RUREC
RURAL ELECTRIFICATION & RENEWABLE ENERGY CORPORATION

MINISTRY OF ENERGY
REPUBLIC OF KENYA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED LORENGIPPI SOLAR MINI-GRID

PROJECT: KENYA OFF-GRID SOLAR ACCESS PROJECT

SUB-PROJECT: COMPONENT 1. MINI-GRIDS FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS

LOCATION : LORENGIPPI VILLAGE, LORENGIPPI SUB-LOCATION, LORENGIPPI LOCATION, LOKIRIAMA WARD IN TURKANA COUNTY.

2023

CERTIFICATION

This ESIA project report for the proposed Lorengippi 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 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 Lorengippi, Turkana county.

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Disclaimer:

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

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CONTENTS

LIST OF TABLES

LIST OF PLATES

LIST OF FIGURES

Abbreviations

ACRONYM	DEFINITION
ADR	Alternative Dispute Resolution
AoI	Area of Influence
BESS	Battery Energy Storage System
BOWEC	Building Operations and Works of Engineering Construction
CBOs	Community Based Organizations
CoK	Constitution of Kenya
CDI	County Development Index
CEMP	Construction Environmental Management Plan
CGRCs	County Grievance Redress Committees
CRA	Commission on Revenue Allocation
CIDP	County Integrated Development Plan
CPS	Country Partnerships Strategy
DOSHS	Directorate of Occupational Safety and Health Services
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EPRA	Energy and Petroleum Regulatory Authority
EPT	Energy and Petroleum Tribunal
ERC	Energy Regulatory Commission
ESI	Electrical Supply Industry
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMMP	Environmental and Social Management and Monitoring Plan
EMCA	Environmental Management and Coordination Act
EMF	Electromagnetic Field
FGD	Focus Group Discussions
GDC	Geothermal Development Company
GoK	Government of Kenya
IAs	Impact Assessment
IPPs	Independent Power Procedures
IPs	Indigenous Peoples
JV	Joint Venture
KII	Key Informant Interviews
KOSAP	Kenya Off-Grid Solar Access Project
KP	Kenya Power
LEP	Labour and Employment Plan
LGRCs	Local Grievance Redress committee
MGs	Mini Grids
MOEP	Ministry of Energy and Petroleum
MSDS	Material Safety Datasheet
NEMA	National Environmental Management Authority
NGOs	Non-Governmental Organizations
NLC	National Land Commission
NTSA	National Transport and Safety Authority
OHS	Occupational Health and Safety
OM	Operation and Maintenance
OP	Operational Policies
PAD	Project Appraisal Document

PAPs	Project Affected Persons
PCU	Project Co-ordination Unit
PPAs	Power Purchase Agreements
PPEs	Personal Protective Equipment
PV	Photo-voltaic
REREC	Rural Electrification and Renewable Energy Corporation
RPF	Resettlement Policy Framework
SA	Social Assessment
SEA	Strategic Environmental Assessment
SHS	Solar Home Systems
SIA	Social Impact Assessment
SOP	Safe Operation Procedure
STDs	Sexually Transmitted Diseases
STI	Science, technology and innovation
SMMP	Social Management and Monitoring Plan
ToR	Terms of Reference
VMGF	Vulnerable and Marginalised Groups Framework
VMGs	Vulnerable and Marginalized Groups
VMGP	Vulnerable and Marginalised Group Plan
WB	World Bank
WMP	Waste Management Plan
WRA	Water Resources Authority

EXECUTIVE SUMMARY

E-1- Introduction and Project Brief

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

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

In Turkana County, one of the target counties, the Proponent is proposing to develop 19 No. mini grid facilities including Lorengippi 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 Lorengippi 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 Lorengippi 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 land in the Lorengippi is majorly communally owned. The land is used for settlements, commercial businesses, livestock grazing and farming purposes during the rainy season. Underground water is also harnessed from the land at the boreholes. The area is majorly semi-arid with a sparse population within the area.

The topography of the project site is an open area with a flat terrain. There are no water bodies that pass though directly the proposed project site. There is a Lagha on the lower side of the project site which was dry at the time of the site visit. Lorengippi village is surrounded by hills. There are many ant hills and termite hills in the village. The main tree found in Lorengippi village is Prosopis Juliflora commonly known as 'Mathenge' which is widespread and has choked most indigenous plants.

Main livelihood activities undertakenby the people of Lorengippi are pastoralism and small-scale farming during rainy season. Majority of the residents of Lorengippi are unemployed. The residents in formal employment are chief, assistant chief, 10 teachers and 6 people working at the dispensary. The informal jobs are motor cycle riders and shop owners. There are 10 shops in the village.

E-6 Project Description

The Lorengippi Mini Grid project aims to provide electricity to approximately 313 residential and 4 nonresidential consumers in Lorengippi Village at Lorengippi village, Lorengippi sub-location, Lorengippi location, Lokiriama Ward in Turkana County.

The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity. A 9 km Low Voltage Power Distribution Network will be established to distribute the power to customers. The project utilizes solar panels with a total capacity of 75 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 188 kWh Battery Energy Storage System is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions. A 60 kVA diesel generator is included to serve as a backup power source for periods of low solar generation or in case of battery depletion. It provides reliability and backup in the event of extended periods of cloudy weather or high demand. A 2,000-liter fuel tank is provided to store diesel fuel for the generator, ensuring continuous operation during extended periods of low solar or high demand. Additionally, PV Inverter: A 75 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. A 60 kW battery inverter charger will also be used.

The estimated cost of the project is around USD 492,628.36 although this amount may change as more detailed plans are developed.

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

To develop the Lorengippi Mini Grid approximately 1.2626 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 Lorengippi MG is chosen as the most suitable location for the mini grid based on factors such as sunlight availability and the community's lack of grid connectivity. The use of wind power, thermal power, fossil fuels, and power import from neighboring countries are considered as alternative methods of power generation but are found to have limitations or environmental concerns. Solar energy is favored due to its low production costs, versatility, clean nature, and economic savings. The "No Project" alternative is deemed unfavorable as it would maintain the current lack of electricity access and hinder socio-economic development. The project will be constructed using modern materials and technology, with a focus on public health, safety, security, and environmental requirements. The technology will involve a Battery Energy Storage System.

E-8 Stakeholder Engagement

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

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

During the ESIA stakeholder engagement public meeting, which took place on October 23, 2021, a total of 129 stakeholders attended. The meeting provided an opportunity to discuss project details, including the preliminary design, positive and negative impacts, and mitigation measures. Stakeholders were encouraged to share their views and provide feedback on the project.

Some of the concerns raised by stakeholders included the type of fence to be constructed around the project site, the treatment of the community regarding the land acquired for the mini-grid construction, and the connection of community boreholes to electricity. The study team addressed these concerns by assuring stakeholders that a chain-link fence supported by concrete poles would be constructed. They also stated that additional projects would be undertaken for the community as compensation, based on their priorities. Furthermore, public facilities such as schools, health centers, and boreholes would be connected to the electricity supply.

E-9 – Impacts and Mitigation Measures

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

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

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

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

Tables 0-1 to 0-3 below present summaries of anticipated impacts and their corresponding levels of significance, both pre- and post-mitigation.

Table 0-1: Summary of Pre-construction Impacts

Impact	**Significance Of Impact (Pre-Mitigation)**	**Residual Impacts (Post-Mitigation)**
Land acquisition	Minor	Negligible
Way leaves	Minor	Negligible
Stakeholder identification and consultations	Major	Minor

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

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

Impact	Pre-construction	Construction phase	Decommissioning phase
Increased water demand		Negligible	Negligible
Forced labor		Minor	Negligible

Table 0-3: Summary of Operation Phase Impacts

Impact	Significance Of Impact (Pre-Mitigation)	Residual Impacts (Post-Mitigation)
Impact On Economy and Employment	Positive	Positive
Quality, reliable power supply	Positive	Positive
Reduction of pollution associated with thermal power generation, 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

Impact	Significance Of Impact (Pre-Mitigation)	Residual Impacts (Post-Mitigation)
Occupational safety and health	Moderate	Minor
Community safety and health	Moderate	Minor
Gender based violence, SEA and SH	Minor	Negligible
Exclusion of VMGs, Vulnerable individuals and households	Major	Minor
Risk of communicable diseases	Minor	Negligible
Shocks and electrocution to the beneficiaries	Moderate	Minor
Risks related to poor and inadequate stakeholder engagement (conflict)	Minor	Negligible

E-10 Environmental and Social Management and Monitoring Plan

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

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

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

For the mitigation measures to be successful, it is imperative that the 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 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 Kilifi, Mandera, Wajir, Garissa, Tana River, Samburu, Turkana, Marsabit, West Pokot, Isiolo, Taita Taveta, Kwale, Lamu and Narok.

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

Turkana County and other identified underserved counties, collectively represent 72% of the country's total land area and 20% of the country's population, including historically nomadic societies that even today continue to rely on pastoralism. 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 Co-ordination Act (EMCA), 1999 and its amendments; the Environmental Management and Coordination (Amendment) Act, 2015 and World Bank's Environmental and Social Operational Policies. 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 and Petroleum 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 Operational policies. The two firms are licensed by National Environment Management Authority (NEMA) to undertake environmental impact assessment studies. 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 three primary factors - public funding, local community participation and institutional capacity of 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 (KP) and the Rural Electrification and Renewable Energy Corporation (REREC).

1.2 PROJECT OVERVIEW

The project site is located in Lorengippi village, Lorengippi sub-location, Lorengippi location, Lokriama Ward in Turkana County at latitude 2°34'11.6034"N and longitude 34°59'31.0554"E. The proposed solar mini grid will be located on a 1.2626 hectares piece of land. The solar mini grid will comprise solar panels, batteries, invertors, perimeter fence and 9 kilometres distribution line to cover a radius of approximately 3km. The project is expected to serve 317 consumers of which 313 are residential and 4 are non residential.

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 and Monitoring Plan (ESMMP) for the project. The report also evaluates the potential environmental and social risks associated with the project and recommends mitigation measures to avoid adverse impacts for the remainder of the project's lifecycle. The project has to comply with international standards(World Bank Environmetal and Social Operational Policies) along with applicable national and local regulations.

1.4 ESIA METHODOLOGY

1.4.1 Screening and Scoping

Evaluation of ESIA procedure has been undertaken as a fundamental procedure to implementation of the

solar power minigrid development project which is systematically mainstreamed into the project's cycle. World Banks Social OPs 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.

1.4.2 Environmental Impact Assessment

The steps below were followed in the preparation of the ESIA Report.

1.4.2.1 Kick-off Meeting

The consultant had a brief kick-off meeting with the proponent on 12th July 2021 followed by subsequent online meetings and discussion on various aspects of the project up to 5th August, 2021. 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.

1.4.2.2 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 provided by the proponent 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.

1.4.2.3 Project Description

The consultant 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 project 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.

1.4.2.4 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 site's physical environment including their topography, land cover, geology, climate and meteorology, air quality and hydrology. This entailed 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 report. The ecological and biophysical environment will be focused on describing the flora and fauna resident in the Turkana county at the mini-grid site level. This was based on observation of flora and fauna, KPIs on local indigenous knowledge on historical and current status of rare, endemic and endangered plant and animal species

known to occur in the project area. Vegetation assessment was done to gain an understanding of the mini-grid site habitat type. This has provided for an in-depth description of existing land use type and their linked socio-economic activities.

1.4.3 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. In order 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 was 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 site.

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 identified included: the poor, elderly persons, PLWDs, the sick, poor women, poor single mothers, child-headed households.

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 power line distribution network; restricted access to grazing lands, water resources, soils and tree resources, economic/livelihoods displacement etc.

1.4.4 Environmental and Social Management and Monitoring Plan (ESMMP)

The ESMMP as the implementation instrument of the ESIA has captured all the parameters that need to be monitored on a routine basis. The parameters are 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 pre-construction, 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 throughout 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 ESMMP include an implementation schedule and budget cost estimates for the mitigation measures. It also describes institutional arrangements with regard to the implementation of the ESMMP 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 ESMMP.

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

Additionally, the ESMMP has a component on contracting management that will ensure the implementation of the ESMMP by all contractors and subcontractors. A contracting mechanism is included in the ESMMP to incentivize contractors and their subcontractors to comply with the ESMMP or alternatively penalize them for failure to comply with the ESMMP. 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, labour rights and the employment of community members. The ESMMP also has a budget to guide the contractor on resources required for the implementation and monitoring of the ESMMP.

Figure 2 is a summary of the methodology the consultant adopted in undertaking environmental and social impacts assessment for the proposed Lorengippi ESIA project.

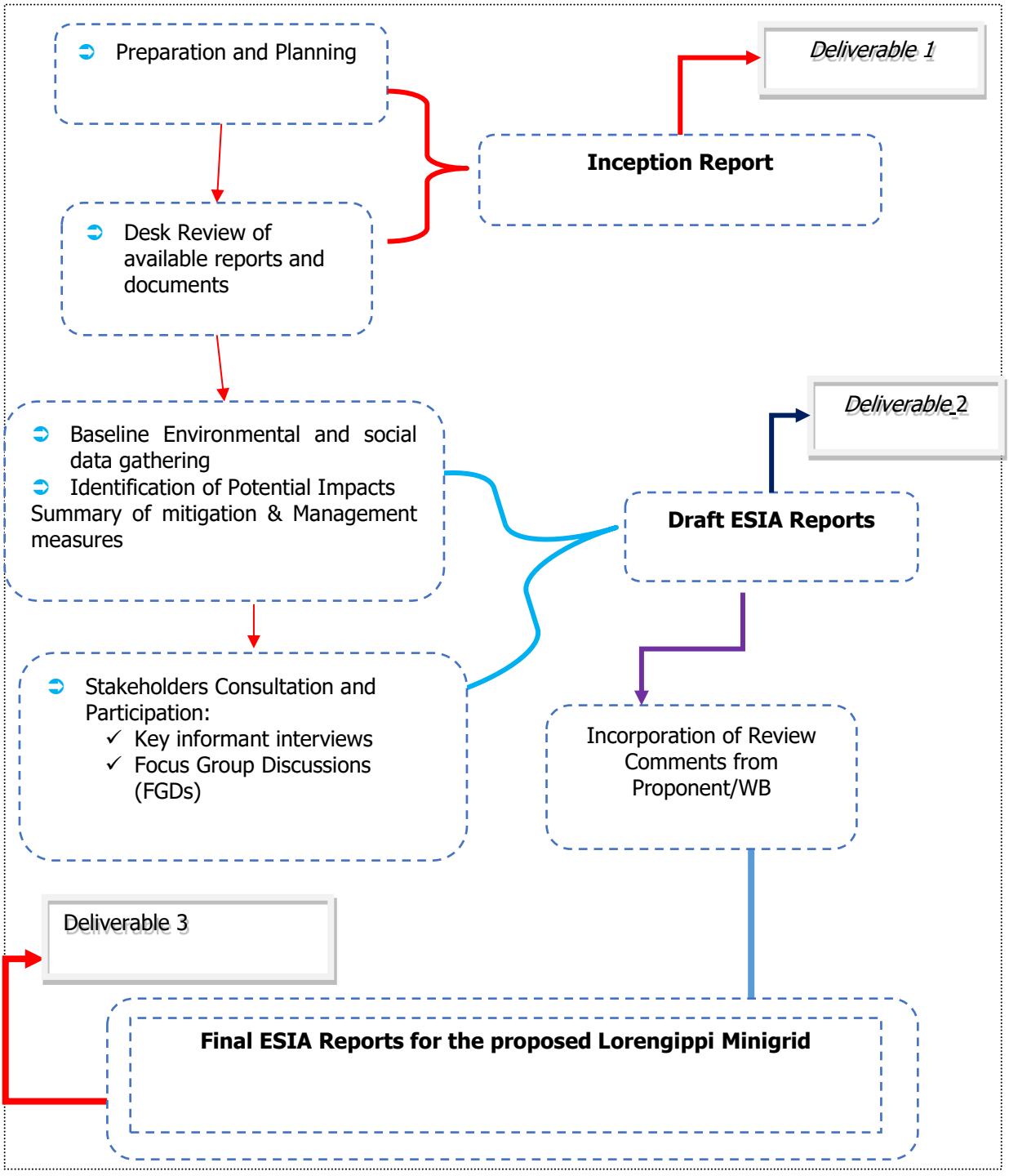

Figure 1: Summary of Environmental and Social Impact Assessment Methodology

1.5 STUDY TEAM

This ESIA process was conducted by a team of experts that comprised the following professionals:

Team - 19/01/2022 – conducted the ESIA study.

Table 1-1: *ESIA Study Team*

S/No	Names	Position
1	Samwel Olela	REREC
2	Samuel Ebei	Energy Department- Turkana County
3	Patrick Ngari	Norken International Limited /Centric Africa Limited- EIA/EA Expert
4	Loise Kioko	Norken International Limited /Centric Africa Limited- EIA/EA Expert
5	Martin Gitonga	Norken International Limited /Centric Africa Limited- EIA/EA Expert
6	Sharon Watiri	Norken International Limited /Centric Africa Limited- EIA/EA Expert

1.6 LIMITATIONS

The limitation experienced during the study are illustrated below.

✓ Due to drought that was being experienced the community member were engaged in looking for water and pasture thus delaying in attending public participation meetings. This was mitigated by starting the meeting early enough

✓ Risk of being infected or transmitting COVID-19. The teams had to adopt preventive measures by wearing face mask and providing the community members with face mask and sanitizers during the public meetings and interactions

1.7 LAYOUT OF THE REPORT

Table 1-2: Structure of the ESIA Report

SECTION	TITLE	DESCRIPTION
Section 1	Introduction	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.
Section 4	Environmental, Ecology and Social Baseline	Outlines Environmental, Ecology and Social Baseline status in the study area of the Project
Section 5	Stakeholder Engagement and Grievance Redress	Provides an overview of the stakeholder engagement activities undertaken during the ESIA, stakeholder categorization and profiling additionally, it details the provision of Grievance Redress Mechanism for the project

Section 6	Analysis of alternatives and project justification	This section includes present power supply position, alternate location for project site, alternate method of power generation and no project alternative
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 and Monitoring Plan	Outline of the ESMMP taking into account 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. It also presents 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 2-1: Summary Information of The Proposed Lorengippi Solar Mini-Grid

S. NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project site is located in Lorengippi village, Lorengippi sub-location, Lorengippi location, Lokriama Ward in Turkana County at latitude 2°34'11.6034"N and longitude 34°59'31.0554"E. The proposed solar mini grid will be located on a 1.2626 hectares piece of land. The solar mini grid will contain solar panels, batteries, invertors, perimeter fence and 9 km distribution line to cover a radius of approximately 3 km.
2.	Land Size/ Tenure	The proposed solar mini grid will be located on a 1,2626 hectares piece of land. The land is unregistered community land.
3.	Minigrid Capacity	PV Array (DC-kW) of 75kw; 188kWh Battery
4.	Minigrid Power	LV Circuit of 9 km
5.	Target Consumers	317(313 Residential and 4 Non-Residential)
6.	Climatic condition	Turkana county has a hot, dry climate with temperature ranging between 20ºC and 41ºC and with a mean of 30.5ºC. Rainfall in the area is bimodal and highly variable. The long rains occur between April and July and the short rains between October and November. The annual rainfall is low, ranging between 52mm and 480mm with a mean of 200mm. rain patterns and distributions are erratic and unreliable. Rain usually comes in brief, violent storms that result in flash flooding. 80% of the county is categorized as either arid or very arid.
7.	Site Conditions	The site is generally in an open area with *Prosopis Juliflora* commonly known as 'Mathenge' being the dominant land cover.
8.	Road Accessibility	Dirt road.
9.	River/canal/nallah/ pond present in project footprint	There is a Lagha approximately 200m on the lower side of the project site.

2.2 PROJECT LOCATION

The project site is located in Lorengippi village, Lorengippi sub-location, Lorengippi location, Lokiriama Ward in Turkana County at latitude 2°34'11.6034"N and longitude 34°59'31.0554"E. The proposed solar mini grid will be located on a 1.2626 hectares piece of land. The solar mini grid will comprise solar panels, batteries, invertors, perimeter fence and 9 kilometres distribution line to cover a radius of approximately 3km. The project is expected to serve 317 consumers of which 313 are residential and 4 are non residential. The project location is shown in Figure 3.

Figure 2: Project Location

Plate 1: Project location, Lorengippi centre

2.3 DESCRIPTION OF PROJECT FACILITIES, COMPONENTS AND ACTIVITIES

Residential Users (No.)	Non-Residential Users (No.)	Monthly Energy Demand (kWh)	Daily Energy Demand (kWh)	Peak demand (kW)	PV Capacity (kWp)	Battery Capacity (kWh)	PV Inverter (kW)	Battery Inverter Charger (kW)	Generator Capacity (kVA)	Fuel Tank for diesel generator (Litres)	LV Network (km)
313	4	7860	262	49	75	188	75	60	60	2,000	9

2.3.1 Project Components

2.3.1.1 Solar PV modules

The project will use PV Array (DC-kW) 75 polycrystalline silicon module with three strings connected in series. Each string will have five sets of panels connected in series, with output converged at the six-way combiners. The life expectancy of the PV modules is estimated at 25-30 years.

2.3.1.2 Battery Energy Storage System

The 188 kWh Battery Energy Storage System (BESS) will comprise of Lithium-ion Battery pack that conforms to IEC standards with warranty of 10 years, 3,000 cycles minimum. The Lithium-ion Battery Power Packs will be used to cater for required energy capacity, or equivalent as per approved design, minimum 80% DOD for Lithium-Ion. Batteries will be capable of at least C/4 charge and discharge rate. Batteries will be charged by Battery Inverter / Charger.

2.3.1.3 Inverters

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 and shut down independently and automatically. A 75 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. A 60 kW battery inverter charger will also be used.

2.3.1.4 Distribution lines

Lorengippi site will have a distribution line circuit of 9km in total. Supply of concrete poles for the distribution lines will be based on detailed survey and accessories like phase plates, circuit plates, number plates, danger plates, anti-climbing devices as per REREC requirements/specifications. Erection of the poles, fixing of insulator strings, stringing of conductor and earth wires along with all necessary line accessories and earthing will be as per REREC requirements/specifications.

2.3.1.5 Project 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.

2.3.1.6 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 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 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;

2.3.1.7 Project cost

Lorengippi project cost is estimated at USD. 492,628.36.

2.3.2 Land Requirement

The land on which the proposed Lorengippi minigrid will be constructed covers a total of 1.2626 hectares of land.

2.3.2.1 Land Tenure

According to the Turkana CIDP, the mean holding size for Turkana County in urban centers measures approximately 15m by 30m (0.045 ha) whereas in rural areas the land is communally owned and thus community members are free to settle anywhere without absolute restrictions. Until the Community Land

Act 2017 is operationalized to pave way for Land Acquisition, Registration and Titling, most of the land in Turkana County remains Unregistered Community land
The land for the project will be compulsorily acquired with just, prompt and full payment of compensation (in-kind) to the Lorengippi community.

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

2.3.2.2 Compensation Details

Compensation for the land for the proposed project will be in kind for the acquired land, the proponent will undertake some projects for the community. The value of the proposed community project will commensurate or be higher than the value of the land acquired for the mini-grid. In Lorengippi, the community requested:

- Improvement of water provision services.

2.4 RESOURCE REQUIREMENT

2.4.1 Workforce Requirement

The solar mini-grid will be installed, operated and maintained by the O&M contractor for the first seven years and then handed over to KPLC engineers and operators. So, for the seven years KPLC will be monitoring the operations of the contractor.

2.4.2 Water Requirement and Source

2.4.2.1 Construction Phase

It has been estimated that approximately 50,000 litres 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 on the mobilisation of construction workers at the site. The water for the construction phase will be supplied by local vendors where applicable.

2.4.2.2 Operation Phase

The water required during operation phase of the project will be mainly for washing the face of the solar modules, minimal water will be used for this purpose. The quantity of water requirement during operational phase of the project is not known at this stage of the project. The water for the operation phase will be purchased from the vendors in the area.

2.4.3 Raw Material Requirement

2.4.3.1 Construction Phase

The major raw materials required for the construction phase will be solar modules, fencing materials, construction materials like cement, sand and aggregate. The fencing materials and the construction materials will be sourced from the local hardware facilities. Solar modules for the project along with associated structures will be obtained from suppliers in the country and if not available imported from

suppliers outside the country.

2.4.3.2 Operation Phase

There will be no 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 design is finalized.

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 project site in the local language.

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. The team managing the site will be trained on Fire safety as per the requirement on Fire Risk reduction rules. Further the proponent will be required to undertake Annual OSH Audits, Fire audits and Risk assessment as per the requirement of OSHA 2007 and the relevant subsidiary legislation.

3 ANALYSIS OF ALTERNATIVES AND PROJECT JUSTIFICATION

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

3.1 PRESENT POWER SUPPLY POSITION

According to the Turkana County Integrated Development Plan (2018-2022), the main challenges faced by the energy sector include poor transmission and distribution infrastructure, the high cost of power, low per capita power consumption and low countrywide electricity access. Only about 2% of the county's households have access to electricty. Households mainly rely on firewood, charcoal, paraffin and solar lanterns for their lighting and cooking needs, with firewood being the main source of energy.
According to Kenya National Bureau of Statistics (KNBS) and Society for International Development (SID), 2013, the potential for investment in renewable energy sources is high given that the county receives over 6 hours of sunlight.

In Lorengippi, majority of the households use solar solutions for lighting and mobile phone charging purposes. During the Focus Group Discussions with men, it was reported that the main challenge to accessing power is inaccessibility.

3.2 ALTERNATE LOCATION FOR PROJECT SITE

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

i. Geophysical Factors-Proximity to Hills-Shade effect, Soil erosion, Drainage of the area, Flooding etc.
ii. Land identified is free from any dispute on ownership or any other encumbrances
iii. Proximity to public utilities-Schools, Dispensaries, Places of worship and community settlements
iv. No squatters, encroachers or other claims to the land
v. 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.
vi. The Land identified should be on spaces set aside for public use within the community centres.

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

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

3.3 ANALYSIS OF ALTERNATIVE CONSTRUCTION MATERIALS AND TECHNOLOGY

The proposed project will be constructed using modern, locally and internationally accepted materials to

achieve public health, safety, security and environmental aesthetic requirements. The materials will include all consumables, tools, testing instruments or any other equipment required for successful commissioning of the project.These may not be desirable from a cost and durability perspective. The technology to be adopted will be the most economical and one sensitive to the environment. The technology will involve a Battery Energy Storage System (including battery Inverter and charger).

3.4 ALTERNATE SOURCES OF ENERGY

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

The possible alternatives to solar energy include;

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

Solar energy was a desirable option because:

- It has low energy-production costs
- The project is environment friendly with minimal greenhouse gas emissions
- Versatile installation
- It is a clean source of energy hence minimal impact on the environment air quality
- Economic savings.

3.5 TECHNOLOGY ALTERNATIVES

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.

3.6 SOLID WASTE MANAGEMENT ALTERNATIVES

A lot of solid wastes will be generated from the proposed project site. 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. 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.

3.7 POWER DISTRIBUTION LINE ALTERNATIVES

The project requires the distribution of generated power into the settlement points within Lorengippi

through optimal access points, therefore all possible options for power distribution have been assessed.

The identified viable option for power distribution within Lorengippi village for the solar mini-grid project is overhead distribution lines. Although other alternatives, such as underground lines and passing the power lines off established community public access routes, may have been considered, they are not feasible for this specific project due to technical and practical reasons. A mini-grid connection with enough capacity and material was recommended due to the anticipated increasing demand for connections. This eliminates the need to overhaul the proposed mini-grid connection when the population increases in Lorengippi.

Underground distribution lines involve the installation of power cables beneath the ground, typically in trenches or conduits. While this option may be visually appealing and minimize the impact on the environment, it presents challenges in terms of cost, maintenance, and accessibility. Excavation for underground lines can be difficult and costly in Lorengippi village due to challenging terrain, and maintenance and repair of underground lines may require specialized equipment and labour. Additionally, accessing underground lines for routine maintenance, fault detection, and repairs can be challenging, especially in remote or inaccessible areas of the area. Furthermore, scalability and flexibility may be limited with underground lines, making future expansions or changes in power demand more complicated and costly.

Passing the power lines off established community public access routes may not be practical in Lorengippi village due to community settlement patterns, existing infrastructure, and environmental considerations. Establishing new routes or modifying existing ones to accommodate power lines may require significant resources, land acquisition, and community consultations, which can be time-consuming and costly.

Additionally, the appropriateness of potential mini-grid site identified by the Proponent was also assessed in terms of various suitability criteria and technical restrictions as outlined below:

Parameter	Comment
Seismicity	According to the Seismic Distribution Map by WHO (2010), generally Turkana county's seismic hazard is categorized as "Very Low". It is however recommended that the civil and structural infrastructure for the project should be designed in compliance with the national seismic regulation embedded within the Building Code
Land Use	The parcel of land earmarked for the project is community land with vegetative cover being natural trees and bushes. At present, the land is unutilized.
Terrain	Consideration is given to the topography of potential sites whereby flat or gently sloping topography is preferred. An ideal gradient for the natural ground is 1:100. A gentle slope facilitates surface drainage and movement of vehicles and people on site during construction. A steep slope requires costly leveling (cut and fill) for the construction of the solar mini-grid and increases the potential for environmental impacts during construction as well as operations i.e. steeper slopes have higher surface water flow rates and therefore higher erosive potential. The proposed site is slightly slopy and cost-effective during construction. The proposed site and distribution alignment does not exhibit significant slopes that may impact on the construction/installation activities.
Hydrology	Consideration is given to the proximity of potential sites to adjacent water courses and wetlands where there may be potential impacts in terms of erosion and siltation of water courses, as well as implications associated with storm-water control at the solar mini-grid site. The site is not close to water resources or wetland and so there will be no impact to water sources through siltation.
Geology and soils	Consideration is given to the soil type present within the potential site whereby stable soil and founding conditions are preferable. Less stable soils, i.e. shallow, dispersive soils and soils with poor drainage present an erosion hazard if not managed correctly, and also require the installment of additional, costly foundation infrastructure. The site has sandy soil which drain more readily than other types of soils.
Flora and Fauna	The potential sites need to be assessed in terms of their ecological value at both a macro and micro sale i.e. within the site and the environment surrounding the site to ensure the protection of endemic and red data species and their habitat, should they be present. The proposed site is not of a high ecological value.

Visibility	Highly visible sites i.e. on a ridge / elevated terrain are considered less favorable in that they have a high visual impact on the surrounding landscape. Sites that are hidden or out of site e.g. behind a hill, may be considered more suitable. The proposed site is on flat and may not create sharp visual impact because it is not on an elevated point.
Accessibility	The proposed site is accessible by existing public roads which will avoid the need for construction of new access roads. Access is also important particularly as it relates to the transportation of the solar panels, batteries and generator to the site, which are heavy weights. As such the site should not be located in an area that has excessively steep inclines or declines that could hinder access particularly during periods of heavy rainfall.

Considering these technical and practical challenges, the identified option of overhead distribution lines along Lorengippi access routes is the most feasible for the solar mini-grid project in Lorengippi village. Overhead lines, which involve the installation of power cables on poles, are more cost-effective, easier to maintain, and provide greater flexibility for future expansion. Proper design, installation, and adherence to safety and environmental standards can ensure reliable and efficient power distribution to the consumers on the area, making overhead distribution.

3.8 DO NOTHING ALTERNATIVE

This option involves remaining on the status quo. The no construct/no project alternative will not achieve the objectives of the project since the listed benefits will not be achieved.

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

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

Vision 2030 is based on three key pillars namely: Economic, Social, and Political.

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

The county government of Turkana needs to invest in solar power which remains a sustainable option for lighting up rural and remote areas of the country and that the sector has the potential to drive economic development in the county. With an arid climate and a vast desert landmass, Turkana is geographically optimal for harnessing the solar power.

Failure to construct and operate the minigrid will lead to the failure of achieving one of the Kenya's national long-term development policies that aims to transform Kenya into a newly industrializing, middle-income country, by providing a high quality of life to all its citizens by 2030 in a clean and secure

environment.

Project Affected Persons (PAPs) will be households, public and community institutions, enterprises and community facilities that cannot access electricity through the national grid and whose use of electricity will replace kerosene and other fuels for lighting and other activities like pumping water.

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 Lorengippi area and Turkana county 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.
- The local community members will not benefit socially from the employment opportunities and improved security.
- Continued aggravation of environmental degradation by use of firewood and charcoal as sources of energy
- Improved service delivery in the existing institutions i.e. school, dispensary, business center will not be actualized
- The exploration and use of solar power will provide opportunities for women to engage in some of the productive and sale activities. Releasing women from looking for firewood would increase their opportunities for caregiving and time for their businesses

3.9 CONCLUSION

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

4 APPLICABLE POLICY 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 ELECTRICITY SUPPLY INDUSTRY(ESI)

The Kenya Electricity Supply Industry (ESI) is one of the sub-sectors in the energy sector which the Ministry of Energy and Petroleum and Petroleum oversees on behalf of the Government of Kenya (GoK). Relevant stakeholders in the ESI are briefly described below.

- **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 responsible for implementing the project, construction of the generation systems and distribution network for the Lorengippi site. Supply of power will be through REREC and same tariffs will be charged for each category

- **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. In the event that 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.

  The Energy and Petroleum Regulatory Authority (EPRA) together with industry stakeholders have developed the Draft Energy (Mini-Grid) Regulations, 2021 (the 'Regulations'). The Regulations have been developed within provisions 10, 11 and 208 of the Energy Act, 2019 (the 'Act') and shall constitute Regulations to the Act. The Regulations will amongst others, provide guidance to mini-grid developers and other stakeholders on the tariff approval and licensing requirements. This will be directly applicable to the Lorengippi site.

- **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 ministry will be responsible for not only implementing the community projects like water and cooking solutions from the proposed project but also the overall coordination of project implementation and oversight.

4.3 ENVIRONMENTAL ADMINISTRATIVE / INSTITUTIONAL FRAMEWORK

Presently, there are over twenty (20) institutions and departments which deal with environmental issues in Kenya. Some of the key institutions include:

4.3.1 National Environment Management Authority (NEMA).

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

4.3.2 The County Environment Committees.

The Governor, by notice in the Gazette, is required by EMCA (Amendment) Act 2015 to constitute a County Environment Committee of the County of the Authority in respect of every County respectively. The County Environment Committees is responsible for the proper management of the Environment within the County in respect of which they are appointed. They are also to perform such additional functions as are prescribed by the Act or as may, from time to time be assigned by the Minister by notice in the gazette. The decisions of these committees are legal and it is an offence not to implement them.

4.3.3 National Environmental Complaints Committee.

The Committee performs the following functions:

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

4.3.4 National Environment Action Plan Committee.

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

- Contain an analysis of the Natural Resources of Kenya with an indication as to any pattern of change in their distribution and transmission quantity over time.
- Contain an analytical profile of the various uses and value of the natural resources incorporating considerations of intergenerational and intra-generational equity.
- Recommend appropriate legal and fiscal incentives that may be used to encourage the business community to incorporate environmental requirements into their planning and operational processes.
- Recommend methods for building national awareness through environmental education on the importance of sustainable use of the environment and natural resources for national development.

- Set out operational guidelines for the planning and management of the environment and natural resources.
- Identify actual or likely problems as may affect the natural resources and the broader environment context in which they exist.
- Identify and appraise trends in the development of urban and rural settlements, their impact on the environment, and strategies for the amelioration of their negative impacts.
- Propose guidelines for the integration of standards of environmental protection into development planning and management.
- Identify and recommend policy and legislative approaches for preventing, controlling or mitigating specific as well as general diverse impacts on the environment.
- Prioritize areas of environmental research and outline methods of using such research findings.
- Without prejudice to the foregoing, be reviewed and modified from time to time to incorporate emerging knowledge and realities and;
- Be binding on all persons and all government departments, agencies, States Corporation or other organ of government upon adoption by the national assembly.

4.3.5 National Environment Tribunal

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

4.4 NATIONAL LEGAL FRAMEWORK REVIEW

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 4-1: 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 water scarcity during the drought season. The proponent will have to purchase water for use during construction.*

The applicable legal framework is illustrated in the table below.

Table 4-2: Legal Framework

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
	NATIONAL POLICY FRAMEWORK		
1	Vision 2030	Kenya Vision 2030 is the current national blueprint for development from its inception in 2008 until the milestone year of 2030. This plan is the national long-term development policy that aims to transform Kenya into a newly industrialised, middle-income country by 2030. The Vision is comprised of three key pillars (economic, social, and political), two of which are projected to be positively affected by project implementation.	Under Vision 2030, Energy is identified as one of the key sectors that form the foundation for socio-political and economic growth. Promoting equal opportunities across the entire Kenyan territory and enhancing access to competitively priced, reliable, quality, safe and sustainable energy is essential to the achievement of this vision.
2	The Poverty Reduction Strategy Paper (PRSP) of 2001	The PRSP has the twin objectives of poverty reduction and enhancing economic growth. The paper articulates Kenya 's commitment and approach to fighting poverty; with the basic rationale that the war against poverty cannot be won without the participation of the poor themselves.	The proposed project aims at provision and access of renewable electricity geared towards improved economic performance and thus will contribute to poverty alleviation in the project area.
3	National Environmental Action Plan (NEAP) of 1994	The NEAP for Kenya was prepared in mid 1990s. It was a deliberate policy whose main effort is to integrate environmental considerations into the country 's economic and social development. The integration process was to be achieved through multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and the conservation of natural resources forms an integral part of societal decision-making.	The NEMA does not approve a development project unless the impacts of the proposed project are evaluated and mitigation measures proposed for incorporation in the project 's development plan, which is in line with the requirements of the NEAP. The project will be reviewed by NEMA for approval before implementation.

4	Environmental and Development Policy (Session Paper No.6 1999)	As a follow-up to the foregoing, the goal of this policy is to harmonize environmental and developmental goals so as to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development. The Government will: 1. Ensure Strategic Environment Assessment (SEA), Environmental Impact Assessment, Social Impact Assessment and Public participation in the planning and approval of infrastructural projects. 2. Develop and implement environmentally-friendly national infrastructural development strategy and action plan. 3. Ensure that periodic Environmental Audits are carried out for all infrastructural projects	The proponent: • is undertaking an Environmental Impact Assessment, Social Impact Assessment and Public participation as part of the planning and approval of infrastructural projects. • Will ensure that periodic Environmental Audits are carried out for the project
5	The 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. The anticipated outcome of this policy as enshrined in the Constitution that aligns to the project include: a) Equality and economic empowerment will be of both genders, b) Women and men will have equality of opportunity to participate in decision making and to contribute to the political, social, economic and cultural development agenda; c) Sexual and Gender based Violence will abate and men, women, boys and girls will live with dignity	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

6	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 a rural setting at Lorengippi 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			
1	The Constitution of Kenya	Article 42 of the Bill of Rights of the Kenyan Constitution provides that 'every Kenyan has the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures'	• The provision of the constitution also encourages public participation and dispute resolution • The ESIA Studies has identified project impacts for implementation of appropriate mitigation measures. The ESIA has undertaken public participation, stakeholder engagement. This will be continuous during all project phases
2	ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT, 1999 (AND THE AMENDMENTS OF 2015)	The EMCA is a framework environmental law in Kenya. This Act (assented to on January 14, 2000) provides a structured approach to environmental management in Kenya. With the EMCA coming into effect, the environmental provisions within the sectoral laws were not superseded; instead, the environmental provisions within those laws were reinforced to better manage Kenya's ailing environment.	The proposed project will be undertaken in accordance with relevant sections of the EMCA, specifically Clauses 58 – 63. These sections of the Act are operationalised by subsidiary legislation promulgated under the Act and specifically Legal Notice (L.N.) 101: Environment (Impact Assessment and Audit) Regulations, 2003.
3	L.N. 101: EIA/EA REGULATIONS, 2003 AND 2016 AMENDMENTS	These regulations provide the framework for undertaking EIAs and EAs in Kenya by NEMA licensed Lead Experts and Firms of Experts. An EIA or EA Study in Kenya is to	The proposed project is subject to relevant provisions of these regulations and subsequently, the ESIA has been undertaken in accordance with the requirements.

		be undertaken by a firm duly licensed by the National Environmental Management Authority (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.	
4	L.N. 120: WATER QUALITY REGULATIONS, 2006	These regulations provide for the sustainable management of water used for various purposes in Kenya. For effluent discharges into the environment and aquatic environment, a Proponent needs to apply directly to the NEMA. For discharges into public sewers, a Proponent needs to apply for the license to the relevant county. The regulation contains discharge limits for various environmental parameters into public sewers and the environment.	These regulations will apply to the proposed project during the construction and operational phases. The contractor will be required to properly manage the effluent from construction activities in accordance with the above regulations prior to discharge into the environment.
5	L.N. 121: WASTE MANAGEMENT REGULATIONS, 2006	These regulations are comprehensive and cover the management of various kinds of waste in Kenya. Generally, it is a requirement under the regulations that a waste generator segregates waste (hazardous and non-hazardous) by type and then disposes the them in an environmentally acceptable manner. Under the regulation, it is a requirement that waste is transported using a vehicle that has an approved "Waste Transportation License" issued by NEMA. Wastes generated in Kenya must be disposed of in a licensed disposal facility. Such a facility will require annual environmental audits to be undertaken by NEMA registered Lead Experts.	During the construction and operation phases, the proposed project will generate various streams of wastes. For the most part, it is expected that the wastes will be non-hazardous in nature and can be disposed of in accordance with these regulations.

		The regulation requires that prior to generating any hazardous waste, a proponent shall undertake an EIA Study and seek approval from the NEMA. Labelling of hazardous wastes is mandatory under the regulation and the specific labelling requirements are provided in Rule 18. The treatment options for hazardous waste disposal provided in Rule 19 include incineration or any other option approved by the NEMA.	
6	L.N. 61: NOISE AND EXCESSIVE VIBRATION CONTROL REGULATIONS, 2009	The general prohibition of these regulations states that no person shall make or cause to be made any loud, unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health, or safety of others and the environment. The regulations further provide factors that will be considered in determining whether or not noise and vibration is loud, unreasonable, unnecessary, or unusual.	Rules 13 and 14 of the regulations define the permissible noise levels for construction sites. These noise limits will be applicable to the proposed project.
7	LICENSES AND PERMITS REQUIRED UNDER THE EMCA	The subsidiary legislations under the EMCA are partially monitored through the use of permits and licenses. Subsequently all licenses and permits required during the construction phase shall be the responsibility of the individual contractors and their agents. During the operational phase, all permits and licenses required to operate the project will be the responsibility of the proponent.	The subsidiary legislations under the EMCA requires some or all the following types of permits to be available for inspection during the construction and operational phases of the project: ✓ Effluent Discharge License under Legal Notice 120: The Environment Management and Coordination (Water Quality) Regulations 2006; ✓ Waste Transport License under Legal Notice 121: The Environment Management and Coordination (Waste Management) Regulations 2006 for disposal of all types of wastes; and

			✓ Noise Permit under Legal Notice 61: The Environment Management and Coordination (Noise and Excessive Vibration Control) Regulations, 2009.
8	OCCUPATIONAL HEALTH AND SAFETY ACT, 2007	The Occupational Safety and Health Act (OSHA) was enacted to provide for the health, safety and welfare of persons employed in workplaces, and for matters incidental thereto and connected therewith. Part II of the Act provides the General Duties to which the occupier must comply with respect to health and safety in the workplace. Such duties include undertaking safety and health (S&H) risk assessments, S&H audits, notification of accidents, injuries and dangerous occurrences. A number of sections under this part shall be applicable to the proposed project. Part IV deals with the enforcement provisions that Directorate of Occupational Safety and Health Services (DOSHS) has under the Act. It discusses the instances when Improvement and Prohibition Notices can be issued as well as the powers of Occupational S&H officers. This part of the Act will be mandatory for the occupier to comply with for the proposed project. Part V of the Act requires all workplaces to be registered with the DOSHS. This part will be applicable for the proposed project as the Occupier will have to apply for registration of their project with the DOSHS on completion of the construction phase and before the operational phase of the project. Part VI of the Act lists the requirements for occupational health provisions which include cleanliness, ventilation,	The proposed project will be undertaken in compliance with the OSHA-2007 during the construction, design, and operational phases. During the construction phase, the contractors will be required to fully comply with the requirements of 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 for the entire construction phase duration in alignment with the OSHA and international health and safety best practices.

		overcrowding, etc. This section of the Act will apply to the Occupier during the operational phase of the project. Part VIII of the Act contains provisions for general safety of a workplace, especially fire safety. This part of the Act will apply to the proposed project during the design, construction, and operational phases. Part X of the Act deals with the General Welfare conditions that must be present during the construction and operational phase of the project. Such conditions include first aid facilities, supply of drinking water, accommodation for clothing, ergonomics, etc. This part of the Act will apply to the proposed project during the construction and operational phases. Part XI of the Act contains Special Provisions on the management of health, safety, and welfare. These include work permit systems, PPE requirements and medical surveillance. Some sections of this part of the Act will be applicable to the proposed project during the construction and operational phase. Part XIII of the Act stipulates various fines and penalties associated with non-compliance with the Act. It includes those fines and penalties that are not included in other sections of the Act and will be important for the Occupier to read and understand the penalties for non-compliance with S&H provisions. Part XIV of the Act is the last section of the Act and contains miscellaneous provisions which are not covered elsewhere in the Act. Some sections under this part of the Act will apply to the proposed project and it is in the	

		interest of the occupier to read, understand, and ensure compliance.	
9	L.N. 31: The Safety and Health Committee Rules, 2004	These rules came into effect on April 28, 2004, and require that an Occupier formalise a S&H Committee if there is a minimum of 20 persons employed in the workplace. The size of the S&H Committee will depend on the number of workers employed at the place of work. For the Proponent and Contractor, the OSHA and the S&H Committee Rules 2004 are important as they require compliance with the following measures: ○ Posting of an Abstract of the Factories and Other Places of Work Act in key sections of each area of the factory or other workplace; ○ Provision of first aid boxes in accordance with Legal Notice No. 160 of 1977; ○ Ensuring that there are an appropriate number of certified first aiders trained by an approved institution and that the certification of these first aiders is current; ○ Provision of a General Register for recording, amongst other things, all incidents, accidents, and occupational injuries; ○ Appointment of a S&H Committee made up of an equal number of members from management and workers based on the total number of employees in the workplace;	The contractor will be required to constitute Health and Safety Committee to oversee safety and health at the construction site. The number of the committee members will be dictated by the number of staffs hired by the contractor. The S&H Committee must meet at least quarterly, take minutes, circulate key action items on bulletin boards, and may be required to send a copy of the minutes to the DOSHS provincial office. Appropriate recordkeeping including maintenance of all current certificates related to inspection of critical equipment such as air compressors, lifts, pulleys, etc. Such inspections need to be undertaken by an approved person registered by the Director of the DOSHS.

		○ Training of the S&H Committee in accordance with these rules; and ○ Appointment of a S&H management representative for the Proponent.	
10	L.N. 24: Medical Examination Rules, 2005	These rules provide for Occupiers to mandatorily undertake pre-employment, periodic, and termination medical evaluations of workers whose occupations are stipulated in the Eighth Schedule to the OSHA and the First Schedule to this Rules. Workers that fall under the above two schedules are required to undergo medical evaluations by a registered medical health practitioner duly registered by the DOSHS.	Some construction activities such as metal cutting and grinding, repair or maintenance of construction equipment could expose the construction workers during construction phase and operations and maintenance workers during operation phase to physical and chemical hazards the contractor should that the workers exposed to such hazards undergo requisite medical examinations as required by these rules
11	L.N. 25: Noise Prevention and Control Rules, 2005	The rules set the permissible level for occupational noise in any workplace (which includes construction sites) as follows: • 90 dB(A) over an 8-hour time weighted average (TWA) period over 24-hours; and • 140 dB(A) peak sound level at any given time. Additionally, the rules set permissible limits for community noise levels emanating from a workplace as follows: • 50 dB(A) during the day; and • 45 dB(A) at night. 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	It is expected that during the construction phase of the project, there may be plant equipment that exceeds the threshold levels of noise stipulated under the Rules. It will therefore be incumbent on the contractor and his or her sub-contractors to ensure that their equipment is serviced properly and/or use equipment that complies with the threshold noise values given above. Alternatively, each contractor will be required to develop and implement a written hearing conservation programme during the construction phase.

		examined as indicated in Regulation 16. If found unfit, the occupational hearing loss to the worker will be compensated as an occupational disease.	
12	L.N. 59: Fire Risk Reduction Rules, 2007	A number of sections of the rules apply to the proposed project as enumerated below. • Regulation 5 requires Proponents to ensure that fire resistant materials are used for construction of new buildings. A number of minimum specifications of materials are provided in this rule. • Regulation 6 requires that all flammable materials be stored in appropriately designed receptacles. Some of the flammable materials anticipated at the project site including; fossil fuel using running construction equipment and vehicles (during construction phase) and stand by generator (operation phase) • Regulation 7 requires that all flammable storage tanks or flammable liquid containers be labelled with the words "Highly Flammable" in English or Swahili. It is therefore practical for the Proponent to use a system similar to the Hazardous Material Identification System of labelling their product containers. The regulation requires a Proponent to consult the product's MSDS for appropriate labelling requirements. • Regulation 8(3) requires a Proponent to have a Spill Prevention, Control, and Countermeasures (SPCC) plan. This may be important if there will be chemicals stored in the refuelling area at the construction site.	The proponent is expected to comply with the requirements of L.N. 59: Fire Risk Reduction Rules, 2007 by i. Carrying out, and record, a fire risk assessment identifying any possible dangers and risks. ii. Reducing, or where possible remove, the risk of fire and take precautions to deal with the remaining risks. iii. Putting in place protection measures if there are flammable or explosive materials used or stored on the premises. iv. Developing an emergency plan should a fire occur which includes evacuation procedures etc

		• Regulation 16 requires Proponents to ensure that electrical equipment is installed in accordance with the respective hazardous area classification system. It is also a requirement that all electrical equipment is inspected every six months by a competent person and the Proponent is required to keep records of such inspections. • Regulation 22 provides a description of the functions of a fire-fighting team. • Regulation 23 requires Proponents to mandatorily undertake fire drills at least once a year. • Regulation 33 requires Proponents to have adequate fire water storage capacity. As a minimum this regulation requires Proponents to have at least 10 cubic meters of dedicated fire water storage capacity. • Regulation 34 requires Proponents to develop and implement a comprehensive written Fire Safety Policy. This policy should contain a Fire Safety Policy Statement signed by the CEO, a Fire Safety Policy Manual and a brief summary of the Fire Safety Policy of the company. • Regulation 35 requires a Proponent to notify the nearest Occupational S&H area office of a fire incident within 24 hours of its occurrence and a written report sent to the Director of DOSHS within 7 days.	
13	THE ENERGY ACT, 2019	The Energy Act 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 Energy Act also established Energy and Petroleum Regulatory Authority (EPRA) in	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;

		place of the Energy Regulatory Commission (ERC), whose mandate is to regulate all functions and players in the energy sector. One of the duties of the EPRA is to ensure compliance with environmental, health, and safety standards in the energy sector, as empowered by Section 99 of the Energy Act, 2019. In this respect, the following environmental issues will be considered before approval is granted: • The need to protect and manage the environment and conserve natural resources; and • The ability to operate in a manner designated to protect the health and safety of the project employees, the locals, and other potentially affected communities. An ESIA approved by NEMA must support licensing and authorisation to generate and transmit electrical power. • Part VI Section 121 (1a) stipulates that the EPRA shall, before issuing a license, take into account the impact of the undertaking on the social, cultural or recreational life of the community. • Part VI Section 121(1b) stipulates that the EPRA shall, before issuing a license, take into account the need to protect the environment and to conserve natural resources in accordance with the Environmental Management and Coordination Act. • Part VI Section 136 (1a) stipulates that it shall be	• the Mini-Grid proponent has the technical and financial capability to conduct the project • The proponent has conducted the necessary engagement with the community.

		the duty of a transmission licensee to operate, maintain (including repair and replace if necessary) and protect its transmission grid to ensure the adequate, economic, reliable and safe transmission of electricity; and	
14	THE ENERGY (SOLAR PHOTOVOLTAIC SYSTEMS) REGULATIONS, 2012	These regulations shall apply to a solar PV system manufacturer, importer, vendor, technician, contractor, system owner, a solar PV system installation and consumer devices. The Regulations prohibits any person from designing or installing any solar PV system unless he/she is licensed by EPRA.	The Regulations regulates, the design and installation of PV systems. The Proponent will ensure that persons engaged in the designing and installation of the Mini-Grid are licensed by EPRA
15	THE PUBLIC HEALTH ACT (CAP. 242)	The Act prohibits the project proponents from engaging in activities that cause environmental nuisance or those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety.	The proponent will be in line with the regulations of this act and will ensure suppression of infectious diseases and maintain proper sanitation during all the phases of the project.
16	COMMUNITY LAND ACT, 2016	This Act is critical for the proposed project is within community land. Section 6(1) of the Act provides that 'county governments shall hold in trust all unregistered community land on behalf of the communities for which it is 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'. Therefore, the proposed project can access land or water resources in community land that may be	The proposed project site falls on community land. The community has since offered to the land in kind for project use. The establishment of the minigrid will convert communal land to industrial use for long term. Further, based on community need assessment the proponent will undertake in kind development project to support the community water needs. The proponent should adhere to the provision of this legislation.

		unregistered and pay compensation to the County Government which the law authorizes to hold such monies in trust for the communities. Section 30(1) states that 'Every member of the community has a right to equal benefit from community land'. Section 26(1) provides that 'a community may set aside part of the registered community land for public purposes' and Sub-section (2) holds that 'where land is set aside for public purposes under Sub-section (1), the (Land) Commission shall gazette such parcel of land as public land'. This provisions offer a window for the proposed project to acquire land for project works legally for communities as necessary and to convert the same into public land. This is useful for the project as once done powerful groups will not have opportunity to exclude them on account of their socio - economic statuses. In any event, Section 35 holds that, 'subject to any other law, natural resources found in community land shall be used and managed- (a) Sustainably and productively; (b) For the benefit of the whole community including future generations; (c) With transparency and accountability; and (d) On the basis of equitable sharing of accruing benefits. The concept of community land has been defined broadly enough to include VMGs. Women, children, old people and future generations have been thought of as beneficiaries and thus their rights secured in this Act	

17	HIV AIDS PREVENTION AND CONTROL (CAP 246A)	This Act is to promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS. It also seeks to positively address and seek to address conditions that aggravate the spread of HIV infection.	Like other projects, the proposed project is expected to attract new people to the project area seeking employment. This can lead to increased transmission of HIV/AIDS and other sexually transmitted diseases (STDs) as they engage in sexual relationships amongst themselves and/or local community members. In line with the requirements of this Act, the Contractors will create awareness and sensitize the workers and other persons on the risks of infections to foster prevention and control.
18	The Employment Act No 11 of 2007	This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the energy sector.	With the contractor and the project proponent being primary employers during the construction and operational phases of the Project, respectively, they are bound by this law to abide to its stipulations on employee management and relations
19	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 objects of this Act related to the project include; (a) the principles, procedures and standards for the preparation and implementation of physical and land use development plans at the national, county, urban, rural and cities level; (b) the procedures and standards for development control and the regulation of physical planning and land use; (d)	The proposed site is not in contravention of any zoning regulations. The project site is within unregistered community land; necessary county approvals will be sought by the proponent e.g. project design approval and change of use. The approvals shall be issued by the Physical planner in the department of Lands, Housing and Urban Development –Turkana County.

		a framework for the co-ordination of physical and land use planning by county governments; (c) a framework for equitable and sustainable use, planning and management of land;	
20	COUNTY GOVERNMENT ACT, 2012	This Act makes provisions for county governments' powers, functions and responsibilities to deliver services and for connected purposes. Part VIII of the act on Citizen Participation (87) (b) emphasizes on the right of citizens to participatein any development projects prior to their implementation. section 135 (1) states that the Cabinet Secretary may make regulations for the better carrying out of the purposes and provisions of this Act and such Regulations may be made in respect of all county governments and further units of decentralization generally or for any class of county governments and further units of decentralization comply to the set regulations and by laws.	This is the primary law governing the development of counties and thereby will be key during implementation of KOSAP. All organs established under this law should be consulted and approvals sought from Turkana County Government by the contractor.
21	NATIONAL LAND POLICY, 2009	The National Land Policy (NLP) has a vision to guide the country towards a sustainable and equitable use of land. The land policy calls for immediate actions to addressing environmental problems that affect land such as degradation, soil erosion and pollution. For instance, the policy stipulates the principle of conservation and management of land based natural resources, the principle of protection and management of fragile and critical ecosystems including wetlands and arid lands. The policy further calls for extensive overhauls to current policies and institutions in an attempt to address chronic	The project shall comply to the provision of this policy to ensure prevention of pollution and sustainable use of natural resources throughout all the project phases for Lorengippi mini-grid.

		land tenure insecurity and inequity. The National Land Policy designates all land in Kenya as public, private (freehold or leasehold tenure), or community/trust land, which is held, managed and used by a specific community. This land policy has thus been formulated to address the critical issues of land administration, access to land, land use planning, restitution of historical injustices, environmental degradation, conflicts, unplanned proliferation of informal urban settlements, outdated legal framework, institutional framework and information management.	
22	LAND ACT, 2012	This Act gives effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land-based resources, and for connected purposes. Section 110(1) of the Act provides that land may be acquired compulsorily under this if the Commission certifies, in writing, that the land is required for public purposes or in the public interest as related to and necessary for fulfilment of the stated public purpose. In such an acquisition, this Act, in section 111(1) provides that just compensation shall be paid promptly in full to all persons whose interests in the land have been determined. The procedure for land acquisition is laid out in Part VIII of the Act.	Land in Lorengippi is community land whose tenure falls under customary land rights. REREC will observe all the relevant provisions of the Act including conversion from community land to public land as will be deemed appropriate

23	LAND AND ENVIRONMENT COURT ACT,2011	This is an Act of Parliament to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. The principal objective of this Act is to enable the Court to facilitate the just, expeditious, proportionate and accessible resolution of disputes governed by this Act. Section 13 (2) (b) of the Act outlines that in exercise of its jurisdiction under Article 162 (2) (b) of the Constitution, the Court shall have power to hear and determine disputes relating to environment and land, including disputes: • Relating to environmental planning and protection, trade, climate issues, land use planning, title, tenure, boundaries, rates, rents, valuations, mining, minerals and other natural resources; • Relating to compulsory acquisition of land; • Relating to land administration and management; • Relating to public, private and community land and contracts, chooses in action or other instruments granting any enforceable interests in land; and • Any other dispute relating to environment and land.	The project will have a grievance redress mechanism with a committee. The work of the committee will be to receive and respond to all the grievances raised. As explained in chapter five of this report, an aggrieved part will turn to the legal system after exhausting the GRM levels of resolution set. In the event any disputes on land and environment are not resolved through the project GRM, this court will provide a forum for timely resolution of such grievances.

24	LAND VALUE(AMENDMENT) ACT 2019	This an Act of Parliament to amend the Land Act, the Land Registration Act and the Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities Act; to provide for the assessment of land value index in respect of compulsory acquisition of land; and for connected purposes. This act advocates for Just, prompt, and full compensation in relation to compulsorily acquired land or creation of way-leaves, easements and public rights through criteria set out under this Act. This act provides establishment of the Land Acquisition Tribunal to arbitrate on land related issues. The Act has amended various sections of the Land Act, the Land Registration Act as well as the Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities Act. It aims at standardising the value of land in Kenya for the primary purpose of enhancing efficiency and expediting the compulsory land acquisition process for public projects. It introduces Section 107A into the Land Act, which provides the criteria for the valuation of freehold and community land that is the subject of compulsory acquisition. Community Land, like freehold land, shall be valued based on the criteria outlined in Section 107A and the Land Value Index which will be jointly developed by the national government and county government. Section 5 introduces a list of the forms in which compensation can	Land in Lorengippi is community land. The KOSAP project will have compulsory acquisition of land and the NLC will acquire land on behalf of the MoE.

		be made. The act states that compensation can be paid in any of the following forms: - a. Allocation of alternative parcel of land of equivalent value and comparable geographical location and land use to the land compulsorily acquired b. Monetary payment either in lump sum or in instalments spread over a period of not more than one year c. Issuance of government bond d. Grant or transfer of development rights as may be prescribed. e. Equity shares in a government owned entity or f. Any other lawful compensation	
25	WATER ACT, 2016	Part 2 section one of the Act notes that every water resource is vested in and held by the national government in trust for the people of Kenya. Section 143 (1) notes that; A person shall not, without authority conferred under this Act- (a) Wilfully obstruct, interfere with, divert or obstruct water from any watercourse or any water resource, or negligently allow any such obstruction, interference, diversion or abstraction; or (b) Throw, convey, cause or permit to be thrown or conveyed, any rubbish, dirt, refuse, effluent, trade waste or other offensive matter or thing into or near to any	All construction, operation and decommissioning phases will take caution to refrain from polluting any water resource and will endeavour to prevent pollution in line with the ESMMP.

		water resource in such manner as to cause, or be likely to cause, pollution of the water resource. (2) A person who contravenes this section commits 144. (l) Without prejudice to any other remedy or course of action, if a person contravenes any provision under this Act, then, the Authority, the Regulatory Board, the county government executive concerned or the licensee concerned may, by order served on the person concerned, require that person within a reasonable time specified in the order to remedy the contravention and in particular- (a) to clean up any pollution or make good any other harm identified in the order which was caused to any water resource by reason of the contravention;	
26	BUILDING CODE OF THE REPUBLIC OF KENYA (2009 EDITION)	The Regulations have been revised in order to encourage the use of innovative designs, new materials and new construction methods; to optimize on resources and to enhance adherence to planning and building standards. Any building designed and constructed with the principles and norms of good building practice should comply with these new Regulations. These Regulations are a guide on good planning and building practice. They set out, in the simplest and shortest way possible, requirements to ensure that planning will be so undertaken and buildings are designed and built in such a way that persons may live and work in a healthy, safe and convenient environment. The overall aim of these Regulations is to	The project shall comply to the provisions of this act and ensure all constructions are up to approved designs and standards in order to promote a safe, healthy and convenient working environment for the Lorengippi mini-grid project.

		promote and enhance planning and its enforcement at all levels; to encourage optimal use of resources; enhance safety, health and convenience; and to improve acceptability and compliance of these Regulations. In order to ensure that these Regulations will remain valid and up-to-date, they will be reviewed and any necessary revision will be published at least 5 yearly intervals. Any person intending to erect any building shall submit to the Authority the following (a) a location plan; (b) a site plan; (c) drainage installation drawing; (d) a fire installation drawing; (e) particulars of any existing building which is to be demolished and details of the method of demolition to be used; Such plans as required by the authority in respect of: (i) general structural arrangements, subject to any requirement contained in these Regulations with regard to design of the structural system; (ii) general arrangement of artificial ventilation;	

		(iii) a fire protection plan; (iv)any certificate contemplated in these Regulations; and any other particulars.	
27	PENAL CODE ACT (CAP. 63)	Section 191 of the penal code states that if any person or institution that voluntarily corrupts or fouls water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighborhood or those passing along public way, commit an offence.	The project will adhere to the provisions of this act and ensure that the designs, fittings and general performance of all installed equipment does not foul water or air. The guidelines as set out in the environmental management and monitoring plan laid out in this report shall be adhered to, as well as the recommendation provided for mitigation/minimisation/avoidance of adverse impacts arising from the project activities.
28	WILDLIFE CONSERVATION AND MANAGEMENT ACT, 2013	This Act provides for the protection, conservation, sustainable use and management of wildlife in Kenya and for connected purposes. The law has as one of its guiding principles the devolution of conservation and management of wildlife to landowners and managers in areas where wildlife occurs, through in particular the recognition of wildlife conservation as a form of land-use, better access to benefits from wildlife conservation, and adherence to the principles of sustainable utilization.	Lorengippi mini-grid power project will not be located in a wildlife conservation area or in an area with endemic or endangered wildlife species.

29	THE FOREST CONSERVATION AND MANAGEMENT ACT, 2016	The Act led to the establishment of Kenya Forest Service which is charged with management of forests in consultation with the forest owners. The body enforces the conditions and regulations pertaining to logging, charcoal making and other forest utilization activities. To ensure community participation in forest management, the service collaborates with other organizations and communities in the management and conservation of forests and for the utilization of the biodiversity. Section 43 subsection 1 provides that if mining, quarrying or any other activity carried out in the forest, shall, where activity concerned is likely to result in forest cover depletion, the person responsible shall undertake compulsory re-vegetation immediately upon the completion of the activity.	Lorengippi mini-grid power project will not be located in gazetted forest area or in an area with endangered tree species. REREC shall plant some suitable trees around the mini-grid station to increase forest cover, minimize visual impacts and promote carbon sinks in the area.
30	WORK INJURIES AND BENEFIT ACT, 2007	This Act provides for compensation to employees for work related injuries and disease contracted in the course of their employment and for connected purposes. Key sections of the Act include the obligations of employers; right to compensation; reporting of accidents; compensation; occupational diseases; medical aid etc.	In case of any accidents or incidents during the project cycle, this Act will guide the course of action to be taken.
31	TRAFFIC ACT CAP 403 OF 2009	This Act consolidates the law relating to traffic on all public roads. Key sections include registration and licensing of vehicles; driving licenses; driving and other offences relating to the use of vehicles on roads; regulation of traffic; accidents; offences by drivers other	The project shall observe the provisions of this Act in order to avoid traffic offenses and ensure safety in all public roads.

		than motor vehicles and other road users. Many types of equipment and fuel shall be transported through the roads to the proposed site. Their registration and licensing will be required to follow the stipulated road regulations. The Act also prohibits encroachment on and damage to roads including land reserved for roads.	
32	CIVIL AVIATION ACT NO. 21 OF 2013	The provisions of this Act or any regulations made there under shall, except where expressly or by implication excluded, apply to— • All aircraft whilst in or over any part of Kenya; • All Kenya aircraft and the crew and other persons on board wherever they may be; and • All aerodromes and service providers within aerodromes. The provisions of this Act shall not, except where expressly included or if the Cabinet Secretary so directs by order published in the Gazette, apply to state aircraft or to any class or classes of state aircraft. All aircraft shall be subject to the requirements of this Act in respect of rules of the air.	The proposed mini-grid is not going to penetrate the atmosphere beyond 15 meters and is not proximal to any airstrip, thus this act will not be triggered.
33	SEXUAL OFFENCES ACT 2006	This is a comprehensive law that criminalises a wide range of behaviours including rape, sexual assault, defilement, compelled or induced indecent acts with child imbeciles or adults, gang rape, child pornography, child trafficking, child sex tourism, child prostitution, exploitation of prostitution, incest by male and female persons, sexual harassment, deliberate transmission of HIV or other life	The risk of GBV has been identified and mitigation measures have been proposed in the ESMMP. The contractor shall comply to the provisions of this act throughout the project life cycle.

		threatening sexually transmitted disease, stupefying with sexual intent, forced sexual acts for cultural or religious reasons among others. The Act also has orders for medical treatment for victims including free HIV prophylaxis, emergency pregnancy pill and counselling. The Act provides stiff penalties in which most of the crimes attract minimum of ten years imprisonment which can be enhanced to life imprisonment. Implementation of a project creates changes in a community in which it is implemented and is has potential to cause shifts in power dynamics between community members and within households. For instance, partner jealousy is a key driver of GBV which can be triggered by labor influx on a project when workers are believed to be interacting with community women. Hence, abusive behaviour can occur not only between project-related staff and those living in and around the project site, but also within the homes of those affected by the project.	
34	THE CHILDREN ACT, 2012	Part 2 of the Act denotes the rights of the children and their welfare shall be protected from child labour and armed conflict i.e. Every child shall be protected from economic exploitation and any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development. The Act also notes that a shall be protected from sexual exploitation and use in prostitution, inducement or coercion to engage in any sexual activity, and exposure to obscene materials.	Sensitization to the community on the need to ensure the protection of children has been done and will continue throughout the project cycle. In addition, the contractor will sensitize workers against abuse and exploitation of children.

		This Act protects the welfare of children within the Country. The Act identifies Children as a person below the age of 18 years old and protects them from exploitation. Of particular importance to this project, is section 10, which protects the child from: • Sexual exploitation • Physical and psychological abuse • Economic exploitation. • Any work that interferes with his/ her education, or is harmful to the child's health or physical, mental, spiritual, moral or social development.	
35	PERSON WITH DISABILITY ACT, CHAPTER 133	This Act provides for the protection of the rights of people with disabilities ensuring they are not marginalized and that they enjoy all the necessities of life without discrimination. The Act guarantees that (1) No person shall deny a person with a disability access to opportunities for suitable employment. (2) A qualified employee with a disability shall be subject to the same terms and conditions of employment and the same compensation, privileges, benefits, fringe benefits, incentives or allowances as qualified able-bodied employees. (3) An employee with a disability shall be entitled to exemption from tax on all income accruing from his employment.	The Act will be adhered to in order to ensure that persons with disability are included in all decision making that affects their lives. This will be monitored to make sure they are not excluded from project benefits and exposed to negative impact from the project that could adversely affect them.

4.5 RELEVANT PERMITS AND LICENSES REQUIRED BY THE PROJECT

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

Table 4-3: Relevant permits and licenses

	Sector	Legislation	Authority	Permit/license	Comments
Construction Phase	Environment	EMCA	NEMA	EIA License	The EIA license will give the decision criteria for NEMA
		EMCA (Waste Management) Regulations,2006	NEMA	Ensure that the contracted waste handlers (Transport and disposal) are licensed by NEMA	During waste disposal
	Land	Physical Planning Act, 1996	Physical Planning Act, 1996	Change of Land Use	Change of land use approval is given at the County level
	Occupational Health and Safety	Occupational Health and Safety, 2007	Directorate of Occupational Health and Safety (DOSHS)	Registration of workplace	Prior to construction and during operation
Operational Phase	Environment	EMCA	NEMA	Initial Environmental Audit Acknowledgement Letter and Self-Audit Acknowledgement thereafter	Annual, throughout the operations phase
		EMCA (Waste Management) Regulations,2006	NEMA	Ensure that the contracted waste handlers (transport and disposal) are licensed by NEMA	When disposing waste

4.6 WORLD BANK OP APPLICABILITY

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 table below shows the applicability of World Bank Operational OPs to the proposed project in Lorengippi site;

Table 4-4: World Bank OP Applicability

S.No.	**Description of World Bank OPs**	**Applicablicability**	**Applicability to Project**	**Trigger for the policy**
1.	OP 4.01 (Environmental and Social Impact Assessment)	Applicable	OP 4.01 is applicable to the project since it is proposed for financing by the Bank. An ESIA ensures that the project is environmentally sound and sustainable, and thus improve decision making.	This policy is triggered if a project is likely to have potential (adverse) environmental risks and impacts in its area of influence. Depending on the project, and the nature of impacts a range of instruments can be used: ESIA, environmental audit, hazard or risk assessment and environmental management plan (EMP). Under KOSAP, the consultant has prepared this ESIA

				report and will comply with national EIA regulations which outline the environmental screening process to be applied to sub-projects implementation.
2.	OP 4.10 (Indigenous People)	Applicable	OP 4.10 requires that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. The policy will guide the free, prior, and informed consultation with an aim of achieving results in broad community support to the project by the affected Indigenous Peoples	The policy is triggered when the project is undertaken in areas where Indigenous Peoples are present (with characteristics described in OP 4.10 para 4) in the project area.
3.	OP 4.12 (Land Acquisition and Involuntary Settlement)	Applicable	The Lorengippi site does not envisage major physical or economic displacement of people. The land has been compulsorily acquired through the NLC for the MoEP, hence the OP 4.12 is applicable for this site. However, residents will not be resettled as there are no inhabitants on the proposed project site.	This policy covers not only physical relocation, but any loss of land or other assets resulting in: • Relocation or loss of shelter; • loss of assets or access to assets; • Loss of income sources or means of livelihood, whether or not the affected people must move to another location. This policy also applies to the involuntary restriction of access to legally designated

				parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.
4.	Natural Habitats OP/BP 4.04	Applicable	OP 4.04 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 policy is applicable for Lorengippi as the project area could be affected by clearing various natural habitats to create room for pole erection and mini-grid construction. However, The project activities in KOSAP areas will not cause conversion or degradation of natural habitats or critical natural habitats as defined by the policy.	This policy is triggered by any project with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).

4.7 COMPARISON BETWEEN WORLD BANK AND KENYAN LAWS FOR THIS PROJECT

Table 4-5: Comparison between World Bank and Kenya Laws

World Bank safeguard Policies	Kenyan laws	Comparison	Recommendation

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

4.8 ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF) FOR KOSAP

An Environmental & Social Management Framework (ESMF) for KOSAP was prepared by the Environment & Social Unit, Safety, Health & Environment (SHE) Department of REREC in liaison with MoEP. The purpose of the Environmental and Social Management Framework (ESMF) was to provide a procedure for environmental and social assessment of the proposed REREC, KP and MoEP subprojects.

The ESMF provides guidelines for MoEP, REREC & KP in determining the appropriate level of environmental and social assessment required for the sub-projects and in preparing the necessary environmental and social mitigation measures for these sub-projects.

This ESIA report for Lorengippi Project Site is guided by this KOSAP ESMF.

4.9 RESETTLEMENT POLICY FRAMEWORK (RPF) FOR KOSAP

A resettlement policy framework report was prepared following the Kenyan laws and World Bank policy (O.P 4.12) on involuntary resettlement. The RPF states that KOSAP component 1 (Mini-grids for Community Facilities, Enterprises, and Households) which involves installation of mini-grids will require land acquisition.

The Framework seeks to avoid, manage, and/or mitigate potential risks arising out of damage to assets, disruption to work, temporary negative impacts on livelihoods and/or in the unlikely case of displacement. The RPF proposes guidelines to develop a Resettlement Action Plan and propose an implementation framework for RAP to mitigate such effects. The RPF states that involuntary resettlement and land acquisition will be avoided where feasible, or minimized or compensated where it cannot be eliminated. Where involuntary resettlement and land

acquisition are unavoidable, resettlement and compensation activities will be conceived and executed as sustainable development programs, providing resources to give PAPs the opportunity to share project benefits.

The Ministry of Energy has partnered with the community who are the owners of the land and the County government of Turkana in identifying land for the proposed project. The sub-project site will be acquired compulsorily by NLC, and in-kind compensation in form of priority community projects provided to affected communities. Further, A-RAPs will be prepared and implemented in sub-project sites on community land (unregistered and registered) and private land. The A-RAP will stipulate procedures and actions for acquiring land and compensating affected communities. The A-RAP will also document the land acquisition consultations undertaken with affected communities

4.10 VULNERABLE AND MARGINALIZED GROUPS FRAMEWORK (VMGF) FOR KOSAP

As noted above the KOSAP project trigged O.P 4.10 policy on Indigenous People and therefore a Vulnerable and Marginalized Groups Framework (VMGF) was prepared for use by the Ministry of Energy and Petroleum (MoEP) and the implementing agencies KP and REREC and other stakeholders. The framework was prepared then because was known that IPs are present in all the 14 target project counties. The VMGF describes the policy requirements and planning procedures that during the preparation and implementation of components especially those identified as occurring in areas where VMGs are present.

The purpose of the VMGF is to guide management of issues related to vulnerable and marginalised groups during the development and operation of proposed sub projects and to ensure effective mitigation of potentially adverse impacts while enhancing sharing of benefits.

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

5 BASELINE SETTINGS - ENVIRONMENT, ECOLOGY AND SOCIAL

5.1 AREA OF INFLUENCE

The Area of Influence (AoI) of the project comprises of the project site and the surrounding area, where the influence of the project activities is anticipated. The areas likely to be affected by the project and its associated activities include;

- The areas where project activities and facilities operated and managed by the Ministry of Energy and Petroleum (MoEP), Rural Electrification and Renewable Energy Corportation(REREC) will be established.
- Project site where project components such as solar modules, control room and any other selected compensation in kind project will be established.
- Areas where impacts from unplanned but predictable developments caused by the project that shall occur later or at a related location such as increase in traffic on the approach road;
- Areas where there is biodiversity or on ecosystem services upon which affected communities' livelihood are dependent; and
- Areas where associated facilities will be established.

Further to this, the AoI with respect to the environmental and social resources was considered based on the following reach of impacts:

Air Quality

- Impact on ambient air quality from vehicle exhaust;
- Impact of air pollutants emission from construction activities and
- Dust fall- typically up to 200 m from construction activities

Noise

- Noise impact area (defined as the area over which an increase in environmental noise levels due to the project can be detected) - typically 500 m from operations and 200 m from the access road

Water

- Surface water body- typically 500 m upstream and downstream of water intake point and downstream of discharge point
- Other surface water bodies within 1 km of the project footprint
- Groundwater in 1-2 km radius of project footprint

Flora and Fauna

- The direct footprint of the project comprising the project site
- The areas immediately adjacent to the project footprint within which a zone of ecological disturbance is created through increased dust, human presence and project related activities (e.g., trampling, water intake/outfall, transportation). This kind of disturbance has been estimated to occur within the project footprint and surrounding areas of about 500 m to 1 km from the activity areas.

Based on the above the AoI for environmental studies was limited to 5 km from the project site.

Socio-economic/Social

The AoI for social receptors was fixed to include 2 km radial zone which has been developed based on the reconnaissance site visits and stakeholder consultations with the local community. The AoI for development of the social baseline is within Lorengippi Village which according to the administrative structure falls within Lorengippi Location. The socio-economic information presented in this report has drawn from primary socio-economic survey and the Population and housing census 2019, Kenya Bureau of Statistics (KBS).

5.1.1 Project Footprint Area

The project site is located in Lorengippi Village, Lorengippi Sub location, Loima Sub County in Turkana County. The site is relatively flat with *Prosopis Juliflora* commonly known as 'Mathenge' as the dominant land cover of the area. The project site is near Lorengippi Primary School. There is a lagha approximately 200m from the project site. The School is approximately 300m from the project site.

Plate 2: project location

5.1.2 Study Area

The project site is located in Lorengippi Village, Lorengippi Sub location, Loima Sub County in Turkana County. Based on the secondary information of the region, the monitoring locations were identified to obtain the representative baseline information. Monitoring locations for surface water quality was selected based on the drainage pattern of the area. Soil sample locations were selected based on the land use and land cover of the study area. Locations of social surveys were also selected based on receptor locations; in addition, special emphasis is given to areas within 3 km radius of the project site and distribution lines

5.2 ENVIRONMENT BASELINE

5.2.1 Land Use

The land in the Lorengippi is majorly communally owned. The land is used for settlements, commercial businesses, livestock grazing and farming purposes during the rainy season. Underground water is also harnessed from the land at the boreholes. The area is majorly semi-arid with a sparse population within the area.

5.2.2 Topography

The topography of the project site is an open area with a flat terrain. There are no water bodies that pass though directly the proposed project site. There is a Lagha on the lower side of the project site which was dry at the time of the site visit. Lorengippi village is surrounded by hills. There are many ant hills and termite hills in the village.

5.2.3 Ecology

The main tree found in Lorengippi village is *Prosopis Juliflora* commonly known as 'Mathenge' which is widespread and has choked most indigenous plants.

Plate 3: Project area flora presentation

5.2.4 Water Resources

Lorengippi village has 3 boreholes. The water from the borehole is used by the villagers for drinking and other domestic uses. The villagers mainly use water from Kambi Chafu village which is approximately 500m from the project site. The water from the borehole is salty. The women and children are in charge of fetching water in the village. The other 2 boreholes have collapsed and are not functional. There is a lagha on the lower side of the project site which was dry at the time of the project visit.

Water was collected from the Kambi Chafu borehole and the results are in the appendices.

4.2.5 Ambient Air Quality

The proposed project area can be described as generally rural with interfaces of natural vegetation. There are no major industrial developments. The air quality at the proposed project site is therefore considered to be generally good.

5.2.5 Ambient Noise Quality

In general, the project area is a rural setting where the main source of noise is from motorists using the dirt road. The noise quality of the proposed project site is therefore considered to be generally good.

5.2.6 Soil Type

The soils in the project location were predominantly sandy loam. Sandy loam soils are dominated by sand particles, but contain enough clay and sediment to provide some structure and fertility. The soils have a high concentration of sand quickly drain excess water and cannot hold significant amounts of water or nutrients for plants.

A soil sample was collected from the project site and the results are in the appendices.

5.2.7 Climate and Meteorology

Turkana county has a hot, dry climate with temperature ranging between 20ºC and 41ºC and with a mean of 30.5ºC. Rainfall in the area is bimodal and highly variable. The long rains occur between April and July and the short rains between October and November. The annual rainfall is low, ranging between 52mm and 480mm with a mean of 200mm. rain patterns and distributions are erratic and unreliable. Rain usually comes in brief, violent storms that result in flash flooding. 80% of the county is categorized as either arid or very arid.

5.3 SOCIO-ECONOMIC BASELINE

5.3.1 Socio-economic status of Study Area

5.3.1.1 Demographic Profile

According to information from the area chief, Lorengippi sub location has an estimated population of 20000 people and 1850 households with an estimate of 5 persons per household. The average gender ration for the population within the project area is estimated to be 30% female and 70% male. The table below presents a summary of demographic profile of Lorengippi.

Table 5-1: Summary of demographic profile

Attribute	Magnitude/Number
Approx. population	20000
Households	1850
Gender.	Male – 70% Female –30%
Ave. No. per household	5 per household
Vulnerable individuals and households	• Poor female headed households • Child headed households • Persons Living with Disabilities • The elderly (80 years and above) • The Pokot
Dominant ethnic group	Turkana
Primary religion	Christianity
Other groups	Pokot , Tepeth

5.3.1.2 Educational Infrastructure

As per the observation and information sought from Lorengippi Village, the schools in the village are Lorengippi ECD, Lorengippi Primary School which are within the village and Lorengippi Secondary School which is approximately 5km from the village. Lorengippi Primary School has 60% girls and 40% boys in the lower level and 70% boys and 30% girls in the upper level. The school has seven teachers. The school offers boarding facilities for students in the upper primary. Lorengippi Secondary School has 5 teachers. The schools will benefit from the project by provision of a reliable source of lighting for the boarding learners. Lorengippi Primary School has 2 classrooms connected by Energy for Impact and the computer room and office was connected by REA.

5.3.1.3 Occupation and Livelihood Profile

Main livelihood activities undertakenby the people of Lorengippi are pastoralism and small-scale farming during rainy season. Majority of the residents of Lorengippi are unemployed. The residents in formal employment are chief, assistant chief, 10 teachers and 6 people working at the dispensary. The informal jobs are motor cycle riders and shop owners. There are 10 shops in the village.

5.3.1.4 Land Use

Land area at Lorengippi is considered semi-arid. The main activities undertaken on available land area at Lorengippi are grazing and farming. The main crops grown are maize, sorghum and cowpeas during the rainy season. The crops grown are used for household use. The main animals kept in Lorengippi village are camels, cows, goats, sheep and donkeys.

5.3.1.5 Housing Types

In Turkana County, permanent houses are mainly found in the urban centres, while temporary house units, known as manyattas, constitute 91% of housing in both rural and urban centres. The houses in Lorengippi village are mainly made of mud walls, makuti roofs and no floors. Most of the residents of Lorengippi practice open defecation with a few households having non ventilated pit latrines.

5.3.1.6 Social and Physical Infrastructure

Public and private institutions provided at Lokiriama Ward includes schools, health facilities and churches. The institutions include Lorengippi ECD, Lorengippi Primary School, Lorengippi Secondary School and Lorengippi Dispensry. There are 2 churches in the village namely Catholic Church and PAG Church. The village has no CBOs but there are 5 self help groups. The self help groups are namely Agete Self Help Group, Losigirgir Self Help Group, Kaloktine Women Self Help Group, Lochola Self Help Group and Konyipad Self Help Group.

Water is sourced from the boreholes in the village. Roads connectivity within the area is also poor and not regularly maintained. Lorengippi area is accessed through a dirt road. The main form of transport is motor cycles and proboxes from the village. The mode of transport is convenient and meets the needs of the community.

5.3.1.7 Livelihood and Economic activities

Main livelihood activities undertaken by people in Lorengippi village is pastoralism. Farming is mainly undertaken during the rainy season. Most of the residents of Lorengippi are unemployed.

5.3.1.8 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 categories of vulnerable individulas and households identified at the project area include:

- Poor female headed household
- Child headed households
- Persons Living with Disabilities
- The elderly (80 years and above)
- The Pokot

The vulnerable households can hardly access the basic needs and most of them really on well-wishers within the community. The project should consider such households for electricity connection.

5.3.1.9 Gender based vulnerability

The society in the project area is characterized by a patriarchal family structure. Women continue to be rooted in traditional norms of social behavior which include early marriages and child marriage, minimal participation in household or economic decision making and lesser economic freedom. During the Focus Group Discussion with women, it was reported that men have more control over household resources. The women are involved in community decision making. The women reported that they do not have equal opportunities as the men in the community.

5.3.1.10 Gender Based Violence

During the focus group discussion with the women, they reported that intimate partner violence is the most common form of GBV in Lorengippi. The nurse at Lorengippi dispensary confirmed that there are cases of intimate partner violence that are reported to the dispensary.

5.3.1.11 Grievance Redress Mechanism

Conflicts are not common in Lorengippi village. Most conflicts are solved by the village elders. The village elders then report to the village administrator who reports to the assistant chief and chief.

5.3.1.12 Culture and heritage

No cultural site of significance was reported or observed within the project area. The community in the project area are a patriarchal society; men typically speak for women and make decisions in the family. The community encourages early marriages for young girls

5.3.1.13 Religion in the project area

The community members are predominantly christians. There are two churches in the village.

5.3.1.1 HIV/AIDs prevalence

According the Turkana CIDP, HIV prevalence in Turkana is 4% lower than the national prevalence of 5.9% (Kenya HIV Estimates 2015). The nurse at Lorengippi Dispensary confirmed that the HIV prevalence is 15% at Lorengippi.

6 STAKEHOLDER ENGAGEMENT

This section profiles the key stakeholders of the Lorengippi 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 for the stakeholder engagement;
iii. disclosure of information;
iv. consultation with stakeholders
v. addressing and responding to grievances; and
vi. reporting to stakeholders

6.1 STAKEHOLDER CONSULTATION AND DISCLOSURE REQUIREMENT FOR THE PROJECT

The World Bank Environmental Social OPs 10 on Stakeholder Engagement and Information Disclosure emphasises on engagement in meaningful consultations with all stakeholders. The stakeholders should be provided 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.

ESIA findings and summaries of safeguard will be be done in a culturally appropriate languages and in accessible locations. Information disclosed will be easily accessible in a timeframe that enables meaningful consultations, in a culturally appropriate format, using relevant local languages and culturally acceptable and accessible techniques such as FGDs public meetings, local dailies and radio stations etc. Further, the process of information disclosure must consider any disability, mobility and literacy challenges.

During the ESIA studies the stakeholders reccommeded public meeting as the preffered mode of information disclosure. In addition to this the proponent should also consider placing relevant summarized documents at Lorengippi Chiefs office. This can also be supported by disclosing information through local radio stations. Other preffered modes include

- Visiting VMGs household under the guidance of local leadership for disclosure at household level. Upon doing this, hard copies of the information can be left at the households.

Key stakeholder proposed the following modes.

- Placing the information in REREC or MoEP website.
- Workshops and seminars

6.2 STAKEHOLDER ENGAGEMENT PLAN AND GRIEVANCE MANAGEMENT POST-ESIA

The rationale for this Stakeholder Engagement Plan (SEP) is to ensure that the stakeholders' involvement, participation and commitment in making decision in the project activities is well implemented.

Stakeholder engagement is an inclusive process conducted throughout the project life cycle. Where properly designed and implemented, it supports the development of strong, constructive and responsive relationships that are important for successful management of a project's environmental and social risks in the entire life cycle.
Communication is critical to transmission of clear concise and factually correct information,

either through inter-personal communication or communication with a group of persons. Some of the key risks to poor communication for this phase of the project include:

- Reduced community buy-in on critical project needs such as material sources;
- Misinformation on project activities, impacts and outcomes resulting in disagreement and in heightened cases, demonstrations (non-violent and violent) by aggrieved communities;
- Growing opposition to the project and its staff;
- Increased costs and serious delays in project implementation due to stakeholder and community objections to the project.

6.2.1 Principles/Objectives of Stakeholder engagement Plan

I. Principles/Objectives

Stakeholder engagement is usually informed by a set of principles that define core values underpinning interactions with stakeholders. Key principles to guide the Stakeholder Engagement under this project are:

- Creating an atmosphere for a two-way dialogue that gives all parties an opportunity to exchange views, listen and have the issues satisfactorily addressed;
- Promoting inclusivity through broad participation of the project affected persons and interested parties by creating appropriate avenues for stakeholder participation;
- Giving attention to special groups including people with disabilities, the elderly, the youth, women, children and the minority/marginalised groups;
- Encouraging open and meaningful dialogue that respects and upholds community's belief, values and opinions without intimidation, coercion, manipulation and interference;
- Demonstrating commitment through identification, recognition and engagement with all stakeholder timeously in a format and language that is easily understandable;
- Respecting the rights, cultural beliefs, values, traditions, community decision-making processes and interest of all stakeholders;
- Exercising transparency when responding to community concerns in a timely, open, and effective manner;
- Developing a clear mechanism for receiving, documenting and responding to stakeholders' concerns and grievances.

6.2.2 Stakeholder Identification and Mapping

Stakeholders are classified in the following two categories;

- **Project Affected Persons (PAPs)**- Stakeholders who have a direct impact on or are directly impacted by the project.

- **Interested Parties**- Stakeholders who have an indirect impact or are indirectly impacted by the project

"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 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;

In line with the nature of the project and its setting in Lorengippi, the stakeholders have been identified and listed in the table given below;

Table 6-1: Identified stakeholders

Stakeholder Category	Stakeholder Group	Connection to the KOSAP
Government	➲ Government agencies ➲ National regulatory bodies	National Government are of primary importance in terms of establishing policy
	County government	➲ County government are also of primary importance in county energy requirements and proposed interventions ➲ They will play an important role in implementation and sustainability of the project
Communities at the project area	Community interest groups	➲ Local communities to be affected either directly or indirectly by Projects ➲ Majority and Minority Vulnerable groups ➲ Health institutions ➲ Education institutions
	VMG	➲ The VMG will be affected by the project either directly or indirectly
Civil Society Non-Governmental Organizations (NGOs)	National, Local and Community based organizations	➲ NGOs with direct interest in the project interventions, and its social and environmental aspects and that are able to influence the Project directly or through public opinion. ➲ Such organizations may also have useful data and insights that are useful to the project and may be able to identify areas of collaboration with the project in areas of common interest.

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 particular 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 the Table below.

Table 6-2:Stakeholder Significance and Engagement Requirement

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

6.2.3 Approach for Stakeholder Engagement Plan

The first approach to an effective stakeholder engagement is to determine who the stakeholders are, who will be adversely affected by potential environmental and social impacts

of the project, who are the most vulnerable among the potentially impacted and whether special engagement efforts would be necessary, at which stage of project development stakeholders will be most affected, what are the various interests of project stakeholders, their expectations and what level of influence they might have on the project, which stakeholders might help to enhance the project design or reduce project costs.

Stakeholders have been, and will continue to be, identified. At this stage, stakeholders identified consists primarily of those who have been engaged during the initial phase of the project, specifically with regard to obtaining the required approvals to commence the feasibility studies and the identification and securing of land for the project.

6.2.4 Monitoring

Stakeholder engagement monitoring will be a continuous function aimed at providing the project and relevant stakeholders with regular feedback and clear indicators of the progress or lack thereof in the achievement of intended results. The project will engage in continuous monitoring throughout the project lifecycle to track actual performance of the Stakeholder Engagement Plan in compliance with the national requirement and World Bank Standards. Lorengippi community will be consulted and be involved at all times during the monitoring of this plan.

Monitoring will be done internally through inspections and performance audits. Key monitoring activities will include collecting and analysing data on stakeholder's engagement activities and recommending corrective measures.

Monitoring will be effected through internal inspections and performance audits. Information of stakeholder engagement activities will be recorded to track progress and establish relevant controls. The project shall conclude the procedures for participatory monitoring of the SEP based on the intended targets.

6.2.5 Reporting

Documentation, reporting and maintenance of good records are important aspects to any engagement process. The effectiveness and efficiency of documentation may lead to perceived transparency in the overall engagement process. All interactions with the Lorengippi community members and interested stakeholders will be recorded through minutes of meetings, field reports and/or photographs among other tools.

Reporting to stakeholders is an important practice to resolving potential project risks and to ensuring that the engagement objectives are achieved. The project will provide periodic reports to the affected communities and interested stakeholders on various aspects of this stakeholder engagement plan. Relevant reports to be communicated to the affected communities and the relevant stakeholders include progress on community development planning and general project progress at planning, construction and operation. The project will also document and report on grievance related matters. The frequency of reports and the necessary documentations will depend on the project environment. However, it is largely expected that reporting will be done daily, weekly, monthly, annually and during community meetings.

6.3 STAKEHOLDER ANALYSIS

The stakeholder 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 of low to medium or medium to high primarily imply that their influence and importance could vary in that particular 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 so as to make it comprehensive for any given period of time.

Table 6-3: Summary of Stakeholder Influence

Stakeholder Category	Relevant Stakeholders	Magnitude of Influence/Impact	Urgency/Likelihood of Influence	Overall rating of stakeholder rating
Government	National Government agencies	Large	High	Major
	National regulatory bodies	Large	Medium	Major
	County government	Large	Medium	Major
Local Community	Local communities to be affected either directly or indirectly by Projects	Large	High	Major
	Majority and Minority Vulnerable and Marginalized groups	Large	High	Major
	Education and Health institutions	Medium	Low	Minor

6.4 KEY FEEDBACK RECEIVED DURING STAKEHOLDER CONSULTATION PROCESS

The general stakeholder consultation was done in a public meeting (Baraza) organized at the Lorengippi Primary School. The meeting was organized by the area chief. The meeting was chaired by the ward admin assisted by the area chief. The key feedback during the stakeholder consultation process have been summarized below:

Benefits of the project

The community was in support of the project. They noted that the project will beneficial to the community as it will:

- Improve their livelihood and enhance their living standards
- The children can learn at night without struggling
- Improved security in the area
- Boost their businesses and also provide them with energy for domestic use

Community Concerns

The community raised the following concerns:

- The women were concerned about their animals being electrocuted
- Termite attack if the poles are made of timber

Community Requests

The community requested the following from the project:

- Training on how to use and operate electrical equipment before the project commences so that they can benefit from employment opportunities

Public participation "Baraza" Session

Focused Group Discussion with the Men

Focused Group Discussion with Women

Focused Group discussion with the Youths

Plate 4: Stakeholders engagement process

The table below presents the issues/ comments raised by the stakeholders during the public meeting and the responses given by the proponent and the consultant.

Table 6-4: Summary of issues raised during public participation

no	Issue	Comments	Response
1.	Electricity distribution	Aletia an Elder, asked what the distance coverage of the electricity will be.	In response, it was explained that distance coverage would be a 3km radius.
2.	Electric poles sustainability and safety	Joseph Lopeiyon an Elder, asked the electricity polls will be made from due to attack by	In response, it was stated that the poles would be made from concrete.

		termites in the village.	
3.	Project safety and fencing	Lokui Samal an elder, asked if there will be compensation incase the animals are electrocuted near the project site.	In response, it was explained that the project site would be fenced off from the community.
4.	Connecton fees	Bernard a youth, asked if there will be a grace period to save up for the connection fee.	In response, it was explained that the connection fee had been subsidized and the villagers were urged to save up from now.

The minutes have been appended in the annexes.

7 IMPACT ASSESSMENT AND MITIGATION MEASURES

7.1 INTRODUCTION

This section provides an assessment of potential environmental and social impacts from the proposed project 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. All the mitigation measures identified in this chapter have been collated into the Environmental and Social Management and Monitoring Plan ('ESMMP') matrix.

According to Chapter 3.6 of the ESMF, there are no significant and/or irreversible adverse environmental issues anticipated from the KOSAP electrification project as these will all be located in remote and sparsely populated areas. Potential negative impacts are expected to be small scale and site specific and appropriate mitigation measures will be included to address these impacts.

7.2 IMPACT ASSESSMENT METHODOLOGY

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

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

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

7.3 DEFINING IMPACT

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

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

7.4 ASSESSMENT OF SIGNIFICANCE

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

- Status of compliance with relevant Kenyan legislation, policies and plans and any relevant Kenyan or industry policies, standards or guidelines, as well as international best practice standards and guidelines;
- The magnitude (including nature, scale and duration) of the change to the natural or socioeconomic environment (e.g. an increase in 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 based on five levels described in table below;

Table 7-1: Categories of Significance

category	**significance**
Positive impacts	Positive impacts provide resources or receptors, most often people, with positive benefits. It is noted that concepts of equity need to be considered in assessing the overall positive nature of some impacts such as economic benefits, or opportunities for employment
Negligible impacts (or Insignificant impacts)	Negligible impacts (or Insignificant impacts) are where a resource or receptor (including people) will not be affected in any way by a particular activity or the predicted effect is deemed to be 'negligible' or 'imperceptible' or is indistinguishable from natural background variations.
Minor	An impact of minor significance ('Minor impact') is one where an effect will be experienced, but the impact magnitude is sufficiently small (with or without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value.
Moderate	An impact of moderate significance ('Moderate impact') is one within accepted limits and standards. Moderate impacts may cover a broad range, from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly to design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is ALARP (as-low-as-reasonably-possible). This does not necessarily mean that 'Moderate' impacts have to be reduced to 'Minor' impacts, but that moderate impacts are being managed effectively and efficiently.
major	An impact of major significance ('Major impact') is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. An aim of EIA is to get to a position where the project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). It is then the function of

	regulators and stakeholders to weigh such negative factors against the positive ones in coming to a decision on the project.

For environmental impacts the significance criteria used in this ESIA is shown in the table below:

Table 7-2: Overall Significance Criteria for Environmental Impacts

Receptor sensitivity (or resource value)	**Impact Magnitude**		
	Low	**Medium**	**High**
Low	Minor	Minor	Moderate
Medium	Minor	Moderate	Major
High	Moderate	Major	Major

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

7.5 MAGNITUDE OF IMPACT

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

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

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

7.6 SENSITIVITY OF RESOURCES AND RECEPTORS

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

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

7.7 LIKELIHOOD

Terms used to define likelihood of occurrence of an impact are explained in the table below

Table 7-3: Explanation of Terms Used for Likelihood of Occurrence

An impact with a		
High probability	Refers to a very likely impact	Refers to very frequent impacts
Medium probability	Refers to a likely impact	Refers to occasional impacts
Low probability	Refers to rare impacts	Refers to rare impacts
	As far as one-time events (e.g. air emissions) or slowly developing effects are concerned (e.g. impacts on local lifestyle)	As far as possibly recurring impacts are concerned, such as accident or unplanned events (e.g. traffic accident, fire)

7.8 DEFINITION OF MITIGATION MEASURES

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

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

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

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

7.9 ASSESSING RESIDUAL IMPACTS

Impact prediction takes into account any mitigation, control and operational management measures that are part of the project design and project plan. A residual impact is the impact that is predicted to remain once mitigation measures have been designed into the intended activity.

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

7.10 KEY NEGATIVE ENVIRONMENTAL AND SOCIAL IMPACTS- PRE-CONSTRUCTION PHASE

7.10.1 Impact on land acquisition

The ministry of Energy through the NLC shall acquire land for the mini-grid development and wayleaves while the contractor shall acquire land for contractor facilities such as yard and workers camp in the pre-construction phase before project begins. The proposed project will entail the acquisition of 1.2626 hectares of land parcel. In addition to the land for the generation assets, way-leave consent for the distribution power-lines and other facilities like storage will also be progressed before construction.

Mitigation measures

- The proponent shall ensure that all land acquisition procedures align to the Resettlement Policy Framework prepared under this project.
- The project proponent will adequately compensate the community in kind for the land that will be acquired for the project.
- Community engagement to educate the public on the need to keep off the site because of the electrical installations and for public safety.

7.10.2 Impact on wayleaves

Supply of electricity will involve passing of low voltage (LV) lines to connect the customers to power. It is estimated that a total of 9 km of LV circuit will be constructed mainly along the road reserve and along the boundaries to supply power. A way-leave trace of 10 meters will be required along the entire power line network. The project contractor will use existing access roads to set up the low-voltage power distribution lines and will seek access from beneficiaries and clients in whose property they will undertake electricity connection to the power grid.

Mitigation measures

- Consultations with the community during construction of the low voltage lines
- Maintain the wayleaves along the road reserve and along the boundaries
- Community engagement to educate the public on the need to keep off the site and not to encroach way-leaves because of the electrical installations and to ensure public safety
- 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.

7.10.3 Stakeholder identification and consultations

Several risks and social impacts may be bound to occur in various stages of the project in relation to project information disclosure and in stakeholder consultations process. These risks

influence the way the project affected persons and interested parties understand the project, their roles and responsibilities and the overall sustainability of the project. The social risks include but not limited to:

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

   Mitigation measures

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

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

   Mitigation Measures

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

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

   Mitigation measures

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

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

   Mitigation measures

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

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

Mitigation measures

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

7.10.4 Impact on Land Acquisition

The ministry of Energy through the NLC shall acquire land for the mini-grid development and wayleaves while the contractor shall acquire land for contractor facilities such as yard and workers camp in the pre-construction phase before project begins. In addition to the land for the generation assets, way-leave consent for the distribution power-lines and other facilities like storage will also be progressed before construction.

Mitigation measures

- The Kenya Power & Lighting Company shall ensure that all land acquisition procedures align to the Resettlement Policy Framework prepared under this project.
- The project proponent will adequately compensate the community in kind for the land that will be acquired for the project
- The proponent shall prepare a land acquisition and consultation report for the sub-project, documenting the consultation process of acquiring land for the mini-grid and the key concerns raised by the affected persons, any agreements reached etc. Community engagement to educate the public on the need to keep off the site because of the electrical installations and for public safety.
- The proponent should ensure that all land acquisition procedures are documented and are followed keenly, including holding regular stakeholder engagement forums giving prior information regarding the land take procedures. In the case of unavoidable land take, that land in question shall be acquired in accordance with the applicable law and the previously done resettlement action plan report
- Further, the proponent shall fast-track Abbreviated Resettlement Action Plan (A-RAP) preparation to ensure that land acquisition and contractor mobilization to the site are undertaken after the A-RAP is finalized, cleared, and disclosed

7.11 KEY POSITIVE ENVIRONMENTAL IMPACTS-CONSTRUCTION PHASE

7.11.1 Change in Land Use

The study area consists of unregistered community land with *Prosopis Juliflora* commonly known as 'Mathenge' as the main vegetation cover. The internal distribution lines will be laid by REREC. The distribution lines will be located on the piece of land. The land procured for the project site is uncultivated and underdeveloped. The land will be converted from communal land to generation and distribution of electrical energy

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 medium. This is due to the fact that there will be visual change upon installation of the minigrid. The land offered is not agricultural land and has no dependency for grazing. The magnitude criteria of this impact will be medium because there will be noticeable change over the restricted site area. The change may be long term and irreversible.

7.11.1.1 Embedded / In-built Control

- The construction activities will be restricted 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 Lorengippi village will be used for access to the project site

7.11.1.2 Significance of Impact

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

7.11.1.3 Additional Enhancement Measures

- On completion of construction activities, land used for temporary structures for example store yard should be restored to its original form to the extent possible
- The land use in and around permanent project facilities should not be disturbed.
- Construction activities should only be restricted to the designated area.

7.12 KEY NEGATIVE ENVIRONMENTAL IMPACTS-CONSTRUCTION PHASE

7.12.1 Impact on Topography

The topography of the project site is an open area with a flat terrain. 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.

The impact magnitude has been assessed as low since the project area is flat.

7.12.1.1 Embedded/ In built Control

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

7.12.1.2 Significance of Impact

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

7.12.1.3 Additional Mitigation Measures

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

7.12.2 Impact on Soil Environment

7.12.2.1 Project Phases and Associated Activities

For impact assessment, the following activities were considered for potential impacts on soil environment.

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.

7.12.2.2 Significance of Impacts

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

7.12.2.3 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 handler

7.12.3 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 emissions from traffic movement;
- Exhaust emissions from operation of machineries like pile drivers, vehicles; and
- Point source emission from diesel generator.

7.12.3.1 Embedded/in-built control

Vehicle engines should be properly maintained to ensure minimization of vehicular emissions.

7.12.3.2 Significance of Impact

There are few receptors (Settlements, Lorengippi Dispensary, Lorengippi Primary School) within 500 m of the project site and the impact magnitude will be medium and sensitivity medium hence the overall impact significance will be moderate.

Sensitive receptors of air and emissions were identified by observation during field visit to project site. The distances from a source that dust impacts can occur is highly site specific and will depend on the extent and nature of incorporated mitigation measures, prevailing wind conditions, rainfall and the presence of natural screening. Due to the variability of the weather, it is impossible to predict what the weather conditions will be when specific construction

activities are being undertaken. Therefore, the assessment of construction dust impacts is typically qualitative.

7.12.3.3 Additional Mitigation Measures

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

7.12.4 Impact on Ambient Noise

Most of the noise generating activities will be performed within the project site area. The construction activities will be likely to 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.
The main receptor will be Lorengippi Dispensary and Lorengippi Primary School which are near the project site. The receptor sensitivity is therefore considered as medium and the impact magnitude as medium.

7.12.4.1 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;

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

7.12.4.2 Embedded/in-built control

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

7.12.4.3 Significance of Impact

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

7.12.4.4 Additional Mitigation Measures

- Only well-maintained equipment should be operated on-site;
- If it is noticed that any particular equipment is generating too much noise then lubricating moving parts, tightening loose parts and replacing worn out components should be carried out to bring down the noise and placing such machinery far away from the households as possible;
- Machinery and construction equipment that may be in intermittent use should be shut

down or throttled down during non-work periods; and

- Minimal use of vehicle horns and heavy engine breaking in the area needs to be encouraged.
- Construction machineries should be maintained regularly to reduce noise resulting from friction;
- Normal working hours of the contractor to be defined (preferable 8 am to 5pm). If work needs to be undertaken outside these hours, it should be limited to activities which do not generate noise;
- Sensitize construction truck drivers to switch off vehicle engines while offloading materials.

7.12.5 Visual Intrusions and Changes in Landscape Impact

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

The construction of the mini-grid site 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, their geometric and sometimes highly reflective surfaces may have visual impacts. However, being visible is not necessarily the same as being intrusive. Aesthetic issues are by their nature highly subjective.

7.12.5.1 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.

7.12.5.2 Significance of Impact

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

7.12.5.3 Additional Mitigation Measures

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

- The extent of the labour camp and storage area should be limited in area to only that which is essential;

- Minimize presence of ancillary structures on the site and minimize roads disturbance;
- Upon completion of construction work, areas utilized for labour camp, storage area to be restored to original form.

7.12.6 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. If improperly managed, solid waste could create impacts on soil quality. Therefore, the receptor sensitivity has been assessed as medium.

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

7.12.6.1 Embedded/in-built control

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

7.12.6.2 Significance of Impact

Given the low sensitivity of the surrounding areas and the medium magnitude of the potential consequences of soil contamination, the potential impact significance is rated as minor.

7.12.6.3 Additional Mitigation Measures

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

7.13 KEY POSITIVE SOCIAL IMPACTS – CONSTRUCTION PHASE

7.13.1 Impact on local economy and employment

The construction of the mini-grid will provide employment opportunities for skilled and unskilled labour. Receptors in the Social area of Interest that may be able to make the most of the direct and indirect employment opportunities in the project are those who have some level of experience in formal employment, as well as those who have gained a basic education. This

will be a source of income for the labourers. Where possible, construction materials will be sourced locally in order to promote local businesses.

Thus, anticipated benefits of the project include direct employment opportunities mainly during construction of the mini-grid; indirect employment generated by the procurement of goods and services for the project; induced employment related to jobs ensuing from the expenditure of incomes associated with direct and indirect. The local community is likely to benefit from the economic opportunities to be created from the following:

- Civil works during construction phase including, construction of solar PV module mounting area, inverter room, internal roads, laydown areas, labour camp, distribution line,
- 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.
- 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.

The area is characterised by major unemployment. This has affected the community members including the youth, men and women as reported during Focus 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 arise if the community feels left out in employment opportunities.

7.13.1.1 Impact Significance

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

7.13.1.2 Enhancement Measures

- A significant segment of labour requirement during the construction phase will be sourced locally. While, the significance of the impact on economy and 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, sub-contractors or suppliers to pass on maximum economic benefit locally;
- Preference should be provided to the vulnerable population in the study area;
- The contractor to adhere to labour laws, and labour management practices (timely renumeration, equitable compensation for both genders)
- The contractor shall keep an updated register of all employed staff
- The project proponent will establish a mechanism to monitor sub-contractors and suppliers with respect to compliance of utilizing local labour and resources.

7.14 KEY NEGATIVE SOCIAL IMPACTS – CONSTRUCTION PHASE

7.14.1 Impact on Occupational Health and Safety

The construction activities include site preparation, infrastructure utilities installation, building

structures. As a result, there 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, 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 site.
- 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 and in Lorengippi village.

7.14.1.1 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;
- Lifting equipment should be operated by trained and authorised persons;
- Training of the workers on climbing techniques, and rescue of fall-arrested workers;
- Excavated areas should be temporarily fenced to avoid access by outsiders.

7.14.1.2 Significance of Impacts

The impact on occupational health and safety during the construction phase is evaluated to be of moderate significance. All the construction activities will be confined at the project site hence high sensitivity and low magnitude.

7.14.1.3 Additional mitigation measures

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

7.14.2 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 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. fire safety and management of emergency situations.

7.14.2.1 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 will be stored within the site for long periods of time and be in contact with the soil in order to prevent against ground water contamination
- The truck drivers carrying construction machinery and materials will be instructed to drive within speed limits with careful consideration for village traffic;
- Movement of heavy equipment and construction materials will be regulated during peak hours (0900hrs to 0500hrs).

7.14.2.2 Significance of Impact

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

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

7.14.3 Labour Influx

The nature of the project will require technical skills that may not be all available in the project area. This will require movement of construction workers into the project area. With an increase in population of the project area, the social set up may be affected resulting to different negative social impacts such as competition for resources, illicit behaviour and crime (including theft and substance abuse).

7.14.3.1 Significance of Impact

The significance of labour influx is considered to be minor because the receptor sensitivity will be medium and the impact magnitude is low. However, except for the technically skilled personnel, most of the labour is expected to be sourced locally.

7.14.3.2 Additional Mitigation measures

- In contract documents for the Contractor, MoEP/REREC should make explicit reference to the need to abide by Kenyan law, international best practice and the ratified ILO conventions and MoEP's policies in relation to health and safety, labour and welfare standards.

- In selection of a Contractor, MoEP/REREC should refer to past performance in similar assignments as an indicator of future performance with respect to worker management, worker rights, health and safety as outlined in Kenyan law and international standards.
- Regular checks by MoEP/REREC should be undertaken to ensure the relevant labour laws and occupational health and safety plans are adhered to at all times.
- All project workers should, as part of their induction, receive training on health and safety.
- The contractor should put in place mechanism to ensure no employee or job applicant is not discriminated against on the basis of his or her gender, marital status, nationality, ethnicity, age, religion or sexual orientation.
- All workers will have contracts which clearly state the terms and conditions of their employment and their legal rights. Contracts will be verbally explained to all workers where this is necessary to ensure that workers understand the provisions. Contracts must be in place prior to workers reporting to duty for the first time. The contract document will be enhanced by the Code of Conduct that will be provided by the proponent.
- The Contractor will put in place a worker grievance redress mechanism accessible to all workers, whether permanent or casual, directly or indirectly employed. The Proponent worker grievance mechanism shall be open to the Contractor workforce in the event that their grievance is not adequately resolved by their direct employer. The Proponent will then have the authority to act to resolve this grievance.
- All project workers should have access to training on communicable diseases and STDs and community interactions in general. This training will be developed in collaboration with local health institutions.
- Carry out surveillance to ensure that no children are employed in the project, and to the extent possible by third parties related to the project and primary suppliers where such risk may exist

7.14.4 Child labour

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

7.14.4.1 Significance of Impact

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

7.14.4.2 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 " No Jobs for children under 18 years" signage is at the project site.
- The contractor shall ensure every worker under their jurisdiction signs a document committing themselves to the protection of the area children.

7.14.5 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.

7.14.5.1 Significance of Impact

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

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

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

- A chance find can be reported by any member of the project. Accordingly, if a chance find is encountered, the first course of action is to stop work in the vicinity of the find. Then the following steps will be undertaken:
- Inform site supervisor/foreman.
- Install temporary site protection measures (warning tape and keep off signs).
- Inform all personnel of the Chance Find if access to any part of the work area is restricted.
- Establish a localized no-go area needed to protect the Chance Find.
- The National Museum of Kenya will be contacted to perform a preliminary evaluation to determine whether the Chance Find is cultural heritage and if so, whether it is an isolate or part of a larger site or feature.
- Artefacts will be left in place when possible; if materials are collected, they will be placed in bags and labelled by an archaeologist and handed over to the National Museum of Kenya; no project personnel are permitted to take or keep artefacts as personal possessions.
- Document find through photography, notes, GPS coordinates, and maps (collect spatial data) as appropriate.
- If the Chance Find proves to be an isolated find or not cultural heritage, the specialists brought in from the National Museum of Kenya will authorize the removal of site protection measures and activity in the vicinity of the site can resume.
- If the archaeological specialists from National Museum of Kenya confirm the Chance Find is a cultural heritage site, they will inform the project team and initiate discussions with the latter about treatment.
- Prepare and retain archaeological monitoring records including all initial reports whether they are later confirmed or not.
- Develop and implement treatment plans for confirmed finds using the services of qualified cultural heritage experts.
- If a Chance Find is a verified cultural heritage site, prepare a final Chance Finds report once treatment has been completed.
- While investigation is on-going, co-ordinate with on-site personnel keeping them informed as to status and schedule of investigations, and informing them when the construction may resume.
- If mitigation is required, then expedient rescue excavations will be undertaken by the National Museum of Kenya specialist, except in the case that the chance find is of international importance (i.e. Critical Cultural Heritage). If an archaeological site of international importance is encountered special care will be taken and archaeologists with the appropriate expertise in addressing the find will be

appointed.

7.14.6 Gender Based Violence, Sexual Exploitation and Abuse & Sexual Harassment

Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) may be committed against the communities by the construction workers during construction phase of the mini-grid. During the FGD with the women, they raised concerns stating that there are gender based violence cases in the community.

7.14.6.1 Significance of Impact

There are incidences of gender-based violence in Lorengippi as identified during FGD with women. Thus, the significance of this impact is considered to be moderate considering meedium sensitivity of the receptor and medium magnitude of the impact.

7.14.6.2 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;
- Prepare a SEAH Prevention and Response Action Plan.
- 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 GRM.
- 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 GRM process for capturing disclosure of GBV;
        - A referral pathway to refer survivors to appropriate support services.

7.14.7 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 and marginalized households and individuals including the elderly, PLWDs, widows, widowers, orphan-led households, minority clans/sub-clans from participating and or benefiting from the mini-grid project. VMGs participation and inclusion could be disadvantaged based on social identity, which may be across dimensions of gender, age, location, occupation, ethnicity, disability, sexual orientation and religion. There is potential risk of lack of intentional actions by the mini-grid contractor 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 MGs, 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-grid 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 those considered vulnerable in the community include

- Poor female headed households
- Child headed households
- Persons Living with Disabilities
- The elderly (80 years and above)
- The Pokot

7.14.7.1 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.

7.14.7.2 Mitigation measures

- Participation will be through meetings with the different groups of the vulnerable people identified primarily to ensure that;
  - The VMGs are aware of the project and its impacts
  - The VMGs are aware of any restrictions and negative impacts
  - Provide support to VMG participation arrangements in the project
- Confer with the VMGs 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 sub-contractors and agents are well briefed on local customs, history and legal status, and understand the need for cultural sensitivity
- Regularly monitor performance in engagement
- Enlist the services of reputable advisers with good local knowledge
- Implement the existing grievance redress mechanism

7.14.8 Risk of Communicable Diseases; HIV/AIDS

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

7.14.8.1 Significance of Impact

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

7.14.8.2 Mitigation measures

- The Contractor should develop and implement pre-employment screening measures for workers, which should include applicable 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 HIV/AIDS and other STIs policy and an information document for all workers directly related to the Project. The information

document should address factual health issues as well as behaviour change issues around the transmission and infection of HIV/AIDS and other STIs.

- 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.

7.14.9 COVID-19 amongst workers and the community

This impact is triggered during project construction phase due to the project attracting various categories of workers drawn from local and national markets. This therefore pose risk of spread of COVID-19 and measures should be in place to curb this.

COVID–19 is a highly infectious disease and since consultations are required during the project implementation, it will also pose a potentially high risk of infection to and among communities. It is important that alternative ways of managing consultations and stakeholder engagement are implemented to mitigate the impacts.

7.14.9.1 Significance of Impact

The receptor sensitivity medium and low magnitude, hence minor significance.

7.14.9.2 Mitigation Measures

- Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to main site;
- Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, doorknobs etc.;
- All workers and visitors accessing the site every day shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs;
- The project proponent shall put in place means to support rapid testing of suspected workers for Covid-19;
- Avoid concentrating of many workers at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;
- Sensitize all community segments and project workers on Covid-19 and precautionary measures that need to be observed;
- Avoid concentrating of many community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;
- The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;
- Restrict site access to only Authorised persons; and
- Continuously adhere to the MoH, WHO and World Bank guidelines on Covid-19 management.

7.15 KEY NEGATIVE ENVIRONMENTAL IMPACTS – OPERATION PHASE

7.15.1 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.

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.

Suggested mitigation measures

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

- Signage related to the minigrid 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 solar site within the project with the participation of the local community.

7.15.2 Impact on Soil Environment

In the operation phase, soil erosion may occur due to vehicle movement, which only happens during the occasional maintenance activities. Factors that may lead to soil erosion include storage of oil and lubricants onsite, disposal of municipal solid waste and waste water from site office and storage of waste materials onsite.

Soil erosion for the operation phase has therefore been considered to be infrequent and low. Since the chances of soil erosion during the O&M phase are less, the impact magnitude is assessed to be small.

Embedded/in-built control

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

Significance of Impact

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

Additional Mitigation Measures

- Any soil potentially contaminated by chemicals, oils, fuels to be collected and disposed off by a NEMA authorized waste handler
- Vehicles will utilize the existing roads to access the site;

7.15.3 Waste Generation and management

During operation phase, the waste generated from project includes domestic solid waste 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 to small.

Embedded/in-built control

The waste generated will be disposed off through NEMA approved 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.

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

Significance of Impact

The overall impact significance on land due to waste disposal during O&M phase has been assessed as minor due to medium sensitivity and low magnitude.

7.15.4 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. During operation phase, there will be no wastewater generation from the power generation process.

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.

Embedded/in-built control

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

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 low magnitude of the impact.

Additional Mitigation Measures

- Ensure proper cover and stacking of loose construction material to prevent surface runoff and contamination of receiving water point;
- 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;
- Construction workers to be sensitised about water conservation and encouraged use of water optimally;
- Regular inspection for identification of water leakages and preventing wastage of water from water supply tankers.
- Recycling/reusing water to the extent possible.
- The contractor should provide portable/mobile toilets for use on site

7.16 KEY POSITIVE SOCIAL IMPACTS – OPERATION PHASE

7.16.1 Impact on Economy and Employment

Community consultations and observations made during the site visit suggest that the existing scenario of pastoralism in the study area is not capable enough to meet requirements of the people who are solely dependent upon it.

During the operations phase, the requirement for unskilled and semi-skilled labour is expected to reduce to a small number. 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.

Significance of Impact

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

Additional Enhancement Measures

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

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

7.17 KEY NEGATIVE SOCIAL IMPACTS – OPERATION PHASE

7.17.1 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 repair of power lines
- Exposure of workers to electro-magnetic field (EMF) during operation and maintenance of the mini-grids

7.17.1.1 Embedded/in-built control

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

7.17.1.2 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 medium. Therefore, the significance is minor.

7.17.1.3 Additional mitigation measures

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

7.17.2 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. fire safety and management of emergency situations.

7.17.2.1 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 operation phase;

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

7.17.2.2 Significance of Impact

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

7.17.2.3 Additional Mitigation Measures

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

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

7.18 KEY NEGATIVE ENVIRONMENTAL IMPACTS – DECOMMISSIONING PHASE

7.18.1 Impact on Soil Environment

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

7.18.1.1 Significance of Impacts

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

7.18.1.2 Additional Mitigations

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

7.18.2 Impact on Air Quality

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

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

7.18.2.1 Embedded/in-built control

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

7.18.2.2 Significance of Impact

There are few Receptors (settlements, Lorengippi dispensary, Lorengippi Primary School) within 500 m of the project site and the impact magnitude will be medium and sensitivity medium hence the impact significance will be moderate.

7.18.2.3 Additional Mitigation Measures

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

7.18.3 Impact on Ambient Noise

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

7.18.3.1 Assessment Criteria for Impact on Ambient Noise

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

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

7.18.3.2 Embedded/in-built control

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

7.18.3.3 Significance of Impact

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

7.18.3.4 Additional Mitigation Measures

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

7.18.4 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 decommissioning phase will be hazardous and will include waste fuel, grease and waste oil containing rags. Therefore, the receptor sensitivity has been assessed as medium.

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.

Significance of Impact

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.

Additional Mitigation Measures

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

7.19 KEY NEGATIVE SOCIAL IMPACTS – DECOMMISSIONING PHASE

7.19.1 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 who will be affected.

Impact magnitude is considered to be small considering the decommissioning period to last for a short duration.

7.19.1.1 Significance of Impact

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

7.19.1.2 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:

- Prioritize the employment of unskilled labour from the local communities.
- Develop and implement a fair and transparent employment policy for decommissioning phase.

- The contractor shall inform the workers and local community about the duration of the demolition work

7.19.2 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 from the project sites.

7.19.2.1 Embedded/in-built control

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

7.19.2.2 Significance of Impacts

The impact on occupational health and safety during the decommissioning phase is evaluated to be of moderate significance. All the demolition activities will be confined at the project site hence high sensitivity and low magnitude.

7.19.2.3 Additional mitigation measures

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

7.19.3 Child labour

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

7.19.3.1 Significance of Impact

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

7.19.3.2 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 " No Jobs for children under 18 years" signage is at the project site.
- The contractor shall ensure every worker under their jurisdiction signs a document committing themselves to the protection of the area children.

7.19.4 Grievance Redress Mechanism

Grievance management applies to all the phases of the project from pre-construction to decommissioning phase. There is a potential of inadequate grievance management.

7.19.4.1 Embedded/ In-built controls

A local GRC has been constituted representing all groups of stakeholders.

7.19.4.2 Significant of Impact

The magnitude of the impact was assessed as high with high sensitivity resulting in a Major significance.

7.19.4.3 Additional Mitigation measures

- Prepare a subproject level timebound GRM in consultation with relevant stakeholders
- Ensure the subproject 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 subproject 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.

7.20 CUMULATIVE IMPACTS

7.20.1 Cumulative Impact Assessment

It was observed during the site survey that there are no other similar solar projects within the project site. Thereore, it is assumed that there will be no cumulative impacts from the above mentioned project on the local soil, water, land, air and ambient noise environment.

8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

8.1 INTRODUCTION

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

The key objectives of the ESMMP are:

- To monitor the implementation of mitigation measures against potential adverse impacts of construction and operation phases of the project to ensure that they conform and comply with relevant environmental and social policies, guidelines and legislation
- To assess for emerging non-anticipated adverse environmental and social impacts and implement relevant mitigation measures to maintain them within acceptable levels
- To maintain best practice in environmental, social health and safety during project construction and operation

The ESMMP outlined below addresses the identified potential negative impacts and mitigation measures of the proposed Mini-grid during pre-construction, construction, operational and decommissioning phases, based on the chapter of Environmental Impacts and Mitigation Measures of the potential negative impacts.

8.2 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 construction phase, the Implementing agency (REREC) 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 operation phase, REREC will monitor facility's operations to ensure compliance with management measures in the ESMMP and operation procedures. As part of this monitoring, the proponent will undertake or statutory initial environmental audit as required by the ESIA/EA Regulations, 2003 and subsequent annual environmental audits.

8.3 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 – REREC 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 provide in **Error! Reference source not found.** below.

8.4 ENVIRONMENTAL AND SOCIAL MONITORING BY CONTRACTORS

REREC 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 REREC determines the issue is resolved satisfactorily.

8.5 ENVIRONMETAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

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

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 Decomissioning	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 vulnerable individuals.	Construction Decomissioning	Contractor	-Number and types of businesses sourced from, businesses owned and operated by vulnerable individuals, types	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
				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, 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	1,000,000

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.					
Labor Influx and related impacts (SEA/SH, HIV/AIDs and other STIs)	-Tap into the local workforce to the extent possible to reduce labor influx. -Recruit local workforce to the extent possible especially for unskilled and semi-skilled jobs. -Consult with and involve local community in project planning and other phases of the project. -Raise awareness among local community and workers on the need to have a good /cordial working relation -Sensitize workers regarding engagement with local	Construction Decomissioning	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)
	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. -Prompt payment of workers as per the contractual agreements/terms.					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Child labor	-Employ workers who are 18 years and above, and with a valid national ID at the time of hire. -Implement and monitor the employment register regularly. Compliance with the national labor laws and labour management practices. -Put visible signage on site "**No Jobs for children**" -Do not allow children at the project site.	Construction Decomissioning	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 and a GRM that ensures confidential reporting of GBV cases.	Construction Operations Decomissioning	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 confidentiality of GBV cases in place. Documented referral	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-Implement a code of conduct signed by all those with physical presence on site.			services for survivors. -Grievances raised, aggrieved persons and status on resolution etc		
Forced Labor	-Adhere to the Employment Act which outlaws any form of forced labor. -Report any form of forced labor at the site. -Ensure that all workers have a national ID card or documentation to show they are adults (above 18 years).	Construction Decomissioning	Contractor Proponent	-Number of reported cases of forced labor.	Quarterly	20,000.00
Risks related to Inadequate stakeholder engagement	-Prepare a stakeholder engagement/consultation plan (SEP) that is proportionate to the subproject and the identified stakeholders. -Timely and prior disclosure of project all project information, including project instruments, the full rights and entitlements of project affected persons, sub-project positive and	Construction Operations Decomissioning	Contractor	-Availabiliy of and implementation of the Stakeholder Engagement Plan. -# of stakeholder consultations held -Record of stakeholder consultations held (minutes of meetings and list of participants). -Information	Quarterly	30,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.			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	Pre-construction Construction Operations Decomissioning	O&M Contractor, KPLC	Minutes of consultative meetings with all community segments including VMGs and	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.			vulnerable individuals and households, grievances raised and status on resolution etc.		
Inaccessibility of project benefits to VMGs and other	-Consult VMGs and Vulnerable individuals and households on charges for sub project services, and put in place specific interventions to	Operations	O&M Contractor, KPLC	-Interventions to enable those vulnerable access project benefits. -Number of	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
vulnerable individuals due to affordability challenges	ensure the vulnerable equally access project benefits.			complaints raised by VMGs/vulnerable individuals regarding access to project services. -GRM that is culturally appropriate and accessible. Grievances raised and status on resolution etc		
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	Construction Operations Decomissioning	O&M Contractor, KPLC	-Local Grievances Committee in place, composition of committee, awareness of community and workers on project and worker GRMs, updated GRM logs, types of grievances -Availability of grievance redress process -Number of grievances reported	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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 sensitive social aspects such as GBV, as well as anonymity.			-Number of grievances resolved in a timely manner -Number of grievances escalated to national courts and the World Bank Grievances Redress Service and Inspection Panel.		
Environmental Impacts						

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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 groundbreaking during the seasons of high rainfall to avoid erosion. 2. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled.	Construction	Contractor	Assess size of rills or Gulleys forming from accelerated run off from compacted areas	Quarterly	Part of contractor's fee

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

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	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)
	conditions to reduce dust emissions. 4. Burning of woody debris & construction waste to be prohibited **5.** Use of personnel protective equipment (PPE) -masks should be provided to all personnel in areas prone to dust emissions 6. Restrict speed on loose surface roads during dry or dusty conditions 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					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	9. Plant short trees to break speed of wind					
Vehicle exhaust and emissions from Generator	1. Drivers of construction vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered. 2. Maintain all machinery and equipment in good working order to ensure minimum emissions of carbon monoxide, 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	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)
	generators to be encouraged 5. The stack chimney of the generators will be increased from its normal height of 3 meters to 6 meters					
Solid waste generation	1. Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is top soil last; 2. Segregate waste 3. Provide litter collection facilities such as bins 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	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)
	2007 and Building rules on storage of construction materials 6. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time 7. Recovery of materials remains and return to stores 8. Re-use of materials where possible 9. Proper budgeting to avoid waste generation 10. Proper disposal of waste in line with solid waste regulation 6. Construction wastes to be managed in accordance with construction standards in Kenya					
Impacts on Water	1. Clear the necessary areas only.	Construction	Contractor	-Oil spill containment plan.	Quarterly	150,000

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Resources and Water Quality	2. Appropriate remedial measures shall be implemented by the contractor in the event of erosion. 3. Infrastructure shall be designed to ensure that contaminated run-off does not reach water source i.e., earth dam. 4. Contractor to develop an oil-spill containment plan as part of the emergency response plan. In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect. 5. No vehicle maintenance and service shall be done at project site 7. Ensure that potential sources of petro-chemical pollution are handled in			-Provision of fuel/oil drip and spill trays		

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

	should be cleaned immediately					

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 labeled 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. Refueling 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.	Construction	Contractor	Records of all accidental spills and number of liters	Quarterly	150,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	5. In case of spillage the contractor should isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent materials and/or other materials approved by materials. 6. All chemicals should be stored within the bunded areas and clearly labeled detailing the nature and quantity of chemicals within individual containers.					
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	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)
	5. A fire risk assessment and evacuation plan should be prepared and must be posted in various points of the construction site including procedures to take when a fire is reported. 6. Designate an assembly point					
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	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)
	use of water in the community to avoid conflicts with the community 3. Source and utilize a sustainable and reliable water supply for both construction and operation phase.					
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	Construction	Contractor	Energy consumption records	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	energy use during construction and set targets for reduction of energy use.					
Occupational Health and safety Impacts	1. Use skilled personnel for activities which demand skills/technical tasks 2. Awareness creation/Tool box talks on safety to workers while at construction site 3. Workers coming to the site should be knowledgeable on safety precautions to take 4. Appropriate PPE (helmet, safety harness, boots, masks, climbing irons) 5. Proper general house keeping 6. Close supervision of workers 7. Risk assessment by contractor of the construction activities and	Construction	Contractor	Records of any near misses, incident, and accidents. Records of corrective actions implemented if there was an accident.	Quarterly	1,000,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	implement mitigation measures appropriately 8. Adherence to occupational Safety and Health Act 2007 9. Availability of equipped first aid box on site 10. Provide safe drinking water for workers 11. Engagement of trained first aider on site 12. Ensure the WIBA cover is taken for the staff 13. Establish safety committees					
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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Public Health Impacts	1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training, awareness campaigns and community *Barazas.* 2. Awareness creation and consultations with local communities prior and during construction on the dangers of these diseases 3. Informing workers on local cultural values and health matters. 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.	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)
	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
Solid Waste Generation	1. Provide waste handling facilities such as labeled waste bins 2. Emphasis on prudent waste generation and give priority to reduction at source	Operation	O&M Contractor, KPLC	Presence of well-maintained receptacles and centralized collection points	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	3. Solid waste management awareness to operators 4. Operator to contract a NEMA licensed waste handler to collect and dispose solid waste					
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. *6.* In the event of accidental leaks, contaminated top	Operation	O&M Contractor, KPLC	-Engine maintenance records -Oil spill containment plan	Quarterly	200,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	soil should be scooped and disposed of appropriately.					
Increased oil Consumption	1. Efficient energy consumption 2. Install an energy-efficient lighting system	Operation	O&M Contractor, KPLC	Energy consumption records	Quarterly	No additional cost
Increased storm water flow	1. Construct the drainage system in a way to follow natural drain of the water 2. Concrete only the required area and leave the rest of the land with vegetation like grass 3. Construct rain water harvesting system on the control buildings/office and harness into storage tanks for use	Operation	O&M Contractor, KPLC	Provision of a drainage system and a rain water harvesting system	Quarterly inspections	200,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Fire Outbreaks	1. The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points 2. Detection/alarm systems that can detect fire should be and installed 3. A fire evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported. 4. Workers especially operators of the plant must be trained on fire management 5. 'No smoking' signs shall be posted within the Mini-grid area 6. A fire Assembly point should be identified and marked	Operation	O&M Contractor, KPLC	-Provision of serviced fire equipment, evacuation plan and safety signages -Records of fire safety training	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Visual Impacts	1. Fence round the solar Mini-grid to keep off/screen the solar panels.	Operation	O&M Contractor, KPLC	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 taps should be fixed promptly.	Operation	O&M Contractor, KPLC	Water usage records	Quarterly	20,000.00
Sanitary waste	1. Provide sanitary waste facilities for both genders clearly marked 2. Disposal of waste through septic tanks	Operation	O&M Contractor, KPLC	Presence of separate and clean washrooms for both the gents and ladies	Quarterly	No additional cost
Flooding	1. Ensure drainage channels are free of any obstruction at all times i.e., not blocked 2. Construct more channels and or expand existing ones 3. Raise foundations of the solar panels and ensure a	Operation	O&M Contractor, KPLC	-Provision of drainage system -Raised foundations for the structures	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	proper and from concrete base 4. Create flooding diversions and or spill ways to divert water from getting into the solar power facility					
Occupation health and Safety	1. Ensure only qualified staff are employed to work in the facility 2. All workers operating the Mini-grid must be equipped with appropriate and adequate person protective equipment (PPE) such as; safety footwear, helmet among others. 3. Operators must be skilled on firefighting management 4. Annual environmental audits should be done 5. WIBA cover for staff is mandatory	Operation	O&M Contractor, KPLC	-Provision of PPEs and WIBA cover -Environmental audit reports	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Hazardous waste-damaged panels	1. Segregation from other waste streams 2. Proper disposal through a NEMA approved/licensed handler	Operation	O&M Contractor, KPLC	Presence of well-maintained receptacles and centralized collection	Quarterly	200,000.00
Noise and Vibration	1. Generator room should be sound proof to ensure no noise of a nuisance level will be produced. 2. Monitor noise levels	Operation	O&M Contractor, KPLC	Noise levels-Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Quarterly	Part of contractor's cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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: o Require community to engage a certified technician to do wiring in the premises o Use of quality materials while wiring o Refraining from individual illegal extensions of power lines to other houses o Observing safety measures while using electricity such as not touching sockets and switches with wet hands or wiping with wet cloths o Keeping off all electricity infrastructure e.g., not tying livestock on electric	Operation	O&M Contractor, KPLC	-Records of awareness sessions conducted -Incidences report	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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	Operation	O&M Contractor, KPLC	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)
	2. Controlled access to the site only with prior approval 3. Maintain records of any person who comes to site					
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, KPLC	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	Operation	O&M Contractor, KPLC	-SEA/SH Prevention and Response Action Plan	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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			-Grievance records		
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, KPLC	Number of awareness creation sessions conducted. -Availability of and distribution of condoms		20,000.00
Public health Impacts -Covid 19 disease	1. Social distance must be observed 2. Provision of hand wash facilities before access	Operation	O&M Contractor, KPLC	Availability of hand washing facilities Utilization of hand washing facilities	Quarterly	30,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	3. Temperature check and monitoring of the temperature of workers and any other person coming to site 4. Enforce wearing of masks 5. Make provision for testing and treating especially of workers 6. Provision of contact numbers for the nearest health facility for testing and treatment 7. Adhering to any other measures from the ministry of health which may be issued from time to time			Number of Covid-19 cases reported		

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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, KPLC	Visual inspection	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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, KPLC	Engine maintenance records	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Noise and Vibration	1. Install portable barriers to shield compressors and other small stationary equipment where necessary. 2. Use quiet equipment (i.e., equipment designed with noise control elements). 3. Co-ordinate with relevant agencies in case the noise produced will require a license. 4. Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible. 5. Demolish mainly during the day when most of the neighbors are out working.	Decommissioning	Contractor	Noise levels-Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Once off	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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 nonhazardous 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	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)
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
	Total					5,380,000.00

8.6 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

8.6.1 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 the KPLC 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 the KPLC 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.

8.6.2 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.

8.6.3 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.

8.6.4 Workplace Health and Safety Plan

The workplace health and safety plan to be implemented by the contractor and KPLC 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.

8.6.5 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.

8.6.6 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.

8.6.7 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

8.6.8 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

8.6.9 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

8.7 Grievance Redress Mechanism

8.7.1 Introduction

Grievance mechanisms should receive and facilitate resolution of the affected institutional or communities' concerns and grievances. Community concerns should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities, at no cost and without retribution. Mechanisms should be appropriate to the scale of impacts and risks presented by a project.

Grievances can be an indication of growing stakeholder concerns (real and perceived) and can escalate if not identified and resolved. The management of grievances is therefore a vital component of stakeholder management and an important aspect of risk management for a project. Projects may have a range of potential adverse impacts to people and the environment in general, identifying grievances and ensuring timely resolution is therefore very necessary. As such the project has developed a grievance management process to serve as a guide during project implementation.

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

The Land Act 2012 and National Land Commission Act 2012 obligate the NLC to exercise the powers of compulsory land acquisition on behalf of the MoE,that is, to acquire land for the mini-grid project and vest the acquired land to the MoE .

8.7.2 Grievance Mechanism

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

8.7.3 National Grievances Redress Committee (NGRC)

NGRC has been established at the National level to ensure participatory and transparent implementation of the project. The NGRC will help the project carry out its mandate efficiently-particularly ensuring effective and amicable settling of disputes among the communities/PAP's. Members to **NGRC** include representation from the following agencies and entities

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

Functions of the National Grievances Redress Committee

a) Ensuring effective flow of information between PAPs, the implementing agency and the County Grievance Redress committee on matters brought before the committee
b) Co-ordinate County Grievance Redress Committees (LGRC)
c) Co-ordinate activities between the various organizations involved; facilitate grievance and

conflict resolution at the highest level

d) Resolving disputes that may arise within the project. If it is unable to resolve any such problems, the PAP's can seek legal redress.

8.7.4 County Grievance Redress Committees (CGRC)

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

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

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

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

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

8.7.5 Locational Grievance Redress Committee (LGRC)

Locational Grievance Redress Committees (LGRC's), based at each location of a sub-projects, are required to be established. The LGRC's will be constituted by implementing agencies and representatives of County Grievance Redress Committees 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 support 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 LRCCs will include among others the following:

a) 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 County GRCs 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

8.7.6 Grievance Mechanism at Lorengippi.

The project proponent has since established project Local grievance redress committee (LGRC). The committee was constituted in a public meeting where the community members elected their representatives to the LGRC. The Lorengippi LGRC is composed of 13 members including the following:

- ✓ The locational Chief, who is the Government administrative representative at the locational unit and who deals with community disputes and represents the Government in GRC
- ✓ 4 female community representatives, elected by women, representing women and children related issues regarding the project
- ✓ 4 youth representatives, elected by youths, representing youths related concerns in the GRCs
- ✓ 4 male representatives elected by the members of the community

8.8 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;

8.8.1 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.

8.8.2 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.

8.8.3 The Implementing Agency (REREC)

REREC 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;

- ➢ REREC 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 REREC engineers and operators. So, for the seven years REREC will be monitoring the operations of the contractor.*

8.8.4 County Government of Turkana

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.

8.8.5 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

8.8.6 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

8.8.7 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
- 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 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.

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.

8.9 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 REREC) 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 REREC. This will be done by implementation of the following steps:

- Inspections
- Corrective action
- Reporting

9 IMPACT SUMMARY AND CONCLUSION

9.1 INTRODUCTION

This chapter gives a summary of impacts conclusion and recommendations

9.2 SUMMARY OF IMPACTS IDENTIFIED AND ASSESSED

9.2.1 Construction Phase Impacts

A number of impacts have been identified as a result of the construction of the proposed Lorengippi project. Of these, impacts on employment, procurement and the economy have been determined to be positive.

The significance of the identified negative impacts associated with the construction phase is moderate and minor prior to the application of appropriate mitigation measures. With the application of appropriate mitigation measures, the significance of all the identified negative impacts associated with the construction phase will be reduced to minor or negligible.

9.3 MANAGEMENT PLAN DURING CONSTRUCTION PHASE

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

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

All negative impacts associated with the project have been mitigated to a level which is deemed appropriate for the construction phase to proceed.

9.3.1 Operational Phase Impacts

A number of impacts have also been identified to be associated with the operational phase of the proposed Lorengippi solar project. Of these impacts, collectively referred to as Impacts on Employment, Procurement and the Economy will be positive impacts. Prior to the application of appropriate mitigation measures, none of the identified negative impacts will be of major significance during the operational phase. With the application of appropriate mitigation measures, the significance of all the identified negative impacts associated with the operational phase will be reduced to MINOR or NEGLIGIBLE

All negative impacts associated with the project have been mitigated to a level which is deemed appropriate for the operational phase of the PV power facility to be sustainable.

9.4 CONCLUSION AND RECOMMENDATIONS

With all the identified impacts, mitigation will reduce the significance of such impacts to a minor or negligible level. The mitigation measures provided and the management of residual impacts are described in a suite of Management Plans in the ESMMP has been described as a vehicle for the continued integrated management of all such impacts.

An Environmental and Social Management and Monitoring Plan (ESMMP) has been prepared to ensure that social and environmental impacts and risks identified during the ESIA process are effectively managed during the construction and operations of the project. The ESMMP specifies the mitigation and management measures to which the project proponent and the contractor will be committed and shows how the project will mobilize organizational capacity and resources to implement these measures. The ESMMP also shows how mitigation and management measures will be scheduled and will ensure that the project complies with the applicable laws and regulations within Kenya, as well as the requirements of WB OPs on environmental and social sustainability.

The consultant is confident that every effort will be made by the project proponent and contractor to accommodate the mitigation measures recommended during the ESIA process to the extent that is practically possible, without compromising the economic viability of the project or having a lasting impact on the environment.

In summary, based on the findings of this assessment, the consultant finds no reason why the proposed project, should not be moved to the next stage of project planning and development, contingent on the mitigations and monitoring for potential environmental and socio-economic impacts as outlined in the ESMMP.

10 APPENDICES

List of appendices	
APPENDIX 1	Minutes Of The Meeting Held During ESIA Process
APPENDIX 2	List of Attendance
APPENDIX 3	Minutes Of Meeting Held During Land Identification Phase
APPENDIX 4	Attendance sheet_ Meeting Held During Land Identification Phase
APPENDIX 5	Abbreviated Resettlement Action Plan (A-RAP)
APPENDIX 6	Nema Firm Of Experts Licence And Lead Expert License

APPENDIX 1 MINUTES OF THE MEETING HELD DURING ESIA PROCESS

Ministry of Energy and Petroleum

REREC
RURAL ELECTRIFICATION & RENEWABLE ENERGY CORPORATION

MINUTES OF EIA CONSULTATION FOR THE PROPOSED KENYA SOLAR MINIGRID PROJECT IN TURKANA COUNTY

Date: 19/01/2022.	**Time:** 1.30pm
Venue: Lorengippi Mixed Day and Boarding Sch	

PRESENT

List of members present is appended here in

AGENDA

1. Introduction
2. Opening Remarks
3. Remarks by the consultant
4. Concerns/Issues from participants
5. Responses to the issues raised
6. Acceptance/rejection of the proposed project
7. Adjournment

Item No	Description	Action by
Min 1/22	**Introduction**	
1-1	The ward admin welcomed all the visitors to the area. He stated that they have been waiting for the project since May 2021. He stated that the community had also offered a piece of land during that visit. He also stated incase they are not pleased with the land they are willing to offer another piece of land. He said incase there are other things brought	Lomoryon ward admin

CHIEF ADMINISTRATIVE OFFICER
P.O BOX ILBUNAR
DATE

by the visitors they shall accept also

1.2 Lase led in the introduction of the consultants and counterparts from REREC and the county. She explained the 2 companies were working together herto carry out the ESIA

Lase Kioko.

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RURAL ELECTRIFICATION & RENEWABLE ENERGY CORPORATION

Min 2/22	**Opening Remarks**	
2.1	Louse explained that after the ESIA process a report will be submitted to NEMA after which the contractor can start the project. She explained that the project will be implemented in 14 counties and Turkana is among the counties with 20 sites	Louse Koko
Min 3/22	**Remarks by the consultant**	
3.1	Louse explained that as a token of appreciation for the land donated the proponent will have a compensation in kind project in 3 admissible areas education, health or water. The project will be a maximum of 1 million.	Louse Koko
3.2	Mr. Ebei explained the project components that will be set up on the land offered. The project site will compose of solar panels, batteries, inverters, wayleaves and he explained the function of each, he explained that the connection fee will be on the consumers bill. He also cautioned on electrical safety	Ebei Samuel

CHIEF LORENGIPPI LOCATION
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DATE.....

3.3	Patrick explained that every project has benefits and anticipated negative impacts. The benefits include employment opportunities, improved security, use of clean energy, productive use of energy eg barbershops, improved economic growth, construction materials will be sourced locally. He further explained that the anticipated negative impacts include vegetation clearance, dust generation, occupational health and safety risks, labour influx, impacts on cultural heritage, risk of communicable diseases eg HIV/AIDS, COVID-19. He explained the mitigation measures that will be employed to mitigate the anticipated negative impacts.	Patrick Ngarra
Min 4/22	**Concerns / Issues/Recommendations from participants**	
4.1	He stated that the community's priority is water since it is not sufficient. He explained that there is a borehole that uses hand pump at church compound. He suggested a pump and piping of the water. The other borehole also has worn out solar panels requests for new solar panels.	Mudima Eryan
4.2	He asked what will be the distance coverage of the electricity	Aletia
4.3	He asked about the materials will be used for construction, he asked if they will be a back up generator. He also asked if the posts will be made from	Joseph Lopeyon

CHIEF LOPEMGIPI LOCATION
P.O BOX LODWAR
DATE..................

	from concrete due to attack from termites.	
	He explained that the 1 million for the compensation in land is very little, he requested if the money can be increased to solve their water problem	Elistar
	He stated that there are animals that like grazing around the land donated, in case of an accident the community will be compensated. he asked	Lokuk
	He asked if they will be a duration of time agreed in order to save to pay for the electricity.	Bernard
	She stated that the area is infested by termites what will they use for the poles.	Mary.
	He requested for a steel tank of 20,000L and above for the community	Lapur Ward Admin.
	He expressed stakeholder fatigue and asked when the project will start	Comer
Min 5/22	**Responses to concerns/issues raised**	
5.1	The distance coverage of the electricity will be a 3 km radius	Samuel Otela.
	He stated that the site will have back up generator in case of rainy days.	
5.2.	He explained that the project site will be fenced to ensure that it does not	Patrick Olela

CHIEF LOKICHAR LOCATION
P.O BOX LOKICHAR
DATE

	harm the animals or the people. In case of an incident, it should be reported to the GRC and chief The connection fee has been subsidized from Ksh 15000 to Ksh 1000, and the power will be paid in terms of tokens He explained that the project will use concrete poles. He explained that the project was waiting for a license from NEMA before commencement.	Samuel Okela REREC.

CHIEF LORENGIPPI LOCATION
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DATE.................................

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Min 6/22	**Acceptance/Rejection of the project**	
6-1	The community accepted the project and settled on a ~~what~~ water project for the compensation in kind.	All
Min 7/22	**Adjournment**	
7-1	The meeting was adjourned at 1615hrs and the members proceeded to focus group discussions.	All

Minutes Prepared By:
Name: MUGI SHARON WAIRI Date: 19/01/2022
Position: Environmentalist Signature:

Minutes Confirmed By:
Name: Nathan Lr Akal Date: 19/01/022
Position: Chief Signature:

CHIEF LOKENGIPI LOCATION
P.O BOX TLODWAR
DATE

APPENDIX 2 LIST OF ATTENDANCE

Ministry of Energy and Petroleum | REREC | Kenya Power

Bomaa.

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: 19/01/2021

Time: 1530 Hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	Martin Gitonga	Norken International Ltd	M	0719319946	
2.	Sharon Wahu	Norken (I) Ltd	F	0724129848	
3.	Njoro Patrick Maina	Centric Africa Ltd	M	0716409493	
4.	Lokwayen Samuel Ebei	Turkana County Energy	M	0716590835	
5.	Samuel Olela	REREC – NBI	M	0724401552	
6.	Loise Kioko	Norken International Ltd	F	0719335653	
7.	Ekai Lea Losiore	Village Administrator Lorengippi	M	0704979928	
8.	Sammy Ekal	Area Ass. Chief Loya	M	0706250795	
9.	David Emekwi	Village Admin – Nakurio	M	0707444942	
10.	Dominic Aleri	Snr. Assistant Chief	M	0715990370	
11.	Nathan L. Akal	Chief – Lorengippi	M	0714055468	
12.	Lomeyan Ewoi	Ward Admin	M	0729069641	
13.					
14.					

CHIEF LORENGIPPI LOCATION
P.O BOX LODWAR
DATE ......

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: 11/01/2022

Time: 10:00 hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	LOBENYO KAKIRO	"	M	—	
2.	LONGECHEL I PAPA	"	M	—	
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
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13.					
14.					

Norken International Ltd CENTRIC AFRICA

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Ministry of Energy and Petroleum

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: 19/01/2022

Time: 10:00am

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	LOKAL ELUTAN	"	M	0746767250	
2.	CLEOPHAS EBET	"	M	0797956624	
3.	FLORENCE LOMALI	"	F	0715023101	
4.	ABEY ASUKOU	"	F		
5.	CHRISTINE NACHIPON	"	F	079583 23879981	
6.	SYM PROSE LIKARU	"	F	0727095964	
7.	EYELE LOWURUKA	"	M	—	
8.	PSON LOKORUYENG	"	M	—	
9.	PAULO LOLONGOI	"	M	25632863	
10.	LOMOE EBET	"	M	0706677109	
11.	NANGOLE LKULAL	"	M	0748990753	
12.	EKAI LUSIKE	"	M	26274499	
13.	MARGRET ADUPA	"	F	—	
14.	PAULINA ACHILA	"	F	0740042213	

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Loregumi

Date: 8/01/2022

Time: 10am

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	LOKOYAN ALFRED	"	M	0703334682	
2.	PIUS YOKI ALEA	"	M	0711665252	
3.	MESHACK EKAI	"	M	0757247428	
4.	EKIRU LOKITELA	"	M	0740832661	
5.	EWOTON FESTUS	"	M	0795317592	
6.	FLORENCE AKWEE	"	F	0757258097	
7.	EKULEU GIDEON	"	M	0724873407	
8.	LOBENGA EBEKAN	"	M	0799991454	
9.	LOMOR LOKORODI	"	M	0758257370	
10.	EDUNG LOBOCHE	"	M	-13648615	
11.	YOKI TIYA	"	M	—	
12.	EKUWAM LOCHOTO	"	M	-26817455	
13.	LOSIKE LOMIL	"	M	—	
14.	AUBA LOWOTO	"	M	0718865952	

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: ....

Date: ....

Time: ....

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	CHRISTOPHER LOTUR	"	MALE	0795975069	
2.	SELINA LONYAMAN	"	F	0797254039	
3.	ABURA PHILIP	"	M	0706499070	
4.	ALBERT ALEA	"	M	0792009049	
5.	BERNARD KALLENG		M	0718036009	
6.	SALINA LONGOLE	"	F	0795538209	
7.	KOKOI NAMOJONG	"	M	8886167	
8.	JOSEPH LOPEYOK	"	M	0715675868	
9.	EKAI LOUPALA	"	M	0702994004	
10.	BONIFACE KARENGA	"	M	0720136855	
11.	VINCENT OUYASI	"	M	0718202568	
12.	BENSON EKAI	"	M	0794586256	
13.	LOPETOR ISAAC	"	M	0779369393	
14.	JAMES NAKUKUL	"	M	0718737434	

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Loregae

Date: 19/01/2022

Time: 10:00hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	Elias Ekuron	"	M	0740107354	
2.	Ella Lopeman	"	M	0710284632	
3.	Tioko Locoro	"	M	0741829554	
4.	Napuses Ekiti	"	M	0740660510	
5.	Nicholas Lokero	"	M	0705309983	
6.	Lowaru Nangolong	"	M	0729274531	
7.	Mark Lotor	"	M	0712804550	
8.	Richard Ekai	"	M	0723613288	
9.	Gabriel Atach	"	M	0712792431	
10.	Francis Lowoi	"	M	1364816	
11.	Adura Ima	"	M	0790827262	
12.	Ekeno Lokuruka	"	M	9672802	
13.	Benson Epuyo	"	M	37315071	
14.	Etabo Frederick	"	M	0712891514	

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: 19/01/2022

Time: 15hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	DAVID LOGANAI	"	M	0700882727	
2.	JACKSON EEEKON	"	M	35758132	
3.	JOHN LORENG	"	M	0707890970	
4.	ALEPELEM LOKURUKA	"	M	—	
5.	EKAI AMATAN	"	M	—	
6.	LOPEYOK LOCINCH	"	M	—	
7.	LOKAY AYAN	"	M	—	
8.	PAUL ETIIR	"	M	0100083600	
9.	EBEI LOCHURO	"	M		
10.	ELIM ARANCUR	"	M	26057432	
11.	ERUWAM ESEKON	"	M	20526379	
12.	LOWASA LAMONGIN	"	M	"	
13.	EPAT ACHILLA	"	M	—	
14.	LOPEYOK EKEDOR	"	M	0700704969	

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: 17/01/2022

Time: 10am

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	Etiriwae Ekadeli	Lorengippi	M		[signature]
2.	Natar Loparan	//	M	0743844379	[signature]
3.	Esuron Lokwumoe	//	M	0115787238	[signature]
4.	Namekedi Kulal	//	M		[signature]
5.	Moru Ngilimo	//	M		[signature]
6.	Ekerete Lochodo	//	M	0768429188	[signature]
7.	Ekuwam Loriu	//	M	0790713999	[signature]
8.	Oscar Sari	//	M	0792726560	[signature]
9.	Lokui Samal	//	M		[signature]
10.	Joseph Lowi	//	M		[signature]
11.	Lorukeny Ekai	//	M		[signature]
12.	Loburo Lokoi	//	M		[signature]
13.	Elibaoh Nakuwa	//	M	078170091	[signature]
14.	Ekorinyang Lobuin	//	N		[signature]

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengipi

Date: 17/8/2022 Time: 10am

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	ARUKUDI LOTADE LOMEER	LORENGIPI	M	0741421769	
2.	EDUKON KANAIS LEKADELI	LORENGIPI	M	0708018022	
3.	KORANG NAMANGO LOSKE	LORENGIPA	M	0791381979	
4.	LOKURE AYAN LOMONGIN	LORENGIPI	M	—	
5.	LOKWANG ELRU NOOD	LORENGIPI	M	0708752061	
6.	NYANGANERO NAKIPON	LORENGIPI	M	0701923477	
7.	NAKUNG EKAL	LORENGIPI	M	0704140469	
8.	ESINYEN LONGOOK	"	M	0790343739	
9.	LOKOPE NGURO	"	M	0707049152	
10.	LOUYALE LOENAMAN	"	M	—	
11.	APENYE KIYONGA	"	M	—	
12.	ENGOR EREGAE	"	M	0795817819	
13.	TOM EYNAE ENDI	"	M	0798799421	
14.	ERIAN LOOMO	"	M	0798676874	

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: [illegible]

Time: [illegible]

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	LOBUIN LOKULUKA	LORENGIPPI	F		
2.	KONO LOBAKYE RAILB	"	F	7071384	
3.	NAWITONGORET NAPAK	"	F		
4.	MARGRET LONGOLAN	"	F		
5.	AWOI ADUFI LOKIR	"	F	33671605	
6.	ECHOM ETELE	"	F	33760576	
7.	AKUWA LOROGOI	"	F		
8.	NAMONGI AKITILA ECHOTO	"	F		
9.	AYANAE EKOTON	"	F		
10.	AKURE KIRIEN	"	F		
11.	PAULINA KAAPUS	"	F		
12.	IMANA LONGOMO	"	F		
13.	NAMUCHURUS AKURE	"	F		
14.	LOMORUKAI LOKWANG	"	F		

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Ministry of Energy and Petroleum

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Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengipi

Date: 17/1/2023 Time: 10AM

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	GABRIELLA ENOI AKALANG	LORENGIPI	F	30453100	
2.	ADUPUR LOKUUMA LONGATUNYUNE	"	F	26274524	
3.	KEVIN MARIOKA SAFARI	"	M	32812640	
4.	SELVIN ERIPIAE	"	F	37665771	
5.	MAMANGO LOSIKE JEREMIAH	"	M	31958624	
6.	LODIO LOTODT	"	F	31057026	
7.	ANNA ARUPE KURIEN	"	F		
8.	EPUR EMOJA LOMARIAPUS	"	F	21224105	
9.	EKALALE LEMUYA EKAE	"	F	23378252	
10.	EDAPAL NANOI ERIPON	"	F	21052162	
11.	AREGAE LOKAT AYEN	"	F	39104608	
12.	ANAM LOKAT	"	F		
13.	ARIBO ECHUCH EREGAE	"	F	85984408	
14.	AYUNTA LOKOPE NGIRO	"	F	26389433	

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CHIEF EXECUTIVE OFFICER
P.O BOX ILORGAR
DATE

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Ministry of Energy and Petroleum

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ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: [illegible]

Time: [illegible]

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	ASINYEN EPEM	LORENGIPPI	F		
2.	ARENG LIMAN AMELE	"	F	7071406	
3.	LOPUWA LOWOI	"	F		
4.	EJILA EKHOTO KOKUAO	"	F		
5.	NAMUS EBEYE EKOTOR	"	F		
6.	AKIDELI MORO NGIRO	"	F	7071196	
7.	LOKOYEN ANGURAT GABRIEL	"	M	0768261536	
8.	NAMANAE NATADE KARONGA	"	F	20283960	
9.	ATABO LOBIO NAMULEN	"	F		
10.	LOPIDING EKENO ETOKORA	"	M	0739 391552	
11.	LOSEKONLEM ILEM	"	F		
12.	NAYANAE AMIYO	"	F		
13.	TIYA EKEDIENY	"	F		
14.	ESTHER ALINGA LOKOPE	"	F		

Norken International Ltd

CHIEF LORENGIPPI LOCATION
P.O BOX LODWAR
DATE

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Ministry of Energy and Petroleum — REREC — Bomas — Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: 13/01/2020

Time: 1500hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	MARY NAKUYAN LOKOEL	LORENGIPPI	F		
2.	AMODONYANG LOWOTO	"	F		
3.	CELINA ARUPE LONGOLE	"	F	33036577	
4.	LOPUYO LOKOMER ABONG	"	F	4785948	
5.	APUKE EKAMUNGO EKOILU	"	F	27426081	
6.	NAKULAN ETOOT	"	F		
7.	AMARIAMONG XIYONGAS	"	F		
8.	LOTORE NGIPEYOK EKIDOR	"	F	26057205	
9.	LOYANAT CHUMAN	"	F		
10.	LODUAL ALINGAT	"	F		
11.	EKUDOR CHAKI LOKUBAL	"	F	21209158	
12.	AWATA NAKUT	"	F		
13.	AKIDOR LOROT LELIBACH	"	F		
14.	NGULENY EROT	"	F		

Norken International Ltd — CHIEF LORENGIPPI LOCATION P.O BOX LODWAR DATE........ — CENTRIC AFRICA

Ministry of Energy and Petroleum

REREC Baraza

Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: 15/11/2022

Time: 1530hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	ALENO EKUWAM	LORENGIPPI	F		
2.	ATABO KAPELO EKAGALE	"	F		
3.	NAKORIO NAKATWAN	"	F		
4.	NABENYO TIYA	"	F		
5.	ABUKUDI LOKORIKEJU	"	F		
6.	SIKE LOKURUKA	"	F		
7.	AMURIA EGERE EIPA	"	F	26247549	
8.	EKURON EKUPE	"	F		
9.	NAKOLI IPAPA LOSURON	"	F	20525794	
10.	LEMUKOL MOOJA ACHILA	"	F	20315823	
11.	AYANAE KOOLOK ACHILA	"	F	32105487	
12.	NAPAKI LOKOMEL	"	F		
13.	SELINA ABEKON LOKWAMANAT	"	F	7071165	
14.	EDUNG ETTON	"	F		

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CHIEF LORENGIPPI LOCATION
P.O BOX ILOGIAR
DATE..........

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Ministry of Energy and Petroleum

REREC Bomaza

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi

Date: [illegible]

Time: [illegible]

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	EKALALE EKAPAL LOUWEIMA	LORENGIPPI	F	26679233	
2.	NGIPEYOK AKHUKA KOLOI	"	F		
3.	AMARIAMONG GAMAL	"	F	31363005	
4.	ALANY LOTIKI APAENGOROK	"	F	27510203	
5.	AKAI TIYA ANOK	"	F	7071442	
6.	SELINA EUBATCH EMETO	"	F		
7.	NGIKURICHANA EMUS LOCHEDAX	LORENGIPPI	F		
8.	ESEKON ALEPER	"	F		
9.	NAWIYONGORET AKHUKA	"	F		
10.	ETOOT EKATO	"	F		
11.	ATABO LOKURE LOKWAALE	"	F		
12.	ANCELA LOKOIYAN	"	F		
13.	CHRISTINA EWOTON ESEYE	"	F	20526391	
14.	AKUWAM LORUNYE	"	F	31057059	

CHIEF LORENGIPPI LOCATION
P.O.BOX LODWAR
DATE

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REREC Baringo

Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengipi

Date: 19/2/2022 Time: 10 AM

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	NAKWANJI ANNE MUNYETE	LORENGIPPI	F		
2.	NACHOMIN LOKUMO NAMEYEN	"	F		
3.	LOKWANG NAPOKOMON	"	F		
4.	RUKOO NATADE	"	F	21344170	
5.	MERIKORI LOID	"	F		
6.	AMINIT KURWAGI	"	F		
7.	NAKORIO KOLOI	"	F	8598144	
8.	NABENTO LEMIL TIOKO	"	F	32105527	
9.	MARGRET PETER LOKOYAN	"	F		
10.	LOSIKE AJORE NKOLEL	"	F	20295824	
11.	SELINA ASEKON LOKWAMANAT	"	F	7071165	
12.	CHODOLE IDUU MERIANGEL	"	F	32112062	
13.	NALUK ADUKEN MORUNGOR	"	F	8592976	
14.	MARY EKIPOR	"	F	9244904	

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APPENDIX 1 – FOCUS GROUP DISCUSSION PARTICIPANTS REGISTER

Men FGD

Ministry of Energy and Petroleum — REREC — Male FDGs — Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi – New Lorengippi Mixed Day & Boarding School Grd

Date: 19/9/2022

Time: 1620hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	LOKAI AYAN	ELDER	M	21399432	
2.	APENYU KINYANGA APENYU	ELDER	M	31189083	
3.	DAVID LOYANAE	ELDER	M	21043202	
4.	LUCAS KANYARENG	ELDER	M	10986177	
5.	FRANCIS LOWASI	ELDER	M	13648416	
6.	AUDA LOWOTO	ELDER	M	21346308	
7.	ETABO ETOOT EKGOR	ELDER	M	12435296	
8.	DAVID EMEKWI	V. A	M	29760318	
9.	LOWOYALE LOCHUMAN	ELDER	M		
10.	ALEPELOW LOKIRUKA LOTODA	ELDER	M		
11.	EDONGA LOWUEN OCHOL	ELDER	M	20311950	
12.	EKAI AMATAE NAROO	ELDER	M		
13.	NAYAPAR ALIM NACHOWETIO	ELDER	M		
14.	KANGKAALA ELBACH NAKUNO	ELDER	M		

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Male FD45

Ministry of Energy and Petroleum

REREC

Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi: Nawi/outside Lorengippi mixed Day & Boarding

Date: 19/1/2022

Time: 1600hrs 1620hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	EKORINYANG LOBUIN	ELDER	M		
2.	NATADE MERINYANG	ELDER	M		
3.	LOTITIA AMOK	ELDER	M		
4.	LOMULEN NGORIAKAMAR	ELDER	M		
5.					
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FEMALE FGD

Ministry of Energy and Petroleum

REREC

Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi Female FGD

Date: 19/01/2021

Time: 1618 hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	EPUR EMOJA LONDEIAPUS	LORENGIPPI	F	21224105	
2.	NABENYO LOMIL TIOKO	LORENGIPPI	F	32105527	
3.	NAUTONG'OROT ACHUKA	"	"	–	
4.	MERIKORI SOYO	"	"	–	
5.	ESEKON ALEPER	"	"	–	
6.	NAKORIO NAKATAN EYANAE	"	"	–	
7.	AKAI TIYA ANOK	"	"	–	
8.	ANINIT KURWAS EDOILOI	"	"	7071448	
9.	LOUKORD LOKORIKEJU	"	"	"	
10.	NAKULAL ETOOT	"	"	"	
11.	MAGRET ANOK LOKOYAN	"	"	"	
12.	CHODOLE LOKO MENIAKOL	"	"	32112062	
13.	LOBUIN LOCITAUNGE	"	"	"	
14.	AMARIAMONG KIYONGA	"		"	

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REREC

Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi Female FGD

Date: 17/11/2021 Time: 1619hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	NGIRO KAPELO	LORENGIPPI	F	–	
2.	ING'OLAN EREGAE	"	"	–	
3.	AKITELA ENOTON	"	"	–	
4.	ATUR EMOJA	"	"	–	
5.	LOBUIN LOUPALA	"	"	–	
6.	NAYEPETE LONYAMAN	"	"	–	
7.	IMURON ERUPE	"	"	21052134	
8.	NAKOLI IPAPA LOBURON	"	"	20525794	
9.	ERUKON ESEKON	"	"	–	
10.	LOCHI EWOTON	"	"	–	
11.	ATABO LOTUKUMOE	"	"	–	
12.	AKENO EKUNOM	"	"	23327764	
13.	Joyce Apule	"	"	27452418	
14.	KOLOK LOSEKE ECHOO	"	"	26274652	

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REREC

Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengipi Female FGD

Date: 13/1/2022 Time: 1618 HRS

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	SIKE LOKORUKA	LORENGIPPI	M	-	
2.	AMODONYANG LOWOTO	"	F	-	
3.	NAPAKI LOKOMER	"	"	-	
4.	SELINA ACHARAIT KARENG	"	"	0738809	
5.	NATOME LORENG	"	"	-	
6.	ARUKOD LOKERAKEJU	"	"	"	
7.	EWOTON KERO	"	"	"	
8.	EDUNG EITON	"	"	"	
9.	ACHARAIT LEKAALA	"	"	"	
10.	ADUKAN LOWOTO	"	"	"	
11.	LOWOTON ACHILA	"	"	"	
12.	NACHUWA LOWOI	"	"	"	
13.	ACHUMAE LONGOLOMDE	"	"	"	
14.	BEATRICE IKALALE	"	"	22665137	

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Female FGD

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REREC

Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi Female FGD

Date: 19.1.22 Time: 16.18hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	MARY KAAPUS	LORENGIPPI	FEMALE	–	
2.	LOBUIN LOKURUKA	LORENGIPPI	FEMALE	–	
3.	SELINA ASEKON	LORENGIPPI	F	7071165	
4.	MARY IKIPOR LOYAKORI	LORENGIPPI	F	9244904	
5.	AYANAE EKIPOR	LORENGIPPI	F	–	
6.	NGILIMO ALERI LOKWEE	LORENGIPPI	F	–	
7.	EDAPAL NANOI	LORENGIPPI	F	21052162	
8.	NAYANAE NATADE KARORON	LORENGIPPI	F	20283960	
9.	EKAALE EKAAL	LORENGIPPI	F	26679233	
10.	NAKORIO KOLOI	LORENGIPPI	F	8598144	
11.	ETOOT EKATO	LORENGIPPI	F	–	
12.	LOKWANG NAPOKMON	LORENGIPPI	F	–	
13.	ROPE NACHIPON	LORENGIPPI	F	–	
14.	LOJORE NGIPEYOK	LORENGIPPI	F	–	

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YOUTH FGD

Ministry of Energy and Petroleum

REREC

Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lokenyippi Youth FGD

Date: 19/01/2022

Time: 1620hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	MACLARENCE ANOR		M	0700701282	
2.	CHRISTOPHER EDUNG		M	0795975069	
3.	EWOTON FESTUS		M	0795317592	
4.	TONY EYANAE		M	0798799421	
5.	BONIFACE ALETIA		M	0780136855	
6.	BERNARD KALLENG		M	0716036009	
7.	PHILIP ABURA		M	0706490705	
8.	PHISTONE LOKOL		M	0114797784	
9.	JOHN LORENG		M	0707890970	
10.	LOMIL NICKSON		M	0769449516	
11.	JAMES NAKHUKUL		M	0708280303	
12.	JACKSON ESEKON		M	[illegible] 0779292826	
13.	JOSEPHAT LEWIDON		M	0712871314	
14.	SIMON LOKUSI		M	39076112	

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Kenya Power

ENVIRONMENTAL IMPACT ASSESSMENT PROJECT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES

Venue: Lorengippi Youth FGD

Date: 19/01/2022

Time: 1620hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	CHEGEM - E. FRED	"	M	0704623508	
2.	JAMES EKURU	"	M	0740832661	
3.	JAFRED GALGALO	"	M	0797289146	
4.	WALTER LOUWANG	"	M	0769887197	
5.	CLEOPHAS EBEI	"	M	0797756624	
6.	BENSON EPUYO	"	M	0740042213	
7.	LOKEYAN GABRIEL	"	M	0768261536	
8.	YOUI PIUS	"	M	0711665232	
9.	BENSON EWAI	"	M	0794586256	
10.	LOPETUK ISAAC	"	M	0799369393	
11.	LOUPALA ANDREW	"	M	0702794004	
12.	LOKOYIAN ALFRED	"	M	0703346 82	
13.	EKULEU LOROT	"	M	0724873407	
14.	SYLEVESTER MEROT	"	M	0792430917	

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Venue: Lorengippi Youth FGD

Date: [illegible]

Time: 1620hrs

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	GABRIEL ATACH	〃	M	0712792431	[signature]
2.	JAMES EKAPAL	〃	M	0710804504	[signature]
3.	EKUT ALI LOPAYA	〃	M	0746767850	[signature]
4.	ANGURAE COLISTUS	〃	M	0712278288	[signature]
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APPENDIX 3 MINUTES OF MEETING HELD DURING LAND IDENTIFICATION PHASE

Minutes

Minutes of Community Engagement Meeting Held in Regard to Kenya off Grid Solar Access Project (KOSAP): Proposed Solar Mini-grid at Lorrengippi Village.

Venue of meeting: Lorrengippi Trading Centre/village.

Date: 18/03/2021

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- ***Nathan called*** the meeting to order at 10.00 a.m. and opening prayer was done by area elder. The chief then welcomed the project team and also members of Lorrengippi 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.

The chief then gave a brief history of the location and its composition, the location has 5 sub-location namely Lorrengippi, Nakurio, Kaemanik, Lodwat and Loya with each having assistant chief. The sub location is then subdivided into small unit.

National Land Commission (NLC) – James. Appreciated the community for getting time to attend the meeting, he explained the reason of the visit to the community and emphasis on the importance of land for the project purpose.

KOSAP Team

No.	Name	Institution
1.	Dorothy Kagweria	Ministry of Energy
2.	Samuel Mbugua	Kenya Power
3.	Nicholas Muigai	REREC
4.	Consolata Hongo	REREC
5.	Jones Magige	Ministry of Energy
6.	Samwel Olela	REREC
7.	Jonathan Musau	REREC
8.	George Kosgei	REREC

Table 1.1 KOSAP Team – Turkana

Minute 2/KOSAP/2020: Project Description

Nicholas from REREC 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 are 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 be 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 number of mini-grid sites in Turkana County will be 23 sites with Lorengippi being one of the site selected. There will also be 16no. of street lights installed in Lorengippi, the connectivity radius will be 3km and the community are requested to donate land for the process to go on.

Consolata (Wayleave Officer) then informed members that the proposed project requires land for its successful implementation. She added that where possible, focus would be on free land donation to help reduce the cost of project implementation. Additionally, the section donated shall be transferred to the implementing agency. She informed members that, it was their right to be sensitized about the project before seeking consent and implementing the same on their land. She informed members that if the land is voluntarily donated, then there shall be no compensation made to that effect. She also informed members that for purposes of connectivity they shall be required to allow for use of plot boundaries and road reserves as way-leave corridors to allow for location of poles and stringing of conductors.

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

Samuel – KPLC. 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

Samuel – KPLC. 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
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
Air pollution dust from construction activities	Fence off construction site to reduce dust going to the public Use of masks for workers
Air pollution dust from construction vehicles	Limit vehicle speed to minimum possible when passing residential areas
Air pollution from vehicle emissions	Maintain vehicles/service vehicles No idling of vehicles
Solid waste	Clear all solid waste and dispose appropriately
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.
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
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 of HIV/AIDS and other communicable diseases.	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.
HIV/AIDS, communicable and sexually transmitted diseases (STDs).	HIV/AIDs awareness to community
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

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
Unwanted pregnancies and school dropouts	Awareness on this impact to schools
Child abuse	Employment of children is illegal Report any case to the chief's office
Demand for Material/resources e.g water	Contractor to consult with elders before using the water resources in the community to avoid conflicts
Oil Spill Hazards	Contractor not to repair vehicles or equipment on site Maintain vehicles and equipment in good state
Storm water and erosion	Contractor to put measures to harvest rainwater and control erosion during construction
Wastewater/ effluent	Provide sanitation facilities for workers
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
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.
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.
Fuel storage on site	Proper maintenance fuel storage tanks and dispensing system Budded wall 1.5 times the fuel storage tank

Table 1.2 Negative impacts of the project

Public safety in regards to electricity

Samwel 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.

- Engage a certified technician to do wiring in your premises;

- Use quality materials while wiring;
- Do not engage in individual illegal extensions of power lines to other houses;
- Don't touch sockets and switches with wet hands or wipe with wet cloths;
- Do not tie your livestock on electric poles;
- Do not cut earth wires that run along some electric poles;
- Do not touch any electric wire if you find it fallen on the ground;
- Report any incident regarding electricity at the local office –staff in charge of operating the Mini-grid;
- Vet all new people coming to the village by checking whether they registered their presence with the office of the chief;
- 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 Lorengippi Market, area Ward Admin, 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 targeted 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 been 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.

Consolata explained to the public forum that the proposed project will require an average of 3 acres of land. She asked them the nature of ownership of the land in the area and they answered that the ownership is communal where by the entire land belongs to the community and not individuals with individual title deeds. They also noted that the land is not formally sub divided (implying not adjudicated). She 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.

She 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.
- right of the community to present their views, opinions or fears on a proposed project;
- Right to accept or reject the project
- 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 REREC 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

She 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.

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

- 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 mitigation 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.

Consolata asked the community to confirm one more time, if the land had been set aside for public use and their willingness to donate land for the Mini-grid. The community members unanimously confirmed that the land had been set aside for community projects and that they were willing to voluntarily donate the land for the solar Mini-grid.

Survey of the land and request for advance possession.

Consolata 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. She noted that the process of land acquisition, land surveying and land transfers are long and requested the community for advance possession once the processes are at an advanced stage. 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.

Consolata 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. She 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). She noted that the project may seek freeway leaves due to budget constraints and requested the community to consider this and 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 Consolata 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 migratory 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 at the appropriate time. 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.

Table 1.3 Land Donation Criteria

Minute 6/KOSAP/2020: Grievance Redress Mechanism

Nicholas 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, Nicholas asked the community to explain how they deal with grievances/issues at the village level.

Project GRM:

Nicholas 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.	Category
1	Kokoi Namojong	8586167	Men
2	Loroti Ekidor	12909294	
3	Aletia Karenga	32102935	Youth
4	Amuria kiyonga	26368581	Women
5	Nathan L. Akal	11513725	Chief

Table 1.4 *grievance redress committee*

Plenary session

Nicholas 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.

Name	Question/ Comment	Remark/Response
Nicholas keboo	Appreciated the visit Sexual harassment – what will happen if sexual harassment occur between works and the community?	***(Nicholas)*** There is GRM committee which formed to undertake all the co welfare and the workers.
Kokoi Namonjok	Accepted the electricity since it benefit outweigh the negative impact. He also noted that ward administrate always influence the project in the location making it difficult for them to benefit.	Noted. (***Nicholas***)
Ingnesus lokamiri	After construction of the project is completed, will there be other job opportunities like security? Electrocution of animals, who will compensate if that occurs?	(***Samuel)*** The project is insured. This will the purpose in case that occurs. T be job opportunity and the comm be given the first priority.
Lorukudi Ewai	The radius outside the community, what will be done to them? Shock of electricity, is their payment or insurance to cover for that	**Samuel** – the project is insured help for the purpose. **Nicholas** – those community w from the stand alone solar syst i9mplement by the same project
Joseph Lopeyok	What percentage in terms of workers will be given to the community? Land acquisition process, there a place for land compensation. Will there be compensation of land and in case not what happens to the money allocated for that purpose.	**Consolata –** there is no compen land in this project since no m been allocated for the compensa Job opportunity- the communit given the first priority and only th which are not within the comm be out sourced.
Aletia Karenga	Backup power to the solar in case there blackout or no sunshine	**Nicholas –** the systems has that can work for 72hrs witho charged hence the power suppl be affected.

Table 1.5 *Plenary*

Focus Group Discussion with the women

Lorrengippi Solar Mini-grid

Consolata Hongo started the meeting by reminding the women that electricity is good. She stated that it would help light their village, improve academic performance of their children since the children will have longer study hours. She also mentioned that their dispensaries will operate much more efficiently and store drugs that require refrigeration. Their market centers will operate for longer hours since they will not have to retire home early due to fear of darkness. Cooking will be faster and safer for those who will opt to use electricity.

Consolata reminded the women to be cautious about early pregnancies, divorce due to extra marital relationships and early marriages. She reminded the women to capitalize on the benefits of the proposed project and organize themselves well in advance. She proposed that women can also earn by growing food crops and selling to those who will be running hotel businesses

during implementation of the project. Any workable activity that can bring income, should be thought about in advance so that they are not late in implementing their ideas.
Emphasis was made on use of GRM committee to help have their voices heard. They were urged to elect representatives who will listen to their challenges and help fight for their rights. Consolata reminded the women that use of local administration was still valid, and women were still allowed to approach these leaders for help.

Plenary session

Agnes Echom Etole: 'Why is it that you have money to engage a contractor, buy all the materials needed for the project, but you cannot pay for our land?'

- Consolata: 'The proposed solar project is very expensive. It is however the best alternative for this area because it will serve many people. While it will cover a distribution radius of approximately 3 kilometers from the plant, the usual transformer would have only covered a maximum radius of 600 meters and very few homesteads. The high project costs have therefore necessitated that the community be requested to donate land as a way of assisting in managing the overall project costs and also as their contribution to the successful implementation of the project. This is why we explained all the other ways land can be obtained, but requested that you consider donating the required land freely, for this project.'

Focus Group Discussion: MEN

No.:	Name:	Question or Comment asked:	Response:
1.	Mr. Namojong Kokoi	Engineer, as men in this group, kindly give us about ten minutes to deliberate by ourselves on all that you have said so that we can ask questions. Secondly, of all the people who have ever stepped in this village, as an elder here I can say you are the best and do have a very welcoming demeanor. You can see even the little village kids fell in love with you	Muigai: Thank you very much for the kindness. (Time given for the men to deliberate) As the men in this village we have made a unanimous decision. Please come and do the electrical solar plant. We shall provide land for this project. Muigai: Thank you very much. I appreciate.
2.	Nicholas Kebo	Welcome and do the project. I concur with what Mzee Namojong has said. We agree to have the project here.	Muigai: Thank you. That is well noted and appreciated.

The men did not have anything to ask as they were all in agreement to give land for the project and did not have any further questions or comments.

Focus Group Discussion: Youth

No.:	Name:	Question or Comment asked:	Response:
1.	Boniface Aletia	I would like to urge that every process be done in accordance with the law and everything be documented.	Samwel: That's a very goo comment, indeed it is the direc have from our ministry ar development partners in this proje world bank. To carry every according to applicable law everything be documented includ meeting whereby we are taking mi this meeting.
2.	Nancy Ekai	Will the committee representatives be trained?	Samwel: Thank you for your obse in line with what we said before plenary whatever job locals can c will be no outsider that will perf job.
3.	Angeline Lomukunyi	I would like to know whether land will purchased.	Samwel: Thank you very mu discussed in the plenary we don't i all to buy land, Actually that's th reason we are here to ask you community to kindly donate l successful implementation of the p

The youth were all in agreement to give land for the project and did not have any further questions.

Vulnerable and Marginalized Groups

The social screening involved identification of vulnerable groups in the project area. The main tribe in Turkana County is the 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.

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, Nicholas explained that the community is allowed to raise any complaints or make requests for information ~~in~~ regarding the project. The first point of getting information or raise complaint 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.

Site specific Environmental and social Aspects

The various observations and Comments on the site with emphasis to Environmental and Social Aspects are enumerated in the table below.

Table 10-1: Environmental and social aspects, observations and recommendations for Lorengipit Mini-grid site

ENVIRONMENTAL AND SOCIAL ASPECTS			
	ASPECT	**OBSERVATIONS**	**RECOMMENDATIONS/ REMARKS**
GENERAL			
1	Project technology	Area will be supplied through Mini-grids comprising of solar photovoltaic generation plant.	Proper installation of solar system to ensure maximum protection to the public
2	List of Materials to be used during construction/ operation	Batteries, Panels, Transformers, sand, stones, gravel, conductors, poles, cements etc	The locally available materials should be sourced from the local community hence benefiting the community.
SOCIAL ASPECTS			
3	Land uses	The site is next to a shopping Centre that is densely settled with residential houses.	Project to ensure that mitigation measures are incorporated from the design stages to ensure the project does not adversely affect the existing land uses but instead coexists and enhance service delivery.
4	Land uses on or near the project likely to be negatively affected	The site is currently not in use but the site is adjacent a shopping Centre and residential houses	Contractor to sprinkle water and work during the day to mitigate against noise and dust.
5	Sensitive areas/ community facilities	No sensitive areas were observed in or near the proposed project area	None will be affected
6	Site Ownership use, and land take	Currently the site is community owned	Once all the conditions are met, KPLC will engage in the transfer of the proposed parcel of land to ensure ownership as construction of the Solar Mini-grid continues
7	Population Density	The trading Centre adjacent to the site is moderately populated.	Create clear buffer zone to avoid people settling within the proposed site.
8	Job opportunities	It was noted that job opportunities will be there during the construction and operation, of the proposed Mini-	Local population should have the priority in accessing job opportunities, – i.e. men, women and youth including PLWD

ENVIRONMENTAL AND SOCIAL ASPECTS			
	ASPECT	**OBSERVATIONS**	**RECOMMENDATIONS/ REMARKS**
		grid. The jobs will be both direct and indirect to the community members. Indirect jobs include barber shops, saloon, phone charging, welding, eateries/hotels and IT businesses.	During consultation it was agreed that the contractor can consider the locals with specialized knowledge for skilled jobs like masonry, drivers, wielding and wiring among others
9	Effect of project on people's access to land and natural resources	There will be no effect on peoples access to land and natural resources and the lands currently not in use	None will be affected
10	Compensation to property damage	The proposed project site is vacant, and Lorengipit community did not demand any form of compensation and they voluntarily donated it for the project	Land acquisition is implemented in line with the provisions in the KOSAP RPF and the WB guidelines on Voluntary land Donation as well as KOSAP Land Acquisition strategy
11	Effects of project on incomes, land value and economic activities	Increase in incomes due to business that will be set up and existing ones will be enhanced due to access to electricity. Land value will increase Economic activities will be enhanced due to long hours of business	Educate the public on economic activities diversification due to availability of electricity
12	Public Exposure to diseases	There will be likelihood of spread of communicable diseases due to labor influx, as well as the risk of GBV/SEA and Sexual Harassment.	Sensitization and awareness creation of the public and contractor workers on impacts of labor influx including spread of communicable diseases; focus on local employment to minimize impacts of labor influx etc.
13	Occupational Health and Safety	It was observed that the project site is relatively in a rural settlement area. The site has no existing power line network. Public awareness on safety is key and hence need to be cautious when working at heights and consider recommended standards It was observed that there will be potential risk of occupational accidents and hazards during the construction and operation phases of the proposed project	The site will need to be condoned during construction; the appropriate use of PPE's will need to be observed. The Sentry house and its utilities should be secluded from the Main Substation. Sensitization and awareness on HIV/AIDs will be required for the contractors' personnel, the public and other Staff especially during the construction phase.
14	Public engagement and roles of the community/ beneficiaries	• Land donation • Participation in meeting / awareness forums • Wiring of premises • Payment of electricity connection fees • Payment of power bills • Signing of way leave consents	Continuous engagement of the public and awareness creation on roles and responsibilities of the communities.

ENVIRONMENTAL AND SOCIAL ASPECTS			
	ASPECT	**OBSERVATIONS**	**RECOMMENDATIONS/ REMARKS**
15	Community expectations	It was observed that there is need to engage and consult stakeholder at all phases of the project, to disclose information and manage community expectations. E.g. jobs, Engagement was done during screening	Public engagement be part of the project cycle because it will minimize grievances that might arise from the construction and operation of the proposed Mini Grid and improve on ownership mentality of the project.
16	Public risks to shocks and electrocution	It is possible especially during operation stage of the project	Safety awareness on the safe use of electricity
17	Public awareness on use of the service (electricity) and Public risk to shocks and electrocution	It was observed that the community has not had much interaction with electricity and they requested further education and awareness once electricity is installed.	The community and all beneficiaries of this project need awareness and training on the safe use of electricity to avoid electrocution incidents
ENVIRONMENTAL ASPECTS			
Physical Features			
18	Topography and Landscape	The topography of the proposed site is flat No scenic features of value were observed within the project vicinity.	Proper civil works will be necessary to avoid any flooding issues on site or soil erosion to the lower part as water is drained from the site. Barricading the site during excavation need to be done to ensure public safety
19	Soils	Soils on proposed site are sandy soils with moderate water retention capacity and good drainage. The soil are mixed with small rocks making water percolate easily hence no flooding anticipated	Excavated soils during foundation setting would be used in backfilling, leveling and landscaping and any excess will be disposed in NEMA approved dump sites. Proper soil and geotechnical analysis should be carried out to determine the civil works to be involved and electrical characteristics of the soil.
20	Hydrology (Surface, subsurface and Ground water)	No streams or water channels observed to be passing through site.	The proposed development should have proper landscaping to ensure no flooding issues are encountered in case of excess storms. Water Contamination should be avoided by ensuring no oil/fuel spillages throughout all the phases of the project. ESIA will elaborate on mitigation measures
21	Air quality (any Pollution issue	No environmental and air pollution noted on site except mild dust during windy periods. Some sections of the proposed site is bare hence may experience dusty conditions due to lose soils.	Watering of site during construction will be recommended since the site is near a shopping centre

ENVIRONMENTAL AND SOCIAL ASPECTS			
	ASPECT	**OBSERVATIONS**	**RECOMMENDATIONS/ REMARKS**
22	Drainage	The proposed site is flat and can flood if civil works don't factor in a proper drainage	Proper drainage and landscaping will need to be done. Storm water will need to be harvested while excess and surface runoff will be directed into a soak pit to allow for infiltration into the ground. Any water leaving the project site has to pass through a well-done drainage system
23	Proximity to Public institutions	1 Public institution was observed within the vicinity of the proposed site. Lorengipit primary school about 300Metres from site	ESIA study will establish any other institutions and advice on the mitigation measures if necessary, for harmonized co-existence.
24	Accessibility	The access road is an all-weather road in good condition and it borders the site.	It is a marked public road in good condition easily accessible during both dry and wet seasons. It boarders the proposed parcel of land to the immediate south. Acquisition of the proposed parcel of land need to take consideration of the existing road buffers before construction of the proposed Solar mini grid
Biological features			
25	Flora (vegetation including trees and shrubs)	The site currently forest with Acacia Trees and Mathenge (Prosopis Juliflora) Shrub. 	During Ground preparation the trees will be cut off and removed especially along the access road Any Open grounds of the constructed Solar Mini-grid can be planted with suitable grass and ornamental vegetation to minimize soil erosion and promote green cover.
26	Wetlands and Fish and fish habitat	No wetlands of aquatic ecosystems were observed on and or close to the proposed site	ESIA to investigate further
27	Fauna (mammals)	No wild animals were observed at the site. The area and its environs is not a known breeding site for any endangered species. The site is mainly grazing land with no natural ecosystem for wildlife habitation.	ESIA will interrogated further the existence of any wildlife in the area

ENVIRONMENTAL AND SOCIAL ASPECTS			
	ASPECT	**OBSERVATIONS**	**RECOMMENDATIONS/ REMARKS**
28	Avifauna / Birds	No migratory birds were observed on the site. The area and its environs are not a known breeding site for any endangered bird species Small birds were noted in the area including weaver and doves	Monitoring of any affected wild migratory birds will be in progress throughout the project life. ESIA study will interrogated further the existence of any wild migratory or endangered species in the area
29	Sensitive habitats	There are no special and sensitive habitat within and around the proposed site that were observed.	ESIA process will determine if any exists
30	Visibility and site intrusion	The area is relatively flat on the top and slightly slopes towards southern side. The site is adjacent residential houses and a trading centre. There will be minimal Visual intrusion.	Install proper perimeter wall fencing to minimize visual and safety impacts of the Solar mini-grid. Plant some short trees a lot the perimeter to reduce the reflective action of the solar panels
31	Protected Area	The area and its surrounding vicinity are not within a protected area under international, national or local legislation for their ecological, Landscape, cultural or other value which will be affected by the project	The EIA process will help to identify if there is any protected area during consultation with Key stakeholders. There is no known or gazetted habitat for endangered, rare, protected or special species within the site for the mini grids.
32	Features of historic or cultural importance	No historic features or archeological articles were observed on site	In case of any chance finding of the features and articles the national museum should be contacted immediately.
33	General environmental conditions	The area relatively gentle slope sloping toward the east. It has hot climatic conditions almost throughout the year. The area has stable soils and ground and thus almost no chances of landslides, but this will be conclusively determined upon soil and geotechnical surveys The vicinity of the proposed site is characterized by various vegetation type including cactus, Prosopis Juliflora and acacia trees.	As a precautionary measure the proponent should put in place appropriate mitigation measures to eliminate or minimize any adverse impacts on Environment.

Photographic illustrations of the proposed KOSAP site

Site infested with Mathenge (Prosopis Juliflora) trees and few acacia trees

Site Land demarcation and assessment in progress with Elders of the community

Loregepiti primary school about 400Metres from site

Public Consultation and engagement for proposed sites

Public Consultation and engagement for proposed sites

APPENDIX 4 ATTENDANCE SHEET_ MEETING HELD DURING LAND IDENTIFICATION PHASE

NEN

REPUBLIC OF KENYA

MINISTRY OF ENERGY

KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP).
ENVIRONMENTAL, SOCIAL SCREENING AND LAND ACQUISITION FOR PROPOSED SOLAR MINI-GRID FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS.

SITE ...LORENGIPPI MINIGRID...

MEETING VENUE...LORENGIPPI VILLAGE

DATE...15/4/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST -FOCUSSED GROUP DISCUSSIONS

No	NAME	Identification number –ID No	Mobile No.	Gender Male/Female	Village	Do you agree to donation of land Yes/no	SIGN.
1.	Nakere Alanyi	27452695		M	Lorengippi	Yes	
2.	Etabo Epoot	12435296		M	" "	Yes	
3.	Kakala Elibach	12463540		M	" "	Yes	

1

4.	Ekilola Achila		M	20285558	Lorengippi	Yes	
5.	Lokwiko Etokora		M	37679460	Lorengippi	Yes	
6.	Nanora Eyanae		M	26274400	" "	Yes	
7.	Poki Tiya Anora		M	7071267	" "	Yes	
8.	Ekoton Losiko		M	4785399	" "	Yes	
9.	Looyale Loekuma		M	40784718	" "	Yes	
10	Lochi Logilae		M	27441240	" "	Yes	
11	Ekal Eyanae		M	20524768	" "	Yes	
12	Paulo Lorengoi		M	28632862	" "	Yes	
13	Lokukoi Ekai	0711723604	M	22573111	" "	Yes	
14	Ekal Loetom		M	9672471	" "	Yes	
15	Simon Lopiran		M	24820691	" "	Yes	
16	Ekuwom Lokorikan		M		" "	Yes	
17	Ngikasukou Eyenae		M		" "	Yes	
18	Ekeru Iburon		M		" "	Yes	

2

19	Michael Lomuya	0704484962	85866944	M	Lorengipi	Yes	~~T~~
20	Naukot Ekulan			M	Lorengip	Yes	
21	Elim Lopeyen			M	Lorengipp	Yes	
22	Eketoe Elim			M	Lorengippi	Yes	
23	Evangae Nanokon		27117920	M	" "	Yes	
24	Paul Lochap		21409578	M	" "	Yes	
25							
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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.

SITE LORENGIPPI MINIGRID

MEETING VENUE LORENGIPPI VILLAGE

DATE 18/4/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST -FOCUSSED GROUP DISCUSSIONS

No	NAME	Identification number –ID No	Mobile No.	Gender Male/Female	Village	Do you agree to donation of land Yes/no	SIGN.
1.	Paulina Lagumale	—	—	F	Lorengippi	Yes	
2.	Mary Lowoya	—	0768428821	F	Lorengippi	Yes	
3.	Elizabeth Namurung	20809137	—	F	Lorengippi	Yes	

4.	Napokos Longoria	11513733	—	F	Lorengippi	Yes	
5.	Aregae Ebekan	21155837	—	F	Lorengippi	Yes	
6.	Nakulan Ekal	30308736	—	F	Lorengippi	Yes	
7.	Lokike Aritong	3141630821	—	F	Lorengippi	Yes	
8.	Chepongipongi Cholongosia	7683657	—	F	Lorengippi	Yes	
9.	Eregae Ngiperol	7072332	—	F	Lorengippi	Yes	
10	Amojong Ipapa	27432163	—	F	Lorengippi	Yes	
11	Ewesit Logiel	32141192	—	F	Lorengippi	Yes	
12	Ngiperok Achuka	27485 25 48	—	F	Lorengippi	Yes	
13	Maggret Atir	0144897	—	F	Lorengippi	Yes	
14	Namon Achuka	20847649	—	F	Lorengippi	Yes	
15	Ekutan Ekal	13648441	—	F	Lorengippi	Yes	
16	Lochuch Lokoriger	26585854	—	F	Lorengippi	Yes	
17	Ikal Lochoro	26391371	—	F	Lorengippi	Yes	
18	Achumae Longolarmoe	27452258	—	F	Lorengippi	Yes	

19	Ngitura Ekal	27452416	—	F	Lorengippi	Yes	
20	Kaamay Nachipon	12435415	—	F	Lorengippi	Yes	
21	Nauseei Lolupala	20982156	—	F	Lorengippi	Yes	
22	Akitela Edoore	20861691	—	F	Lorengippi	Yes	
23	Botrice Ikalale	22665137	0720706955	F	Lorengippi	Yes	
24	Eraan Alinga	—	—	F	Lorengippi	Yes	
25	Nabenyo ayangan	30826160	—	F	Lorengippi	Yes	
26	Imoni Awalan	—	—	F	Lorengippi	Yes	
27	Melvin Nakary	—	—	F	Lorengippi	Yes	
28	Ngitapar Ekiru	—	—	F	Lorengippi	Yes	
29	Helvina Lorot	—	—	F	Lorengippi	Yes	
30	Adipo Ekuwom	25472350	—	F	Lorengippi	Yes	
31	Nasipan Nangolia	33036551	—	F	Lorengippi	Yes	
32	Logum Lokuruka	20526371	—	F	Lorengippi	Yes	
33	Dorothy Kaguveria	24678685					

YOU28

REPUBLIC OF KENYA

MINISTRY OF ENERGY

KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP).
ENVIRONMENTAL, SOCIAL SCREENING AND LAND ACQUISITION FOR PROPOSED SOLAR MINI-GRID FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS.

SITE ..LORENGIPPI MINIGRID.....

MEETING VENUE..LORENGIPPI VILLAGE

DATE....15/4/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST -FOCUSSED GROUP DISCUSSIONS

No	NAME	Identification number –ID No	Mobile No.	Gender Male/Female	Village	Do you agree to donation of land Yes/no	SIGN.
1.	EDUNG JOTUR	34340458	0795975069	M	LORENGIPPI	YES	
2.	ALETIA KARENGA	32156131	0720136853	M	11	YES	
3.	ANDREW JOPEM	37679013	0758400582	M	11	YES	

4.	BENARD KALLENG	24743433	0718036009	M	U	Yes	
5.	JOHN TORENG	26351839	0707890970	M	U	Yes	
6.	AMERU JINET	36887447	0701127342	F	U	Yes	
7.	PIUS YOYI	37708773	0711665232	M	U	Yes	
8.	JULIA NAJI	38424813	0799915911	F	U	Yes	
9.	THOMAS TOROT	37153104	0745296175	M	U	Yes	
10	EDONGA ECHOTO		0705661736	M	U	Yes	
11	DAVID JOSIKE	37315057	0793792278	M	U	Yes	
12	JOSEPH TOPETOK	22779871	0715675868	M	U	Yes	
13	FLORENCE TOMALI	31420043	0740042213	F	U	Yes	
14	JEREMIAH JOSIKE	31958624	0715143744	M	U	Yes	
15	JAFRED GALGALO	32031923	0797289146	M	U	Yes	
16	MOSES LOTELEI	37384169	0745414126	M	U	Yes	
17	FRANCIS LOWOI	13648416	0705367560	M	U	Yes	
18	NICHOLAS KEAPAH	37384171	0745713616	M	U	Yes	

19	LOMONGIN LOKOEL	32476201	0701473462	M	"	Yes	
20	LUCAS EREGAE	21346524	0745817819	M	"	Yes	
21	EREGAE LOKUMA	26389271	0748090078	M	"	Yes	
22	LOTER LOPARAN		0743844379	M	"	Yes	
23	NANCY EKAI	26247543	0717302711	F	"	Yes	
24	ANJELINE LOMUKUNY	26390143	0706732969	F	"	Yes	
25	LILIAN AKENO	32102935	0714143929	F	"	Yes	
26	JAMES EDAPAL	32102844	0710804504	M	"	Yes	
27	ATABO EBEKAN	25664896		F	"	Yes	
28	WILBERFORCE ELIM	34296034	0721105384	M	"	Yes	
29							
30							
31							
32							
33							

REPUBLIC OF KENYA

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KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP).
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SITE ..LORENGIPI MINIGRID.....

MEETING VENUE..LORENGIPI VILLAGE

DATE.....18/4/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST

No	NAME	Identification number –ID No	Mobile No.	Gender Male/Female	Village	Do you agree to donation of land Yes/no	SIGN.
1.	GEORGE KOSGEI	26777049	0728082745	M			
2.	SAMUEL MBUGUA	22288101	0720956314	M			
3.	CONSOLATA HONGO	10843185	0722933281	F			

4.	Esinyen E- Moses	28755229	0729420901	M	Lorengippi		[signature]
5.	LOMEYAN EKOI	12907007	0729069644	M	Lorengippi	YES	[signature]
6.	MARY IKOLOM	12952458	07	F	Lorengippi	YES	[signature]
7.	Lomunyenkhu			M	Lorengipp	Yes	[thumbprint]
8.	Peter Ekai			M	Lorengipp	Yes	[thumbprint]
9.	Lokol Lomunyoka		0768235232	M	〃 〃	Yes	[signature]
10	Lomusimoe Ekai	26809467	0707062836	M	〃 〃	Yes	[signature]
11	Doudi Lomsekon	31411432	0702497909	M	〃 〃	Yes	[signature]
12	Dismas Lopiki		0758557379	M	〃 〃	Yes	[signature]
13	JOSEPH LOPEYOK	22779871	0715675868	M	〃	Yes	[signature]
14	GILBERT KAAPUS	26317408	0703919787	M	〃	Yes	[signature]
15	LOTUR EDUNG	34340458	0795975069	M	〃	Yes	[signature]
16	SELINA LONYAMAN	32019118	0797254039	F	〃	Yes	[signature]
17	TITUS APORON	38967364	0714774142	M	〃	Yes	[signature]
18	LONGOH SELINA	01484501	0795568209	F	〃	Yes	[signature]

2

19	Robert Ekusi Tuka	39079796	0720107881	M	Lorengipe	Yes	robert
20	Kulal Ekal			M	〃 〃	Yes	
21	EREGAE LOKUMA	26389271	07	M	〃 〃	Yes	
22	ERUKUDI EKAI	22573111	0711723604	M	〃 〃	Yes	[illegible]
23	TUMBO EKGOR	47782192		M	〃 〃	Yes	[illegible]
24	Nicolas Kombo	12435407	0708309983	M	〃 〃	Yes	[illegible]
25	KOKOI NAMONGIN	35486167	07	M	〃 〃	Yes	[illegible]
26	Lowapele Lochuman	47884718	0798989883	M	〃 〃	Yes	
27	Lochi Logilae	27441240		M	〃 〃	Yes	
28	Aleper Lowoto			M	〃 〃	Yes	
29	Longoh Akol			M	〃 〃	Yes	
30	Audan Ekeya			M	〃 〃	Yes	
31	David Loyanae			M	〃 〃	Yes	[illegible]
32	John Nadiko	10125050	0708964409	M	〃 〃	Yes	[illegible]
33	Elim Ekeroi			M	〃 〃	Yes	

3

34	Ekeno Lokiruruka	9672805		M	Lokoreengipi #04	Yes	
35	Naukot Ekaalan			M	" "	Yes	
36	Erengae Lowoi	26486086	0740662510	M	" "	Yes	
37	Yoki Tiya		0757127967	M	" "	Yes	
38	Meriki Yoki Tiya	27102753		M	" "	Yes	
39	Simon Lopirin	22027755		M	" "	Yes	
40	Ekal Lochom	9672871		M	" "	Yes	
41	Paulo Lorowoi	25632863		M	" "	Yes	
42	Lonehoh Eyanae			M	" "	Yes	
43	Mark Ilikurel	21801755		M	" "	Yes	
44	Ekai Lonok			M	" "	Yes	
45	Lokorio Nakatwan	26249808		M	" "	Yes	
46	Ewoton Losike	40785399		M	" "	Yes	
47	Loriu Naut			M	" "	Yes	
48	Lokidor Naro			M	" "	Yes	

49	JOHN LoRengi	26351839	0707890970	M	LoRongiAA	yes	
50	Regina Nachipon	11513709		F	〃 〃	Yes	
51	Lolkuwoi Ekali	32051258		F	〃 〃	Yes	
	Cecilia Ebongon	26351824		F	〃 〃	Yes	
	Selvin Lokol	37665171	07967443636	F	〃 〃	Yes	
	JOHN EDUNG	35814598	07982433964	M	〃 〃	Yes	
	Stellah ADIAKA	39075671		F	〃 〃	Yes	
	NAKOROD AKERU	8598381		F	〃 〃	Yes	
	Ekal ENGOR	47784657		M	〃 〃	Yes	
	AMURIA ESEYE	26247549		F	〃 〃	Yes	
	LOCHOMIN ILANY	9527223		M	〃 〃	Yes	
	PAULINA NEHILLA	47855969		F	〃 〃	Yes	
	EKUOM EKAL	47974783		M	〃 〃	Yes	
	PATRICIA AKENO	26389483		F	〃 〃	Yes	
						Yes	

5

REPUBLIC OF KENYA

MINISTRY OF ENERGY

KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP).
ENVIRONMENTAL, SOCIAL SCREENING AND LAND ACQUISITION FOR PROPOSED SOLAR MINI-GRID FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS.

SITE ..LORENGIPPI MINIGRID.....

MEETING VENUE..~~LORENGIPPI~~ VILLAGE

DATE..18/4/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST

No	NAME	Identification number –ID No	Mobile No.	Gender Male/Female	Village	Do you agree to donation of land Yes/no	SIGN.
1.	Thomas Lorot	37311584	0745296175	M	Lorengippi	Yes	~~Thomas~~
2.	Emmanuel Lokotela	22475276	0728704014	M	Lorengippi	Yes	~~Emmanuel~~
3.	Mary Lowoya	—	0708428821	F	Lorengippi	Yes	~~Mary~~

4.	Julia Kaapis	26249746	—	F	Lorengippi	Yes	
5.	Akoru Ikaruon	36387447	—	F	Lorengippi	Yes	~~Zack~~
6.	Ebenyo Ekuchuo	13648408	—	F	Lorengippi	Yes	
7.	Paulina Ingolan	27452239	—	F	Lorengippi	Yes	
8.	Cecilia Auran	—	—	F	Lorengippi	Yes	
9.	Akaran Ekaal	20741735	—	F	Lorengippi	Yes	
10	Egiron Alany	9692916	—	F	Lorengippi	Yes	
11	Margaret Aleman	8586025	—	F	Lorengippi	Yes	
12	Achaat Lokala	4784465	—	F	Lorengippi	Yes	
13	Etoot Auda	—	—	F	Lorengippi	Yes	
14	Ajukon Emase	—	—	F	Lorengippi	Yes	
15	Atabo Lokala	95297258	—	F	Lorengippi	Yes	
16	Napokamae Sora	10122561	—	F	Lorengippi	Yes	
17	Nayenae Natubwa	20267754	—	F	Lorengippi	Yes	
18	Natop Naro	27497361	—	F	Lorengippi	Yes	

19	Anna Arupe	11513706	—	F	Lorengippi	Yes	
20	Longoroko Loring	—	—	F	Lorengippi	Yes	
21	Leakol peelo	—	—	F	Lorengippi	Yes	
22	Lokoton Epuyo	—	—	F	Lorengippi	Yes	
23	Aitia Akai	—	—	F	Lorengippi	Yes	
24	Betty Lokeno	32102212	—	F	Lorengippi	Yes	
25	Nakuruka Lokeya	37668255	—	F	Lorengippi	Yes	
26	Erogge Lokui	26487693	—	F	Lorengippi	Yes	
27	Akadeil Aruoto	27555811	—	F	Lorengippi	Yes	
28	Asuguru Ewesit	—	—	F	Lorengippi	Yes	
29	Arcella Lokuoi	—	—	F	Lorengippi	Yes	
30	Alepar Kiyonga	—	—	F	Lorengippi	Yes	
31	Esuron Edoma	7071132	—	F	Lorengippi	Yes	
32	Ngisitepe Ekiru	26159981	—	F	Lorengippi	Yes	
33	Chepongipenya Cholongoria	70833657	—	F	Lorengippi	Yes	

34	Claudina Logumale	27441553	—	F	Lorengipi	Yes	
35	Akai Lokatosat	8596804	—	F	Lorengipi	Yes	
36	Irene Lesiko	32968578	—	F	Lorengipi	Yes	
37	Iperit Lothegur	4782620	—	F	Lorengipi	Yes	
38	Aramai Ekiru	27497375	—	F	Lorengipi	Yes	
39	Muigai Kariu	14421675		M		Y	
40	Dorothy Kaguiria	24678685					
41							
42							
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REPUBLIC OF KENYA

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MEETING VENUE..LORENGIPPI VILLAGE

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LIST OF ATTENDANCE/PARTICIPANTS LIST

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1.	Samwel Ida	29825107		M			
2.	Jones Masige	24333538	0724217128	M		Yes	
3.	DOMINIC EKENO	4782491	0715991370	M	SOWETO	YES	

	NAME	ID. NO	Mobile No	Gender	Village	Both agree donation Edung Yes/No	SIGN
4.	LOROT EKISON	12905294	0707495144	M	Lorengippi	Yes	
5.	Asekon Nakiru	—	—	F	Lorengippi	Yes	
6.	Adipo Nangisa	—	—	F	Lorengippi	Yes	
7.	Ataba Nakusa	33777708	—	F	Lorengippi	Yes	
8.	Lonyaman Elubach	32988390	—	F	Lorengippi	Yes	
9.	Erogae Ekadeli	31609409	—	F	Lorengippi	Yes	
10	Edung Loiton	—	—	F	Lorengippi	Yes	
11	Amarat Iripon	—	—	F	Lorengippi	Yes	
12	Komol Asekon	—	—	F	Lorengippi	Yes	
13	Eroka Lokitela	—	—	F	Lorengippi	Yes	
14	Nayanae Nataide	—	—	F	Lorengippi	Yes	
15	Sike Lokuruke	—	—	F	Lorengippi	Yes	
16	Erogae Ngipeyok	—	—	F	Lorengippi	Yes	
17	Ayanae Ekuwam	—	—	F	Lorengippi	Yes	
18	Arupe Lopeyok	—	—	F	Lorengippi	Yes	

19	Narot Awoton	—	—	F	Lorengippi	Yes	
20	Logilai Lomulon	—	—	F	Lorengippi	Yes	
21	Echom Etole	—	—	F	Lorengippi	Yes	
22	Amana Longomo	—	—	F	Lorengippi	Yes	
23	Lokamar Aporon	—	—	F	Lorengippi	Yes	
24	Abei Adupa	—	—	F	Lorengippi	Yes	
25	Selina Elibach	—	—	F	Lorengippi	Yes	
26	Amuria Lorukudi	—	—	F	Lorengippi	Yes	
27	Ariqae Ebekan	21155037	—	F	Lorengippi	Yes	
28	Elizabeth Namury	9245135	—	F	Lorengippi	Yes	
29	Alinga Lopeyo	27432414	—	F	Lorengippi	Yes	
30	Amuria Kiyonga	26368581	—	F	Lorengippi	Yes	
31	Selina Asekon	7071165	—	F	Lorengippi	Yes	
32	Naluk Adukon	85929776	—	F	Lorengippi	Yes	
33	Lomoja Mutia	39166130	—	F	Lorengippi	Yes	

34	Alimlim Logeumè	—	—	F	Lorengippi	Yes	
35	Amojong Ipapa	27432163	—	F	Lorengippi	Yes	
36	Nalebéi Ekileu	—	—	F	Lorengippi	Yes	
37	Lokde Losuru	—	—	F	Lorengippi	Yes	
38	Florence Lomalé	—	—	F	Lorengippi	Yes	
39	Asinyen Lasike	32112055	—	F	Lorengippi	Yes	
40	Ewoton Lokamsa	—	—	F	Lorengippi	Yes	
41	Tiya Kiditen	—	—	F	Lorengippi	Yes	
42	Nasinyen Edasal	—	—	F	Lorengippi	Yes	
43	Ao Lowoi	32981248	—	F	Lorengippi	Yes	
44	Ewesit Logiel	32141192	—	F	Lorengippi	Yes	
45	Ekwangia Ewoi	—	—	F	Lorengippi	Yes	
46	Edung Amoyo	—	—	F	Lorengippi	Yes	
47	Brisilly Nachuru	—	—	F	Lorengippi	Yes	
48	Ikali Lochuro	—	—	F	Lorengippi	Yes	

49	Margrot Ekuwa	—	—	F	Lororgippi	Yes	
50	Akitela Lokorodi	—	—	F	Lorogippi	Yes	
51	Lydia Ekal	37665019	0793792340	F	Loriengippi	Yes	

5

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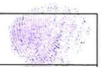
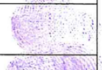
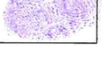
1.	BONFACE KARENGA	32156131	0720136855	M	LORENGIPPI	YES	
2.	MICHAEL LEMUYA	8586634	0704484967	M	NAKURU	YES	
3.	EKAMAIS EDIDOR	26389157	0712976151	M	LORENGIPPI	YES	

	N	ID	HN	G	V	Y	S
19	NAPEYOK LOPETA	26315367		F	11	Yes	
20	ERAGAE NAWOKON	27117920		M	11	Yes	
21	AUREN IMANA	12908286		F	11	Yes	
22	LONGECHEL IPAPA	20537761		M	11	Yes	
23	LUKEUN NANGOLEO	21643311		F	11	Yes	
24	JACINTA LOKWANI			F	11	Yes	
25	KOLOK LOSIKE	26274652		F	11	Yes	
26	LOKALE LODUNG	7070707		F	11	Yes	
27	ASINYEN LOKAI			F	11	Yes	
28	AREGAE LOKAI			F	11	Yes	
29	BENARD KALLENG	24743433		M	11	Yes	
30	KOOLE EWOTON	20401825		F	11	Yes	
31	TITUS EWOI			M	11	Yes	
32	WILLIAM NAKERE	32122838		F	11	Yes	
33	EMITELA ACHILLA	20285556		M	11	Yes	

		ID	N	K	V	Y	S
4.	LOCHILIA EWOI	25663162	0718954043	M	LORENGIPPI	YES	
5.	NANG'OLE EMAALE	26473068	0748996753	M	〃	Yes	
6.	LOPETOCK EKIDOR	26506409	0700704969	M	〃	YES	
7.	FRANCIS LOWOI	13648496	0705367560	M	〃	Yes	
8.	MARK LOKOMOL	32105336	07	M	〃	YES	
9.	FRANCIS LOWOI NAMUS	32102322	0768996072	M	〃	Yes	
10	AKAAL PERAE	8598198		F	〃	Yes	
11	JOSEPH LOH	30834161		M	〃	YES	
12	SYLVESTER NAMOE	23481504	0792430917	M	〃	Yes	
13	LOREGAE LOWAKORI			M	〃	Yes	
14	AKUWOM EKOTO	7477427		M	〃	Yes	
15	MERINYANG EKIRU	11512120		M	〃	Yes	
16	KORIANG LOPETA	4784524		F	〃	Yes	
17	LONGOLE MUYA	29676944		M	〃	Yes	
18	NGIRO EMORU			M	〃	YES	

34	VAKALA ELIBACH	12435407		M	11	yes		
35	AREGAE EKUTAN	27454147		F	11	yes		
36	FREDRICK ESEON	30437264	0726367152	M	11	yes	Fredrick	
37	LEAH EDUR	29812167	0795877477	F	11	yes		
38	ETANAE SOTO	38951639		M	11	yes		
39	NGITORA EMAI	27842418		F	11	yes		
40	ADODOI JOBUIN	26315302		F	11	yes		
41	ALIPAN JOBUIN	47957732		F	11	yes		
42	AREGAE LOMOI	26486086		F	11	yes		
43	MARET EDAPAL	26505370		F	11	yes		
44	ARUPE EMIRU	32122445		F	11	yes		
45	ILIMWEL NOSPIR	32029258		F	11	yes		
46	NAKOROI ENKOIAT	32029249	0758760878	F	11	yes		
47	NATABA EKUSI	37660785		F	4	yes		
48	CECILIA EKUSI			F	11	yes		

49	LOCHI LOWOTO	2635'9765		F	11	Yes	
50	AMITELA EWOTON	26505491		F	11	Yes	
51	INGOLAN ESEKON	25672286		F	11	Yes	

APPENDIX 5 ABBREVIATED RESETTLEMENT ACTION PLAN (A-RAP)

1. Lorengippi Sub-project Site

The Lorengippi sub-project site is on unregistered community land. It is relatively flat with minimal vegetation cover. The proposed site is uninhabited, has no structures, community facilities, or encumbrances and is utilized by the community for livestock grazing. The community agreed for the project to utilize 1.2626 hectares for the mini grid.. Consultations leading to the identification and selection of the sub-project site are captured in the Lorengippi Environmental and Social Screening report. *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 20000 (approximately 1850 households). The land acquisition-related impacts are loss of land and pasture. Mitigation measures include in-kind compensation for loss of land and pasture, and designing power distribution lines to avoid impacting trees, crops, structures, and community facilities. No physical displacement is anticipated; however, there is minimal loss of pastures occasioned by the acquisition of land utilized by the community for grazing. . The 1.2626 hectares identified for the sub-project will be acquired compulsorily by the National Land Commission (NLC). The proposed site will be valued and compensated in line with the provisions of the Resettlement Policy Framework (RPF) prepared under KOSAP. *Refer to section 2.2 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 Lorengippi community requested for the improvement of water provision services. The value of the priority community project will be proportional to or higher than the value of land under acquisition. In addition, loss or damage to crops, trees, structures, and community facilities will be compensated in line with the provisions of the RPFand as summarized in the entitlement matrix below.

3.1 Entitlement Matrix

Types of Impact	Person(s) Affected/Eligible for Compensation	Compensation/Entitlement/Benefits	Responsible organization
1. Loss of Land			
Loss of unregistered community land.	Community.	Compensation in-kind as prioritized by the community.	REREC
Loss of land in unregistered group ranches.	Group ranch members.	Compensation in-kind as prioritized by the community.	
Loss of land in registered group ranches.	Group ranch members.	Compensation in-kind as prioritized by the community.	
Loss of land owned by the National Police, county governments and the Ministry of Interior	Government agencies.	No compensation for public land allocated to another government body.	
Loss of land owned by the Kenya Forest Service (KFS) and Kenya Wildlife Service (KWS).	Government agencies.	No compensation for public land allocated to another government body. However, payment of conservation fees to KWS and KFS as stipulated under their respective regulations is foreseen.	
2. Loss of Use on Land			
Loss of use on public land (e.g., grazing, farming etc.).	Communities utilizing public land.	Communities do not own public land; however, they utilize public land with consent from the relevant agencies. The project will implement the infrastructure project prioritized by the community as compensation for the loss of public land use.	REREC
Loss of use on unregistered community land, unregistered group ranches and registered group ranches (e.g., grazing, farming etc.).	Communities utilizing unregistered community land, unregistered group ranches, and registered group ranches.	Compensation in-kind as prioritized by the community.	
3. Loss of /Damage to Assets on Land			
Trees	Community members on	During detailed design for power distribution lines and construction of the	REREC
Crops			

Structures	unregistered community land; community members utilizing public land; members of registered and unregistered group ranches and government entities.	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,[1] in line with the provisions of the RPF.	
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.

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

Figure 1:

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

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 Lorengippi 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
March 18th 2021	Environmental and Social Screening. Voluntary land donation (VLD). Constitution of the Locational Grievance Redress Committee (GRC).	Ministry of Energy (MoE) Rural Electrification and Renewable Energy (REREC) Kenya Power (KPLC)	Site identification and land allocation for the sub-project. Criteria for VLD. Community entitlements (forms of compensation and implications for each).	What percentage in terms of workers will be given to the community? Land acquisition process, there a place for land compensation. Will there be compensation of land and in case not what happens to the money allocated for that purpose.	There is compensation land in this pr since no money been allocated the compensati Job opportunity community wil given the priority and those skills w are not within community wil out sourced.
				I would like to know whether land will be purchased.	Thank you much. As discu in the plenary don't intend at buy land, Act that's the reason we are to ask you as community to k donate land successful implementation the project.
February 4th 2022	Environmental and Social Impact Assessment.	Consultants MoE REREC KPLC	Land acquisition through compulsory acquisition (not voluntary land donation).	Community requested for the improvement of water provision services.	The proponent set aside KES million to imple the priority in compensation project.

			Selection of three priority community projects, whereby one is to be implemented as in-kind compensation for land.		The value of project will proportional to greater than value of land. NLC will deter the value of lan
May 2023	Compulsory Land Acquisition.	NLC	Site inspection and inquiries. Land valuation. Award of compensation.		

5. Institutional Responsibility for Implementation of the ARAP

Entity	Role
Ministry of Energy	• Coordinate A-RAP implementation and provide budget for in-kind compensation.
National Land Commission	• Implement the statutory process for compulsorily land acquisition, including site gazettement and inspections, inquiries, valuation, and award of compensation.
REREC	• Monitor all land acquisition and compensation aspects (including A-RAP closure), complemented by a third-party monitor. • Provide budgets for stakeholder engagement, grievance management, and monitoring, including the facilitation of the Land Acquisition and Compensation Implementation Committee, and the Grievance Redress Committee.
Mini-grid Contractor	• Implement in-kind compensation concurrently with the solar mini-grid project.
Supervising Consultant	• Monitor and report on implementation of in-kind compensation, and overall project compliance with social safeguards.
Grievance Redress Committees	• Formed at the locational, county, and national levels, and responsible for resolving complaints, including A-RAP related grievances.
A-RAP Implementation Committee	• Coordinate A-RAP engagements at the community level, monitoring A-RAP implementation and closure.
Affected Community	• Responsible for the operation and maintenance (O&M) of in-kind compensation project. An agreement stipulating the O&M roles and responsibilities of the community will be effected.

6. Procedures for Grievance Redress

The Project procedures for grievance redress were established through a public consultation process and informed by the existing conflict resolution structures in the community. The Grievance Redress Mechanism (GRM) comprises tiers at the project, county, and national levels. *Refer to Chapter 6 of the ESIA for a detailed GRM.*

7. Implementation Timetable and Budget for the ARAP Implementation

7.1 Timelines

The proponent will commission the community project by May 25th, 2025, before operationalizing the mini-grid. The mini-grid contractor will implement the mini-grid and the community project simultaneously. The Supervision Consultant and IAs will implement a commitment register to ensure the mini-grid contractor can achieve the agreed-upon milestones. The register will be complete with clear and practical timebound indicators, which can be monitored by all parties – the PAPs, IAs, the Ministry, third-party monitor, and the Bank.

7.2 Budget

The proponent has set aside KES 1 million for the community project (budget captured in the ESMP). The compensation award from NLC and the Bill of Quantities will inform the final cost of the community project. The costs for in-kind compensation, stakeholder engagement, grievance management (including the facilitation of the GRCs and the A-RAP Implementation Committee), and monitoring are covered under the project.

APPENDIX 6: NEMA FIRM OF EXPERTS LICENCE AND LEAD EXPERT LICENSE

FORM 7 (r.15(2))

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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

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in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **12/30/2022** Expiry Date: **12/31/2023**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001 BUREAU VERITAS Certification UKAS

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/18279

Application Reference No: NEMA/EIA/EL/23951

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Issued Date: **12/30/2022** Expiry Date: **12/31/2023**

Signature.....

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The National Environment Management Authority

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ISO 9001:2015 Certified