENCE LEKIANA	47662118	0741283459	SEREOLIPI	YES	
50	NASINTE LEKISAAT	24821209	0758653798	SEREOLIPI	YES	
51	TIKISIAN LEYAPOKO	4195617	0768965998	SEREOLIPI	YES	

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MEETING VENUE..SEREOLIPI....CHURCH.......

DATE....14/12/2020.....

LIST OF ATTENDANCE/PARTICIPANTS LIST

No	NAME	Identification number –ID No	Mobile No.	Village	Do you agree to donation of land Yes/no	SIGN.
1.	LENAIPA LAWRENCE	28452003	0768470343	SERE-OLIPI	Yes	
2.	KENNEDY LEKESIRE	11455912	0742469717	SERE-OLIPI	Yes	
3.	JONATHAN LEKALAILE	32657452	0706303361	SERE-OLIPI	Yes	
4.	Jackson Patrowarai	10 9532507	0702457133	SEREOLIPI	YES	
5.	Ngerizon Lechere	–	–	Sere-olipi	Yes	
6.	Sipen Leilimo	3440664	–	SERE-OLIPI	Yes	
7.	Rumai Lekarkarule	3440365	–	SERE-OLIPI	Yes	
8.	Husen Lepedmarai	1418 9543	0724954020	SERE-OLIPI	YES	
9.	LPARARIAN LEKOPIR	3656057	0112117516	Sere-olipi	Yes	
10	JAMES ROLPUSKE	13047212	0711647224	SEREOLIPI	YES	
11	MPAANI LEMDIRA	24721174	0706377002	SERE-OLIPI	Yes	
12	MAPONGRO LEMDIRA	12750375B	0707575877	SEREOLIPI	YES	
13	MANYU LEMAIPA	31600510 ~~0702477~~	0792023154	SEREOLIPI	Yes	
14	CHAANGOI LEMINGANI	30999291	0708208650	SEREOLIPI	YES	
15	Benika Lemolong	33699018	070738681 ~~070738681~~	Sereolipi	yes	
16	EVANA Idoro	24049473	0702625530	sere-olipi	yes	
17	MKICHOMOI LEKILEMO	27308905	0765875099	SEREOLIPI	Yes	
18	Durano Lesasunyan	–	0706857953	SEREOLIPI	Yes	

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19	ANN Leparmarei	1287360	0746982476	SERE-Olipi	Yes	[signature]
20	Lawrence Lekesike	12871168	0710678912	Sereolipi	Yes	[signature]
21	PHILIP Letaare	13046155	0713343084	SEREOLIPI	Yes	[signature]
22	DARIO LEMALASIA	0861541	0719706199	SEREOLIPI	Yes	[signature]
23	LMUYALE LEKISAAT	114552252	0712391208	SEREOLIPI	Yes	[signature]
24	COBIKI LERKARAULE	24762912	0700656925	SEREOLIPI	Yes.	[signature]
25	Nganga Lenaipa	22181326	0728872789	Sere-olipi	Yes.	[signature]
26	Lterewua Laigwanani		0799553077	Sere-olipi	Yes.	[signature]
27	LOPONU LEPARMARAI	20176299	0721971293	SEREOLIPI	Yes	[thumbprint]
28	MASERU LEKIRAPITI	23130592	0757402476	SEREOLIPI	Yes	[thumbprint]
29	YEYAI LETORGE	24044142	—	SEREOLIPI	Yes	[thumbprint]
30	MALANGU LENANYOKIE	24756839	0795532703	SEREOLIPI	Yes	[thumbprint]
31	Stella Chachu Chana	28137359	0741544714	Sereolipi	Yes	[signature]
32	RISABI LEMALESOI	23066194	0706866352	SEREOLIPI	Yes	[thumbprint]
33	LUCY Lenamunyi	11264038	0713011470	Sereolipi	Yes	[signature]

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34	Rita Lebamuyi	38251066	0799581907	Sere-oliri	Yes	[signature]
35	SANTOROI LEKAHALE	—	0706384602	SERE-OLIPI	Yes	[thumbprint]
36	NAMUSUNGU LENPASALIA	—	0799656051	SERE-OLIPI	Yes	[thumbprint]
37	SINTIWAN LOPURANAI	21149744				[thumbprint]
38	WAREM LEKAIHALE	—	0719406888	SEREOLIPI	Yes	[thumbprint]
39	Silvana Lemalasia	27276581	0795806603	SEREOLIPI	Yes	[signature]
40	Martha Learpanai	36251634	0746824378	SERE-OLIPI	Yes	[signature]
41	Ajeni N Lengnom	22874274	071466347	11	Yes	[signature]
42	Julieta Lerpile	—	0792003966	11	Yes	[signature]
43	Vincent Leparkaras	31000632	0768702146	11	Yes	[signature]
44	michael Lepokodaw	33696758	0748354891	11	Yes	[signature]
45	REBECCA AKIRU	24835591	0759809811	11	Yes	[thumbprint]
46	CAROLYNE LEMOKOYAA	36275405	0782063139	11	Yes	[signature]
47	SAILAM LEOGUSA	24922228	-	11	Yes	[thumbprint]
48	JESIMA LECHAM	32282726	0741504580	11	Yes	[signature]

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49	NDIGONYOM LERIALUZATOP	42020041	—	—		
50	PAULINA CENAMOLE	2644284	0746983004	SERGOLIP	YES	
51	JESINTA LEKOMINIA	20272363	0758400301	SERGOLIP	YES	

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Annex 6: ESS and Land Acquisition Focus Group Discussion Attendance List

Youth

REPUBLIC OF KENYA

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MEETING VENUE..SEREOLIPI.....CHURCH.....

DATE.....14/12/2020.....

LIST OF ATTENDANCE/PARTICIPANTS LIST –YOUTH

No	NAME	Identification number –ID No	Mobile No.	Village	Do you agree to donation of land Yes/no	SIGN.
1.	MICHAEL	24760378	0795290391	SEREOLIPI	YES	
2.	MICHAEL LEPOKOLEN	37196758	0748254891	SERE-OLIPI	YES	
3.	SOLOMON LESIRITE	37154312	0746520086	SERE-OLIPI	YES	

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4.	FAILIN lekoloto	34017236	0740879587	SERE-OLIPI		YES
5.	Vini Cent leparkiteu	31000632	0768702146	SERE-O		YES
6.	Lerunya Leorre	32086723	0713077588	SEREOLIPI		YES
7.	Daniel Ngugi	38953525	0744251490	SEREOLIPI		YES
8.	ROSE LEKIRAPITI	37405721 21SI	0115061733	SEREOLIPI		YES
9.	Benita Lemalong	33699018	0707386819	Sereolipi		YES
10	Thomas Lepuure	11121960	0720275208	Sere-olipi		Yes
11	Elisa lesimuyio	39001674	0714695593	Sere-olipi		Yes
12	Ann Nyambura	11121960	0720275208	SERE-OLIPI		Yes
13	Mamprian Lea.	31404876	0754602809	Sere-olipi		Yes
14	PATRICK LEKALAYON LEKIRANI	38232885	0742529358	SERE OLIPI		Yes.
15	MALANGU LEBUSIKE LEMUKON	0205929				
16	Godwilly wilson	29788984	0748752296	SERE-OLIPI		YES
17	Ntiing Lolpusike	26251607	0746874382	Sere-olipi		Yes
18	Nakung Lebusike	0205929	0718986707	Sere-olipi		Yes

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19	LENGOLIMI TOOTO FRANCISCO	34074246	0799389825	SERE-OLIPI	YES	
20	KARUAN LESIYAT	2482120	0701675090	SERE-OLIPI	YES	
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Men

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.

MEETING VENUE...SEREOLIPI CHURCH.....

DATE......14/12/2020.

LIST OF ATTENDANCE/PARTICIPANTS LIST – MEN

No	NAME	Identification number –ID No	Mobile No.	Village	Do you agree to donation of land Yes/no	SIGN.
1.	PHILIP LETAARE	13046155	0718843024	SEREOLIPI	YES	[signature]
2.	NGANGA LENAIPA	22181326	0728872789	SERE-OLIPI	YES	[signature]
3.	LAWRENCE LEKESIKE	12871168	0710678912	SERE OLIPI	YES.	[signature]

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4.	JOHN LEMALASIA	8733370	0721129243	SEREOLIPI	YES	[signature]
5.	ALFRED LEMERKETO	11455942	0796163506	SERE-OLIPI	YES	[signature]
6.	RICHARD LESASUYIAN	1576864	0724843507	SERE OL IPI	YES	[signature]
7.	PESTA LEMARMARAI	9053377 -09	0705912479	SEREOLIPI	YES	[signature]
8.	LMENGIS LEPOROLE	23133054	0798940609	SEREOLIPI	YES	[signature]
9.	LPULOS LEOGUSA	2176158	0768539358	SEREOLIPI	YES	[signature]
10	JAMES LOLPUSKE	13047212	0711647224	SEREOLIPI	YES	[signature]
11	WILFRED KOECH	1357404	0722[illegible]	KPLC	–	[signature]
12	JOSEPH K. KORER	7867177	0722566394	KPLC	–	[signature]
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Women

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.

MEETING VENUE..SEREOLIPI......CHURCH......

DATE....14/12/2020......

LIST OF ATTENDANCE/PARTICIPANTS LIST - WOMEN

No	NAME	Identification number –ID No	Mobile No.	Village	Do you agree to donation of land Yes/no	SIGN.
1.	Sandra lemayian			Sere-olipi	Yes	
2.	Sankalan lolgosine			Sere-olipi	Yes	
3.	Wiyayon lehanu			Sere-olipi	Yes	

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No	NAME	Identification number –ID No	Mobile No.	Village	Do you agree to donation of land Yes/no	SIGN.
4.	Risial lekiale			Sere-olipi	Yes	
5.	Joyce lororua			Sere-olipi	Yes	
6.	Ramingei lekupanai			Sere-olipi	Yes	
7.	Pauline Lesamaja			Sere-olipi	Yes	
8.	Rose Lesimerto.			Sere-olipi	Yes	
9.	Julia N lediiy	28835147	0703358395	Sere-olipi	Yes	
10	Julia lecharwals	31367462	0740260077	Sere-olipi	Yes	
11	Kadaki laliono	24758387		Sere-olipi	Yes	
12	Nakini Lemaracho	36277124	0794182805	Sere-olipi	Yes	
13	Evaline lesirama	24445779		Sere-olipi	Yes	
14	Sofia Lesamaja	33906436	0725224588	Sere-olipi	Yes	
15	GABRiela learpale	24722258	0719538916	Sere-olipi	Yes	
16	Gurani lEMARIENI	24720557		Sere-olipi	Yes	
17	Mdura lepartingati			Sere-olipi	Yes	
18	Nkerete lenHaka	24722347	0705867912	Sere-olipi	Yes	

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19	Paulino Lemirgichan	36277390	0799229217	Sereolipi	Yes	
20	Naparachuo Lokolojo	29398669	0701340309	Sere-olipi	Yes	
21	Nasambai LENAIKOOL	25630302	0791632852	Sere-olipi	Yes	
22	Neheni Leturuka	27310857	0740879206	"	Yes	
23	Sekisen Lemoriketo	3/3/7/26	0799553108	"	Yes	
24	Teiyelai Lekesike	27308943	0742025118	"	Yes	
25	Nangisa Lesalkapo	20177343				
26	Mperesian Leikar	23497866	0748354911	"	Yes	
27	Lmakaso Lesasuyan	30999602	0710405595	"	Yes	
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Annex 7: Lead Expert License

FORM 7 (r.15(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/ERPL/18279

Application Reference No: NEMA/EIA/EL/23951

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.

ISO 9001:2015 Certified

FORM 7 (r.15(2))

nema
mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/18263

Application Reference No: NEMA/EIA/EL/23929

M/S **Norken International Limited**
(individual or firm) of address
P.O. Box 9882 - 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 BUREAU VERITAS Certification
UNAS
ISO 9001:2015 Certified