MINISTRY OF ENERGY AND PETROLEUM
Nairobi
Republic of Kenya

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

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

Comprehensive Project Report (CPR) FOR THE PROPOSED KOKURO OFF-GRID SOLAR PROJECT AT COORDINATES 04°40'05.0"N 35°42'46.1"E

2023

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

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CERTIFICATION

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

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

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LIST OF ACRONYMS

ACRONYM	DEFINITION
ADR	Alternative Dispute Resolution
AoI	Area of Influence
CBOs	Community Based Organizations
CoK	Constitution of Kenya
CDI	County Development Index
CEMP	Construction Environmental Management Plan
CGRCs	County Grievance Redress Committees
CRA	Commission on Revenue Allocation
CSR	Customer Social Responsibility
CIDP	County Integrated Development Plan
CPS	Country Partnerships Strategy
DOSHS	Directorate of Occupational Safety and Health Services
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EPRA	Energy Petroleum Regulatory Authority
EPT	Energy and Petroleum Tribunal
EPRA	Energy and Petroleum Regulatory Authority
ESI	Electrical Supply Industry
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management Systems
EMCA	Environmental Management and Coordination Act
EMF	Electromagnetic Field
FGD	Focus Group Discussions
GDC	Geothermal Development Company
GoK	Government of Kenya
HDPE	High Density Poly Ethylene
IAs	Implementing Agencies
IPPs	Independent Power Procedures
IPs	Indigenous Peoples
JV	Joint Venture
KETRACO	Kenya Electricity Transmission Company
KII	Key Informant Interviews
KOSAP	Kenya Off-Grid Solar Access Project
KPLC	Kenya Power and Lighting Company
LEP	Labour and Employment Plan
LGRCs	Local Grievance Redress committee
MGs	Mini Grids
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
SERC	Standards and Enforcement Review Committee
SHS	Solar Home Systems
SIA	Social Impact Assessment
SOP	Safe Operation Procedure
STDs	Sexually Transmitted Diseases
STI	Science, technology and innovation
SMMP	Social Management and Monitoring Plan
ToR	Terms of Reference
VMGF	Vulnerable and Marginalised Groups Framework
VMGs	Vulnerable and marginalized groups
VMGP	Vulnerable and Marginalised Group Plan
WB	World Bank
WMP	Waste Management Plan
WRA	Water Resources Authority

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EXECUTIVE SUMMARY

E-1- Introduction and Project Brief

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

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

In Turkana County, one of the target counties, the Proponent is proposing to develop 23 No. mini grid facilities including Kokuro 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 Kokuro 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 Kokuro 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 major soil types in the county are tertiary volcanic soils. They contain hard erosion resistant basalts and are usually softer. The soil in the project area is skeletal soil i.e., they are rocky, shallow and stony and contains gravel and sand. The high concentration of sand in the soil makes it to quickly drain excess water and cannot hold significant amounts of water or nutrients for plants. The soils in the project area are not suitable for crop farming.
Kokuro has drought tolerant *flora* tree species *(Acacia spps including Vachellia reficiens and Commiphora Spps, Balanites aegyptiaca, Azadirachta indica (Mwarobaini), Salvadora persica)* and gum tree. The *Fauna*: include the somali ostriches, antelopes, dik-dik, Avian Spps (Kite, Heron, Sacred Bird and Marabou Stork). The area's ecological conditions are influenced by the soil type, altitude, vegetation, rainfall pattern and human activities. As like the rest of the county, Kokuro is a semi-arid area falling in the ecological zone V-VI. The county receives an average of rainfall of 240 mm per year. The rainfall is usually erratic and short making it unfavorable for vegetation growth

E-6 Project Description

The Kokuro Mini Grid project aims to provide electricity to approximately 326 residential and 10 nonresidential consumers in Kokuro Village, Lopur Ward in Turkana County. The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity. A Low Voltage Power Distribution Network will be established to distribute the power to customers. The estimated cost of the project is around USD 417,391.77 although this amount may change as more detailed plans are developed.

The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity. A Low Voltage Power Distribution Network will be established to distribute the power to customers. The project utilizes solar panels with a total capacity of 120 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 300 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 82 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 120 kW solar PV inverter is used to convert the direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use.

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

To develop the Mini Grid, approximately 1.215 hectares of land will be compulsorily acquired by NLC. This land is part of the community's designated public purposes area. The Proponent engaged with the community during the land acquisition process, and there were no objections to transferring 1.215 hectares of land to(REREC) for the management of the solar mini-grid. In accordance with the World Bank's

Operation Procedure 4.12 on Involuntary Resettlement, an abbreviated Resettlement Action Plan (A-RAP) was prepared, outlining the principles and procedures for land acquisition and compensation. This plan is annexed to the project report.

E-7 Project Alternatives

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

E-8 Stakeholder Engagement

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

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

During the ESIA stakeholder engagement public meeting, which took place on January 19th, 2022, a total of 140 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 employment opportunities available, on the reliability of the solar power and the distance to be covered by the project, The study team addressed these concerns by assuring stakeholders that that the project encourages the participation and empowerment of the community regardless of gender and age, both skilled and non-skilled based opportunities will be available and that the proponent in conjunction with the contractor will manage the project and ensure that the power is reliably and equally availed to all the PAPs.

E-9 – Impacts and Mitigation Measures

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

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

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

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

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

Table 0-1: Summary of Pre-construction Impacts

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

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

Impact	**Pre-construction**	**Construction phase**	**Decommissioning phase**
Impacts on Local Economy and Employment	Not Applicable	Positive	Positive
Change in land use	Not Applicable	Moderate	Positive
Site rehabilitation	Not Applicable	Not Applicable	Positive
Topography	Not Applicable	Minor	Not Applicable
Soil environment	Not Applicable	Minor	Minor
Air Quality	Not Applicable	Moderate	Moderate
Ambient noise	Not Applicable	Minor	Minor
Visual intrusion and change in landscape	Not Applicable	Minor	Positive
Waste generation and soil contamination	Not Applicable	Minor	Minor

Impact	Pre-construction	Construction phase	Decommissioning phase
Impact on water environment	Not Applicable	Minor	Not Applicable
Impacts from hazardous materials	Not Applicable	Minor	Not Applicable
Fire hazards	Not Applicable	Moderate	Minor
Impacts of construction material sourcing	Not Applicable	Moderate	Not Applicable
Energy consumption	Not Applicable	Negligible	Not Applicable
Occupational safety and health	Not Applicable	Moderate	Moderate
Community safety and health	Not Applicable	Moderate	Moderate
Labor influx	Not Applicable	Minor	Minor
Child labor	Not Applicable	Minor	Negligible
Cultural heritage	Not Applicable	Minor	Not Applicable
Gender based violence, SEA and SH	Not Applicable	Minor	Minor
Exclusion of VMGs, Vulnerable individuals and households	Not Applicable	Major	Major
Risk of communicable diseases	Not Applicable	Minor	Minor
Increased water demand	Not Applicable	Negligible	Negligible
Forced labor	Not Applicable	Minor	Negligible
Acquisition of land and wayleaves	Minor	Not Applicable	Not Applicable

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

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

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

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

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

For the mitigation measures to be successful, it is imperative that REREC 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. Turkana county was identified as one of the underserved Counties and others include Mandera, Narok, Garissa, Tana River, Samburu, Isiolo, Marsabit, West Pokot, Taita Taveta, Turkana, Kilifi and Lamu.

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

KOSAP directly promotes the achievement of these objectives by supporting the use of solar and clean cooking Solutions to drive electrification of households (including host communities), enterprises, community facilities, and water pumps in 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 as 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. They present profound infrastructure deficits, including lack of access to roads, electricity, water, and social services. There is also significant insecurity in certain areas, giving rise to substantial numbers of displaced persons and livelihood adaptations that further undermine economic prosperity.

1.1 Context

This ESIA report has been prepared based on Site visit baseline survey, desktop survey, documentation review, consultation with stakeholders and in accordance Environmental Management and Coordination (Amendment) Act, 2015 and World Bank's Environmental and Social Safeguards. The study has also assessed the requirement of the project with respect to the local and national regulations relevant to the project.

Norken International Limited in Joint Venture with Centric Africa Limited were appointed by Ministry of Energy to undertake consultancy services for the Environmental and Social Impact Assessment (ESIA), Social Assessment (SA) and Vulnerable and Marginalized Groups Plan (VMGP) as per the standard TOR and NEMA and WB ESS. As reported, land acquisition has not resulted in any economic or physical displacement and no resettlement is envisaged for the proposed project.

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

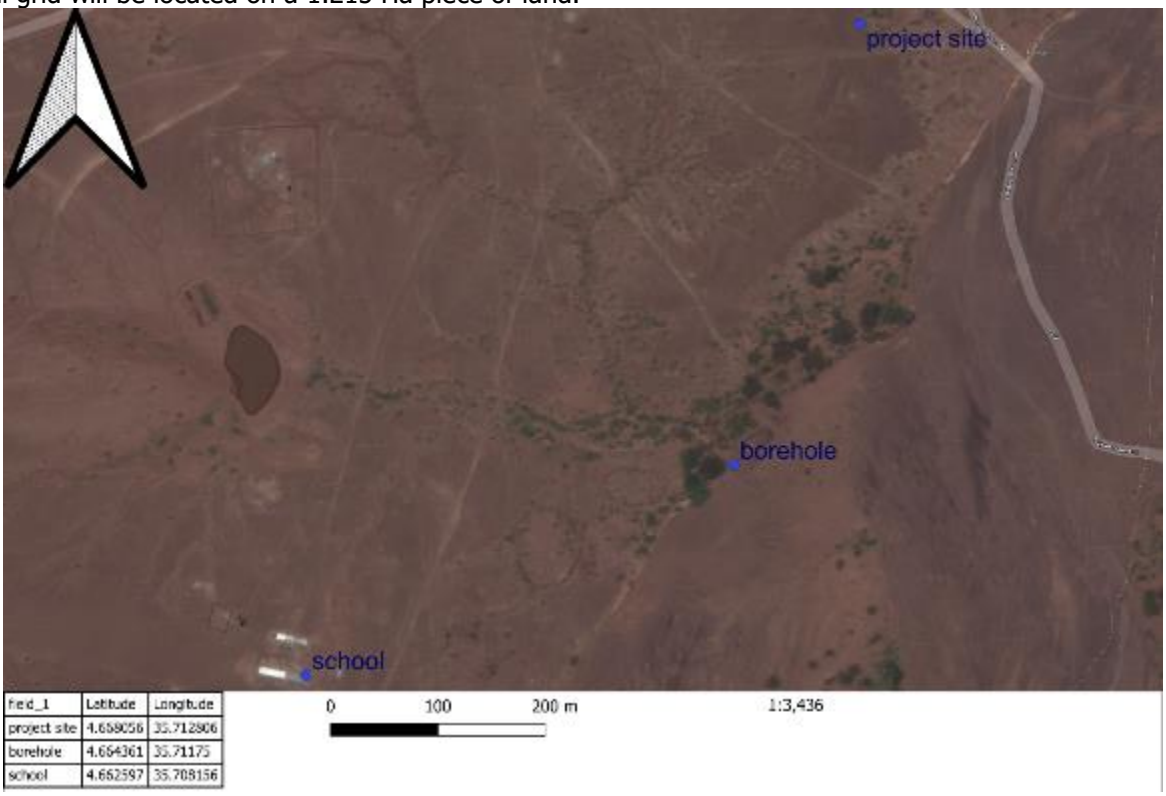
The project components are:

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

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

1.2 Project Overview

The project is located 65km of Lokitaung town Kokuro village, Lopur Ward in Turkana North subcounty, Turkana County at coordinates of Latitude 04°40'05.0"N and Longitude 35°42'46.1"E. The proposed solar mini grid will be located on a 1.215 Ha piece of land.



field_1	Latitude	Longitude
project site	4.668056	35.712806
borehole	4.664361	35.71175
school	4.662597	35.708156

Figure 1. Map showing the proposed site

The solar mini grid will contain Solar panels, batteries, invertors, perimeter fence and length of transmission line to cover a circuit distance of approximately 6 km.

1.3 Purpose and Scope of Work

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

1.4 ESIA Methodology

1.4.1 Screening and Scoping

1.4.1.1 Screening Methodology

Evaluation of ESIA procedure has been undertaken as a fundamental procedure to implementation of the solar power mini-grid development project which is systematically mainstreamed into the project's Cycle. World Banks Social safeguards underpin and demonstrate this commitment. The main aim of this is to enhance positive social opportunities and benefits as well as ensure that adverse social and environmental risks and impacts are avoided, minimized, and mitigated.
The below steps were followed.

1.4.1.2 Kick-off Meeting

Norken and Centric team had a brief kick-off meeting with the Proponent on 12th July 2021 followed by subsequent online meetings and discussion on various aspects of the project up to 5th August, 2021 and 15th September, 2021. The meetings addressed varied deliverables and thresholds to be achieved and maintained during this assessment in terms of scope of work, deliverables, timeline and the methodology. All communication and meetings were done online.

1.4.1.3 Desk based review and baseline assessment

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

1.4.2 Project Description

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

1.4.3 Baseline Condition

This entails description and collection of relevant primary data within the project site's bio-physical, socio-economic, and cultural profile with respect to the biodiversity profile, land use types, cultural heritage and practices, social and economic issues likely to be affected, expected project activities to be involved during the design, construction, and operation of the proposed facility. The information also includes description of the community social structure, employment and labour market, sources and distribution of income, cultural/religious sites and properties, vulnerable groups, and indigenous populations. This also covers description of the sites' physical environment including their topography, land cover, geology, climate and meteorology, air quality and hydrology. This entails use of secondary data sources and for some specific

environmental parameters the deployment of specialized equipment to measure and record the environmental readings as primary data for analysis and inclusion in the ESIA CPR report. The ecological and biophysical environment will focus on describing the *flora* and *fauna* resident in the Turkana County at the mini-grid site level. This will be based on ecological surveys, KPIs on local indigenous knowledge on historical and status of rare, endemic, and endangered plant and animal species known to occur in these localities. Vegetation assessment was done to gain an understanding of the mini-grid sites habitat type. This has provided for an in-depth description of existing land use type and their linked socio-economic activities.

1.4.4 Impact Assessment Prediction

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

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

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

1.4.5 Environmental and Social Management Plan (ESMP)

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

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

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

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

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

Figure 2 is a summary of the methodology the firm will adopt in undertaking environmental and social impacts assessment for the proposed KOSAP project

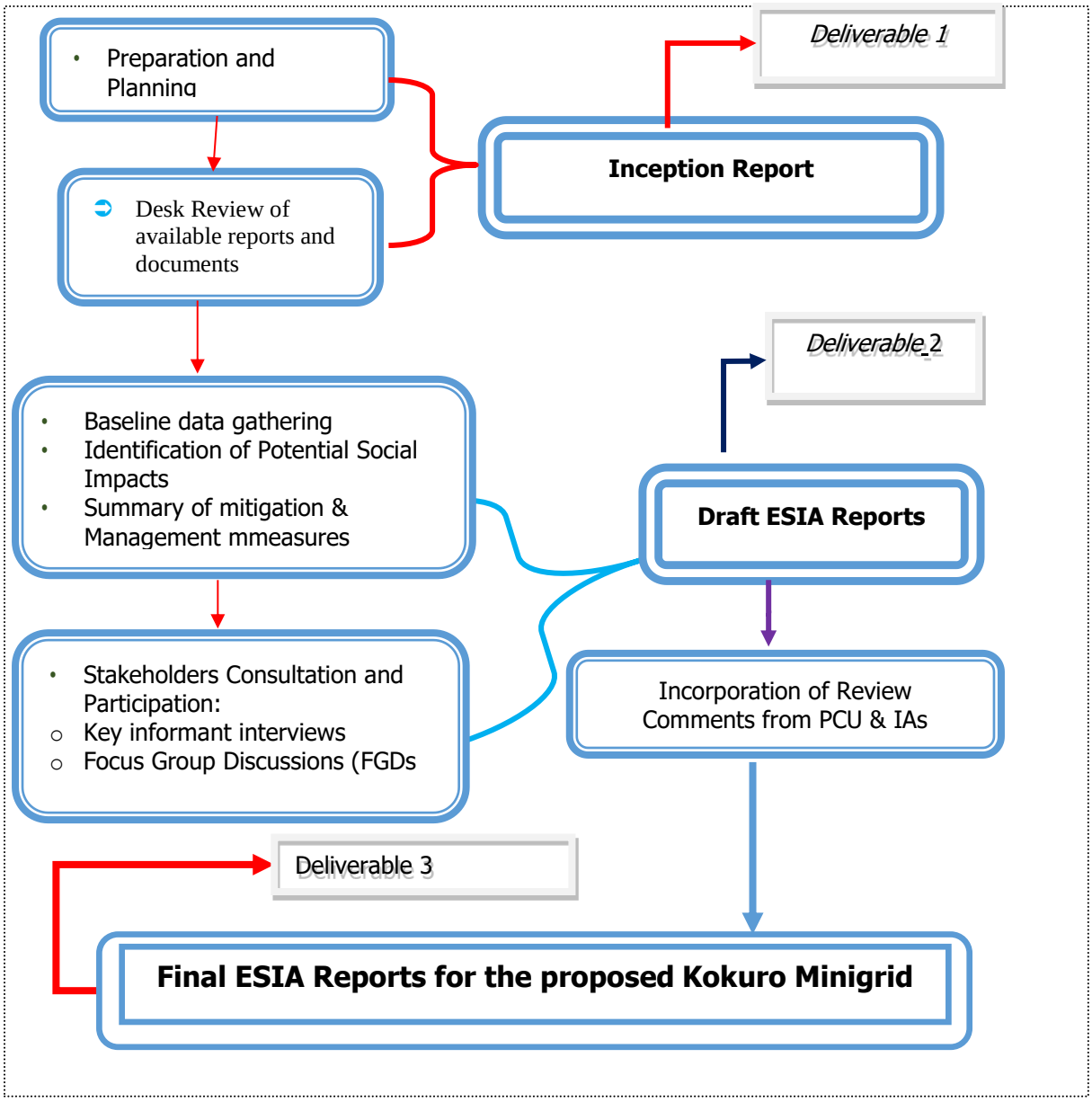


Figure 2: Summary of Environmental and Social Impact Assessment Methodology

1.4.6 Stakeholder Consultation and Participation

Section 17 of the Environmental (Impact Assessment and Audit) Regulations of 2003, requires that all ESIA Studies undertake Public Consultation (PC) as part of the study. The aim of the PC is to ensure that all stakeholders interested in a proposed project such as project PAPs, government officers and the general public in the vicinity of the proposed project be identified and their opinion considered during project planning, design, construction, operation and decommissioning phases. Consequently, public consultations were carried out in the project area in a bid to inform the public and other interested parties on the proposed project and obtain their views on the same. The consultations also presented an opportunity for the community to raise issues and concerns pertaining to the project.

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

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

A detailed CPP and community engagement for Kokuro Solar Mini Grid was held at Kokuro Baraza park in Kokuro village on 19th January 2022 chaired by the area chief assisted by the assistant chief. The general stakeholder consultation was done in a public meeting (Baraza) organized at Kokuro community baraza park where 64 males and 76 women were in attendance. Background information document (BID) with project details was posted clearly at the Chief's office and Kokuro shopping center. Community engagement proceedings and resolutions are presented in form of minutes taken/written during the meetings. The meetings were well attended by all people including men, women, youth and persons with special needs.

Interactive approach was adopted for the immediate neighbourhood in discussing relevant information key among them being;

- Land use aspects,
- Project acceptability,
- Social, cultural and economic aspects,
- Environmental Impacts
  - ✓ Physical impacts,
  - ✓ Biological impacts,
  - ✓ Legal Compliance.

The meeting was held in accordance with the requirements of NEMA and the WB OP. 4.01 policy and guidelines for conducting an ESIA. The specific objectives of this public consultation were to: Disseminate information on the proposed project to the community members; Collect views and issues to be considered in the ESIA; Evaluate perceptions about positive and negative impacts of the project and; Receive concerns about environmental and social impacts and other implementation challenges.

1.5 Limitations

The limitation experienced during the study are illustrated below.

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

1.6 Layout of the Report

Table 4. Structure of the ESIA Report

SECTION	TITLE	DESCRIPTION
Section 1	Introduction	(*This section*) Introduction to the Project and ESIA scope and methodology adopted.
Section 2	Project Description	Technical description of the Project & related infrastructure and activities.
Section 3	Land Requirement and Procurement Process	Description of the land requirement, land tenure and compensation details.
Section 4	Applicable Legal and Regulatory Framework	Discusses the applicable environmental and social regulatory framework and its relevance for the Project. (The world bank safeguards and EMCA and environmental regulations)
Section 5	Environmental, Ecology and Social Baseline	Outlines Environmental, Ecology and Social Baseline status in the study area of the Project
Section 6	Stakeholder Engagement.	Provides an overview of the stakeholder engagement activities undertaken during the ESIA, stakeholder categorization and profiling.
Section 7	Grievance Redress Mechanism	Describes the Grievance mechanism, the National, County and Locational Grievance Committee
Section 8	Analysis of Alternatives and Project Justification.	Discusses the site selection process, power scenario and the analysis of alternatives.
Section 9	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 10	Environmental and Social Management Plan	Outline of the ESMP considering identified impacts and planned mitigation measures and monitoring requirements.
Section 11	Impact Summary and Conclusion	Summary of impacts identified for the Project and conclusion of the study.

2 PROJECT DESCRIPTION AND ALTERNATIVES

2.1 Introduction

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

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

Table 5. Component of the proposed Solar Mini-grid

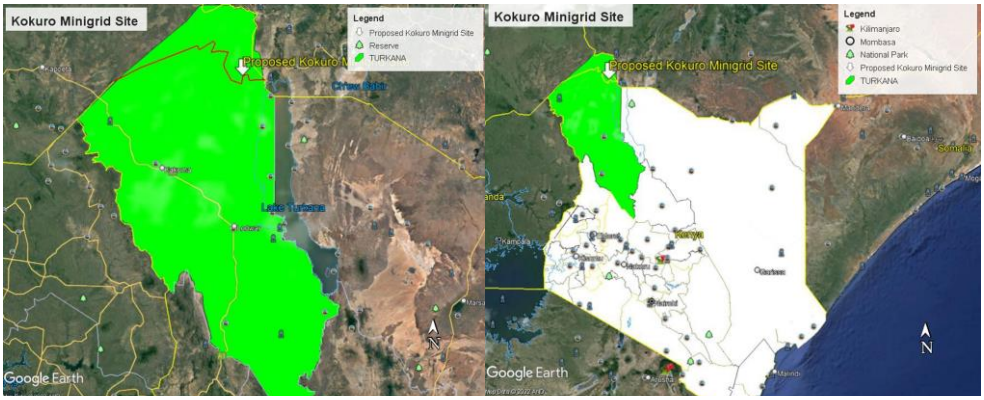
S/NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project is located 65km from Lokitaung town in Kokuro village, Lopur Ward, Turkana North subcounty in Turkana County on 1.215 Ha of unregistered community land set aside for public use. Geographically, the site is located on Latitude 04°40'05.0"N and Longitude 35°42'46.1"E, at altitude of 172 metres above the sea level.
2.	Land Size/Tenure	The proposed solar mini grid will be located on a 1.215 Hectares piece of land in Kokuro sub-location, Kokuro location. The land is an unregistered community land set aside for public use
3.	Energy Demand	Monthly energy demand of 10,520 kWh and daily energy demand of 351 kWh
4.	Generator & Fuel Tank	The generator capacity of 82kV and the fuel tank for diesel generator of 2000 liters.
5.	Target Consumers	336(326Residential and 10Non-Residential)
6.	Climatic condition	The area experiences annual average relative humidity of 61.8 per cent which ranges from 56 per cent in February to 68 per cent in June. The average annual precipitation is 240 mm or 20 mm each month. June is the driest month with an average of 1 mm of rain while April is the wettest month with an average of 68 mm of rain. The higher areas of Bute and Gurar receive higher rainfall of between 500mm and 700mm. The average temperature is 27.9 °C and the range of average monthly temperatures is 3.5 °C. The warmest months are February & March with an average of 36°C while the coolest months are June, July, August & September with an average low of 21 °C.
8.	Site Conditions	The side is generally in open area with minimal and scarce *fauna* and *flora*.
9.	Road Accessibility	Earth road
10.	Nearest Airport	Lodwar Airport at about 170km
11.	River/canal/nallah/ pond present in project footprint	No rivers or canals present in the village
12.	Protected areas (National Park/ Sanctuary)/ Forest land within 10 kms	None

2.2 Project Location

The project site is located in Kokuro village in Lopur Ward, Turkana North subcounty in Turkana County at coordinates of 04°40'05.0"N and Longitude 35°42'46.1"E. The proposed power plant will be constructed on approximately 1.215Ha.

The site soil is primarily sandy within the area. The project site is approximately 65km of Lokitaung town.

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



2.2.1 Project site setting

The proposed Kokuro mini grid is in Turkana County. It falls under cluster 1 with a total of 49 minigrids and lot 1 which has a total of 23 mini-grids. Geographically, Kokuro site falls on coordinate's latitude 04°40'05.0"N and Longitude 35°42'46.1"E.

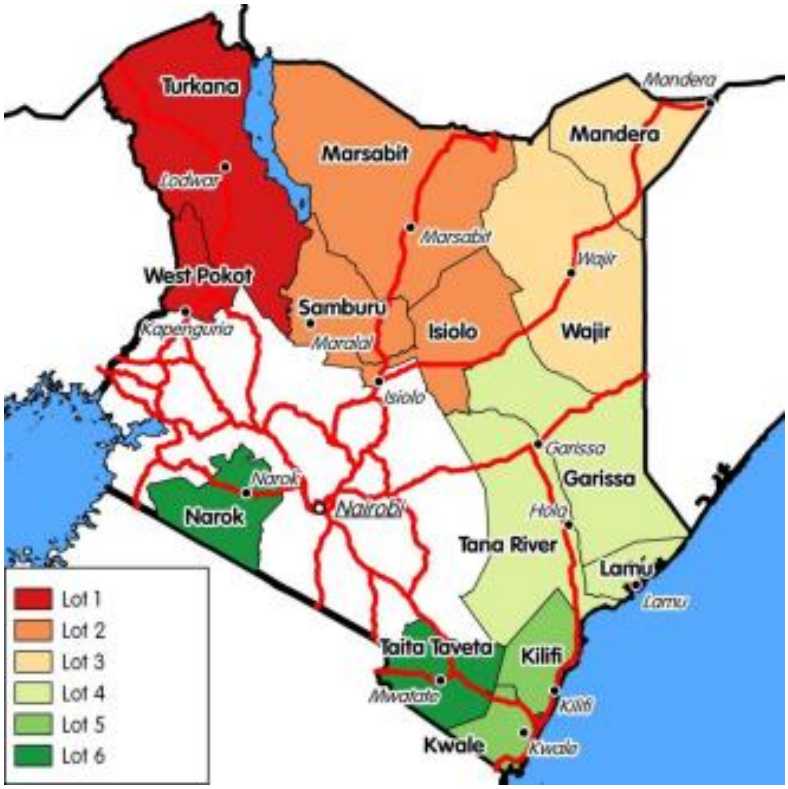


Figure 5: Map Showing the KOSAP Counties Lot 1

2.3 Description of Project Facilities, Components and Activities

2.3.1 Technical aspects of Solar Mini grid

Kokuro is among the beneficiaries of the KOSAP based on an aerial survey done in 2019 and has a potential customer base approximated at 1200 households within the Kokuro area, and a 120 kWp solar Mini-grid to supply power to the community will be installed. The Solar PV hybrid system is based on a centralized photovoltaic plant connected to a 3-phase 415V AC busbar line, where the multi-mode battery inverter and the diesel generator are also connected. The noise rating for the inverter and the diesel generator is 85-90dB.

2.3.2 Project Components

2.3.2.1 Solar PV modules

The project will use PV Array (DC-kW) 60 polycrystalline silicon module with three strings connected in series. Each string will have five sets of panels connected in series, with output converged at the six-way combiners. The life expectancy of the PV modules is estimated at 25-30 years.

2.3.2.2 Battery Energy Storage System

The Battery Energy Storage System (BESS) will comprise of Lithium-ion Battery pack that conforms to IEC standards with warranty of 10 years, 3,000 cycles minimum. The Lithium-ion Battery Power Packs will be used to cater for required energy capacity, or equivalent as per approved design, minimum 80% DOD for Lithium-Ion. Batteries will be capable of at least C/4 charge and discharge rate. Batteries will be charged by Battery Inverter / Charger. A 300kWh Battery Capacity is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions.

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

2.3.2.3 Battery Inverters/ Chargers

A 82-kW battery inverter charger is employed to manage the energy flow to and from the battery storage system. The Inverters/charges shall be designed for nominal voltage of 415 Vac which will be continuous, reliable power supply as per specification and shall have internal protection arrangement against any sustained fault in the feeder line and against lightning strikes in the feeder line. The inverters shall be capable of complete automatic operation including wake-up, synchronization & shut down independently & automatically. The inverter shall be 3-phase multi-mode (DC to AC and AC to DC), bi-directional, four-quadrant capability.

2.3.2.4 Distribution lines

The site will have a distribution line circuit of 7 km 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 KPLC requirements/specifications. Erection of the Poles, fixing of insulator strings, stringing of conductor and earth wires along with all necessary line accessories and earthing will be as per KPLC requirements/specifications.

Project Metrics:

Monthly Energy Demand: The project is expected to meet a total monthly energy demand of 10,520 kWh.

Daily Energy Demand: The average daily energy demand is approximately 351kWh, ensuring a consistent supply for the consumers.

Peak Demand: The peak demand of the system is 65kW, which is the maximum power requirement during any given moment.

PV Capacity: The solar photovoltaic panels have a total capacity of 120kWp.

Battery Capacity: The Battery Energy Storage System has a capacity of 120kWh, providing energy storage and ensuring a continuous power supply.

Generator Capacity: The diesel generator has a capacity of 82 kVA, serving as a backup power source.

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

Estimated Project Cost:
The estimated cost of the Kokuro Mini Grid project is approximately USD 417,391.77 It's important to note that this cost may be subject to change as more detailed plans and implementation phases are developed. The investment is expected to provide long-term benefits to the local community, improving their quality of life, economic opportunities, and access to modern amenities.

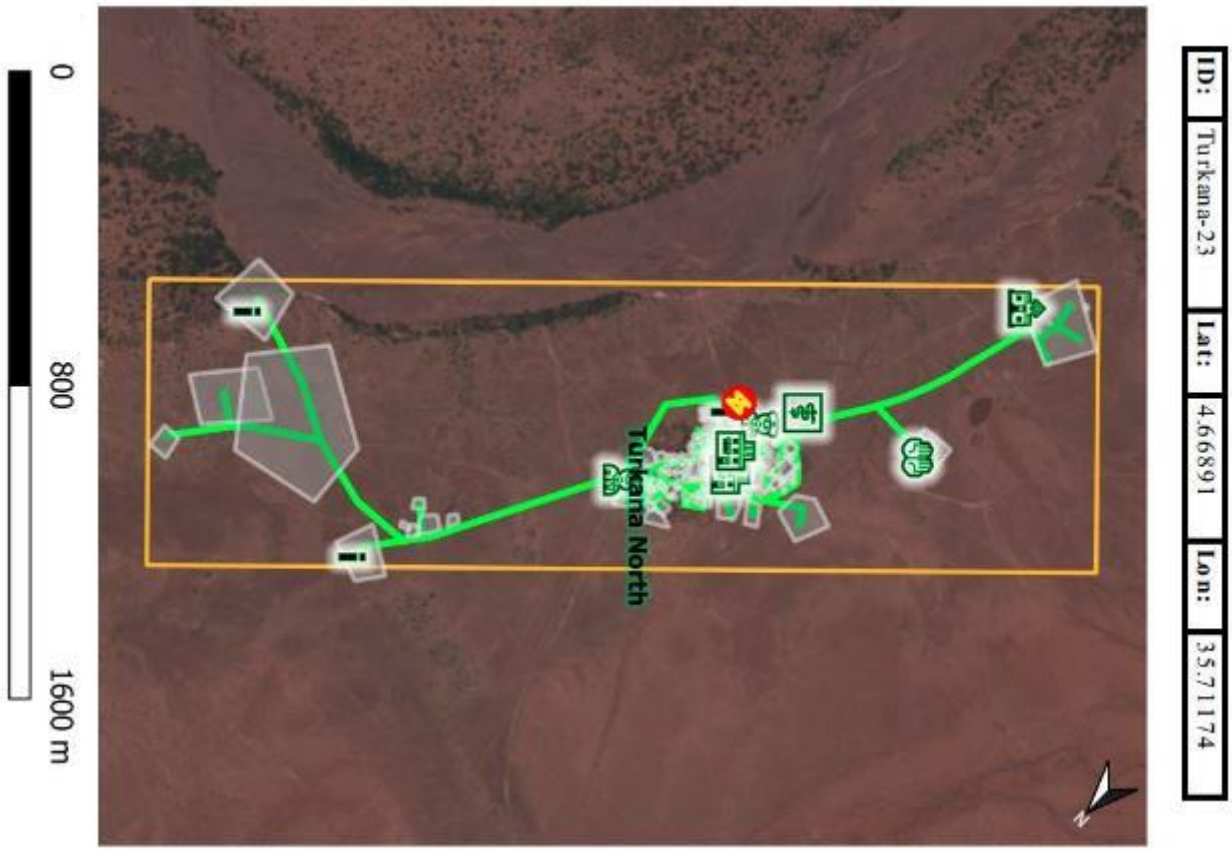


Figure 6: Kokuro distribution line circuit

2.3.3 Project Phases and Activities

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

2.3.3.1 Construction Procedures

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

The project inputs will include the following.

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

Construction activities will include the following:

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

2.4 Resource Requirement

2.4.1 Workforce Requirement

Approximately 40 skilled, semi-skilled and unskilled Laboure's will be required at the construction stage. During the operation phase, the following personnel will be required; one operations and maintenance head, 2 engineers and 5 technicians. The Kenya Power Company will be conducting the operations and management of the project through the O&M contractors for the first seven years.

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

2.4.2 Water Requirement and Source

2.4.2.1 Construction Phase

It has been estimated that approximately 50,000 liters of water will be required per day for civil works during construction stage. Further, water will be required for workers at project site. However, this quantity of water requirement will vary depending upon the mobilization of construction workers at site. The water for the construction phase will be sourced from the local water points, the nearest is located at about 200m to the proposed site next to school and health facility. The available water points within Kokuro area are sourced from Lagha and Boreholes within the area.

2.4.2.2 Operation Phase

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

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

2.4.3 Raw Material Requirement

2.4.3.1 Construction Phase

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

2.4.3.2 Operation Phase

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

2.4.4 Power Requirement

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

2.4.5 Fire Safety and Security

2.4.5.1 Construction Phase

Appropriate firefighting system and equipment shall be provided throughout the construction period. The fire extinguishers will be well distributed according to the fire risks and will be available in areas such as the site office, security area, storage yard etc. A comprehensive emergency response plan with all the emergency numbers will be well displayed at the site and on the fence.

2.4.5.2 Operation Phase

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

The systems and equipment's will align to the Kenyan Fire Reduction Rules of 2007. The Fire protection and fighting systems will be maintained and serviced after every 6 months.

2.5 Pollution Streams during Construction Phase

2.5.1 Solid Waste Generation

2.5.1.1 Construction Phase

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

The hazardous wastes will be stored onsite at separate designated covered area provided with impervious flooring and secondary containment. The storage containers/ bins/ drum will be clearly marked, and color

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

2.5.1.2 Operation Phase

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

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

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

2.5.2 Air Emissions

2.5.2.1 Construction Phase

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

- Dust emissions from the dusty roads leading to the site.
- Increased vehicular emissions due to the high traffic of vehicles transporting construction materials, PV Modules, and accessories.
- Dust emissions from site clearing, material handling, piling and use of the construction machinery.
- Exhaust emissions from the diesel generator.

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

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

2.5.2.2 Operation Phase

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

2.5.3 Waste Generation

2.5.3.1 Construction Phase

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

2.5.3.2 Operation Phase

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

2.5.4 Noise Emissions

2.5.4.1 Construction Phase

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

2.5.4.2 Operation Phase

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

2.6 Analysis of Alternatives

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

2.7 Site Selection

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

The proponent identified one location for the proposed solar project which located in Kokuro village. The site was identified based on the location of settlement areas, commercial/ public facilities in Kokuro.

Further details on the other locations identified were not available.

- No settlement present in the project site;
- The project site land is predominantly unregistered community land;
- The project site has few scattered trees and shrubs

The proposed project site has the following location advantages:

- The land is unoccupied and does not have any ecological sensitive receptor such as national parks, Wildlife Sanctuary within 10 km radius;
- No cultural property of archeological importance within 5 km radius

PROPOSED PROJECT SITE & PROXIMITY TO CONSUMER SITES

2.8 Power Scenario at Kokuro

Kokuro location has an estimate of 10,000 number of people with approximately 800 households within the area. The proposed solar offgrid project is estimated to cover up to 633 residential and non-residential consumers within the area. This will reach out to over 78% of the population within the area.

KIHBS 2005/6 shows that 98.4 per cent of the Turkana County households depend on wood fuel (Firewood and Charcoal) for cooking and 31.5 per cent depend on kerosene lantern for lighting. 96.6 per cent of households use traditional stone fire for cooking.

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

The use of firewood contributes to massive environmental degradation, increased health risks and additional workload for women and girls, and increased emissions of carbon content. Moreover, low enrollment, retention and transition for girls is partly attributed to increased workload related to energy search (firewood).

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

Failure to construct and operate the minigrid in Kokuro 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. 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.

2.8.1 Vision 2030

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

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

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

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

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

2.9 Analysis of Alternative

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

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

2.9.1 Alternate Power Distribution Lines Right of Way

The project requires the distribution of generated power into the settlement points within Kokuro through optimal access points, therefore all possible options for power distribution have been assessed.

The identified viable option for power distribution within Kokuro 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 Kokuro.

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 Kokuro 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 Kokuro 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 flat 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 Kokuro access routes is the most feasible for the solar mini-grid project in Kokuro 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.

2.9.2 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:

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

Kokuro was identified as the most suitable area for the establishment of the proposed minigrid based on the following factors:

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

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

Solar energy was a desirable option because:

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

2.9.4 Zero or No Project Alternative

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

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

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

2.9.5 Analysis of Alternative Construction Materials and Technology

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

2.9.6 Conclusion

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

2.10 Land Requirement and Procurement Process

2.10.1 Land Requirement

The land on which the proposed Kokuro mini-grid will be constructed covers a total 1.215 Ha in size. The distribution power lines will be aligned to already existing access roads within the project area.

The Land Acquisition Strategy under KOSAP has been reviewed to include Compensation in Kind in unregistered and registered community land. Therefore, the community in Kokuro were given an opportunity to identify projects where one will be selected and implemented by the mini-grid Contractor based on the budget available.

Kokuro site will have a distribution line (DL) circuit of 6 km in total. Construction of the distribution line will involve the acquisition of land. It is likely that the DL will pass through communal land/private land. Additional information is required on the routing of the DL to enable a proper impact assessment of the wayleave acquisition. At the time of the study, the consultants did not have this inform. Additionally, it is recommended that extensive consultations should be carried out with the stakeholders affected by the DL and those who reside in close proximity to the wayleave

2.10.1.1 Land Tenure

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

2.10.1.2 Compensation Details

Compensation will be done in kind. It was informed that the community is willing to offer their land. They requested for a water project (water reticulation – equipping of the community borehole and pipping the water to the village).

3 BASELINE SETTINGS- ENVIRONMENT, ECOLOGY AND SOCIAL

3.1 Study Area

The project site is located in Kokuro village, Lopur ward in Turkana North subcounty, Turkana County. Based on the secondary information of the region, the following baseline information on environment, ecology and social has been discussed under the sections below.

3.2 Environment Baseline

3.2.1 Soil Type

The major soil types in the county are tertiary volcanic soils. They contain hard erosion resistant basalts and are usually softer. The soil in the project area is skeletal soil i.e., they are rocky, shallow and stony and contains gravel and sand. The high concentration of sand in the soil makes it to quickly drain excess water and cannot hold significant amounts of water or nutrients for plants. The soils in the project area are not suitable for crop farming.

The presence of tertiary volcanic soils in the county containing erosion resistant basalts, and skeletal soil with high concentrations of sand and gravel in the project area suggests that the soils in the region are not suitable for crop farming. This is important in informing the planning and implementation of the Kokuro Solar Minigrid project and ensuring that potential negative impacts on the surrounding ecosystem are minimized.

3.2.2 Topography

The topography of the project site is an open area that is relatively flat with a mild undulation on the north west side of the site. The elevation difference of about 3m is observed within the project site. The fact that the site is relatively flat with a mild undulation on the northwest side may have implications for drainage and soil stability, which should be taken into consideration during the planning and implementation of the Kokuro Solar Minigrid project.

The 3m elevation difference within the project site may impact the placement and orientation of solar panels and other infrastructure, which could potentially affect the efficiency and performance of the system. This may require careful consideration during the design phase to ensure that the project is optimized for the site's unique topography.

3.2.3 Hydrogeology and Drainage

Geologically, Turkana County is within Africa's Tectonic region in the Great Eastern Rift Valley. It is on altitude of 360 meters while the surrounding basin's elevation varies between 375 and 914 meters. The county has three main inflows: Omo, Turkwel and Kerio rivers. However, there is no outflows with predominant water loss from evaporation. Lake Turkana where the project area lies at the western shores is the only lake with water from two distinct catchment areas of the Nile. The potential impacts of the Kokuro Solar Minigrid project on local water resources and take appropriate measures to mitigate any negative impacts. This may include measures to ensure that the project does not interfere with local water sources, such as avoiding water extraction from critical sources or implementing appropriate drainage and runoff controls.

3.2.4 Water Resources

With regard to water availability in Kokuro, water is mainly sourced from two boreholes located about 1-2 km from the village centre while others especially those living far from the village centre prefer to source water from a seasonal river located about 3-4kms from the village centre.

3.3 Ecological Conditions

The project area is characterised with large areas with shrubs and vegetative cover. The remainder is predominately moderate or senescent cover, representing those plants that are in the process of aging. Vegetation types in the county are diverse and include patchy, annual grassland and herbaceous plants interspersed with woody shrubs to riverine woody tree species. Most areas of Kokuro are dominated by dwarf shrubs and bush species. The herbaceous tree species include Aristide adscensionis, Blephanis linafolia, Cenchrus ciliaris, Cyperus rotundus, Cynodon plectostachyus, Echnochloa haploclada, Evolvulus alsinoides, and Launea cornuta.

According to the Turkana County Integrated Development Plan (2018-2022), Turkana has a wide variety of natural vegetation and desert fauna. Vegetation types in the county are diverse and include patchy, annual grassland and herbaceous plants interspersed with woody shrubs to riverine woody tree species. Most areas of the county are dominated by dwarf shrubs and bush species. The main forest types in Turkana are riverine, mountain, lake-shore, woodland and range-land forests, as well as Prosopis juliflora (invasive) pockets. The areas covered by these forests have not been ascertained since they have not been gazetted. The county has one gazetted forest (Loima Mist Forest) covering 19,739 hectares of land. Other non-gazetted forests are Turkwell Riverine Forest, Loriontom-Mountain Forest, Mogila-Mountain Forest, Pelekech-Mountain Forest and Kailongkol Mountain Forest. The main wood forest products are poles, posts and fuel wood. The non-wood forest products are fruits, leaves, roots backs, Aloe species, gums, resins, fodder and flowers. There are a number of tree species in Turkana County serving multiple purposes, including food and fodder, timber, fuel wood, fertilizer and habitat. Over-exploitation of forest resources for charcoal production and construction material are major contributors to environmental degradation in the county.

The main wildlife found in Turkana county are lions, cheetahs, hyenas, elephants, gazelles, and dik-diks. These are mainly found in the game reserve in Turkana South. There are also hippos, crocodiles, and tilapia fish in addition to the various fish species in the lake. There exists various bird species, key among them the flamingos in Lake Turkana. Wildlife and birds identified during ESIA study includes; Dikdik, common ostrich (stuthio Camelus), African Cuckoo(Cucus Gularis),lappet-faced vulture,isabelline wheatear among other.
These factors should be considered when assessing the potential impacts of the Kokuro Solar Minigrid project.

3.4 Climatic Conditions

Turkana County is situated in the arid region of Kenya and receives Turkana County is situated in the arid region of Kenya and receives between 150mm and 400mm of rainfall annually. It is characterised by unpredictable rainfall, extreme rainfall, frequent and prolonged dry spells, and increased daytime temperatures. Turkana has a hot, dry climate with temperatures 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. Annual rainfall is low, ranging between 52 mm and 480 mm with a mean of 200 mm (Turkana County Investment Plan, 2016-2020). Rain patterns and distributions are erratic and unreliable. Rain usually comes in brief, violent storms that result in flash floods. The driest periods (akamu) are in January, February and September and the county is highly prone to drought. 80% of the county is categorised as either arid or very arid.

The hot and dry climate with temperatures ranging between 20ºC and 41ºC and a mean of 30.5ºC, combined with the low and variable annual rainfall, means that the soils in the project area are likely to be dry and unsuitable for crop farming. Moreover, the frequent and prolonged dry spells, flash floods resulting from violent storms, and high susceptibility to drought indicate that water availability may be a significant challenge for the solar minigrid project. The potential impacts of the Kokuro Solar Minigrid project on the local hydrogeology, particularly with respect to water resources has been considered and appropriate measures to ensure that it does not contribute to further water scarcity or degrade the already fragile local hydrogeology have been provided in this report.

3.5 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, Kenya Power (KP), will be established,
- Project site where project components such as solar modules, control room and transmission line to power grid sub-stations; and any other selected CSR project, such as the construction water abstraction and distribution points 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 e.g. approach road construction and widening of existing road.

  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 Nyango Village which according to the administrative structure falls within Vigurungani 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).

3.5.1 Land Use

The land-use and land-cover of the study area (5kms) has been interpreted from visual interpretation, survey maps of the area, and subsequently by ground checking during field surveys. The land use within 5 km radius of project site represents grassland (45%) and open shrub land (55%). The area is majorly semi-arid with a sparse population within the area.

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

3.6 Socio-economic Environment

3.6.1 Community Profile

Kokuro village is in Lopur ward, Turkana North subcounty in Turkana County. It is located 65 km from Lokitaung town. The top community development priorities are 1st electricity, 2nd water reticulation and 3rd improvement of health care. Houses in the community mainly composed of thatched and/or polythene covered manyattas with a few that are roofed by iron sheet. The community support mechanism includes emergency relief food/feed (for livestock and human). The primary ethnic group is Turkana while other ethnic groups such as the Kalenjin, Kikuyu and Luhya are present in the area. Christianity is the dominant religion. Below is a summary of demographic profile of Kokuro.

Attribute	Magnitude/Number
Approx. population	8,500
Households	1200
Gender.	Male – 40% Female – 60%
Ave. No. per household	7 per household
Community composition	Indigenous- 99% Settlers – 1%
Vulnerable classes	orphans, PLWDs
Dominant ethnic group	Turkana
Primary religion	Christianity

Other groups	Kalenjin, Kikuyu, Luhya
Employment (formal/Informal)	Formal – Less than 1% Informal – 99%

Table 12: Demographic status of Kokuro

3.6.2 Socio-economic status of Study Area

3.6.2.1 Demographic Profile

The information shared on community profile by the area assistant chief (Kokuro location) showed that Kokuro has a population of approximately 8,500 and with an estimated number of households to be 1200 with an average of 7 people. Kokuro has a gender ration that is currently estimated to be about 40% male and 60% female.

3.6.2.2 Educational Infrastructure

The village has only one primary school - Kokuro Primary School located 1 km from the village center. The school has a total of 243 pupils (151 Boys and 92 Girls) with 7 teachers employed by Teachers Service Commission (TSC). The school completion rate among the boys is approximately (95%) while that of the girls is at (50%). Most pupils drop out at class 8 or Form 4 mainly due to lack of school fees, child labor (Taking care of livestock).

Plate 3: Kokuro primary school

3.6.2.3 Occupation and Livelihood Profile

Kokuro community are mainly pastoralists moving with livestock in search of pasture and water. Major livestock kept are camel, cattle, sheep, goats, and donkey. The community rely of livestock products for food at the household level and for income generation. Formal employment is 1%. Other sources of income in the society include sale of wood fuel/charcoal burning. Due to the aridity of the county, food production (crop growing) is limited and contributes little to food security.

3.6.2.4 Land Use

Land in the community is mainly communal. The land is used for homesteads and mainly for livestock grazing, underground water is also harnessed from the land.

3.6.2.5 Health facilities

Kokuro has only one public health center with one Clinical Officer, one Public Health Officer,1 lab Technician,1 Nurse,1 Senior Personal Assistant. Main services provided include Out-patient, Immunization, Nutrition, Lab, Pharmacy and Maternal care services. The main challenges faced at the facility include inadequate infrastructure, lack of electricity, water, high level of insecurity cases and other basic equipment.

3.6.2.6 Social and Physical Infrastructure

Water: There are two boreholes about 2 km from the community.
Borehole water is supplied to the community is noted to be clean however during the dry season the levels of the water decreases. The community members collect water in Jerricans for domestic use and also their livestock.

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

Road Network: Roads connectivity within the area is also poor and not regularly maintained. The main forms of transport within the area are Motor bikes while donkeys also provide alternative modes of transport.

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

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

4 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. S relevant to this Project are presented.

4.2 Kenya Policy Provisions

4.2.1 Kenya Energy Policy, 2014

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

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

The Policy strategizes the need to:

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

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

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

The overall goal of this Sessional Paper is to ensure that environmental concerns are integrated into the national planning and management processes and provide guidelines for environmentally sustainable development. The objectives of the Paper are to conserve and manage the natural resources of Kenya including air, land, flora, and fauna and promote environmental conservation about soil fertility and conservation, biodiversity, to foster afforestation activities, and to protect water catchment areas. More importantly, the Policy emphasizes the enhancement of public awareness and appreciation of the essential linkages between development and environment, involving NGOs, private sector, and local communities in the management of natural resources and their living environment and ensures that an environmental impact assessment report is undertaken for all public and private projects and programmes.

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

4.2.3 National Policy on Water Resources Management and Development, 1999

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

During construction, water will be required for concrete works and during the operational period water supply may be necessary for cleaning the PV modules. Appropriate water treatment and waste handling must be incorporated into the Project design to be in alignment with this policy.

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

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

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

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

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

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

4.3 National Legal Framework

4.3.1 Administrative Framework

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

Table 6. Administrative stakeholders and their roles

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

4.4 Relevant statutes

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

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

Table 9 Policy and Legislative framework.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
	NATIONAL POLICY FRAMEWORK		
1.	Vision 2030	Kenya Vision 2030 is the current national blueprint for development from its inception in 2008 until the milestone year of 2030. This plan is the national long-term development policy that aims to transform Kenya into a newly industrialised, middle-income country by 2030. The Vision is comprised of three key pillars (economic, social, and political), two of which are projected to be positively affected by project implementation.	Under Vision 2030, Energy is identified as one of the key sectors that form the foundation for socio-political and economic growth. Promoting equal opportunities across the entire Kenyan territory and enhancing access to competitively priced, reliable, quality, safe and sustainable energy is essential to the achievement of this vision.
2	The Poverty Reduction Strategy Paper (PRSP) of 2001	The PRSP has the twin objectives of poverty reduction and enhancing economic growth. The paper articulates Kenya 's commitment and approach to fighting poverty; with the basic rationale that the war against poverty cannot be won without the participation of the poor themselves.	• The proposed project aims at provision and access of renewable electricity geared towards improved economic performance and thus will contribute to poverty alleviation in the project area.
3	National Environmental Action Plan (NEAP) of 1994	The NEAP for Kenya was prepared in mid 1990s. It was a deliberate policy whose main effort is to integrate environmental considerations into the country 's economic and social development. The integration process was to be achieved through multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and the conservation of natural resources forms an integral part of societal decision-making.	• The NEMA does not approve a development project unless the impacts of the proposed project are evaluated and mitigation measures proposed for incorporation in the project 's development plan, which is in line with the requirements of the NEAP. The project will be reviewed by NEMA for approval before implementation.
4	Environmental and Development Policy (Session Paper No.6 1999)	As a follow-up to the foregoing, the goal of this policy is to harmonize environmental and developmental goals to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development.	The proponent: • Is undertaking an Environmental Impact Assessment, Social Impact Assessment and Public participation as part of the planning and approval of infrastructural projects. • Will ensure that periodic Environmental Audits are carried out for the project
5	The National Energy and Petroleum Policy 2015	The overall objective of the energy and petroleum policy is to ensure affordable, competitive, sustainable, and reliable supply of energy to meet national and county development needs at least cost, while protecting and conserving the environment. This policy stipulates the	The policy is relevant to the project in the sense that the project will provide sustainable and reliable energy supply and measures will be put in place to protect and conserve the

		transformation of the Rural Electrification Authority (REA) to Rural Electrification and Renewable Energy Corporation (REREC) to be the lead agency for development of renewable energy resources.	environment during its development. REREC will oversee the development of the mini grid and maintenance.
6	The Gender and Development Policy (Sessional paper no.2 2019)	The overall goal of this policy is to achieve gender equality by creating a just society where women, men, boys, and girls have equal access to opportunities in the political, economic, cultural, and social spheres of life.	• In the absence of appropriate measures, the project can exacerbate gender inequalities and sexual and gender-based violence. In adherence to this policy, measures will be put in place to: • ensure gender inclusivity in decision making, employment opportunity and access to the energy generated from the Mini-Grid • mitigate social risks including sexual and gender-based violence, and any form of discriminations
7	The HIV/ AIDS Policy 2009	In summary, the policy aims at: i. Establishing and promoting programmes to ensure non-discrimination and non- stigmatization of the infected. ii. Contributing to national efforts to minimize the spread and mitigate against the impact of HIV and AIDS. iii. Ensuring adequate allocation of resources to HIV and AIDS interventions;	• The proposed project is to be implemented in the rural setting at Turkana 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			
8	The Constitution of Kenya, 2010	The Constitution of Kenya promulgated in 2010 is the supreme law of the republic and binds all persons and all State organs at all levels of government. The Constitution provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectoral legislative documents are drawn.	The proposed project complies with the Constitution by proposing a structure in its ESIA on how to deal with Social, Health, safety and environmental issues for sustainable development.
9	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.

10	L.N. 101: EIA/EA Regulations, 2003 And 2016 Amendments	These regulations provide the framework for undertaking EIAs and EAs in Kenya by NEMA licensed Lead Experts and Firms of Experts. An EIA or EA Study in Kenya is to be undertaken by a firm duly licensed by the NEMA. The EIA/EA Regulations also provide information to project proponents on the requirements of either an EIA or EA as required by the EMCA.	• The proposed project is subject to relevant provisions of these regulations and subsequently, the ESIA has been undertaken in accordance with the requirements.
11	L.N. 120: Water Quality Regulations, 2006	This regulation provides for the sustainable management of water used for various purposes in Kenya. The regulation contains discharge limits for various environmental parameters into public sewers and the environment.	• The contractor will be required to properly manage the effluent from construction activities in accordance with the above regulations prior to discharge into the environment.
12	L.N. 121: Waste Management Regulations, 2006	Generally, it is a requirement under the regulations that a waste generator segregates waste (hazardous and non-hazardous) by type and then disposes them in an environmentally acceptable manner.	• Waste to be disposed in accordance with these regulations.
13	L.N. 61: Noise and Excessive Vibration Control Regulations, 2009	The general prohibition of these regulations states that no person shall make or cause to be made any loud, unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health, or safety of others and the environment.	• Rules 13 and 14 of the regulations define the permissible noise levels for construction sites. These noise limits will be applicable to the proposed project.
14	Licenses and Permits Required Under The EMCA	The subsidiary legislations under the EMCA are partially monitored using permits and licenses. Subsequently all licenses and permits required during the construction phase shall be the responsibility of the individual contractors and their agents. During the operational phase, all permits, and licenses required to operate the project will be the responsibility of the proponent.	The following permits to be available for inspection during the construction and operational phases of the project: ✓ Waste Transport License under Legal Notice 121: The Environment Management and Coordination (Waste Management) Regulations 2006 for disposal of all types of wastes; and ✓ Noise Permit under Legal Notice 61: The Environment Management and Coordination (Noise and Excessive Vibration Control) Regulations, 2009.
15	Occupational Health and Safety Act, 2007	The Occupational Safety and Health Act (OSHA) was enacted to provide for the health, safety and welfare of persons employed in workplaces, and for matters incidental thereto and connected therewith.	The contractors will be required to fully comply with Legal Notice 40 titled: Building Operations and Works of Engineering Construction Rules, 1984 (BOWEC). Each contractor will develop and implement a formal construction health and safety plan.
16	L.N. 31: The Safety and Health Committee Rules, 2004	These rules came into effect on April 28, 2004, and require that an Occupier formalise a S&H Committee if there is a minimum of 20 persons employed in the workplace. The size of the S&H Committee will depend on the number of workers employed at the place of work	The contractor will be required to constitute Health and Safety Committee to oversee safety and health at the construction site

17	L.N. 24: Medical Examination Rules, 2005	These rules provide for Occupiers to mandatorily undertake pre-employment, periodic, and termination medical evaluations of workers whose occupations are stipulated in the Eighth Schedule to the OSHA and the First Schedule to this Rules. Workers that fall under the above two schedules are required to undergo medical evaluations by a registered medical health practitioner duly registered by the DOSHS.	The contractor should ensure that the workers exposed to hazards and or accidents undergo requisite medical examinations as required by these rules
18	L.N. 25: Noise Prevention and Control Rules, 2005	The rules set the permissible level for occupational noise in any workplace (which includes construction sites) The Proponent is to ensure that • any equipment brought to the site for use shall be designed or have built-in noise reduction devices that do not exceed 90 dB(A). • those employees that may be exposed to continuous noise levels of 85 dB(A) are medically examined as indicated in Regulation 16. If found unfit, the occupational hearing loss to the worker will be compensated as an occupational disease.	The contractor to ensure that equipment is serviced properly and/or use equipment that complies with the threshold noise values provided in the act. Alternatively, each contractor will be required to develop and implement a written hearing conservation programme during the construction phase.
19	L.N. 59: Fire Risk Reduction Rules, 2007	Several sections of the rules apply to the proposed project as enumerated below. - Regulation 16 requires Proponents to ensure that electrical equipment is installed in accordance with the respective hazardous area classification system. It is also a requirement that all electrical equipment is inspected every six months by a competent person and the Proponent is required to keep records of such inspections. - Regulation 22 provides a description of the functions of a fire-fighting team. - Regulation 23 requires Proponents to mandatorily undertake fire drills at least once a year. - Regulation 34 requires Proponents to develop and implement a comprehensive written Fire Safety Policy - Regulation 35 requires a Proponent to notify the nearest Occupational S&H area office of a fire incident within 24 hours of its occurrence and a written report sent to the Director of DOSHS within 7 days.	The proponent is expected to comply with the requirements of L.N. 59: Fire Risk Reduction Rules, 2007 by i. Carrying out, and record, a fire risk assessment identifying any possible dangers and risks. ii. Reducing, or where possible remove, the risk of fire and take precautions to deal with the remaining risks. iii. Developing an emergency plan should a fire occur which includes evacuation procedures etc
20	The Energy Act, 2019	The Energy Act of 2019 deals with all matters relating to all forms of energy including the generation, transmission, distribution, supply and use of electrical energy as well as the legal basis for establishing the	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.

		systems associated with these purposes. The Act also established the Energy and Petroleum Regulatory Authority (EPRA).	- the Mini-Grid proponent has the technical and financial capability to conduct the project - The proponent has conducted the necessary engagement with the community.
21	The Energy (Solar Photovoltaic Systems) Regulations, 2012	These regulations shall apply to a solar PV system manufacturer, importer, vendor, technician, contractor, system owner, a solar PV system installation and consumer devices. The Regulations prohibits any person from designing or installing any solar PV system unless he/she is licensed by EPRA.	- The Regulations regulates the design and installation of PV systems. The persons engaged in the designing and installation of the Mini-Grid shall be licensed by EPRA
22	The Public Health Act (Cap. 242)	The Act prohibits the proponents from engaging in activities that cause environmental nuisance or those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety.	- The proponent will be in line with the regulations of this act and will ensure suppression of infectious diseases and maintain proper sanitation during all the phases of the project.
23	The Land Act, 2012	An Act of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land- based resources, and for connected purposes Forms of Tenure. 5. (1) There shall be the following forms of land tenure- (a) freehold; (b) leasehold; (c) such forms of partial interest as may be defined under this Act and other law, including but not limited to easements; and (d) customary land rights, where consistent with the Constitution. Methods of acquisition of title to land. 7. Title to land may be acquired through— (a) allocation; (b) land adjudication process; (c) compulsory acquisition; (d) prescription; (e) settlement programs; (f) transmissions; (g) transfers; (h) long term leases exceeding twenty-one years created out of private land; or (i) any other manner prescribed in an Act of Parliament. Conversion of land. 9. (1) Any land may be converted from one category to another in accordance with the provisions of this Act or any other written law. (d) Community land may be converted to either private or public land in accordance with the law relating to community land enacted pursuant to Article 63(5) of the Constitution.	Land in Kokuro is community land whose tenure falls under customary land rights. KPLC will observe all the relevant provisions of the Act. The proponent shall compensate the community land through a 'compensation in kind' approach
24	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	- The proposed project site falls on community land and the land belongs to the Turkanacommunity pastoralist in

		trust all unregistered community land on behalf of the communities for which it is held'. Furthermore, Section 6(2) maintains that 'the respective county government shall hold in trust for a community any monies payable as compensation for compulsory acquisition of any unregistered community land'. Section 30(1) states that 'Every member of the community has a right to equal benefit from community land'. Section 26(1) provides that 'a community may set aside part of the registered community land for public purposes and Sub-section (2) holds that 'where land is set aside for public purposes under Sub-section (1), the (Land) Commission shall gazette such parcel of land as public land'. These provisions offer a window for the proposed project to acquire land for project works legally for communities as necessary and to convert the same into public land. This is useful for the project as once done powerful groups will not have opportunity to exclude them on account of their socio - economic statuses. In any event, Section 35 holds that, 'subject to any other law, natural resources found in community land shall be used and managed- (a) Sustainably and productively. (b) For the benefit of the whole community including future generations. (c) With transparency and accountability; and (d) On the basis of equitable sharing of accruing benefits. The concept of community land has been defined broadly enough to include VMGs. Women, children, old people, and future generations have been thought of as PAPs and thus their rights secured in this Act	Kokuro. The community has since offered to the land in kind for project use. The establishment of the mini grid will convert communal land to industrial use for long term. Further, based on community need assessment the proponent will undertake in kind development project to support the community water needs. - The proponent should adhere to the provision of this legislation
25	Land Registration Act, 2012	Section 27 (2) provides that a transfer without valuable consideration shall have the same effect as a transfer for valuable consideration when registered.	Once the KOSAP PIU finalizes stakeholder engagements in all the identified counties, the transfer process shall be commenced to ensure that the land - rights are secured. This gives the project the required land security to allow project implementation, which is in compliance with this legal requirement.
26	Land value amendment Act 2019	It aims at standardizing the value of land in Kenya for the primary purpose of enhancing efficiency and expediting the compulsory land acquisition process for public projects.	Land in Kokuro is community land and shall be allocated by the community for the proposed mini-grid will be acquired for the project. The MOE will pay compensation in kind through

		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 be made.	implementation of projects based on the community preferenc; water project.
27	The Physical and Land Use Planning Act, 2019	This Act of Parliament makes provision for the planning, use, regulation, and development of land and for connected purposes.	The proposed site is not in contravention of any Zoning regulations. The project site is within unregistered community land; necessary county approvals will be sought by the proponent e.g., Project design approval and change of use. The approvals shall be issued by the Physical planner in the department of Lands, Housing and Urban Development – TurkanaCounty.
28	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
29	The Children Act, 2012	Part 2 of the Act denotes the rights of the children and their welfare shall be protected from child labor 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.
30	The Sexual Offenses Act 2006	This is a comprehensive law that criminalizes a wide range of behaviors including rape, sexual assault, defilement, compelled or induced indecent acts with child imbeciles or adults, gang rape, child pornography, child trafficking, child sex tourism, child prostitution, exploitation of prostitution, incest by male and female persons, sexual harassment, deliberate transmission of HIV or other life threatening sexually transmitted disease, stupefying with sexual intent, forced sexual acts for	Implementation of a project creates changes in a community in which it is implemented and is has potential to can cause shifts in power dynamics between community members and within households. For instance, male drunkness is a key driver of Gender Based Violence (GBV) which can be triggered by labor influx on a project when workers are believed to be interacting . Hence, abusive behavior can occur not only between project-related staff and those living in and around

		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.	the project site, but also within the homes of those affected by the project.
31	Persons with Disability Act, Chapter 133	This Act provides for the protection of the rights of people with disabilities ensuring they are not marginalized and that they enjoy all the necessities of life without discrimination. The Act guarantees that (1) No person shall deny a person with a disability access to opportunities for suitable employment. (2) A qualified employee with a disability shall be subject to the same terms and conditions of employment and the same compensation, privileges, benefits, fringe benefits, incentives or allowances as qualified able-bodied employees. (3) An employee with a disability shall be entitled to exemption from tax on all income accruing from his employment.	The Act will be adhered to in order to ensure that persons with disability are included in all decision making that affects their lives. 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.
32	The Work Injury Benefit Act, 2007	This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment	The Proponent and Contractor will maintain an insurance policy cover for its employees, record of accident, carryout proper accident investigations; organize for pre-employment and regular medical examinations for staff.
33	Air Quality Regulations (2014)	Regulation 3 stipulates that the objective of these Regulations is to provide for the prevention, control, and abatement of air pollution to ensure clean and healthy ambient air.	The Proponent and contractor will implement mitigation during construction to ensure neighbouring properties are not impacted by nuisance dust

4.5 National Administrative Requirements

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

Table 7: Relevant Enforcement agencies

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

4.6 International Safeguard Requirements

The table below shows the applicability of World Bank Operational Safeguard Policies as it applies to the proposed project in Kokuro site.

Table 8. World Bank Safeguards

OP	TITLE	APPLICABILITY	COMMENTS
4.01	Environmental and Social Impact Assessment	Applicable	The proposed project is likely to have potential environmental and social impacts. The objective of OP 4.01 is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate environmental and social screening, analysis of actions and mitigation of their likely environmental and social impacts and monitoring. Therefore, OP 4.01 has been triggered, and in line with this operational policy, the environmental and social screening process for the mini-grid project.
4.04	Natural Habitats	Applicable	The proposed project may be in or close to areas with natural unique flora and fauna though the component is unlikely to have significant negative impacts on natural habitat. Works will nevertheless be implemented in an area in Kokuro that may not negatively affect diverse flora, fauna, and avifauna. The area is dependent on pastoralism.

4.12	Land Acquisition and Involuntary Settlement	Applicable	The proposed project will involve land take for construction purposes including, solar panels; generator rooms and distribution lines, as well as contractor yard and workers camp site
4.10	Indigenous People	Applicable.	The proposed project will be operating in Kokuro where the PAPs are classified as Indigenous Peoples (IPs).The main ethnic group in Kokuro area is the Turkanaand the community is known to have owned the land.

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

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

Table 9: Comparison between the WB safeguard policies and the Kenya Legislation

World Bank safeguard Policies	Kenyan laws	Comparison	Recommendation
O.P 4.01 **requires screening to determine level of environmental and social assessment to be done** **An ESIA is prepared before project implementation**	EMCA requires screening of project to determine level of environmental and social assessment to be done An ESIA is required once determination is done	Similar both require screening	Screening has been done and the project is established as medium risk which requires and ESIA
ESIA is needed once determination had been established and should be prepared identifying all environmental and social impacts and mitigation measures proposed to address the impacts	ESIA is needed once determination had been established and should be prepared identifying all environmental and social impacts and mitigation measures proposed to address the impacts	Similar-both require ESIA depending on the project impacts	ESIA is prepared in line with EMCA /EIA regulations and makes reference to WB safeguard policies
O.P 4.12 **Land Acquisition and Involuntary resettlement should be avoided wherever possible or minimized and exploring all alternatives**	The Government and any other organization shall prevent internal displacement linked to development projects to the extent possible by exploring other alternatives.	Similar**-** displacement in projects should be avoided to the extent possible by exploring alternatives.	WB policy is more elaborate than the Kenyan Law.
O.P 4.10 **on indigenous people seeks to promote the inclusion of these group in development project and especially through consultation to ensure they also share in the project benefits and ensure negative impacts do not disproportionately fall on them**	The 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	Similar-both seek to promote inclusion of these group so that they do can share the projects benefits and ensure that negative impacts of the project do not fall on them disproportionately WB needs a social assessment to be conducted	WB policy more elaborate and the two are being used to compliment

World Bank safeguard Policies	Kenyan laws	Comparison	Recommendation
The policy requires these groups to be consulted separately to enhance their participation	of these persons in all issues as they are often overlooked and left out. Emphasis is also on consulting with them		
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

5 STAKEHOLDER ENGAGEMENT

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

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

5.1 Stakeholder Consultation and Disclosure Requirement for the Project

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

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

The respective minutes and list of participants for the public consultation undertaken at Kokuro is enclosed under appendices of this report. Background information document (BID) with project details was posted clearly on one of the regular shops at shopping center.

Plate 3. BID document with project details posted at Kokuro Centre

5.2 Stakeholder Characterization and Identification

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

- **Primary Stakeholders**- Stakeholders who have a direct impact on or are directly impacted by the project.
- **Secondary Stakeholders**- Stakeholders who have an indirect impact or are indirectly impacted by the project.

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

Table 10. Identified Stakeholders

Stakeholder Category	Stakeholder Groups			Consultation Tool
Project Affected Persons	Local Community	Households	Local Laboure's Local Community Pastoralists	**Public Meeting** ✓ 1 public meeting was held in Kokuro shopping Centre on 19th January 2022. ✓ The meeting was held with attendance of 140 people. **Focus Group Discussions (FGD)** ✓ The FGDs were conducted with the men, women, youth. **Key Informant Interviews (KII)** ✓ The KIIs for Kokuro Primary school. The chief was also interviewed on the Community Profile of Kokuro
		Individuals	VMG's	
	Institutions		Community & Faith Based Organizations Education & Healthcare institutions	
Interested Parties	Government Bodies		District and local administration	✓ Key informant interview ✓ Administering questionnaires ✓ Physical Meeting
			NEMA County Government	

5.2.1 Stakeholder Mapping

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

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

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

Table 11: Stakeholder Significance and Engagement Requirement

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

5.3 Stakeholder Analysis

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

both been primarily rated as:

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

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

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

5.4 Summary of Community Consultation Meeting Leading to Land Identification and GRC Constitution-(screening level)

Project: Proposed Kokuro Solar Mini-grid
Venue of meeting; Kokuro Village
Date: 17/03/2021

Ms Myra explained that the national government is implementing KOSAP in partnership with County Government in 14 Counties in areas that are far away from the national grid. She said the proposed project is called KOSAP-(Kenya Off-grid Solar Access Project) is being implemented jointly by the Ministry of Energy, the Kenya Power and Lighting Company (KPLC) and the Rural Electrification and Renewable Energy Corporation (REREC) in partnership with the World Bank as a development partner, County Government as a partner and the communities in Off-grid areas being the PAPs.

She further noted that the agenda of the visit was to undertake

- Undertake an environmental and social screening of the proposed sites to check suitability in terms of environmental, technical, social and health requirements.
- Undertake community engagement to sensitize the community on the project.
- Explain the land requirements for the project and sensitize the community on their rights in regard to land so that they can make an informed decision.
- Need to set up Grievance Redress Mechanism for the project.
- Guide the community in electing Grievance Redress Mechanism committee members and sensitize the members of their work during project implementation

The environmentalist (Ms. Irene) explained the benefits and negative impacts and their proposed mitigation measures of the project.

5.4.1 Land for the Project

Ms Agnes (Surveyor), informed the Baraza that the main purpose of the Baraza was to seek community consent for land donation for the project. Land required for the construction of the Mini grid is 2-5 acres. Land in Kokuro, falls under the Community land category, though they have no title deed, its use and management is governed by the Community Land Act 2016. She informed the community that the surveyor will need to pick exact GPS points of land proposed for the project and with community consent from their nominated representatives, land will be registered in the name of implementing agency.

5.4.2 Plenary Session

The community members were briefed on what had been discussed and invite community members to ask questions or seek clarifications on information shared. The questions raised are presented in the table below.

Table 5-12: Issues /Comments Raised by the Stakeholders During the Public Meeting and the Responses Given by the Proponent and the Consultant

	Name	Question / Comments	Answer / Remarks
1.	Agnes Maria	Stima itawekwa wapi? kwa boma ama kipande yenye tumepeana? (Where will be the solar panels be installed? in our home compounds or land donated)	It will be installed in the identified land but distributed to houses though transmission cables
2.	Ekori Nimekwea	Sisi hatuna pesa ya stima na kenya mzima hakuna pahali land is given free, tunataka tulipwe na tupewe stima free. (We don't have money to pay for electricity and no land in Kenya is given free, we need to be paid and given free access to electricity.)	Noted. Views have been captured
3.	**Francis Ekori**	After paying 1000 do you start using power immediately? How long does it take?	Yes after buying tokens After purchase of tokens and loading them into the meter it is instantaneous.
4.	**Moses Ekidore**	After paying 1000 for connection is there grace period maybe a month free, before commencement of purchase of tokens?	No there is no grace period

5.4.3 Project Grievance Redress Mechanism

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

1. Locational grievance redress committee. At this level you the community will choose project committee members who will also double as grievance redress committee. The membership will comprises; elders/men representatives, representatives from women, youth, and special needs (persons with disability). The office of the chief will be the first stop for receiving information and raising grievances.

2. County Grievance Redress committee. This will comprise members of the county working group. This committee will resolve complains or issues that are unable to be resolved at the locational/project level. The chairman of the project grievance redress committee at the community will forward issues/ complains to the county grievance redress committee through CREO who will also be responsible for giving feed back to the local committee.

3. National Grievance Redress committee. Comprising of KOSAP Project Implementation Unit at the Ministry of Energy and the implementing agencies. Matters that could not be resolved at the county level will be escalated to this National GRC by the CEC-Energy
The last level of the GRM for the community or project affected persons will be arbitration or legal redress in a court of law once all the three levels have been exhausted.

The GRC should constitute representation from all genders, youth and vulnerable persons. It should be structured in such a way that it provides multiple channels for lodging grievances, ensure anonymity and confidentiality.

5.4.4 Focus Group Discussions

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

a) Focus Group Discussion with the Women

Ms Myra who led the women discussion forum, explained to the women that it was important to hold a separate discussion with them so that they have opportunity to raise any concern or give opinions about the project.

Question, Suggestions, Feedback and Response for the Focus Group Discussion with Women

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team	Response by agency on how feedback will be used or acted upon
Napeyiok Eipa	When will electricity come?	Myra responded that electricity will come in 2022 since there is a process that needs to be completed for procurement of the contractor who will construct the minigrid	The Ministry will expedite the process of procurement of the contractor
Roselyne Amon	Where will the minigrid be located? Will the owner of the plot be compensated?	Agnes responded that the minigrid will be located on community land. No one will be compensated for use of the land. We are here today to get your free will consent to donate the land. Please remember the benefits that having electricity will bring	
Apetet Maraka	Who will choose the location of the Minigrid?	Agnes responded that the land has been identified in close consultation with the community. today's meeting is also part of the consultatioin	
Paulina Ewat	Is the total cost of the electricity only KES 1,000	Myra responded that the KES 1,000 is only a connection fee. Thereafter households will need to pay for the electricity that they use	
Lokipi Emure	Apart from centralised places near the minigrid, will other households benefit.	Myra responded that only households within a 3km radius of the minigrid will benefit. Those outside the radius can purchase solar home systems which are	

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team	Response by agency on how feedback will be used or acted upon
		also being promoted by KOSAP	
Roselyn Atemeju	We support the project. As the community is grateful for the project since it will benefit the community. It will give the community an opportunity to have businesses like salons, help the children study at night and improve security through provision of street lights.		This should be factored into the awareness creation activities by Media Edge, the Ministry's communication consultant
Esther Lopiyo	The project will also create jobs by employing the youths knowledgeable in wiring.	Myra stated that the Ministry is looking forward to creating local jobs	The contractors for the minigrid project should make extra effort to ensure that the job creation opportunities should harness community

After the discussions in the FGD for women, Myra requested that they elect 2 women who will be in charge of Resolving grievances.

The women nominated were:

Name	ID number	Telephone number
Paulina Ewat	20140948	0724874542
Napeiyok Eipa		0711198092

b) Focus Group Discussion with the Youth

The youth said they support the project. The youth were then allowed to ask questions. The youths did not raise any questions and proceeded to nominate the GRC representatives.

Name	ID number	Telephone number
David Ekai Longor	22989346	079989`356
Akiru Eremon	33580114	0796279645

c) Elders/Men Discussions

Mr Kioko led the men focus group discussion, he told them the FGD was a good avenue for the elders to express their opinions and freely ask any questions. The group was also informed on the need to select GRC representatives.

The following as their representatives in the GRC;

Name	ID number	Telephone number
Loregai esinyen achika	9336650	0768429463
Adukan tiboye kapalakan	0609515	Un available

5.5 Summary of Community Consultation during the ESIA

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

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

The general stakeholder consultation was done in a public meeting (Baraza) organized at Kokuro community baraza point where 64 males and 76 women were in attendance. The meeting was chaired by the area chief assisted by the assistant chief. The feedback received during the stakeholder consultation process have been summarized below.

Table 13: Summary of feedback received during the stakeholder consultation

No		Concerns	Issues/comments discussed
1.	Local employment opportunities Gender inclusivity	Concerns on the employment opportunities available and if the local expertise and whether the women will be considered	The consultants responded that the project encourages the participation and empowerment of the community regardless of gender and age, both skilled and non-skilled based opportunities will be available. The consultant also added that; that the project will follow guidelines and set out laws in seeking qualified staff and workers to work on the project. The consultant further informed them that the contractor will be advise to utilise locally available human resources where available.
2.	Reliability to power	Concerns on the reliability of the solar power and the distance to be covered by the project.	The consultants informed the proponent in conjunction with the contractor will manage the project and ensure that the power is reliably and equally availed to all the PAPs. The consultant responded to him, he informed the community that every member of the community, business or public facility will be connected to the electricity at an affordable cost regardless of the houses they live in, however, the members

were warned, to ensure roofing is made water-proof to avoid accidents.

5.5.1 Positive Comments about the Project from the Participants

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

- ✓ Learning will improve due to availability of lighting
- ✓ Business opportunities will improve since farmers will be able to cool their milk, welding business will arise
- ✓ Employment opportunities will increase for the youth due to increase in business opportunities
- ✓ Security will improve due to availability of lighting
- ✓ Medical services will improve due to availability of refrigeration services
- ✓ The electricity will assist in pumping of water from the boreholes

5.5.2 The identified negative impacts of the project

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

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

  The proponent will ensure that dust levels at the site are minimized through sprinkling water in areas being excavated and along the tracks used by the transport trucks within the site. Additional mitigation measures presented in this report will be fully implemented to minimize the impacts of dust generation.

5.5.3 Focused Group Discussions analysis

The in-depth interviews were used as a tool for stakeholder identification and mobilization as well as collection of baseline data to enable identification of the likely project impacts. In addition, it provided an opportunity to the participants to raise their fears and concerns as well as make recommendation as pertains to the project. The consultative meeting had a wide representation as follows:

Table 14. The consultative meeting had a wide representation

Category	Male	Female	Total
Youth	7	7	14
Adult	57	69	126
TOTAL	**64**	**76**	**140**

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

5.5.3.1 Female Stakeholders' Consultation and Participation

The females' participants in the FGD were 11 and between 20-70 years of age. There was no female headed households in the meeting. The following were their responses.

The project perception

The women indicated that the project would have a positive impact in their lives through provision of lighting especially to be used by children for homework, and power for pumping of water for domestic use and livestock watering.

Women in Kokuro community and their roles as reported by the FGD

- ✓ Building houses, fetching of firewood and water.
- ✓ Cooking and other house chores.
- ✓ Women and men have equal opportunities in the community however, Women control household equipment while male control livestock and other major assets.
- ✓ Women feel safe in the community and level of crime is low. No conflict is experience.
- ✓ The challenges encountered by women include inadequate water, lack of proper sanitation, high levels of illiteracy.
- ✓ Women receive information about local issues and development or news through radios and from the local chief.
- ✓ Women are currently involved in herding of livestock, roles that were exclusively for men. They are also involved in decision making of various issues in the community

5.5.3.2 Male Stakeholders' Consultation and Participation

- ✓ The male participants were 14 in number between 40-71 years of age. The male participants are household heads. The following were the response during the male FGD.

The project perception

- ✓ The men indicated that they had heard about the project. During this time, the proponent discussed the project with the community and they agreed to offer a piece of land.
- ✓ The men also indicated that the project is long overdue. Some of the benefits to be accrued by the community include, a source of reliable electricity which will help improve businesses, education, health and security within Kokuro.

Role of Men as per the FGD

- ✓ The findings showed that the roles of men are mainly siring of children, herding, and watering of livestock, providing leadership, decision making and security at the household level.
- ✓ They indicated that men and women have equal opportunities in the community, however sometimes women have more opportunities because they do not fight during cattle raids.

- ✓ Men feel unsafe in the community because of several incidences of conflict and cattle rustling.
- ✓ The main challenges encountered by men in Kokuro community mainly include drought which greatly affect the animals thus forcing them to trek for long distances up to 20km in search of water and pasture, water scarcity, lack of electricity, poor roads and transportation.
- ✓ Men generally receive information about local issues and development by attending baraza meetings and also from the village elders.

5.5.3.3 Youth Stakeholders' Consultation and Participation

- ✓ The youth participants were 14 in number, and consisted of 7 males and 7 females. The following opinions were provided by the youth participants during the FGD.

The project perception

- ✓ The youth disclosed that they were aware and understood the importance of the project to the community.
- ✓ They suggested that the project had positive impact since it will create employment opportunities, and improve quality of education, security, businesses growth and development in the area.
- ✓ They however noted that negative impact as likely injuries through electric shocks and suggested great care while handling electrical appliances.

Role of Youth

- ✓ The youth indicated that main community decision making is undertaken entirely by the elders and therefore their voices are generally not heard.

Institutions/community Development

- ✓ The youth have Ariim and Edoot youth group that was established in the year 2019 and 2015 respectively, that majorly deals with community sensitization in terms of Health awareness.

Economy /Income Generation/Employment

- ✓ An estimate of twenty (50%) of the youth are self-employed while about one (2%) have full-time salary jobs.
- ✓ The income-generating skills pre-dominant among youth in Kokuro include driving, cooking, mechanical, teaching and accounting.
- ✓ Other skills that enable them gain employment include mechanical works, plumbing and wiring.

Education, literacy, and training for youth FGD

- ✓ An estimate of 25% of the youth have completed secondary education while a further 5% have completed Vocational/College level education.

Key Priorities among the Youth & Issues

- ✓ The Youth top three priorities include provision of employment opportunities, provision of grants to empower them and construction of the youth empowerment center and vocational training colleges.

5.5.3.4 Education Stakeholders' Consultation and Participation

- ✓ The Education Stakeholder in Kokuro was the head teacher at Kokuro Primary School which is a government sponsored institution. The head teacher has worked in the school for 10 years. The following responses were recorded from the stakeholder.

The project perception

- ✓ He has heard about the project within the village in the year 2021.
- ✓ The project will improve socio-economic levels within Kokuro area, this includes; improvement of businesses, security, education and health care.
- ✓ The respondent indicated that the project would have a positive impact to the school through access of electricity that will provide light especially in the evening study by students and also improve the performance and attendance of the students.
- ✓ Provided various possible ways of mitigating the negative impact from the solar project through fencing the project area, informing and properly educating the locals on negative effects of the projects and employing security personnel.

Plate 1. Women FGD meeting in progress at the time of assessment

Plate 3. Public Participation

Plate 2. Male FGD

Plate 5. Youth FGD

6 IMPACT ASSESSMENT AND MITIGATION MEASURES

6.1 Introduction

This Section identifies and discusses both negative and positive Environmental and Social impacts associated with the proposed Mini grid at Kokuro. The impacts are identified according to Phases namely: Construction Phase, Operational Phase and Decommissioning Phase.

6.2 Identification of Impacts

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

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

6.3 Impact Assessment Methodology

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

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

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

6.4 Defining Impact

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

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

6.5 Assessment of Significance

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

- Status of compliance with relevant Kenyan legislation, policies and plans and any relevant Kenyan or industry policies, standards or guidelines, as well as international best practice standards and guidelines;

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

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

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

Table 6-1: Categories of Significance

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

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

Table 6-2: Overall Significance Criteria for Environmental Impacts

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

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

6.6 Magnitude of Impact

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

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

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

6.7 Sensitivity of Resources and Receptors

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

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

6.8 Likelihood

Terms used to define likelihood of occurrence of an impact are explained in Table 6-3 below.

Table 6-3: Explanation of Terms Used for Likelihood of Occurrence

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

6.9 Definition of Mitigation Measures

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

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

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

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

6.10 Positive Impacts - Pre-Construction

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

6.11 Positive Impacts During Construction Phase

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

6.11.1 Creation of Employment Opportunities

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

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

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

Enforcement Measures

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

6.11.2 Improving local economy

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

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

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

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

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

6.12 Positive Impacts during Operation Phase

6.12.1 Quality, Reliable Power Supply

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

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

Enforcement Measures

- REREC should ensure that they have a functional customer support team and a field response team;

- REREC should ensure that they communicate power outages early to consumers

6.12.2 Employment Creation

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

The impact significance is low.

Enforcement Measures

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

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

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

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

Enforcement Measures

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

6.12.4 Improvement of Local and National Economy

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

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

Enforcement Measures

- REREC should ensure that their contractors/suppliers remit taxes and have a tax compliance certificate

- Prioritise local purchases over imports.
- Remit taxes on behalf of employees

6.12.5 Education

Access to electricity at the household level and schools will create opportunities for children be able to study even for longer hours. Additionally, children in households can also access education programs being aired through different radio and T.V. channels. Schools will be able to take advantage of information technology and communication that are becoming a way of life in education sector and learning in general.' The impact significance is high as it will provide power to schools over a long period for additional study time in the night and morning

Enforcement Measures

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

6.12.6 Health Benefits of the Project

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

6.12.7 Improved Standard of Living

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

6.12.8 Security

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

6.12.9 Communications

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

6.13 Positive Impacts during Decommissioning Phase

6.13.1 Employment Opportunities

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

6.13.2 Site Rehabilitation

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

6.14 Negative Impacts during Pre-construction Phase

6.14.1 Land Take

The identified site for the proposed Mini-grid is part of a 1.215 Ha of land owned by the Kokuro community that they set aside for construction of public facilities. The assessment found that;

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

6.14.2 Acquisition of Way Leaves

Supply of electricity will involve passing of low voltage (LV) lines to connect the customers to power. It is estimated that a total of 6 km of LV circuit will be constructed mainly along the road reserve and along the boundaries to supply power.

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

Mitigation Measures

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

6.15 Negative Impacts During Construction Phase

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

6.15.1 Vegetation Clearance

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

Mitigation Measures

1. Clear only the necessary areas
2. Ensure proper demarcation and delineation of the project area to be affected by construction works.

3. Specify locations for vehicles and equipment, and areas of the site which should be kept free of traffic, equipment, and storage.
4. Designate access routes and parking areas
5. Re-vegetation including planting of trees around the plant/facility

6.15.2 Soil Erosion Impact

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

Mitigation Measures

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

6.15.3 Contamination of Soil from Fossil Fuels

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

Mitigation Measures

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

6.15.4 Dust Emissions

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

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

Mitigation Measures

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

6.15.5 Vehicle Exhaust Emissions

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

Mitigation Measures

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

6.15.6 Pollution from Solid Waste Generation

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

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

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

Mitigation Measures

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

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

6.15.7 Impacts on Water Resources and Water Quality

During construction, excavation activities will involve soil exposure which results in soil erosion due to wind and surface runoff due to rains. Seepage from spilled fuels and oils and leaking machinery can also negatively impact groundwater water which could lead to potential contamination. Generally, due to the localized area of impact, the overall significance of the related impacts on water quality is considered to be minor, provided the necessary mitigation/ management measures are implemented.

Mitigation Measures

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

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

6.15.8 Noise and vibration

During construction activities noise pollution will occur and is bound to be a nuisance and a disturbance to neighboring communities. This noise is from construction equipment, excavation works, concrete mixing and vehicles coming to site but will be temporary. From the prediction of the specialist study on ambient noise quality measurements, the traffic noise that will be emitted by traffic accessing the proposed project site during construction is expected to have an adverse impact on ambient noise. The level of traffic noise

will increase depending on the traffic volume. General guideline indicates that an increase of 20% in traffic volume approximates to a noise level increase of around 1 dB, while a doubling of traffic volume results in a noise level increase of about 3 dB. It is however, worth noting that the level of noise is attenuated with increase in distance from the source and thus the sites/objects in close proximity to the source will receive more noise in comparison to those at remote location. The impact significance has therefore been assessed minor. This due to the fact that the impact magnitude is low and the receptor sensitivity is medium.

Mitigation Measures for Noise and Vibration

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

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

6.15.9 Impacts from Hazardous Materials

Some hazardous materials will be used during construction phase of the project. They include insulating oil, paints, solvents and oils. Spilled chemicals can contaminate soil as well as pollute water resources. Additionally, hazardous and flammable substances if improperly stored and handled on site become potential health hazard for construction workers and the public. The amount of hazardous waste generated will be minimal. The significance of the impact will be minor due to a low magnitude and medium sensitivity.

Mitigation Measures

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

6.15.10 Accidental Oil Spills or Leaks

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

Mitigation Measures

- In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately.
- It is proposed that the refueling and maintenance of vehicles will not take place at the construction site.

- Contractor to create awareness for the employees on site on procedures of dealing with spills and leaks from oil for the construction machinery
- Vehicles and equipment must be serviced regularly and kept in good state to avoid leaks.
- In case of spillage the contractor should isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent materials and/or other materials approved by materials.
- Proper training for the handling and use of fuels and hazardous material for construction workers.
- All chemicals should be stored within the bunded areas and clearly labeled detailing the nature and quantity of chemicals within individual containers.

6.15.11 Fire Hazards

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

Mitigation Measures

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

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

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

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

Mitigation Measures

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

6.15.13 Increased Water Demand

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

Mitigation Measures

- ❖ Prudent use of available water
- ❖ Consultations with the project local committee on use of water in the community to avoid conflicts with the community

- ❖ Contractor to make own arrangements to provide water for construction works different from the community dam to avoid any conflicts with community.

6.15.14 Energy Consumption

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

Mitigation Measures

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

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

6.15.15 Occupational Health and Safety Impacts

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

Mitigation Measures

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

6.15.16 Community Safety -Access to Site by General Public

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

Mitigation Measures

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

6.15.17 Spread of HIV/AIDS and STIs

HIV and AIDS remain a major challenge in Kenya as well as Turkana County. The epidemic continues to adversely impact on all spheres of the County; economic, social and health sectors.

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

Mitigation measures include:

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

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

The influx of workers in the area is expected to lead to increase in demand for public amenities such as hospitals, transport, schools water resources etc. This could lead to a loss of access to these services by locals especially those who could be among the vulnerable categories. Due an increase in demand, cost of housing near the sites will disadvantage the locals.

The nature of the project will require technical skills that might not be available in the community. This might require movement of construction workers into the community. It is expected that technically skilled personnel might be sourced from outside the community while the unskilled labour is expected to be sourced locally. It is therefore a possibility that the neighbouring communities might go out looking for opportunities in project area thus creating competition. The significance of this impact is considered to be minor because the receptor sensitivity will be medium, and the impact magnitude is low.

Mitigation Measures

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

6.15.19 Child Labor

Implementation of the project could lead to increased opportunities for the host community 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 school truancy. The impact significance is rated minor, based on low sensitivity of the receptor and medium magnitude of the impact.

Mitigation Measures

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

6.15.20 Gender Based Violence- SEA and SH

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

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

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

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

There are few but rare incidents of gender-based violence in as identified during FGD with Men, women and youths. However, it cannot be ruled out during project implementation. Thus, the significance of this impact is considered to be Minor considering low sensitivity of the receptor and low magnitude of the impact.

Mitigation Measures

To manage GBV risks, the contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The plan should have an Accountability and Response Framework. The plan will include the necessary measures for prevention and response. The contractor can make reference to World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2020) for further guidance.

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

Key tasks will include:

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

6.15.21 Exclusion of VMGs, Vulnerable Individuals and Households

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

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

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

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

6.15.21.1 Significance of Impact

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

6.15.21.2 Mitigation measures

- Participation will be through meetings with the different groups of the vulnerable people identified primarily to ensure that;
- The VMGs and the vulnerable individuals and households are aware of the project and its impacts
- The VMGs and the vulnerable individuals and households are Aware of any restrictions and negative impacts
- Provide support to VMG and the vulnerable individuals and households participation arrangements in the project
- Confer with the VMGs and the vulnerable individuals and households at the outset on how they wish to be engaged
- Understand and respect local entry protocols as they relate to permission to enter a community and access traditional lands
- Commit to open and transparent communication and engagement from the beginning and have a considered approach in place
- Ensure that all representatives of the contractor and Proponent staff carrying out the specific sub project investment including third party subcontractors and agents are well briefed on local customs, history and legal status, and understand the need for cultural sensitivity

- Regularly monitor performance in engagement
- Enlist the services of reputable advisers with good local knowledge
- Implement the existing grievance redress mechanism Early identification and inclusion of VMGs and disadvantaged groups.
- Meaningful consultation to effectively participate in the project.
- Timely and prior disclosure of relevant project information to VMGs and disadvantaged groups.
- Adequate and ongoing consultations with VMGs and disadvantaged groups in line with the SEP.
- All concerns or grievances raised are fully resolved in a timely manner.
- Access to culturally appropriate project benefits and opportunities.

6.15.22 Public Health Impacts

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

Proposed Mitigation Measures

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

Public Health Impacts Sanitary Waste

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

Mitigation Measures

- Construct/ install pit latrines for both genders clearly labelled

6.15.23 Forced Labour

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

Mitigation Measures

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

6.15.24 Risks related to Inadequate Stakeholder Engagement

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

Mitigation measures;

- ❖ The contractor will design and implement a stakeholder engagement schedule to ensure various stakeholders are engaged at and informed about the project on a timely basis and respond to issues that the stakeholders may require.
- ❖ The contractor will also prepare and implement a grievance redress mechanism to deal with grievances. The grievance redress mechanism committee of this GRM should also include representatives from the community.

6.16 Negative impacts during Operation phase of the project

NOTE: According to the MOE the proposed project will be constructed by a third party (contractor) who will also operate and maintain the solar mini-grid for a period of ten years and then hand over the plant to Kenya Power who is the implementing agency of the plant on behalf of the MOE. Therefore, mitigation measures against negative impacts during the first ten years will be the responsibility of the contractor after which REREC will take over.

6.16.1 Solid Waste Generation

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

Mitigation measures

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

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

6.16.2 Liquid Waste/Oils Generation

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

Proposed mitigation measures

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

6.16.3 Increased oil Consumption

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

Mitigation Measures

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

6.16.4 Increased Storm Water Flow

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

Mitigation Measures

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

6.16.5 Fire Outbreaks

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

Mitigation Measures

- The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points
- Detection/alarm systems that can detect fire should be considered and installed
- A fire risk assessment and evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported.

- Workers especially operators of the plant must be trained on fire fighting and management
- 'No smoking' signs shall be posted within the Mini-grid area
- A fire Assembly point should be identified and marked

6.16.6 Visual Impacts

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

Mitigation Measures

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

6.16.7 Water demand

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

Mitigation Measures

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

6.16.8 Sanitary waste

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

Mitigation Measures

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

6.16.9 Flooding

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

Mitigation measures

- ❖ Ensure drainage channels are free of any obstruction at all times i.e., not blocked
- ❖ Construct more channels and or expand existing ones
- ❖ Raise foundations of the solar panels and ensure a proper and firm concrete base

- ❖ Create flooding diversions and or spill ways to divert water from getting into the solar power facility

6.16.10 Workers Occupation Health and Safety

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

Mitigation Measures

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

6.16.11 Hazardous waste

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

Mitigation Measures

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

6.16.12 Noise and Vibration

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

Mitigation Measures

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

6.16.13 Electric and magnetic fields (EMFs)

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

6.16.14 Shocks and electrocutions to the PAPs

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

Mitigation Measures

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

- Inspect the wiring of the houses before connecting power

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

6.16.15 Community safety -Access to the facility by general public

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

Mitigation Measures

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

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

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

Mitigation measures

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

6.16.17 Gender Based Violence- SEA/ SH

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

Mitigation Measures

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

Key tasks will include

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

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

6.16.18 Public Health Impacts –HIV/AIDs

There is potential for HIV/AIDs risks during operation phase. Therefore, the contractor needs to put measures to prevent the same. Based on the fact that the receptor sensitivity will be medium and the impact magnitude low, the impact significance will be Minor.

Mitigation Measures

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

6.16.19 Public health Impacts -Covid 19 disease

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

Mitigation Measures

- Social distance must be observed
- Provision of hand wash facilities before access
- Provide thermal guards for temperature check and monitoring for workers and any other person coming to site
- Enforce wearing of masks

- Make provision for testing and treating especially of workers
- Display Ministry of Health guidelines on COVID 19 at strategic points and ensure adherence
- Create awareness on COVID 19 preventive measures
- Provision of contact numbers for the nearest health facility for testing and treatment
- Adhering to any other measures from the ministry of health which may be issued from time to time

6.16.20 Dust emissions

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

Mitigation Measures

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

6.16.21 Vehicle exhaust emissions

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

Mitigation Measures

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

6.17 Negative impacts during decommissioning phase

Preparation for decommissioning

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

- ❖ Prepare a Decommissioning Plan and submit to NEMA and the County Governments of Turkana to obtain approval for implementation.
- ❖ Implement the decommissioning plan including backfilling, revegetation, disposal of waste material, recycling of recyclable material among others

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

6.17.1 Noise and Vibration

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

Mitigation Measures

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

- ❖ Install portable barriers to shield compressors and other small stationary equipment where necessary.
- ❖ Use quiet equipment (i.e., equipment designed with noise control elements).

- ❖ Co-ordinate with relevant agencies in case the noise produced will require a license.
- ❖ Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible.
- ❖ Demolish mainly during the day when most of the neighbours are out working.

6.17.2 Solid Waste Generation

Demolition of the Mini-grid and related infrastructure will result in generation of solid waste. The waste will contain the materials used in construction including concrete, metal, wood, glass, paints, adhesives, sealants and fasteners, conductors, poles solar panels and batteries. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. The impact will be of major significance due to high magnitude and medium receptor sensitivity. The batteries and panels need to be disposed in a specific way, in accordance to the manufacturer's guidelines and relevant regulations (both National and Turkana County Government regulations).

Mitigation Measures

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

6.17.3 Dust Emissions

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

Mitigation Measures

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

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

6.17.4 HIV/AIDs awareness and prevention

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

6.18 Social Protection

There will adequate mechanisms in place to protect local vulnerable population especially women and minors from risks associated with influx of workers (harassment, underage sex). This system will ensure having security on site provided by the contractor as well as sensitization and enforcement by the contractor. There will also be a code of conduct established for contractor employees and contract workers

acknowledging a zero-tolerance policy towards child labour and child sexual exploitation. Additionally, the contractor will employ their skilled staff and apply unskilled construction labour from the local population as far as possible to minimize on influx of foreigners into the community.

6.19 Social Inclusion

Gender Mainstreaming

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

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

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMMP)

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

Table 37: Environmental and social monitoring and management plan ESMMP

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

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

	assets will be compensated in line with the RPF provisions.					
Labor Influx and related impacts (SEA/SH, HIV/AIDs and other STIs)	-Tap into the local workforce to the extent possible to reduce labor influx. -Recruit local workforce to the extent possible especially for unskilled and semi-skilled jobs. -Consult with and involve local community in project planning and other phases of the project. -Raise awareness among local community and workers on the need to have a good /cordial working relation -Sensitize workers regarding engagement with local community. -Make provision to provide resources needed by the workers if the need for such resources may result to competition e.g., water. -Establish and operationalize an effective Grievance Redress Mechanism accessible to community members. -The contractor and the project/community grievance	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

	redress committee to work closely address complains raised on time. -Include gender considerations in employment opportunities. -Provide appropriate compensation for work done. -Respect for community values/culture. -Prompt payment of workers as per the contractual agreements/terms.					
Child labor	-Employ workers who are 18 years and above, and with a valid national ID at the time of hire. -Implement and monitor the employment register regularly. Compliance with the national labor laws and labour management practices. -Put visible signage on site "**No Jobs for children**" -Do not allow children at the project site.	Construction 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	Construction Operations Decomissioning	O&M Contractor Proponent	-Minutes of awareness creation sessions for the community and workers on GBV-SEA/SH.	Quarterly	50,000.00

	creation for communities and workers; identification of referral services for survivors and a GRM that ensures confidential reporting of GBV cases. -Implement a code of conduct signed by all those with physical presence on site.			-Code of conduct signed by all those with physical presence on site. -GRM that ensures confidentiality of GBV cases in place. Documented referral services for survivors. -Grievances raised, aggrieved persons and status on resolution etc		
Forced Labor	-Adhere to the Employment Act which outlaws any form of forced labor. -Report any form of forced labor at the site. -Ensure that all workers have a national ID card or documentation to show they are adults (above 18 years).	Construction 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 negative	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	Quarterly	30,000.00

	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.			and list of participants). -Information disclosed, to whom it was disclosed (men women, PWD, youth, vulnerable individuals and households etc., methods and languages used in the disclosure (culturally appropriate and accessible), grievances raised and status on resolution etc. -Concerns raised and actions raised.		
Exclusion of VMGs and vulnerable individuals and households	In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following. • Early identification and inclusion of VMGs and disadvantaged groups. • Meaningful consultation to effectively participate in the project.	Pre-construction Construction Operations Decomissioning	O&M Contractor Proponent	Minutes of consultative meetings with all community segments including VMGs and vulnerable individuals and households, grievances raised and status on resolution etc.	Quarterly	No additional cost

	• 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.					
Inaccessibility of project benefits to VMGs and other vulnerable individuals due to affordability challenges	-Consult VMGs and Vulnerable individuals and households on charges for sub project services, and put in place specific interventions to ensure the vulnerable equally access project benefits.	Operations	0&M Contractor, Proponent	-Interventions to enable those vulnerable access project benefits. -Number of complaints raised by VMGs/vulnerable individuals regarding access to project services. -GRM that is culturally appropriate and accessible.	Quarterly	No additional cost

				Grievances raised and status on resolution etc		
Inadequate grievances management	-Constitute a Local Grievances Committee is in consultation with all community segments, and incorporates the existing local dispute resolution mechanism. -Implement a workers grievances mechanism. -Awareness on the culturally appropriate and accessible GRM to all community segments including VMGs, vulnerable individuals and households and CSOs -All reported grievances are logged, dated, processed, resolved and closed out in a timely manner. -Proportionate representation of VMGs and vulnerable individuals in the local grievances committee. -GRM provides for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.	Construction Operations Decomissioning	O&M Contractor Proponent	-Local Grievances Committee in place, composition of committee, awareness of community and workers on project and worker GRMs, updated GRM logs, types of grievances -Availability of grievance redress process -Number of grievances reported -Number of grievances resolved in a timely manner -Number of grievances escalated to national courts and the World Bank Grievances Redress Service and Inspection Panel.	Quarterly	No additional cost
Environmental Impacts						

Vegetation clearance	1. Clear only the necessary areas 2. Ensure proper demarcation and delineation of the project area to be affected by construction works. 3. Specify locations for vehicles and equipment, and areas of the site which should be kept free of traffic, equipment, and storage. 4. Designate access routes and parking areas ***5.*** Re-vegetation including planting of trees around the plant/facility	Construction	Contractor	-Number of trees cleared -Planted trees	Once off	50,000.00
Soil erosion	1. Avoid groundbreaking during the seasons of high rainfall to avoid erosion. 2. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled. 3. Construction related impacts like erosion and cut slope destabilizing should be addressed	Construction	Contractor	Assess size of rills or Gulleys forming from accelerated run off from compacted areas	Quarterly	Part of contractor's fee

	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.					
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	Construction	Contractor	Records of any leakages from construction equipment/ vehicles.	Quarterly	50,000.00

	disposed-off appropriately. 5. No servicing vehicles on site					
Dust emissions	1. The construction area should be fenced off to reduce dust to the public 2. Suppress dust during dry periods by use of water sprays; **3.** Stockpiles of excavated soil should be enclosed/covered/watered during dry or windy conditions to reduce dust emissions. 4. Burning of woody debris & construction waste to be prohibited **5.** Use of personnel protective equipment	Construction	Contractor	-Visual Observation of dust -Provision of PPEs especially masks	Daily	100,000.00

	(PPE) -masks should be provided to all personnel in areas prone to dust emissions 6. Restrict speed on loose surface roads during dry or dusty conditions 7. Keep stockpiles and exposed soils compacted and re-vegetate as soon as possible. 8. Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas 9. Plant short trees to break speed of wind					
Vehicle exhaust and emissions 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	Construction	Contractor	-Engine maintenance records - inspection of stacks	Quarterly	100,000.00

	working order to ensure minimum emissions of carbon monoxide, NO_X, SO_X and suspended particulate matter 3. Maintain equipment in good running condition – no vehicles to be used that generate excessive black smoke 4. Use of diesel which is Sulphur- free to run the power producing generators to be encouraged 5. The stack chimney of the generators will be increased from its normal height of 3 meters to 6 meters					
Solid waste generation	1. Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is top soil last;	Construction	Contractor	Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00

	2. Segregate waste 3. Provide litter collection facilities such as bins 4. Contractor to put in place and comply with a site waste management plan 5. The contractor should comply with the requirement of OSHA ACT 2007 and Building rules on storage of construction materials 6. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time 7. Recovery of materials remains and return to stores 8. Re-use of materials where possible 9. Proper budgeting to avoid waste generation					

	10. Proper disposal of waste in line with solid waste regulation 6. Construction wastes to be managed in accordance with construction standards in Kenya					
Impacts on Water Resources and Water Quality	1. Clear the necessary areas only. 2. Appropriate remedial measures shall be implemented by the contractor in the event of erosion. 3. Infrastructure shall be designed to ensure that contaminated run-off does not reach water source i.e., earth dam. 4. Contractor to develop an oil-spill containment plan as part of the emergency response plan. In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect. 5. No vehicle maintenance and service shall be done at project site	Construction	Contractor	-Oil spill containment plan. -Provision of fuel/oil drip and spill trays	Quarterly	150,000

	7. Ensure that potential sources of petro-chemical pollution are handled in such a way to reduce chances of spills and leaks.					

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

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. 5. In case of spillage the contractor should isolate the source of oil spill and	Construction	Contractor	Records of all accidental spills and number of liters	Quarterly	150,000.00

	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 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.	Construction	Contractor	-Records of any Fire incidences -Fire equipment and evacuation plan	Quarterly	100,000.00

	6. Designate an assembly point					
Impacts of construction material sourcing (e.g., quarrying)	1. Source all building materials such as stone, sand, ballast and hard core from NEMA approved sites. 2. Ensure accurate budgeting and estimation of actual construction materials to avoid wastage. 3. Reuse of construction materials where possible.	Construction	Contractor	Sources of raw materials (from local community)	Quarterly	Part of contractor's cost
Increased water demand	1. Prudent use of available water 2. Consultations with the project local committee on use of water in the community to avoid conflicts with the community 3. Source and utilize a sustainable and reliable water supply for both construction and operation phase.	Construction	Contractor	Water usage records	Quarterly	Part of contractor's cost

Energy Consumption	1. Ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used. 2. Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. 3. Complementary to these measures, they monitor energy use during construction and set targets for reduction of energy use.	Construction	Contractor	Energy consumption records	Quarterly	No additional cost
Occupational Health and safety Impacts	1. Use skilled personnel for activities which demand skills/technical tasks 2. Awareness creation/Tool box talks on safety to workers while at construction site 3. Workers coming to the site should be	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

	knowledgeable on safety precautions to take 4. Appropriate PPE (helmet, safety harness, boots, masks, climbing irons) 5. Proper general house keeping 6. Close supervision of workers 7. Risk assessment by contractor of the construction activities and implement mitigation measures appropriately 8. Adherence to occupational Safety and Health Act 2007 9. Availability of equipped first aid box on site 10. Provide safe drinking water for workers 11. Engagement of trained first aider on site 12. Ensure the WIBA cover is taken for the staff 13. Establish safety committees					

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

	4. Provision of condoms to workers 5. Allowing migrant workers time to be with their families 6. The contractor is impressed upon not to set a construction camp on site. 7. The contractor will provide public education/information about HIV/AIDS transmission and prevention measures. 8. Ensure equal treatment of workers 9. Provide all appropriate COVID-19 preventive measures including campaign to maintain individual measures at the workplace.					
Sanitary waste	**1.** Construct/ install pit latrines for both genders clearly labelled	Construction	Contractor	Presence of separate and clean washrooms for	Quarterly	300,000.00

				both the gents and ladies		
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 3. Solid waste management awareness to operators 4. Operator to contract a NEMA licensed waste handler to collect and dispose solid waste	Operation	O&M Contractor	Presence of well-maintained receptacles and centralized collection points	Quarterly	50,000.00
Liquid Waste/Oils Generation	*1.* Proper storage of the oil is required to ensure no leakages 2. Frequent inspection and maintenance of the generator to minimize leakages. 3. No vehicles should be serviced or maintained at the Mini-grid area.	Operation	O&M Contractor	-Engine maintenance records -Oil spill containment plan	Quarterly	200,000.00

	4. The waste oil or used oil must be disposed-off appropriately. 5. Proper training for the handling and use of fuels for the operators of the Mini-grid. *6.* In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately.					
Increased oil Consumption	1. Efficient energy consumption 2. Install an energy-efficient lighting system	Operation	O&M Contractor	Energy consumption records	Quarterly	No additional cost

Increased storm water flow	1. Construct the drainage system in a way to follow natural drain of the water 2. Concrete only the required area and leave the rest of the land with vegetation like grass 3. Construct rain water harvesting system on the control buildings/office and harness into storage tanks for use	Operation	O&M Contractor	Provision of a drainage system and a rain water harvesting system	Quarterly inspections	200,000.00
Fire Outbreaks	1. The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points 2. Detection/alarm systems that can detect fire should be and installed 3. A fire evacuation plan should be prepared and	Operation	O&M Contractor	-Provision of serviced fire equipment, evacuation plan and safety signages -Records of fire safety training	Quarterly	50,000.00

	posted at strategic points and should include procedures to take when a fire is reported. 4. Workers especially operators of the plant must be trained on fire management 5. 'No smoking' signs shall be posted within the Mini-grid area 6. A fire Assembly point should be identified and marked					
Visual Impacts	1. Fence round the solar Mini-grid to keep off/screen the solar panels.	Operation	O&M Contractor	Presence of a perimeter fence	Quarterly inspections	No additional cost
Water demand	1. Ensure prudent use of water. 2. Install water-conserving automatic taps. 3. Any water leaks through damaged pipes and faulty taps should be fixed promptly.	Operation	O&M Contractor	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	Presence of separate and clean washrooms for both the gents and ladies	Quarterly	No additional cost
Flooding	1. Ensure drainage channels are free of any obstruction at all times i.e., not blocked 2. Construct more channels and or expand existing ones 3. Raise foundations of the solar panels and ensure a proper and from concrete base 4. Create flooding diversions and or spill ways to divert water from getting into the solar power facility	Operation	O&M Contractor	-Provision of drainage system -Raised foundations for the structures	Quarterly	100,000.00

Occupation health and Safety	1. Ensure only qualified staff are employed to work in the facility 2. All workers operating the Mini-grid must be equipped with appropriate and adequate person protective equipment (PPE) such as; safety footwear, helmet among others. 3. Operators must be skilled on firefighting management 4. Annual environmental audits should be done 5. WIBA cover for staff is mandatory	Operation	O&M Contractor	-Provision of PPEs and WIBA cover -Environmental audit reports	Quarterly	100,000.00
Hazardous waste-damaged panels	1. Segregation from other waste streams 2. Proper disposal through a NEMA approved/licensed handler	Operation	O&M Contractor	Presence of well-maintained receptacles and centralized collection	Quarterly	200,000.00

Noise and Vibration	1. Generator room should be sound proof to ensure no noise of a nuisance level will be produced. 2. Monitor noise levels	Operation	O&M Contractor	Noise levels- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Quarterly	Part of contractor's cost
Shocks and electrocutions	1. Inspect the wiring of the houses before connecting power 2. Safety awareness campaigns to the community before connection of power on 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	Operation	O&M Contractor, Consumer	-Records of awareness sessions conducted -Incidences report	Quarterly	No additional cost

	touching sockets and switches with wet hands or wiping with wet cloths ○ Keeping off all electricity infrastructure e.g., not tying livestock on electric poles, no cutting earth wires that run along some electric poles, not interfering with sockets or switches ○ Reporting any electric wire/conductors if found fallen on the ground ○ Report any incident regarding electricity at the local office –staff in charge of operating the Mini-grid					
Community Safety- Access to site by general public	1. Fencing off the facility to keep of community members, children and livestock from entering into the facility 2. Controlled access to the site only with prior approval	Operation	O&M Contractor	Presence of a controlled access and records of every person accessing the site	Daily	Part of contractor's cost

	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, Proponent	Grievance records	Quarterly	20,000.00

Gender Based Violence –SEA and SH	To manage GBV risks, the contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The plan will include the necessary measures for prevention and response and must ensure survivor-based approach	Operation	O&M Contractor	-SEA/SH Prevention and Response Action Plan -Grievance records	Quarterly	20,000.00
Public Health Impacts – HIV/AIDs	1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff awareness and awareness campaigns for the community 2. Provision of condoms to workers 3. Allowing migrant workers time to be with their families	Operation	O&M Contractor	Number of awareness creation sessions conducted. -Availability of and distribution of condoms		20,000.00
Public health Impacts - Covid 19 disease	1. Social distance must be observed	Operation	O&M Contractor	Availability of hand washing facilities	Quarterly	30,000.00

	2. Provision of hand wash facilities before access 3. Temperature check and monitoring of the temperature of workers and any other person coming to site 4. Enforce wearing of masks 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			Utilization of hand washing facilities Number of Covid-19 cases reported		

Dust Emission	**1.** Trees can be planted around the plant/facility provided they do not cast shadows to the solar panels to act as wind breakers and hence decrease dust pollution 2. Ensure planting of grass around and within the facility compound	Operation	O&M Contractor	Visual inspection	Quarterly	50,000.00
Vehicle Exhaust Emissions	1. Drivers of the vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered. 2. Company vehicles should be well maintained	Operation	O&M Contractor	Engine maintenance records	Quarterly	No additional cost

Noise and Vibration	1. Install portable barriers to shield compressors and other small stationary 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

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

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					4,380,000.00

Table 7-1: Institutional Framework and Compliance/Implementation of the ESIA/ESMMP

No	Institution	Role/Function
1.	The National Environment Management Authority (NEMA)	NEMA: • Approves the ESIA Report; • Issues EIA License for project implementation; and • Carries out independent Audit to determine compliance with ESMMP.
2.	Directorate of Occupational Safety and Health Services (DOSHS)	DOSHS: • Provides OSH permits for workplaces of the project including campsites and quarries; and • Conducts inspections to ensure conformance to OSHA.
3.	Water Resources Authority (WRA)	WRA: • Provides necessary water abstraction permits for boreholes and surface water sources (rivers, streams etc.); and • Monitors water use in the region and provide guidance water use.
4.	National Land Commission (NLC)	NLC: • Verifies the identified land for the purposes of ascertaining land ownership; and • Transfer of land ownership details to the proponent.
5.	County Government of Turkana	County Governments will: • Provide approval for the project & project site; • Approval of community land consent & verification; and • Provide support.
6.	Supervision Consultant	Supervising Consultant: • Will engage the following full-time safeguards staff to support risk mngment: ✓ Supervising Engineer (RE) ✓ Social Safeguards Specialist ✓ Environmental Safeguards Specialist • Review and approval of the ESMMPs and other plans; • Day to day supervision of Contractor implementation of the ESMMPs and other plans; • Regular reporting on the ESMMP implementation; and • Has full time Environmental, Health and Safety and Social Specialists
7.	Contractor	Contractor: • Will engage the following dedicated full-time safeguards staff; ✓ Environmental Safeguards Specialist ✓ Social Safeguards Specialist ✓ Registered Occupational Health and Safety (OHS) Expert ✓ Community Liaison officer to act as link between the community and contractor and to support the social specialist. • Will Prepare the C-ESMPs informed by the proponent's ESMMP and other plans before commencing construction; • Will Operationalize and implement the C-ESMPs; • Carries out day to day management of ES, H& S risks; and • Reports on incidents and accidents to the Resident Engineer and regulators.

7.1 Management Plan during Construction Phase

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

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

7.1.1 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 KPC.

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) Neighbouring Land Owner and Occupier Relations

- The Contractor shall respect the property and rights of neighbouring landowners and occupiers at all times and shall treat all persons with deliberate courtesy.
- The contractor shall respect any special agreements between the KPC and the neighbours 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 KPC that logs all the complaints raised by the neighbours or the general public about construction activities. The register shall be regularly updated, and records maintained including the name of the complainant, his/her domicile and contact details, the nature of the complaint and any action taken to rectify the problem.

g) Construction Control

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

Control of Access

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

Control of material supply and burrow areas

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

7.1.2 Rehabilitation and Site Closure Plan

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

7.1.3 Local Recruitment Plan

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

In designing the local recruitment plan contractor shall:

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

The mitigation measure is:

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

7.1.4 Workplace Health and Safety Plan

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

- The contractor shall comply with all relevant legislative requirements governing worker health and safety at the work place (e.g., OSHA 2007 and its subsidiary legislations).
- The contractor shall prepare and implement measures to minimize diseases likely to be contracted by the construction workers as a result of the proposed project such as HIV &AIDs and other communicable diseases
- The contractor shall have obligations of managing the safety of its employees by;
    - Provision of appropriate PPEs to employee
    - Training employees on competence
    - Employing competence and qualified staff
    - Provision of First Aid Kits onsite

    - Should have a trained first aider
    - Document and create awareness on safe work procedures and work instruction
- The contractor will manage accidents by having an emergence response plan which will include contacts for emergency service providers e.g., ambulances, fire brigade and nearest hospitals
- Health and safety performance will be continuously monitored, and procedures reviewed with the aim of eliminating risk as far as reasonably practicable.

7.1.5 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 neighbours and the public is not threatened.
- The contractor to ensure that construction work is undertaken in manner not likely pose risks to community health and safety.
- The contractor shall undertake an independent risk assessment prior to construction. The findings of this assessment will inform the development of a community safety plan and create awareness to the community on the same.

7.1.6 Emergency Preparedness Plan

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

7.1.7 SEA/SH Prevention and Response Action Plan

The contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The plan should have an Accountability and Response Framework. The plan will include the necessary measures for prevention and response 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 GRM for use by workers and community members (as appropriate).
- The GBV GRM should allow for anonymous incident reporting and should be GBV survivor-centric
- Sensitize community members and workers on contractor GRMs
- Prepare and sensitise Code of Conduct (CoC) for SEA and SH, and their responsibilities for the same, to demystify the stigma associated with SEA and SH

7.1.8 Stakeholder Engagement Plan

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

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

The plan shall put this measure in to consideration:

- In consultation with the identified stakeholders, prepare a stakeholder engagement plan (SEP) that is based on their locations (maps) and their information needs at the various subproject phases

7.1.9 Labor Influx Management Plan

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

The objectives of this plan are as follows:

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

The plan shall consider these measures:

❖ Prepare and Implement a Labour Management Plan (LMP) with policies and measures for ensuring that:
- Subproject managers and workers are sensitised on:
  - ✓ County/National Labour laws
  - ✓ County/National Child Labour laws
  - ✓ National/International Forced Labour laws
- Enforce:
  - ✓ The Code of conduct
  - ✓ County/National Labour laws
  - ✓ County/National Child Labour laws
  - ✓ National/International Forced Labour laws

7.2 Grievance Redress Mechanism

7.3 Introduction

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

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

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

7.4 Grievance Mechanism

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

7.5 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 Agencies (IA)-KPLC and REREC
4. Representative from the Ministry's Legal office to guide on Alternative Dispute Resolution methods
5. Representative from the County Grievance Redress Committee-depending on the matter at hand; Land or Environment

6. Representative from Gender and Social Development Office who will be responsible for ensuring gender issues are well addressed.
7. Representative from NEMA to handle environmental issues
8. County Surveyor/Physical planner from the county Lands office
9. Project Affected Person's-to represent the matter before the committee

Functions of the National Grievances Redress Committee

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

7.6 County Grievance Redress Committees (CGRC)

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

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

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

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

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

7.7 Locational Grievance Redress Committee (LGRC)

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

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

The implementing agency representatives present during this forum included MoEP, KPC and REREC (County Renewable Energy Officer). They held a consultative forum with the community and constituted an LGRC consisting of six (6) members. The members consisted of two (2) ladies, two (2) men, two (20) Youth, consisting of the chief and his assistant, village administer, the village peace monitor, representative of PLWDs, business men and women and finally a youth. All identified and elected from each category of PAP except for the location Chief and village administrator who are automatic members of the team.

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

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

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

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

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

The roles of LRCCs will include among others:

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

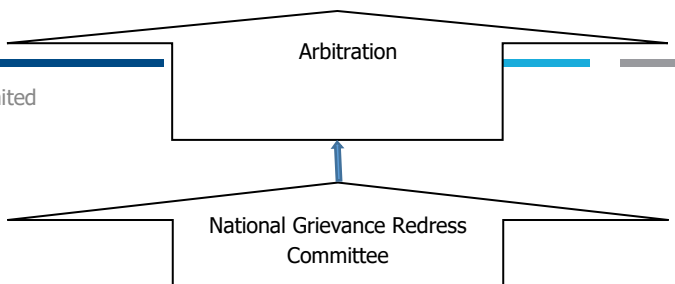


Figure 8. KOSAP Grievance Redress Mechanism

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

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

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

7.8 World Bank Grievances Redress Mechanism

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

7.8.1 World Bank Grievances Redress Service

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

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

7.8.2 World Bank Inspection Panel

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

7.8.3 Government Management of Land Acquisition Disputes

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

8 IMPACT SUMMARY AND CONCLUSION

8.1 Conclusions

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

The analysis of the ESIA has demonstrated that the construction and operation of the proposed Solar Mini-grid will have positive impacts to the government and Kenyan society at large. The impacts will include; Increase in reliable and sustainable clean energy, employment to local community members, increase in the national/local investment, increase in government revenue, improvement of standards of living for Kokuro residents. However, despite the outlined positive impacts, the proposed development will cause some negative impacts such as; noise, dust generation, soil erosion, oil spills, fire hazards, electrocution, shocks, solid waste generation, occupational health hazards, social risks such as labour influx, demand for resources, gender-based violence, conflicts, public health impacts (HIV & AIDs, Covid 19) among others that need to be avoided, reduced and mitigated against.

It is the duty of NEMA to consider licensing the project subject to EIA study; in accordance with the Environmental Management and Coordination Act, EMCA of 1999 and its Amendment, 2015 and the Environmental Impact Assessment and Audit Regulations, Legal Notice No. 101 of 2003.

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

A monitoring plan that highlights some of the environmental performance indicators that should be monitored has been developed. Monitoring creates possibilities to call to attention changes and problems in environmental quality. It involves the continuous or periodic review of operational and maintenance activities to determine the effectiveness of recommended mitigation measures. Consequently, trends in environmental degradation or improvement can be established, and previously unforeseen impacts can be identified, or pre-empted and mitigation measures proposed.

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

- The proposed project will generate socio-economic benefits which would not be realized if the 'NO development option" is considered.

- The beneficiary community has been consulted among other stakeholders and project information shared including the negative impacts and the views of the stakeholders is that the project is long overdue.
- The potential adverse impacts associated with the proposed project are possible to mitigate successfully. The impacts before implementation of mitigation measures are assessed as very low to medium low and the ratings are expected to improve further with the implementation of the proposed mitigation measures
- The impacts that will be adverse will be temporary during the construction phase and can be managed to acceptable levels with the implementation of the recommendation of the mitigation measures for the project.
- The project will be designed, constructed, and operated according to the acceptable industry norms and standards. Successful implementation of the proposed ESMMP will ensure environmental sustainability

The proposed project design has integrated mitigation measures with a view to ensuring compliance with all the applicable laws and procedures. The Solar Mini-grid and associated structures will be installed to the required planning/architectural/structural designs and standards. During project implementation, operation and decommissioning stages sustainable environmental management would be ensured; avoiding inadequate use of natural resources, conserving nature sensitively and guaranteeing a respectful and fair treatment of all people working on the project, general public at the vicinity and the expected PAPs of the project.

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

8.2 Recommendations

It is strongly recommended that a concerted effort is made by the implementing agency in particular, to implement the Environmental Social Management and Monitoring Plan provided herein. Following the commissioning of the project, statutory Environmental and Safety Audits shall be carried out in compliance with the national legal requirements, and the environmental performance of the site operations should be evaluated against the recommended measures and targets laid out in this report.

Recommendations

- The KP and the contractor must adhere to relevant legal and regulatory framework to ensure compliance and success of the project
- Adherence to the mitigation measures as spelt out in the ESMMP and monitoring of the same is mandatory to ensure environmental and social sustainability of the project.
- Cultivate and maintain a good working relationship with the community members
- Ensure social inclusion of the vulnerable groups by paying attention to the most vulnerable and provide ready boards as spelt out
- Contractor to plant trees in construction phase to promote environmental sustainability
- Stakeholder engagement to the carried out throughout the construction and operation and decommissioning phases.
- Contractor to ensure grievance redress mechanism is established and operational

- Environmental Audits should be carried annually or as prescribed by the Authority during the operational phase and invitation of Inspectors and Experts from NEMA to ascertain compliance with the provided ESMMP and set NEMA regulations and Standards.
- Diligence on the part of the contractor and proper supervision by the KP is crucial for mitigating the potential impacts and ensuring structural strength, safety, and efficient operation of the project.

Authorization Opinion

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

9 REFERENCES

The following list of references was referred to in preparing this Project Report:

1. Environmental Assessment Source Book, 1999 (World Bank),
2. George, C. and Lee, N., 2000 Environmental Assessment in Developing and Transitional Countries, Willey: Chichester, UK
3. Government of Kenya (GoK), 1999. The Environmental Management and Co-ordination Act, 1999. Government Printer.
4. Government of Kenya (GoK), 2003. The Environmental (Impact Assessment and Audit) Regulations, 2003.
5. Government of Kenya (GoK), 2009. The Environmental Management and Co-ordination Act, Regulations 2009, Legal Notice No. 61, 2009. Government Printer
6. Government of Kenya (GoK). The Public Health Act Chapter 242 Laws of Kenya.
7. Government of Kenya (GoK), 2002. The Water Act 2016. Government Printer, Nairobi, Kenya.
8. Government of Kenya (GoK), Building code, Building order 1968 and Grade 11 Building Order 1968
9. Government of Kenya: The Physical Planning Act 2019
10. Government of Kenya: Occupational Safety and Health Act,2007
11. Government of Kenya: Factories and Other Places of Work (Safety and Health Committee) Rules 2004
12. Government of Kenya: Water Quality Regulations, 2006
13. Government of Kenya: Waste Management Regulations, 2006
14. Government of Kenya: The Occupational Safety and Health Act, 2007
15. Government of Kenya: Noise Prevention and Control Rules 2005
16. Government of Kenya: Hazardous Substances Rules, 2007
17. Government of Kenya: Factories and Other Places of Work (Noise Prevention and Control) Rules 2005
18. British Standard (BS) 5228 Part 4, 1997: Noise Control on Construction and Open Sites: Code of Practice for Noise and Vibration Control applicable to piling operations
19. International Labor Organization 1983: Encyclopedia of Occupational Health and Safety Vol. II, Geneva.
20. Sombroek WG, Braun HMH & Van der Pouw BJA, 1982: Exploratory Soil Map and Agro-climatic Zone Map of Kenya, 1980 (Kenya Soil Survey, Nairobi),
21. Community Land Act, 2016
22. The Land Registration Act, 2012
23. The Land Act, 2012
24. The Energy Act, 2019
25. The Constitution of Kenya, 2010
26. Turkana County Integrated Development Plan 2018-2022

10 APPENDICES

10.1 Appendix 1: Minutes and List of attendance of the public consultation meeting during the ESIA

10.1.1 The Attendance List of Public participation for the ESIA Meeting

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

Venue: KOKURO

Date: 19/01/2022 Time: 10:45 am.

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	SELINA ASIRIKALE EKIDOR	KOKURO	F	–	
2.	PAULINA ENAT	KOKURO	F	–	
3.	ROSELINE ~~ACHUKUDA~~ MACHU	KOKURO	F	20067000	
4.	ADIPO EROO	KOKURO	F	–	
5.	AKENO LAPUR	KOKURO	F	–	
6.	MAIDE LOMEKWI	KOKURO	F	–	
7.	LOWOTON ERENG	KOKURO	F	–	
8.	ENOI EROT	KOKURO	M	–	
9.	NAJEREI NAMOTOBA	KOKURO	M	–	
10.	EKITELA CHOLOMA	KOKURO	F	–	
11.	APETET LOYANAE	KOKURO	F	–	
12.	EMANMAN LOTAGOR.	KOKURO	F	–	
13.	ARENG LOCHUKWAE	KOKURO.	F	–	
14.	LOKIRDI LOWOYAN	KOKURO.	F	–	

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

Venue: KOKURO

Date: 19/04/2022 Time: 11:00 AM

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	SELINA ASIRIKACE EKIDOR	Kokuro.	F	5588507	
2.	TIOKO EKUWOM	Kokuro.	F	–	
3.	ACIMLIM NATOO	Kokuro	F	–	
4.	AREMON EKUYEN	Kokuro.	F	28737693	
5.	NAKOSONAN LOBIT	Kokuro.	F	28 9/9058	
6.	BENTA KAMARET	Kokuro.	F	33087935	
7.	REBECCA ANGOLOL	Kokuro.	F	–	
8.	LOKUDE ENOTON	Kokuro.	F	–	
9.	NABUR IBORAN	Kokuro	F	23716189	
10.	ARENG EDAPAL EKOEL	Kokuro.	F	22456611	
11.	EYANAE NAKIRU	Kokuro.	F	–	
12.	TERESA EBIRON	Kokuro.	F	–	
13.	DORCAS EKAALE	Kokuro	F	0795401485	
14.	AKAI NAKALI	Kokuro.	F	–	

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Venue: Kokuro

Date: 19/01/2022 Time: 10:45 am

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	Kamaret Philip	Youth	M	0790672938	[signature]
2.	Meyan Aanansorot	Youth	M	0718534898	[signature]
3.	Lotingangole Ebei	Youth	M	0701451819	[signature]
4.	Nakipi Ekai	Youth	M	0797840321	[signature]
5.	Tolus Ewoi	Youth	M	—	[signature]
6.	Eyomo Nanyakot	Youth	M	—	[signature]
7.	Ekiru Ewesit	Youth	M	—	[signature]
8.	Ewoi Ikai	Youth	M	—	[signature]
9.	Lotao Edou	Youth	M	—	[signature]
10.	Loterei Ahoro	Youth	M	—	[signature]
11.	James Ewoi	Youth	M	—	[signature]
12.	Lomuleu Adukon	Youth	M	—	[signature]
13.	Lonnko Ngare	Youth	M	0786294726	[signature]
14.					

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

Venue: Kokuro chiefs office

Date: 17/01/2022 Time: 10:00 AM

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	PATRICK AMERI LOPORITO	Kokuro	M	0758644468	
2.	JOHN ESEKON	Kokuro	M	0799437142	
3.	ADIAKA NATOO	Kokuro	M	28742126	
4.	EKIRU EDOU	Kokuro	M	0743547445	
5.	KURUK AKOLOWO	Kokuro	M	0715706149	
6.	IKINOOL IMONI	Kokuro	M	0794497651	
7.	LOMULEN ADUKON	Kokuro	M	0100115136657	
8.	ENOI LOPURUI	Kokuro	M	33088426	
9.	KOKURO TIRIKWEL	Kokuro	M	0743062894	
10.	IKAALE LOYONG	Kokuro	M	0718849155	
11.	EMURIA ERUS	Kokuro	M	0707042308	
12.	NAKIRION LONGOLE	Kokuro	M	0798623571	
13.	MEYAN LOUYONGOROT	Kokuro	M	0718534898	
14.	ESEKON ADUKAN		M	0743392843	

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Venue: ....

Date: ....   Time: ....

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	Ezra L Lochoka	Chief	M	0719158941	
2.	Lokiruka Benson	Village Administrator	M	0791321591	
3.	Francis E. Ekiru	Peace monitor	M	0746612865	
4.	Eposiyo C James	Youth leader	M	0705154929	
5.	Ekuwa Echong	Youth	M	–	
6.	Peter Echuko	Youth	M	0769524998	
7.	Yakani Eragaton	Elder	M	–	
8.	Akuto Etiam	Youth	M	–	
9.	Ebenyo Ereng	Youth	M	–	
10.	Gregory Esimit	Hospital Staff	M	–	
11.	Fredrick Ekale	Youth	M	0792837470	
12.	Dickson Namadekeny	Youth	M	0798840320	
13.	Nakirion Longole	Youth	M	0798623571	
14.	Ereale Eroi	Youth	M	0713468817	

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

Venue: KSKTO chiefs office

Date: 19/01/2022 Time: 11:05 Am

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	ANESIT LONGOLOK	Kokuro.	F	8561686	
2.	EKALE EKUTAN ABONG	Kokuro	F	33782935	
3.	EREGAE EREMON LOTUM	Kokuro.	M	343417-93	
4.	LONEET EKAALE IKUTAN	Kokuro.	F	33085434	
5.	ICHOR NANYATT NAKAIN	Kokuro.	F	2019 21	
6.	ASINYON TICADO AMERIKOK	Kokuro.	F	24234693	
7.	AKIDOR ERENG	Kokuro.	F	33089992	
8.	LOPORIYO ELOTOM	Kokuro.	M	0609548	
9.	AKIRU JOHN ELINYEN	Kokuro.	F	28008060	
10.	APETET LOIANAE	Kokuro.	F	23712718	
11.	AKIRU ELAAR EKITELA	Kokuro.	F	38911005	
12.	YOYO MARAKA LOTINO	Kokuro	M	33038779	
13.	ARALALE ELOTON	Kokuro.	F	34336574	
14.	ATAAN EKUNOTT LOREON	Kokuro.	M	27996910	

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

Venue: KOKRO GRC

Date: 19/02/2021

Time: 12:00 PM

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	EZRA L. LOCHOKA	CHIEF	M	0719158941	[signature]
2.	VIVIEN P. EKADELI	ASSISTANT/ Chief	F	0708103593	[signature]
3.	BENSON L. LOKURUKA	VILLAGE ADMIN	M	0791321591	[signature]
4.	FRANCIS E. EKIRU	PEACE MONITOR	M	0716012865	[signature]
5.	MICHAEL K. LOPEAT	Disable rep	M		[signature]
6.	NAPETOM CHILA EIPA	Business women rep	F	0711198092	[signature]
7.	DIMINAS EKOTON	Businessmen rep	M		[signature]
8.	MARTHA ABUNE.	Women rep	F		[signature]
9.	ABLB ROSE				
10.	MAURICE PELEKECH	Youth Rep	M	0741764803	[signature]
11.					
12.					
13.					
14.					

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

Venue: 19/8/2022.

Date: Kokuro Village Time: 12:45 am.

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	LEAH EKALIMON	Kokuro.	F	0797307915	
2.	ADIPO ALANY	Kokuro.	F	0757497947	
3.	NAYESIRE EWOTON	Kokuro.	F	37348949	
4.	AKAI NAMOJONG	Kokuro.	F	0795633592	
5.	EBURE LOKWABOWOI	Kokuro.	F	-	
6.	NAPETET LOWASA	Kokuro.	F	-	
7.	LOKUBUK ERUPE	Kokuro.	F	-	
8.	AMAPET LONGOLOL	Kokuro.	F	-	
9.	TIRIKWEL ELIMLIM	Kokuro.	F	-	
10.	EVALINE EKAI	Kokuro.	F	-	
11.	EKAI EWOTON	Kokuro.	M	-	
12.	NAPEYOK MARAKA	Kokuro.	F	-	
13.	AKIRA EBEKON	Kokuro	F	-	
14.	JOZANTOS KERIO	Kokuro.	M	-	

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KOKURO SUB [illegible]
P. O. BOX 30504 LOKICHOGIO

CENTRIC AFRICA

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: 19/01/2022

Date: KOKURO VILLAGE Time: 10:45 am.

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	ABEL LOBUIN	Kokuro.	F	–	
2.	JACKLINE CHEPKURUI	Kokuro.	F	–	
3.	SIMON EKENO KOKUWA	Kokuro.	M	27980456	
4.	AROO EKUWOM	Kokuro.	F	0795634572	
5.	NDAINYENO EDONGA	Kokuro.	F	–	
6.	CATHERINE AMBEEL ELIM	Kokuro.	F	–	
7.	ASEKON EBEI ENOTON	Kokuro.	F	–	
8.	NAKOLONYOI LONGOPON	Kokuro	F	–	
9.	NAWOTO LOPERITO	Kokuro.	F	–	
10.	Nachorikela EMOTON	Kokuro	M	–	
11.	MERCY IKAALE	Kokuro.	F	0794832353	
12.	APUR EKAYA	Kokuro	F	–	
13.	NAIDRU ESINYEN	Kokuro	F	–	
14.	LILIAN ETABO	Kokuro.	F	–	

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

Venue: KOKURO

Date: 19/01/2022 Time: 10:45 am

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	N GOLENORU LOCHU SEKON	- Kokuro.	F	—	N.L.S.
2.	EKOMWA EKAMAIS	- Kokuro	F	—	
3.	AKIDOR LOKWANI	— Kokuro.	F	—	
4.	NAMANAKWEE LOCHWAN	— Kokuro.	F	—	
5.	ERASTUS EMONI	— Kokuro.	F	—	
6.	ADAPAL KAMARET	— Kokuro.	F	—	
7.	AREYO LOKOLONG	— Kokuro.	F	—	
8.	LOKAALE LORINYEI	— Kokuro.	F	—	
9.	ALANY LONGOK	— Kokuro.	F	—	
10.	AMIIR ENOI	— Kokuro.	F	—	A.L.
11.	ANOTE LORISAE	— Kokuro.	F	—	
12.	AGOLE LOKOCONYEI	— Kokuro.	F	—	
13.	ANEEIT ENOJA	— Kokuro.	F	—	
14.	ASINYEN MESEK	— Kokuro.	F	—	

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

Venue: KOKURO

Date: 14/01/2022

Time: 10:45 am

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	LOMUOLOL NAKIRION	ELDER	M		
2.	NGIORIAKO EKOL	ELDER	M.	—	
3.	LOKWOMOL LOLIMO	ELDER	M.	—	
4.	EWOTON LOMALA	ELDER	M.	—	
5.	LOYANAE LOMURUKAI	ELDER	M.	—	
6.	NAKIPI EKAI	ELDER	M.	—	
7.	FREDRICK EKALIMON	ELDER	M.	—	
8.	EKAI ELAR	ELDER	M.	0792837470	
9.	Joseph Lomala	ELDER	M.	—	
10.	ALFRED ACHIA	ELDER	M	0714664553	
11.	PETER ARIKOR	ELDER	M	0740385345	
12.	Umulkheir Qaballe Adi	CENTRIC AFRICA	F	—	
13.	Caleb Ewoi	KOSAP - CRED	M	0795023964	
14.	ALLAN OWINO	CENTRIC AFRICA	M	0719371688	
15.	Lydia Komen	Norken CI LTD		0729924873	
				0717153250	

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10.1.2Minutes of the public consultation meeting during the ESIA

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:** 10:45am
Venue: KOKURU VILLAGE	

PRESENT

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**	
	The meeting started at 10:45am with a word of prayer from a participant. The area chief introduced the village elders and welcomed everyone to the meeting Mr. Ewoi the cree introduced the KOSAP team.	

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Min 2/22	**Opening Remarks**	
	Mr. Booi discussed the main objective of the day (ESIA) as he briefed the community on KOSAP. He said that; KOSAP is funded by the World Bank & Implimented by the Ministry of Energy in conjunction with Kenya Power and REREC. He also informed the community on the "compensation method ("compensation-in-kind)"	
Min 3/22	**Remarks by the consultant**	
	Mr. Alan Owino discussed the benefits that the community will accrue from KOSAP such as reliable electricity supply, employment opportunities, reduced indoor pollution, sanitation services, improved access to water e.t.c. He also explained the ESIA processes such as identification of potential impacts and benefits, stakeholder engagement & public consultation, mitigation & optimization measures e.t.c The consultant also discussed the anticipated social issues/impacts of KOSAP such as Labour Influx, Child labour, Elite capture, Impacts on cultural Heritage, GBV, Risk of Insecurity incidences e.t.c.	

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	Mrs. Lydia discussed the anticipated Environmental issues/impacts e.g Impacts on the local diversity and air quality, environmental exposure to hazardous & Toxic materials, operations of stand by generators occupational health & safety risks etc. The consultants discussed the mitigation measures of the negative environmental and social impacts such as minimization of the use of heavy trucks, plants and equipments, vegetation re-planting to offset cleared vegetation, creating awareness on project opportunities to ensure all community segments have equitable access.	
Min 4/22	**Concerns / Issues/Recommendations from participants**	
	Alfred Achia was concerned on the project timelines. Ebenyo was concerned on whether there would be any insurance cover incase of injuries/accidents occurence. Esimith was concerned on whether the solar power was free or not. Celina Ekidor was concerned on whether the youths will be considered for employment opportunities.	

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	Peter arikor was concerned on the reliability of the power and electrical safety. He was also concerned on the distance to be covered by the Project since some of the members lived far from the site. He also equired on the connection fee for the vulnerable. He was also concerned on whether the poles will be placed within the communities designated plots.	
Min 5/22	**Responses to concerns/issues raised**	
	The consultants responded to the concerns/issues raised by the community. It was said that; ➢ The project encourages the participation & empowerment of the community, regardless of gender & age; both skilled	

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and non-skilled based opportunities will be available & shall be distributed fairly

- The ministry of energy & KPLC power will manage the project & ensure that power is reliable/reliably availed to the beneficiaries
- The solar power will be provided inform of tokens and for each household the connection fee will be one thousand shillings (1000) and payment for consumption will be determined by their usage.
- The members were also informed that they will need a qualified electrician to do wiring for their homes.
- The project has 4 components, the mini-grid being one, the distance coverage for the power will likely be a diameter of 3 or less kilometres and the use of other components will facilitate power coverage within Kokuro.

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Min 6/22	**Acceptance/Rejection of the project**	
	All members accepted the project The members agreed on water reticulation (equiping the borehole and piping of water.) as their prioritized community project.	
Min 7/22	**Adjournment**	
	The Meeting adjourned at 12:52 pm with closing remarks from the area chief.	

Minutes Prepared By:
Name: Umulkher Qabalie Abdi Date: 19/1/2022
Position: ESIA Expert. Signature:

Minutes Confirmed By:
Name: VIVIEN P. EKADELI Date: 19/1/2022
Position: ASS-CHIEF Signature:

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10.1.3 Men Focus Group Discussion attendance list during the ESIA

Male FGD (KOKORO.)

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: 19/01/2022.

Date: KOKURO VILLAGE

Time: 10:45am.

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	KOKURU EWOTON	Elder / BUSINESS	M	0705656403	
2.	SASAME EKIDOR	SDR	M	0748763341	
3.	LUCK NAMERISINYEN	SDR.	M	0796124852	
4.	IKONG EPETET	ELDER	M	0745711457	
5.	EBENYO KULA	ELDER	M		
6.	LODIPI LOMORU	ELDER	M.		
7.	EKORI APOROTO	ELDER	M.		
8.	MICHAEL EKAMAIS	SDR	M	0742739345	
9.	ADUKAN TIBOYE	ELDER	M.		
10.	AROMUNG EKAL	ELDER	M.		
11.	EMURIA ABIRIT	ELDER	M.	0746078524	
12.	NAKAYAN LOKAPETET	ELDER	M.		
13.	LOKOLIO LOKAPETE	ELDER	M.		
14.	EKWAKAI AMANANKIT	ELDER	M.		

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10.1.4Women Focus Group Discussion attendance list during the ESIA

Female FGD. (KOKURO)

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: KOKURO

Date: 19/07/22 Time: 11:00 AM

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	ALiLim EKARU	Kokuro.	F	–	
2.	NOASIKE EKUYEN	Kokuro.	F	–	
3.	AKUWOM KOKURO	Kokuro.	F	–	
4.	LOROGOT LOBICH	Kokuro.	F	–	
5.	MAIDE LOMEKWI	Kokuro.	F	22699839	
6.	ANGOLOL ATAABA	Kokuro.	F	8599832	
7.	MELVIN AKAPELI	Kokuro.	F	0114148663	
8.	LOPIL LOTEIRO	Kokuro.	F	8561260	
9.	TIRIKWEL ELimLim	Kokuro.	F	0702495300	
10.	ANAKANAK KWTE	Kokuro.	F	–	
11.	NGASIKE AWTE	Kokuro.	F	38002157	
12.		Kokuro.			
13.		Kokuro.			
14.					

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P. O. BOX

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10.1.5 Youth Focus Group Discussion attendance list during the ESIA

Youth FGD. (KOKURO)

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: KOKURO CHIEFS OFFICE

Date: 19/01/2022 Time: 10:00 AM

List of Participants

#	Name	Position/Institution/Business/ Location	Gender M/F	Phone No. or ID No.	Signature
1.	PHILIPH KAMARET	Kokuro.	M	0790672938	
2.	JAMES NATELO	Kokuro.	M	0769974912	
3.	JAMES CUMA	Kokuro.	M	0705194924	
4.	LOTINGANOOLE EBEI	Kokuro.	M	0701451849	
5.	CALISTERS EWOI	Kokuro.	M	0713468817	
6.	DICKSON NANGOLEKENY	Kokuro.	M	0798890321	
7.	STELLA ANOK	Kokuro.	F	0748254739	
8.	ARUPE NAMEJA	Kokuro.	F	0791812618	
9.	AMONI LOMADAK	Kokuro.	F	0114144978	
10.	CLEMENTINA AROT	Kokuro.	F	0715706149	
11.	LOKWANYA NANGINA	Kokuro.	F	0112362557	
12.	AKADELI AMOS	Kokuro.	F	0758644468	
13.	ABENYO LOKOLI	Kokuro.	F	0706496690	
14.	EKATOROT ENOTON	Kokuro.	M	0725916474	

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10.2 Appendix 2: Minutes and List of attendance of the public consultation meeting leading to land identification and GRC constitution

10.2.1 Minutes of community consultation meeting leading to land identification and GRC constitution

Minutes of the community consultation meeting held on 17/03/2021 at Kokuro Village

AGENDA

- Public forum: Welcoming and opening remarks
- Project information: KOSAP and the Kokuro mini grid
- Project Land requirements: Disclosure of community rights and entitlements to compensation, the options and implications)
- Project Technical Description, Wiring, Connection and Payments
- Potential environmental and social risks and impacts: positive and negative impacts and project opportunities.
- Grievance Redress Committee
- Focus Group Discussions: Men, Women and Youth.
- Review of feedback from FGDs by all community members.

In attendance (refer to annexed list of participants)

MIN 1.0 WELCOMING AND OPENING

Mr. Bernard lomar the Ward Administrator (Lapur Ward) said after the grid is operational, street lights will be installed by county government. He then invited the project team to address the community.

The visiting team introduced themselves as following;

1.	Kioko Maithya	- Social Safeguards Officer	- REREC
2.	Irene Kawira	- Senior Environmentalist	- REREC
3.	Caleb Ewoi	- CREO	- CREO
4.	Agnes Gachoki	- Senior Surveyor	- REREC
5.	Lawrence Lorika	- Technician	- KPLC (lodwar)
6.	Myra Mukulu	- Technical Advisor Cook Stoves	- MOE

2.0 KOSAP AND KOKURO MINI GRID

Ms Myra Mukulu informed the participants that the proposed project is part the Kenya off Grid Solar Access Project (KOSAP) which is funded by the World Bank and is being implemented by the Ministry of Energy, the Kenya Power and Lighting Company (KPLC) and the Rural Electrification and Renewable Energy Corporation (REREC). MoE will provide overall coordination of the Project including responsibility for safeguards due diligence, and compliance monitoring. REREC will implement the mini grid and will be responsible for the implementation of

Resettlement Framework Plan, Environmental Social Management Framework and Social Assessment. She said the Government is committed to providing electricity to communities that have not been served by the national grid such as Kokuro because it recognises energy as key to advancing development.

She said KOSAP entails the following components;

1. Provision of electricity through solar mini grids to households, enterprises and community facilities,
2. Provision of energy services through solar home systems for and clean cooking technologies for households
3. Provision of solar power to electrify boreholes as well as to power community facilities
4. Community engagement and education as well as capacity building and institutional support for the national and county Governments

She further, said KOSAP is being implemented in 14 counties. In Turkana County 23 minigrid sites, 98 stand-alone solar facilities (public facilities) and 38 boreholes (solarisation) had been identified. One of these minigrid sites is Kokuro.

She noted that the agenda of the visit was to; undertake an environmental and social screening of the proposed project site, to sensitize the community on the project land requirements and community rights and entitlements, explain the Project Technical Description and connection requirements, discuss potential environmental/social risks and impacts and mitigation and sensitize members on grievance redress mechanism.

3.0 PROJECT LAND REQUIREMENTS: RIGHTS AND ENTITLEMENTS OPTIONS AND IMPLICATIONS

The Surveyor, Ms. Agnes Gachoki told the Baraza that the main purpose of the Baraza was to seek community consent for land donation for the project. Land required for the construction of the Mini grid is 2-5 acres. Land in Kokuro, falls under the Community land category. It is yet to be registered, has no title but is jointly owned by the community. Its use and management is governed by the Community Land Act 2016.

She explained the various forms of acquiring interest in land including; allocation, land adjudication process, compulsory acquisition, settlement programs, transfers, donation and long-term leases. The Surveyor informed the meeting that if they opted to consent to donation of the project land following VLD criteria has to be met;

VLD criteria

1	The infrastructure must not be site specific.
2	The impacts must be minor, that is, involve no more than 10 percent of the area and require no physical relocation.
3	The land required to meet technical project criteria must be identified by the affected community, not by line agencies or project authorities
4	The land in question must be free of squatters, encroachers, or other claims or encumbrances.

5	Verification (for example, notarized or witnessed statements) of the voluntary nature of land donations must be obtained from each person donating land.
6	If any loss of income or physical displacement is envisaged, verification of voluntary acceptance of community-devised mitigatory measures must be obtained from those expected to be adversely affected.
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.
8	Establishment of Grievance mechanisms

Agnes also told the community on their rights and entitlements to the following;

1. They can refuse to donate the land.
2. They can opt to seek compensation for the project land.
3. They can refuse or accept the project.
4. The right to resettlement assistance in addition to compensation for affected assets, where the more vulnerable individuals/households have been identified among them.
5. The right to livelihood restoration measures where the project has impacted their livelihood strategies, if they choose compensation.

The surveyor further informed the meeting that there were several options on land compensation;

a) Payment of cash for the land that has been identified for the project. For this to take place the land is has to be valued first. All monies payable as compensation for acquisition unregistered community land are then held in trust by the county government. Any such monies shall be deposited in a special interest earning account by the County Government and shall be released to the community upon registration of the community land.
b) Compensation of land for land. The community would identify a similar piece of land in value to the project site and request that the same is purchased for the community.
c) A further option is compensation in kind. This option is for the community to grant land for the project and request for compensation in kind. This could be in the form of a project for the benefit of the community like the construction of classrooms or a borehole. This is the most preferred option.

She said the surveyor will need to pick exact GPS points of the land proposed for the project and with community consent the land will be registered in the name of the implementing agency. The surveyor encouraged the community to make an informed decision that collectively involved every member of the community the elders, men, women, the marginalised and PLWDs. Any land donation would have to be signed by at least five representatives nominated by the community. She disclosed to the meeting what the term advance possession on land issues meant and

requested them to consider allowing the implementing agency to take possession of the parcel and commence construction of the project even as the land transfer process is going on.

4.0 PROJECT TECHNICAL DESCRIPTION, WIRING, CONNECTION AND PAYMENTS

Mr. Lawrence Lorika from KPLC told the meeting the proposed mini grid will comprise a solar system and a thermal unit (generator). The Mini-grid will have a capacity of 31KVA and PV 104kwp). He said based on an aerial survey done on 2019, Kokuro has a potential customers base of approximately 448 households and 12non-residential users. These customers are mapped for connection. Energy meters will be installed by KPLC staff and the locals living within the required 3 km radius would be connected to power. He said to be connected one will be required to pay a one-off connection fee of kshs.1000 as opposed to other places like Lodwar, Kitale and other big towns whereby they pay kshs.15000 or more.

Power would not be for free, and residents will be buying tokens to facilitate their needs as far electricity is concerned. Tokens can be purchased in amounts of Kshs 50 and above. Purchase is done through a vendor or directly purchasing and paying through the mobile money platforms. The token purchased through this 'Pay As You Go' (PAYG)) mechanism, will last according to the individual power usage. If you have more load for example ceiling fans and air conditioners in your shop, it will last for short period of time.

He told the Baraza that power distribution will involve passing of electrical lines along the roads in order to reach their houses, business premises and public facilities and requested the community grant way leave consent.

He said the project land where the powerhouse comprising solar panels, diesel generator, batteries and inverters will be installed will be fenced of as a safety measure and access will thus be restricted to people and animals. The minigrid system would be operating throughout the day and night. In case of overload, cloudy day or low battery, the generator will automatically kick in to supply power.

MIN 5.0 SOCIAL AND ENVIRONMENTAL ISSUES

The Environmental specialist Ms Irene Kawira Mate said that there were many benefits that would accrue to residents due to the supply of power to the area. She cited some of them as:

Potential positive impacts:

1. Improved educational standards as a result of longer study hours for leaners.
2. Enhanced heath care as Clinics/dispensaries can operate at night and store perishable drugs and vaccines
3. Employment of locals during the construction phase
4. Increased information access and entertainment (TV, Radio, Internet phones and computers).
5. refrigeration of food products like meat and milk thereby increasing their shell life
6. Opportunity for locals to establish business ventures like hairdressing, photocopy and welding.

Potential negative impacts:

1. The land that is currently in use for grazing will now no longer be accessible to the residents as it would be fenced off.
2. The risk of electrocution due to lack of proper handling and care. The Contractor shall however educate the community on safety precautions.
3. Labour influx leading to sexual exploitation and harassment.
4. Environmental contamination may arise due to disposal of used batteries, inverters and other materials.
5. Increase in cases of Gender Based Violence and sexual harassment of workers

She affirmed that the project PAPs were the Yapakunur Clan, a major sub-tribe of the Turkana language group who are Indigenous people and are the only VMG residing near the sub-project area thus the sole project beneficiary. Construction of the mini grid could restrict the access of VMGs to grazing land thus affecting availability of pasture, and consequently their main source of livelihoods, and forcing families to relocate grazing activities elsewhere. Consequently, a VMGP may not be required. The project can include specific interventions in the final ESMP to ensure the community has access to culturally appropriate benefits. The project will strive to minimize adverse impacts on the indigenous people and ensure that they fully and continuously participate in the consultation process and receive culturally appropriate benefits from construction of the mini grid. The ESIA study would be conducted before the onset of the project and an ESMP developed outlining viable mitigation measures.

Screening would be undertaken to ensure that the project is designed and implemented in an environmentally and socially sustainable manner, taking into account Kenya's relevant sector legislation as well as World Bank Safeguard Policies. This would be undertaken using screening checklists in reference to requirements of the Environmental Management and Coordination Act, 1999 (amended 2019) and KOSAP-Environmental and Social Management Framework (ESMF). The screening process would consider potential impacts of the project and propose viable mitigation measures. She assured the community that temporary or minor impacts which are foreseen during project implementation will be sufficiently mitigated.

6.0 GRIEVANCE RESOLUTION COMMITTEE (GRC)

Ms. Mate informed the Baraza on the need for constitution of a locational Grievance Resolution Committee (GRC) for purposes of resolving any grievances that may arise in the lifetime of the project as guided by project frameworks. The local GRC will be the first stop shop for resolution of project related disputes and grievances for project affected persons and interested parties. The GRM should be culturally appropriate, inclusive, accessible and developed in consultation with Kokuro community. Grievances which cannot be resolved by the local GRC shall be escalated to the sub-county GRC and the National GRC respectively. Any unresolved matter can then be referred for arbitration or to a court of law. World Bank's GRS is also available to stakeholders to lodge their grievances. The GRC should constitute representation from all genders, youth and vulnerable persons. It should be structured in such a way that it provides multiple channels for lodging grievances, ensure anonymity and confidentiality.

The following details shall be recorded for each grievance reported; and a close-out form issued to indicate the grievance registered has been closed.

a) Date of compliant
b) Name of complainant
c) ID of complainant
d) Telephone contact of complainant
e) Nature of complaint
f) Name of the Person handling the complaint
g) Contacts of person addressing the complaint
h) Action taken
i) Date of conclusion of complaint

Existing indigenous grievance redress mechanism

Conflicts occasionally arise within individuals and families. The Kaaling community like in all other parts of the Turkana society is endowed with elaborate and systematic traditional mechanisms of conflict management. When disputes occur, they are referred elders (*Ng'akasukou*). The elders then summon involved parties and witnesses to the meeting point (*Ekitoe Ng'akasukou*).The elders will listen to the conflicting parties/individuals, weigh adduced evidence and pronounce the verdict accordingly.

Any matter that is not resolved or when the parties are not satisfied they can report to the chief or seek discourse in a court of law.

The summary of the comments/remarks from the community in the meeting held at Kokuro on 17/03/2021

QUESTION/COMMENTS ANSWER/REMARKS

QUESTION/COMMENTS	ANSWER/REMARKS
Agnes Maria (woman) Stima itawekwa wapi? kwa boma ama kipande yenye tumepeana?	It will be installed in the identified land but distributed to houses though transmission cables
Ekori Nimekwea Sisi hatuna pesa ya stima na kenya mzima hakuna pahali land is given free- Tunataka tulipwe na tupewe stima free.We require compensation	Noted. Views have been captured
Francis Ekori After paying 1000 do you start using power immediately? How long does it take?	Yes after you buy tokens After purchase of tokens and loading them into the meter it is instantaneous
Moses Ekidore 1000 ni ya connection – Sasa kuna grace period maybe a month free, before commencement of purchase of tokens? Lawrence-	No there is no grace period

Focus Group Discussions

After the main meeting women, men and youth convened for separate discussions (FGDs) where they could freely express with and among themselves and provide insights (hopes, fears, aspirations and expectations in relation to the mini grid and the land question).

FGD-MEN

The main objective of this discussion was to get gather and document how men thought/felt about the issues discussed during the main meeting including; environmental and social screening of the project site, land requirements and community rights/ entitlements, Project Technical Description and connection requirements, potential environmental/social risks and impacts, mitigation and grievance redress mechanism. The FGD would also provide them an opportunity to air their issues/give their opinions on the project.

Kioko them the FGD was a good avenue for the elders to express their opinions and freely ask any questions they might not have been unable to ask in front of the youth and women, He said that at the end of the FGD discussion the group should come into consensus on issues discussed

in the earlier meeting, select a representatives to the GRC. Matters agreed on and selected representatives would then be presented to the main meeting for adoption.

During the meeting the elders agreed to voluntary land donation and selected the following as their representatives in the GRC;

Name	**ID number**	**Telephone number**
Loregai esinyen achika	9336650	0768429463
Adukan tiboye kapalakan	0609515	Un available

The main issue raised by the group was electricity safety concerns in relation to children, livestock and property

Question, Suggestions, feedback and responses for Focus group discussion with men

QUESTION/COMMENTS	ANSWER/REMARKS
Nakaiyen Okapet (men) Kweli nyinyi mmekuja. Kuna wengine wakikuja apa kwanza/ first group Wakaongea – tukangoja tukachoka. atujui kama stima itawekwa wakati huu. Na madhara yake kwa watoto na wanyama ni gani?	Those who came first came to collect data. Yes power will be installed. There is danger when live power cables come in contact with a human being or animal. There is possibility of electrocution.
Longeri Kerio Kuna stima niliona lowarengak, kuna wakati karibubu ichome kila kitu saa hii imejengwa mbali. Waweke watchmen wenye wanaelewa hiyo ni stima	Noted There will be a project technician on site 24/7
Ekara Lomukuny Words and actions - we want completion of this project. Promises which don't mature- we need timelines. Tumekubali mkuje mjenge	Construction to start immediately project land is acquired
Moses Sasamei Ni sisi ndio tutamuonyesha place to put power Contractors don't involve locals in projects Project to be set up a distance from settlement area	Yes it is the community to identify a suitable parcel of land. Contractor shall work closely with locals and the GRC.

FGD-WOMEN

A focus group discussion was held with women. The main objective of this discussion was to gauge whether the women had understood the project and its requirements and to provide them an opportunity to air their issues/give their opinions on the project. Myra explained to the women that it was important to hold a separate discussion with them so that they have opportunity to freely express themselves as this may have not been possible in the Baraza. The women were allowed time to ask questions, give suggestions and or seek clarifications.

From the questions in the group, it was clear that they had not understood the issue. Myra then explained that the meeting was to clarify any issues about the project on environmental and

social issues as well as request land donation from the community. She explained further that the Ministry wanted land for was to construct a solar minigrid.

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

Name of Person making the contribution (e.g. comment or question)	**Question, Comment, Suggestion**	**Feedback/Responses by project team**	**Response by agency on how feedback will be used or acted upon**
Napeyiok Eipa	When will electricity come?	Myra responded that electricity will come in 2022 since there is a process that needs to be completed for procurement of the contractor who will construct the minigrid	The Ministry will expedite the process of procurement of the contractor
Roselyne Amon	Where will the minigrid be located? Will the owner of the plot be compensated?	Agnes responded that the minigrid will be located on community land. No one will be compensated for use of the land. We are here today to get your free will consent to donate the land. Please remember the benefits that having electricity will bring	
Apetet Maraka	Who will choose the location of the Minigrid?	Agnes responded that the land has been identified in close consultation with the community. today's meeting is also part of the consultation	
Paulina Ewat	Is the total cost of the electricity only KES 1,000	Myra responded that the KES 1,000 is only a connection fee. Thereafter households will need to pay for the electricity that they use	

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team	Response by agency on how feedback will be used or acted upon
Lokipi Emure	Apart from centralised places near the minigrid, will other households benefit.	Myra responded that only households within a 3km radius of the minigrid will benefit. Those outside the radius can purchase solar home systems which are also being promoted by KOSAP	

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team	Response by agency on how feedback will be used or acted upon
Roselyn Atemeju	We support the project. As the community is grateful for the project since it will benefit the community. It will give the community an opportunity to have businesses like salons, help	Noted	This should be factored into the awareness creation activities by Media Edge, the Ministry's communication consultant

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team	Response by agency on how feedback will be used or acted upon
	the children study at night and improve security through provision of street lights.		
Esther Lopiyo	The project will also create jobs by employing the youths knowledgeable in wiring.	Myra stated that the Ministry is looking forward to creating local jobs	The contractors for the minigrid project should make extra effort to ensure that the job creation opportunities should harness community

After the discussions in the FGD for women, Myra requested that they elect 2 women who will be in charge of Resolving grievances.

The women nominated were:

Name	ID number	Telephone number
Paulina Ewat	20140948	0724874542
Napeiyok Eipa		0711198092

FGD YOUTH

The youth said they had understood the issue of the minigrid and proceeded to nominate representatives to the GRC

Name	ID number	Telephone number
David Ekai Longor	22989346	079989‘356
Akiru Eremon	33580114	0796279645

8.0 REVIEW OF FEEDBACK FROM FGDS BY ALL COMMUNITY MEMBERS

After the FGDs the participants convened back to the main meeting to review the respective resolutions from the FGDs. During the meeting they expressed their support towards the project saying the benefits to the area shall be enormous. They mentioned the opportunity to light their homes, establish income generating business ventures and employment as some of the major benefits.

They resolved to freely donate land for the project, validated the nominees to the GRC and elected officials to lead the identification of project land and sign the land donation form on their behalf.

The community nominated the following as members of the GRC:

No	Name	Design.	1D No.	Mobile No.
1	David Ekai Longor	YOUTH	22989346	079989‘356
2	Akiru Eremon	YOUTH	33580114	0796279645
3	Paulina Ewat	WOMEN	20140948	0724874542
4	Napeiyok Eipa	WOMEN		0711198092
5	Loregai esinyen achika	MEN	9336650	0768429463
6	Adukan tiboye kapalakan	MEN	0609515	Un available

10.2.2List of Attendance for Community Engagements meetings

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 ..... KOKURO .....

MEETING VENUE..... KOKURO .....

DATE..... 17.3.2021 .....

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.	Caleb Ekadeli	28058415	0714337688	M		YES	
2.	Vivien P. Ekadeli	25779231	0708103593	F		YES	
3.	Francis E. Ekiru	10986476	0716022865	M	Kamsi Somalia	Yes	

	Name	ID	Phone	Gender	Village	Do You Agree Land Donation	Sign
4.	PHILIMON EKAI KERIO	4772989	0769208507	M	KOKURO	Yes	
5.	ESEKON Longolo	79968496	0706496690	M	KOKURO	yes	
6.	John ESEKON	34328996	0799437142	M	KOKURO	yes	
7.	Lokangri ngikala	26428902	0769847726	M	KOKURO	yes	
8.	COSMAS EMURIA	38013557	0701143357	M	Kokuro	Yes	
9.	FREDRICK PELEKECH	34336561	0742392854	M	KOKURO	Yes	
10	EBENYO Cume Francs	25260339	0702562985	M	Kokuro	Yes	
11	MATHEW LOGIEL MARIAJ	27998727	075971483	M	Kokuro	Yes	
12	PHILIP KAMARET	32855798	0790672938	M	KOKURO	Yes	
13	SABAME EKIDOR	20989794	0748763341	M	KOKURO	Yes	
14	Kamen Michael	22961863	0741894649	M	Kokuro	Yes	
15	MICHAEL Akamaco	32790222	0742739335	M	KOKURO	Yes	
16	Ekanaisi EKADELI [illegible]	34207284	0790862753	M	KOKURO	yes	
17	Ebenyo ARUPE	33034511	0798949143	M	KOKORO	yes	
18	MARKLEVIS Loyanae	20098026	0795763989	M	KOKURO	yes	

				Gender	Village	Do you agree Doubt	Sign
19	MERCY APUA	33088457	0795647476	F ~~KOKURO~~	KOKURO	yes	
20	APOSTA MACHAU	27993572	0798623465	F	KOKURO	Yes	
21	PULINE EWAHAT	20140948	0724874542	F	KOKURO	yes	Pauline
22	SELINA ARENGE	10986080	0757150374	F	KOKURO	yes	
23	EKOMWA EKAMAIS	22665248	0703652443	F	KOKURO	yes	
24	AROO EKUMWOM	28002885	0795634572	F	KOKURO	yes	
25	Jesen AMONI Lokulongei	28005657	~~07 07~~ 0114144978	F	KOKURO	yes	
26	WILFRIDAH LOBUES	36426939	0711252762	F	KOKURO	yes	[illegible]
27	AN GOLOL ATAABA	8599832	0745825974	F	KOKURO	yes	
28	KALENG KAMERI	28007756	074383255	F	KOKURO	yes	
29	MANA ESORE	20230019	0724089859	F	KOKURO	yes	
30	DORCAS NAJOREI	33071616	0795410485	F	KOKURO	yes	
31	TIOKO EKUOM	23559611	0793759324	F	KOKURO	yes	
32	MANGRET NABWAL		0745505088	F	KOKURO	yes	
33	ANGOLE AMALIMA			F	KURAKU	yes	

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				Gender	Village	Dongou duty bont	Sign
34	AKAI EMURIA		0716985892	F	KOKURO	Yes	
35	NAPEITOW LOKORU	21380859	013592511	F	KOKURO	Yes	
36	~~El~~ PRISILLA AKOLOL	27689929	0795650836	F	KOKURO	Yes	
37	NAPEIKAR EBENYO	27998462	0759719952	F	KORORO	Yes	
38	John EKWAKai	33188304	0711634687	~~F~~ M	KOKURO	Yes	
39	FEVALLYN ASINGEN	/	0794887899	F	KOKURO	Yes	
40	ESEKON LOKWWA		0707583946	M	KOKURO	Yes	
41	ChORO NAMOKINY	13647658		M	KOKURO	Yes	
42	~~JOSES~~ JOSEPHAT	24077588	0714664353	F	KOKURO	Yes	
43	MAIDE LOMEKUI			F	KOKURO	Yes	
44	LOKWANYAI NANGITA			F	KOKURO	Yes	
45	ELISA FIZO		0711372077	F	KOKURO	Yes	
46	LOKAALE ERUNGAI			F	KOKURO	Yes	
47	EYANA NAPETHE			F	KOKURO	Yes	
48	AKIRU KEIKO			F	KOKURO	Yes	

Literate

4

				Gender	Village	Do you agree	Sign	
49	AKUT AKOLOM			F	KORURO	Yes	[signature]	Witness
50	AKAI EKORI	34800435		F	KORURO	Yes	[signature]	
51	LESO LOKUWA		0790862753	F	KOKURO	Yes	[signature]	
52.	AKOB GACHOKI.	11599322	0722583865	F	NAIROBI	N/A	[signature]	
53.	LAWRENCE LOKAMAR	23663641	0716062707	M			[signature]	

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 Kokuro

MEETING VENUE Kokuro

DATE 17/3/2021

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.	SUSAN NAISA	11513273		F	Kokuro	Yes	
2.	NASURU EJIOT	22700387		F	Kokuro	yes	
3.	ARUPE IKAI			F	Kokuro	Yes	

							Sign
4.	AWOI Lotharait			F	KOKURO	Yes	[illegible]
5.	ARUKUDI IKAI	23558075		F	KOKUR	Yes	[illegible]
6.	KIOKO MAITHYA	10924666		M	-	Yes	[illegible]
7.	IRENE KAWIRA	26961056	0729081220	F	[illegible]	N/A	[illegible]
8.	Myra Mukulu	21796290	0722659305	F	Nairobi	N/A	[illegible]
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10.2.3 List of Attendance for Women Focus Group Discussion

REPUBLIC OF KENYA

MINISTRY OF ENERGY

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

SITE ....Kokuro....

MEETING VENUE....Kokuro Chief's office

DATE....17/3/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - WOMEN

No	NAME	Identification number –ID No	Mobile No.	Gender Male/Female	Village	Do you agree to donation of land Yes/no	SIGN.
1.	AGNES NASURoI		[illegible]	F	Kokuro	Yes	
2.	ROSELINE MACHU	20067000	0742392773	F	"	Yes	[illegible]
3.	[illegible]	2448149	N/A	F	"	Yes	

4.	ATIIR CHORO LOMULUATI	24234456	N/A	F	Lokwar	76.	
5.	JENIFFER KOKURO	23223129	0795409993	F	"	70.	[signature]
6.	ASIWEN ARAS			F	"	76	
7.	CHRISTINE EPEE		0794410618	F	Lokwar	76.	
8.	ORIRDO LOWETON	–	N/A	F	"	75.	
9.	NAJORET LOMUTOGATOLE	34343297	0792457618	F	"	75	
10	ELIMLIM NATOO	–	N/A	F	"	76.	
11	OTOR KILEKILEW	–	N/A	F	"	76.	
12	LOKIPI LMORIA ABINT	23267288	0705112592	F	"	75	
13	PRISILA ALUKAR	27956829	0795685336	F	"	75.	
14	AMURIA ~~AMOOI~~ KALOWAS	~~20192079~~ N/A	0795653429	F	"	75	
15	AMURIA GWOI	20192079	N/A	F	"	76	
16	LOSO NAKWA LOTAPARIN	4791647	N/A	F	"	75.	
17	ALOMET EBEI NATIRO	21372996	N/A	F	"	75	
18	LOCHWAALONGAN EKAI	39327750	N/A	F	"	75	

19	MERCY ECHODIO OMOTOGA	33033657.	N/A	F	Lokwamo	YES.	
20	EKIPUR NATOO			F	11	YES	
21	AKUNE MAME EKRIN	23536526		F	11	YES	
22	AKWEE LOKENO			F	11	YES	
23	PAULINA EWOT,	02940948	0724874542	F	11	YES.	[signature]
24	ATIR EWOI			F	11	YES.	
25	NAPEYO AIPA		0711495092	F	11	YES.	
26	AJINYON TIKADO AMERIKOL	24234693	N/A	F	11	YES	
27	AKIMU NGIKOI LOKORO	8580185	0799437142. N/A	F.	11	YES	
28	UMURU EWOI LOPEKO	20234869	N/A	F	11	YES	
29	NAMUKE NADUNG CHOM	23578296	N/A	F	11	YES'	
30	IKAADA ILETE ETHUKO	23760363	0745497957	F	11	YES	
31	TIDO EKULIMENKWORIKOMOR	2359611		F	11	YES.	
32	EBEI NGIMEKUYA	-	-	F	11	YES.	
33	AGNES GACHOKI	11579322	0722583865	F	Kakuma	U/A	[signature]

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34	Nyra Mukudy	21796290	0722659305	F	Nairobi	N/A	
35	IRENE KAWIRA	26961056	0729081220	F	HAIROBI	H/A	
36	AGNES GACHOKI	11599322	0722583865	F	NAIROBI	N/A	
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10.2.4List of Attendance for Men Focus Group Discussion

REPUBLIC OF KENYA

MINISTRY OF ENERGY

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

SITE KOKURO

MEETING VENUE Kokuro

DATE 17/3/21

FDG-MEN

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.	KAMERI MICHAEL	22961863	0741889464	M	KOKURO	YES	
2.	SASAME EKUDOR ETON	20984794	0748763741	M	KOKURO	YES	
3.	LOKURE NYAMSIMMER ELIPETH	21375866	0726124862	M	KOKURO	YES	

		ID	PHNE	SEX			
4.	LOMOYO ELIMLIM		0769263588	M	Solar	Yes	
5.	EWOTON LOLIM NATAAH		0799772923	M	Solar village	Yes	
6.	EPUAN APEM EKUNOIT		0797134401	M	Solar	Yes	
7.	NAKIRION LONGOLE EMETO		0798623571	M	Solar village	Yes	
8.	ESEKON EKUTAN ABONGT			M	Kukoro B	Yes	
9.	EMASE LOUCHUM LOREL	23559498		M	Kukoro A	Yes	
10	LOBUIN LOTAAGOR			M	Kukoro A	Yes	
11	NAKONA ATOOT ABIRIT				Solar	Yes	
12	Moses [illegible]	22666780	0727204993	M.	Solar	Yes	
13	Alfred Achia	28043578	0740355345	M	Nachuro	Yes	
14	EKUTOM EPETET	33060192	0745 71457	M	Kambi Somali	yes	
15	LOREGAE EJINYEN	3336650	0768429663	M	NATEKET	yes	
16	PETER KIYO	8561198		M	Mori Koki	Yes	
17	EBENYO NAMAJOR			M	Mkambi Kayaya	Yes	
18	ABIRIT CATOROKOL	4789500		M	Kachoda	yes	

19	EPETET ERUNOIT			M	KACHODA	Yes	
20	EKALELE EWOI			M	NAKWAMOI KAWI	Yes	
21	KIOKO MATTHYA			M	-	Yes	
22	LAWRENCE LOKAMARE	23663661	0713080220	M	LODWAR	Yes	
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10.2.5 List of Attendance for Youth Focus Group Discussion

REPUBLIC OF KENYA

MINISTRY OF ENERGY

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

SITE: KOKURO

MEETING VENUE: KOKURO

DATE: 17/03/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST YOUTH FDG

No	NAME	Identification number –ID No	Mobile No.	Gender Male/Female	Village	Do you agree to donation of land Yes/no	SIGN.
1.	EBENYO CUNA JAMES	25260339	0702562985	M	KOKURO	Yes	[signature]
2.	ESEKON LOWBELOL		0706496690	M	KOKURO	YES	[thumbprint]
3.	EKAROROT EWOTON		0725916747	M	KOKURO	Yes	

4.	KOKURO [illegible]	37225461	0798350821	M	KOKURO	Yes	[illegible]
5.	JOHN ESEKON EKUTAN	34328996	0799437142	M	KOKORO	YES	[illegible]
6.	ANTONY ONYANGO		0715073382	M	KOKUR	Yes	[illegible]
7.	LOGIEL MATTHEW	27998727	0759717483	M	Kokuro	Yes	[illegible]
8.	COSMAS EMURIA	38013557	0701143357	M	KOKORO	Yes	[illegible]
9.	MARKLEVIS LOYANAE	20098026	0793763989	M	Kokuro	YES	[illegible]
10	EPEM AWATAUTET	20399836	0794945358	M	KOKURO	YES	[illegible]
11	EKUWOM EPOTON	33249593	0700338574	M	KOKURO	YES	[illegible]
12	PELEKECH ESEKON	33087611	—	M	KOKURO	YES	[illegible]
13	LEAH EKALIMON	33042394	0797307915	F	KOKURO	YES	[illegible]
14	AKAI NAMONGONG	—	0795633592	F	KOKURO	YES	
15	AKADELI AMOS	—	0748254739	F	KOKURO	YES	[illegible]
16	TERESA ELIMILIM	—	0741876508	F	KOKURO	YES	
17	JOYCE ABENYO	—	—	F	KOKURO	YES	
18	ADOR EPORON	—	—	F	KOKURO	YES	

19	CICILIA EDUNG		0719305647	F	KOKUNO	YES	
20	EKAI NAKERO		0714664553	M	KOKUNO	YES	
21	JAMES MAINA EDAPAL	39252274	0796871956	M	KOKUNO	YES	
22	ESTHAR MEYAN			F	KOKUNO	YES	
23	NAWOTO ENGIMON			F	KOKUNO	YES	
24	WILFRIDAH LOBUES	36426939	0711252762	F	KOKUNO	YES	
25	EMONI LOKOLONYOI	28005657	0140404998	F	KOKUNO	YES	
26	AROO EKULWOM	28003385	0795634572	F	KOKUNO	YES	
27	LEAH EKOMWO	29665248	0703652443	F	KOKUNO	YES	
28	APUA EKATAA	—	—	F	KOKUNO	YES	
29	ABEI ELIRON CHALOMA	25741763	—	F	KOKUNO	YES	
30	ARUPE EKAI	—	—	F	KOKUNO	YES	
31	KOKUNO EKIDOR	—	—	F	KOKUNO	YES	
32	AKAI NAKALI	—	—	F	KOKUNO	YES	
33	APERIT EKARU LOMUKUNY	33091215	—	F	KOKUNO	YES	

34	ELIZA PUDA NGARE			0711372077	F	KOKURO	YES	[signature]
35	LOUCHUM	EKARU	33090234		F	KOKURO	YES	[thumbprint]
36	MERCY	APUA	33088457	0795647476	F	KOKURO	YES	[signature]
37	ASINYEN	LOKOMOLI			F	KOKURO	YES	[thumbprint]
38	LILIAN	CHUCHU		0796231935	F	KOKURO	YES	[signature]
39	NAPEYOK	LOMOTONGA			F	KOKURO	YES	[thumbprint]
40	APOSTA	MACHAR	27993572	0798623465	F	KOKURO	YES	[thumbprint]
41	EMONYANG	LOWOI	37434401		M	KOKURO	YES	[signature]
42	NGASITAE	LOWOI	21340485		F	KOKURO	YES	[thumbprint]
43	AROOT	AMANANGIT		0758343215	F	KOKURO	YES	[thumbprint]
44	AKUWOM	ERAI	33660666		F	KOKURO	YES	[thumbprint]
45	ACHOBOT	NASURA	33037959		F	KOKURO	YES	[thumbprint]
46	EDUNG	EDAPAL	27997261		M	KOKURO	YES	
47	Caleb	Ewoi	28858415	0714371688	M	Lodwar	NA	[signature]
48								

							Sign
49	AKUT AKOLOM			F	KOKUR	40	[signature]
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51							

10.3 Appendix 3: Lead Expert's License

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/18263

Application Reference No: NEMA/EIA/EL/23929

M/S **Norken International Limited**
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is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts** registration number **0181**

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

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

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/18279

Application Reference No: NEMA/EIA/EL/23951

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

Signature.....

(Seal)
Director General
The National Environment Management Authority

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10.4 Appendix 4: Abbreviated Resettlement Action Plan (A-RAP)

1. Kokuro Sub-project Site

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

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

The number of project-affected persons (PAPs) is 8500 (approximately 1200 households). The land acquisition-related impacts are loss of land and pasture. Mitigation measures include in-kind compensation for loss of land and pasture, and designing power distribution lines to avoid impacting trees, crops, structures, and community facilities. No physical displacement is anticipated; however, there is minimal loss of pasture occasioned by the acquisition of land utilized by the community for grazing. The 1.215 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 Kokuro community proposed 1st electricity, 2nd water reticulation and 3rd improvement of health care. The value of the priority community project will be proportional to or higher than the value of land under acquisition. In addition, loss or damage to crops, trees, structures, and community facilities will be compensated in line with the provisions of the RPF, and as summarized in the entitlement matrix below.

3.1 Entitlement Matrix

Types of Impact	Person(s) Affected/Eligible for Compensation	Compensation/Entitlement/Benefits	Responsible organization
1. Loss of Land			
Loss of unregistered community land.	Community.	Compensation in-kind as prioritized by the community.	REREC
Loss of land in unregistered group ranches.	Group ranch members.	Compensation in-kind as prioritized by the community.	
Loss of land in registered group ranches.	Group ranch members.	Compensation in-kind as prioritized by the community.	

Loss of land owned by the National Police, county governments and the Ministry of Interior	Government agencies.	No compensation for public land allocated to another government body.	
Loss of land owned by the Kenya Forest Service (KFS) and Kenya Wildlife Service (KWS).	Government agencies.	No compensation for public land allocated to another government body. However, payment of conservation fees to KWS and KFS as stipulated under their respective regulations is foreseen.	
2. Loss of Use on Land			
Loss of use on public land (e.g., grazing, farming etc.).	Communities utilizing public land.	Communities do not own public land; however, they utilize public land with consent from the relevant agencies. The project will implement the infrastructure project prioritized by the community as compensation for the loss of public land use.	REREC
Loss of use on unregistered community land, unregistered group ranches and registered group ranches (e.g., grazing, farming etc.).	Communities utilizing unregistered community land, unregistered group ranches, and registered group ranches.	Compensation in-kind as prioritized by the community.	
3. Loss of /Damage to Assets on Land			
Trees Crops Structures	Community members on unregistered community land; community members utilizing public land; members of registered and unregistered group ranches and government entities.	During detailed design for power distribution lines and construction of the mini grid and community project, any crops, structures, trees, and community facilities shall be avoided to the extent possible. However, loss or damage to the above will be compensated/restored at full replacement cost,[1] in line with the provisions of the RPF.	REREC
Community facilities e.g., water sources (earth pans, boreholes etc.).	Community members on unregistered community land, community members utilizing public land, and members of registered and unregistered group ranches.		

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

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 5 of the ESIA on public consultation and engagement.*

Once the compensation award and Bill of Quantities (BoQs) are known, the Implementing Agency (IA) will engage the community and agree on the community project to be executed as in-kind compensation. During these consultations, the IA and the community will define the roles and responsibilities of the community in monitoring the implementation of in-kind compensation and maintenance once the IA hands it over to the community. Thus, the IA and the community will effect an agreement to be signed by the local leadership; representatives of the Grievance Redress Committees at the locational, county, and national levels; A-RAP Implementation Committee, and Implementing Agencies.

4.2 Identification of Community Representatives

The Kokuro Locational Grievance Redress Committee (LGRC), constituting a chairperson, secretary, and three members, was formed through community consensus. The committee's membership comprises men, women, youth, persons with disabilities, and ethnic minorities. The LGRC is responsible for engaging PAPs and resolving complaints. Refer to Chapter 6 of the ESIA on the Grievance Redress Committees. Further, the community will constitute the A-RAP Implementation Committee responsible for coordinating community engagements on the A-RAP and monitoring the implementation and closure of the A-RAP. The representation of the committee will consider gender, vulnerability, and intergenerational sensitivities.

4.3 Summary of Consultations on Land Acquisition and Compensation Options

Date	Objective	Implementing Entities	Land Acquisition and Compensation Aspects Discussed	Key Issues Raised	Responses Given
March 17th 2021	Environmental and Social Screening. Voluntary land donation (VLD). Constitution of the Locational Grievance Redress Committee (GRC).	Ministry of Energy (MoE) Kenya Power (KPLC) Rural Electrification and Renewable Energy Corporation (REREC)	Site identification and land allocation for the sub-project. Criteria for VLD. Community entitlements (forms of compensation and implications for each).	Ni sisi ndio tutamuonyesha place to put power.	Yes, it is the community to identify a suitable parcel of land.
				Where will the mini-grid be located? Will the owner of the	Agnes responded that the mini-grid will be located on community land. No one will be

				plot be compensated?	compensated for use of the land. We are here today to get your free will consent to donate the land. Please remember the benefits that having electricity will bring.
				Who will choose the location of the Mini-grid?	Agnes responded that the land has been identified in close consultation with the community. today's meeting is also part of the consultation.
Jan 19th 2022	Environmental and Social Impact Assessment.	Consultants MoE KPLC REREC	Land acquisition through compulsory acquisition (not voluntary land donation). Selection of three priority community projects, whereby one is to be implemented as in-kind compensation for land.	Community requested 1st electricity, 2nd water reticulation and 3rd improvement of health care.	The proponent has set aside KES 1 million to implement the priority in-kind compensation project. The value of the project will be proportional to or greater than the value of land. NLC will determine the value of land.
May 2023	Compulsory Land Acquisition.	NLC	Site inspection and inquiries. Land valuation. Award of compensation.		

5. Institutional Responsibility for Implementation of the ARAP

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

A-RAP Implementation Committee	• Coordinate A-RAP engagements at the community level, monitoring A-RAP implementation and closure.
Affected Community	• Responsible for the operation and maintenance (O&M) of in-kind compensation project. An agreement stipulating the O&M roles and responsibilities of the community will be effected.

6. Procedures for Grievance Redress

The Project procedures for grievance redress were established through a public consultation process and informed by the existing conflict resolution structures in the community. The Grievance Redress Mechanism (GRM) comprises tiers at the project, county, and national levels. *Refer to Section 7.4 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.