MINISTRY OF ENERGY
Republic of Kenya

REREC
RURAL ELECTRIFICATION & RENEWABLE ENERGY CORPORATION

THE WORLD BANK

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

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

Comprehensive Project Report (CPR) FOR THE PROPOSED KARGI OFF-GRID SOLAR PROJECT AT COORDINATES 2°30'27.7" N 37°34'46.4" E

2023

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

CENTRIC AFRICA LTD

CERTIFICATION

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

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

ESIA/EA FIRM OF EXPERTS:

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For REREC

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

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
GBV	Gender Based Violence
GDC	Geothermal Development Company
GoK	Government of Kenya
HDPE	High Density Poly Ethylene
IAs	Implementing Agencies
IEC	International Electrotechnical Commission
IPPs	Independent Power Procedures
IPs	Indigenous Peoples
JV	Joint Venture
KETRACO	Kenya Electricity Transmission Company
KII	Key Informant Interviews
KOSAP	Kenya Off-Grid Solar Access Project
KPLC	Kenya Power and Lighting Company
LEP	Labour and Employment Plan
LGRCs	Local Grievance Redress committee
MGs	Mini Grids
MOE	Ministry of Energy
MSDS	Material Safety Datasheet
NEMA	National Environmental Management Authority

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

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EXECUTIVE SUMMARY

E.1 Context Setting

The Government of Kenya target to achieve universal access to electricity by 2020 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. 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. The Ministry of Energy (MOE) Kenya is coordinating the implementation of the Kenya Off-Grid Solar Access Project (KOSAP) to provide access to clean and modern energy services through off-grid solar to 14 underserved counties. The 14 underserved Counties include Mandera, Wajir, Garissa, Tana River, Samburu, Isiolo, Marsabit, Narok, West Pokot, Turkana, Taita Taveta, Kwale, Kilifi and Lamu.

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 around the refugee camps), enterprises, community facilities, and water pumps in fourteen (14) "marginalized areas" based on the County Development Index (CDI) by the Commission on Revenue Allocation (CRA, 2013).

The 14 underserved counites collectively represent 72% of the Country's total land area and 20% of the Country's population most of them are pastoralist. Their population is highly dispersed, at a density four times lower than the national average. They present profound infrastructure deficits, including lack of access to roads, electricity, water, and social services. There is also significant insecurity in certain areas undermining economic prosperity.

The proposed project is designed to address low affordability of the potential users, and sustainability of service provision in the underserved identified counties. Therefore, sustainability of the proposed approach to energy access expansion beyond the Nationally owned power network is predicated on two primary factors - public funding, local community participation: and institutional capacity of Kenya Power and, Rural Electrification and Renewable Energy Corporation (REREC) and the Ministry of Energy (MOE) as the implementing agencies.

The objective of KOSAP is to increase access to modern energy services in through the implementation of four components namely; Component 1: 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: Standalone Solar Systems and 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: Standalone Solar Systems and Solar Water Pumps for Community Facilities and Component- This component will support electrification of public institutions and community facilities using standalone systems and also support the installation of solar PV-powered water pumps for consumptive purposes 4: 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.

In Marsabit County, one of the target counties, the Proponent is proposing to develop 14 No. mini grid facilities including Kargi 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

World Bank Context: 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 Kargi proposed site aligns with this category of projects that the World Bank has been involved in.

Kenyan Context-Section 8 (f) of the Environmental Management and Coordination Act (EMCA 1999) Legal Notice 31 of 2019 Amendment of the 2nd Schedule categorizes solar power farms 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 Kargi 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

This ESIA report has been developed to ensure that the proposed mini-grid is in conformity with national policy requirement of securing sustainable development. This report has been developed to ensure compliance with requirements of the EMCA 1999 and its 2015 Amendment- Kenya's supreme environmental law and the National Constitution. Section 58 of EMCA requires that all proposed development in Kenya to be subjected to environmental impact assessment and to be conducted in line with the Second Schedule (of EMCA) and the Legal Notice 101 (Regulations for Environmental Assessment and Audit) of June 2003, World Bank Operational Policy OP 4.01 and other relevant legal obligations.

The Environmental and Social Impact Assessment (ESIA) for the proposed Kargi project followed a structured process, beginning with kick-off meetings and online discussions involving the Proponent, Implementing agencies, and the World Bank Environmental and Social Safeguard Team. These consultations were instrumental in establishing the project's scope, deliverables, timeline, and methodology. Subsequently, screening and scoping exercises were conducted to evaluate potential social and environmental risks. A thorough desk-based review was also undertaken to assess existing project documentation, legal requirements, and relevant plans.

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

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

E.4 Legislative Regulatory Framework

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

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

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

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

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

E.5 Environmental Setting

The project site is located in Marsabit County, which is categorized as a dryland county because it falls within an arid and semi-arid area. Most parts of the county are arid, with the exception of high potential areas around Mt. Marsabit such as Kulal, Hurri Hills and the Moyale Sololo escarpment. The county experiences extreme temperatures ranging from a minimum of 10.10C to a maximum of 30.20C, with an annual average of 20.10C. Rainfall ranges between 200mm and 1,000mm per annum and its duration, amount and reliability increases with increase in altitude. North Horr (550m) rainfall of 150mm; Mt. Marsabit and Mt. Kulal 800mm while Moyale receives a mean annual rainfall of 700mm.

The project site area falls under Ecological zone VI. This zone comprises the most extensive in the county and includes all the hills and plains below 700m above sea level. The typical vegetation is dwarf-shrub grassland or a very dry form of bushy grassland. These areas have extremely short grazing season, mostly lasting not more than two months after the rain seasons. In extreme period of rainfall failure, the only vegetation available in this area is dwarf-shrub, which mainly supports goats and camels.

Loss of biodiversity degrades the ecosystem of Kargi location and Laisamis Sub County, it comprises of vegetation and animals. The project site lacks prominent vegetation mostly being bear with few shrubs and patches of grass. Kargi also experiences perennial drought. The clear sky and lack of tall vegetation has

rendered Marsabit County very dry and hot. This is true for Laisamis Sub-County including at the project site. Despite occasional cool breeze from nearby hills, the temperatures are high. The project site soil type is red sandy soil. The most common soil colour in Marsabit is red to brown, mainly comprising of fine red earth and sand-sized quartz and feldspar pieces that give it a sparkly appearance. It is moderately porous, with thickness fluctuating between 20 cm to 5m. The terrain at the project site is nearly flat with an approximated slope of 0.001 which would be ideal for mounting of the solar panels.

Fauna- The project area suffers from paucity of wildlife. This is mainly due to increasing population with subsequent increase in poaching activities especially for the big game. For example, Elephants (*Loxodonta africana*) and black rhinoceroses (*Diceros bicornis*) were once plentiful on the lower slopes of Mt. Kulal until 1976 but have now been exterminated by poaching. Other wildlife species including Greater kudu (*Tragelaphus strepsiceros*) Oryx (*Oryx beisa*), Gerenuk (*Litocranius walleri*), Grant's gazelle (*Gazella granti*), Giraffe (*Giraffa camelopardalis*) and Grevy's zebra (*Equus grevyi*) occurred on the middle and upper slopes of Mt. Kulal. The last buffaloes (*Syncerus caffer*), which lived in the higher levels of the montane forest, were seen in 1976 and the species is apparently extinct on Mt. Kulal now. During the field study, we were only able to see an occasional dikdik and hare within the project area. However, the team saw gerenuk, stripped hyaena, jackal and ostrich between the project area and Marsabit (outside the project area). The exceptionally low densities of wildlife especially the mega fauna within the project area is attributed to poaching and intense competition between the wildlife and livestock.

Flora- Most of the project area is covered by deciduous dwarf shrubland There are also large areas of barren land where vegetation is very scarce. The common plant species of the project area include shrubs such as *Indigofera spinosa*, *Duosperma eremophilum, Sericocomopsis hildebrandtii, Acacia reficiens, Acacia mellifera* and *Commiphora Africana*. Annual grasses are common especially during the rainy season. They include *Aristida mutabilis, Aristida adscensionis* and the species of *Eneopogon* and *Cencrus*. Although the vegetation is scarce, plants play an important role in the life of pastoralists of the project area. They provide firewood, materials for the construction of the houses and livestock enclosures and feed for livestock including camels, sheep and goats. Vegetation at Kargi is under great pressure of exploitation, human and livestock population of the area has been growing steadily in recent years causing high demand for fuel wood and building materials. The increased resource utilization and degradation has brought about dwindling vegetation cover and encroachment of desertification related phenomenon.

The project area is predominately inhabited by Rendille. The Rendille community occupies the area in Laisamis. Other communities in the area are the Somalis. The community's main abode, also known as Manyatta. However, in town centers the houses are permanent (Concrete or iron sheets). Kargi has a population of approximately 15,000 people with about 2300 households. The gender ratio is currently estimated at about 40% male and 60% female. Pastoralism is predominantly practiced by communities in the entire region with minimal business enterprises. In the regions of South Horr and Marsabit, Mt. Kulal and Hurri Hills there are some agricultural activities where some of the main crops are maize, citrus fruits, beans and vegetables. Sheep, goat and poultry keeping are also prevalent activities in the project area. Livestock production has great potential particularly the establishment of more large-scale milk processing plants to produce butter, cheese, yogurt, and other milk products. Tanning industry for processing of leather products is also viable in view of the availability of hides and skins. The inhabitants of Kargi are mainly pastoralists keeping livestock such as cattle, shoats, camels, donkeys and to a lesser extent poultry. The old men and the middle-aged men who have graduated into elders are charged with the responsibility of overseeing the performance of their livestock herds. They spend most of their time under a tree discussing matters affecting the community, gambling and later in the day they audit their livestock after returning from the fields. However, in town centers like Kargi commercial enterprises,

trading and provision of services are important undertakings.

E.6 Project Overview

The Kargi Mini Grid project aims to provide electricity to approximately 620 residential and 9 non-residential consumers on unregistered community land in Kiwanja Village at Kargi Sub-location, Kargi South Horr Ward, Laisamis Subcounty, Marsabit County at GPS coordinates of Latitude 2°30'27.7" N and Longitude 37°34'46.4" E. Kargi boarders Korr to the south, olturot to the west and Bubisa to the north east.

The proposed project site neighbours Manyattas to the South East, Kargi primary school approximately 100m to the North East and access road to the North West.

The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity. A 17.77 km Low Voltage Power Distribution Network will be established to distribute the power to customers. The project utilizes solar panels with a total capacity of 160 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 400 kWh Battery Energy Storage System is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions. A 130 kVA diesel generator is included to serve as a backup power source for periods of low solar generation or in case of battery depletion. It provides reliability and backup in the event of extended periods of cloudy weather or high demand. A 2,000-liter fuel tank is provided to store diesel fuel for the generator, ensuring continuous operation during extended periods of low solar or high demand. Additionally, PV Inverter: A 160 kW solar PV inverter is used to convert the direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use.

The estimated cost of the project is around USD 628,806 although this amount may change as more detailed plans are developed

To develop the Mini Grid, approximately 1.494 hectares of land will be compulsorily acquired by the Proponent from the community. This land is unregistered community land. The Proponent engaged with the community during the land acquisition process, and there were no objections to transferring 1.494 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. The local community has agreed to a compensation in kind arrangement for the land acquired in Kargi, the top three community development needs are health, roads and electricity.

The contractor for the Project, responsible for installation of the Project components and development/ procurement of Project related common infrastructure, is yet to be finalized and hired; the process of hiring shall be done after NEMA approval.

E.7 Project Alternatives

Solar energy is identified as a non-polluting and site-specific option, and this proposed site 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. The project alternatives are discussed details in chapter 4. The solar mini grid project has most benefits with negative

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

E.8 Stakeholder and Public Participation

Stakeholder consultation is generally useful for gathering environmental data, understanding likely impacts, determining community and individual preferences, selecting Project alternatives and designing viable and sustainable mitigation and compensation plans.

Stakeholder and public participation are guided by various legal and policy framework documents. For the proposed Kargi solar mini-grid site public consultation activities conform to both National and International Legal Instruments as described in Kenya Constitution 2010, Public Participation Bill 2016, The Environmental Management and Coordination Act (EMCA), 2015 and subsequent regulations of Environment Impact Assessment and Audit Regulation of 2003 and World Bank Operational Policy OP 4.01.

Stakeholder mapping was done to ensure that all the stakeholders likely to be affected or influenced by the Project were identified and involved in ESIA detailed study. During the ESIA, 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. A total of 115 stakeholders were in attendance (*see table 2*). 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.

Table 1: Schedule of Public Consultations

Date of the meeting	**Meeting Venue**	**Participants Involved**	**No. of Participants and Gender Representation**
17th January 2022	Kargi community baraza point	Area Assistant Chief KPLC & REREC representatives Consultant representative Affected persons and interested persons of Kargi	Male 50 Female 55 Youth 10 **Total =115**
		Focus Group Discussions (FGD)	FGD- Male 13 FGD- Female 65 FGD- Youth/Association 12

The Project designs and Environment and Social Impact Assessment (ESIA) incorporated issues discussed and resolved in the consultative meeting as summarized below.

Table 2: Issues Discussed and in cooperation into the Project Reports

No.	**Summary of Issues Discussed**	**Response**
1	Accidents and injuries from shock, electrocution, and electrical fire hazards following poor wiring	Electric specialist to be involved in the project will ensure that proper protocols are followed to minimize such risks. Further wiring of the households will be done at the cost of the owner and it is advised that an electric specialist is engaged.
2	Site safety (Vandalism)	A Chainlink fence will be erected and guards to man the sub-station day and night
3	Fire risk noting some households are thatched	Rules and regulations that govern the risk of flammability in regards to electric installation shall be adhered to. Electric specialist to shall

		be involved to ensure that proper protocols are followed to minimize such risks
4	Project Commencement	Procedures to implement the project are underway and will commence as soon as compliance is met including acquiring a NEMA licence for the proposed project

E.9 Potential 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.

Summary of anticipated impacts and their corresponding levels of significance, both pre- and post-mitigation are outlined in Table 4, Table 5 and Table 6 below.

Table 3. Summary of Pre-construction Impacts

Impact	Significance (pre-mitigation)	Residual Impact (Post mitigation/enhancement)
	Pre- Construction Phase	
Land acquisition	Minor	Negligible
Way leaves	Minor	Negligible
Stakeholder identification and consultations	Major	Minor

Table 4. Summary of Construction and Decommissioning Phase 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

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

Table 5. Summary of Operational Phase Impacts

Impact	Significance of Impact (Pre-Mitigation)	Residual Impacts (Post-Mitigation)
Impact on Economy and Employment	Positive	Positive
Quality, reliable power supply	Positive	Positive
Reduction of pollution associated with thermal power generation, kerosene and wood fuel usage	Positive	Positive
Education	Positive	Positive
Health benefits	Positive	Positive
Improved standard of living	Positive	Positive
Security	Positive	Positive
Communication	Positive	Positive
Soil environment	Minor	Negligible
Waste generation and management	Minor	Negligible
Water environment	Negligible	Negligible
Landscape and visual impacts	Minor	Negligible
Increased oil consumption	Minor	Negligible
Increased storm water flow	Minor	Negligible
Fire outbreaks	Moderate	Minor
Water demand	Negligible	Negligible
Sanitary waste	Negligible	Negligible
Flooding	Negligible	Negligible
Noise and Vibration	Negligible	Negligible

Impact	Significance of Impact (Pre-Mitigation)	Residual Impacts (Post-Mitigation)
Electric and magnetic fields (EMFs)	Negligible	Negligible
Dust Emission	Negligible	Negligible
Vehicle Exhaust emission	Minor	Negligible
Collision and electrical hazards from distribution infrastructure	Minor	Negligible
Occupational safety and health	Moderate	Minor
Community safety and health	Moderate	Minor
Gender based violence, SEA and SH	Minor	Negligible
Exclusion of VMGs, Vulnerable individuals and households	Major	Minor
Risk of communicable diseases	Minor	Negligible
Shocks and electrocution to the beneficiaries	Moderate	Minor
Risks related to poor and inadequate stakeholder engagement (conflict)	Minor	Negligible

E.10 Environmental and Social Management and Monitoring Plan

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

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

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

For the mitigation measures to be successful, it is imperative that the Kenya Power and Lighting Company (KPLC) allocates sufficient resources for the implementation of the ESMMP. Adequate resources will enable the proper execution of the proposed measures and ensure their effectiveness in minimizing the identified negative impacts.

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

E.11 Conclusion

Based on the assessment findings, the consultant concludes that there are no substantial reasons to hinder the proposed project from progressing to the next stage of planning and development. However, this progression is conditional upon the implementation of the recommended mitigations and the monitoring of potential environmental and socio-economic impacts as outlined in the ESMMP. It is in the opinion of the Environmental expert that the anticipated negative impacts can readily and effectively be mitigated and on the whole the proposed project does not pose any significant threat to the Environment and may be licensed to proceed.

1 INTRODUCTION

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

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

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

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

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

1.1 Context

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

Norken International Limited in Joint Venture with Centric Africa Limited were appointed by Ministry of Energy to undertake consultancy services for the Environmental and Social Impact Assessment (ESIA),

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

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

The project components are:

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

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

1.2 Project Justification

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

1.3 Project Overview

The project is located within Kiwanja village at Kargi town centre, Kargi location, Kargi/South Horr Ward in Laisamis subcounty, Marsabit County at coordinates of Latitude 2°30’27.7” N and Longitude 37°34’46.4” E. 61km south of Korr town. The proposed solar mini grid will be located on undeveloped piece of land that neighbours Manyattas to the South East, Kargi primary school approximately 100m to the North East and access road to the North West.

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 16.7 km.

1.4 Purpose and Scope of Work

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

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

1.5 Terms of Reference (ToR) for the ESIA Process

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

The ESIA experts conducted the study guided by the following terms of reference:

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

1.6 ESIA Study Team

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

NAME	INSTITUTION	POSITION
Bubicha Mohamed	Centric Africa Ltd	Environmentalist
Mathew Mutua	Centric Africa Ltd	Environmentalist
Daniel Chumo	Centric Africa Ltd	Environmentalist
Hotensia Kabuki	Centric Africa Ltd	Sociologist
CLIENT REPRESENTATIVES		
Jalle Gesille	Marsabit County Government	CREO

1.7 Project Justification for the ESIA

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

This Assessment has identified both positive and negative impacts of the proposed project to the environment and community. The report proposes mitigation measures in the Environmental and Social Management and Monitoring Plan (ESMMP) developed to mitigate the negative impacts and enhance positive impacts thus ensuring sustainability of the project

1.8 ESIA Methodology

This Environmental & Social Impact Assessment (ESIA) has been conducted in compliance with the Environmental Impact Assessment Regulation as outlined under the Gazette Notice No. 56 of 2003 established under the Environmental Management and Coordination Act (EMCA) 2015 and EMSF and provisions of the World Bank OP 4.01. The ESIA is expected to achieve the following:

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

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

1.8.1 Screening and Scoping

1.8.1.1 Screening Methodology

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

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

1.8.1.2 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 17th January 2022. The meetings addressed varied deliverables and thresholds to be achieved and maintained during this assessment in terms of scope of work, deliverables, timeline and the methodology. All communication and meetings were done online.

1.8.1.3 Desk based review and baseline assessment

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

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

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

1.8.2 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

1.8.3 Baseline Condition

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

1.8.4 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 Kargi 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.

1.8.5 Environmental and Social Management Plan (ESMMP)

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, monitorable indicators, timeframe, responsibilities, and budget implications.

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

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

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

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

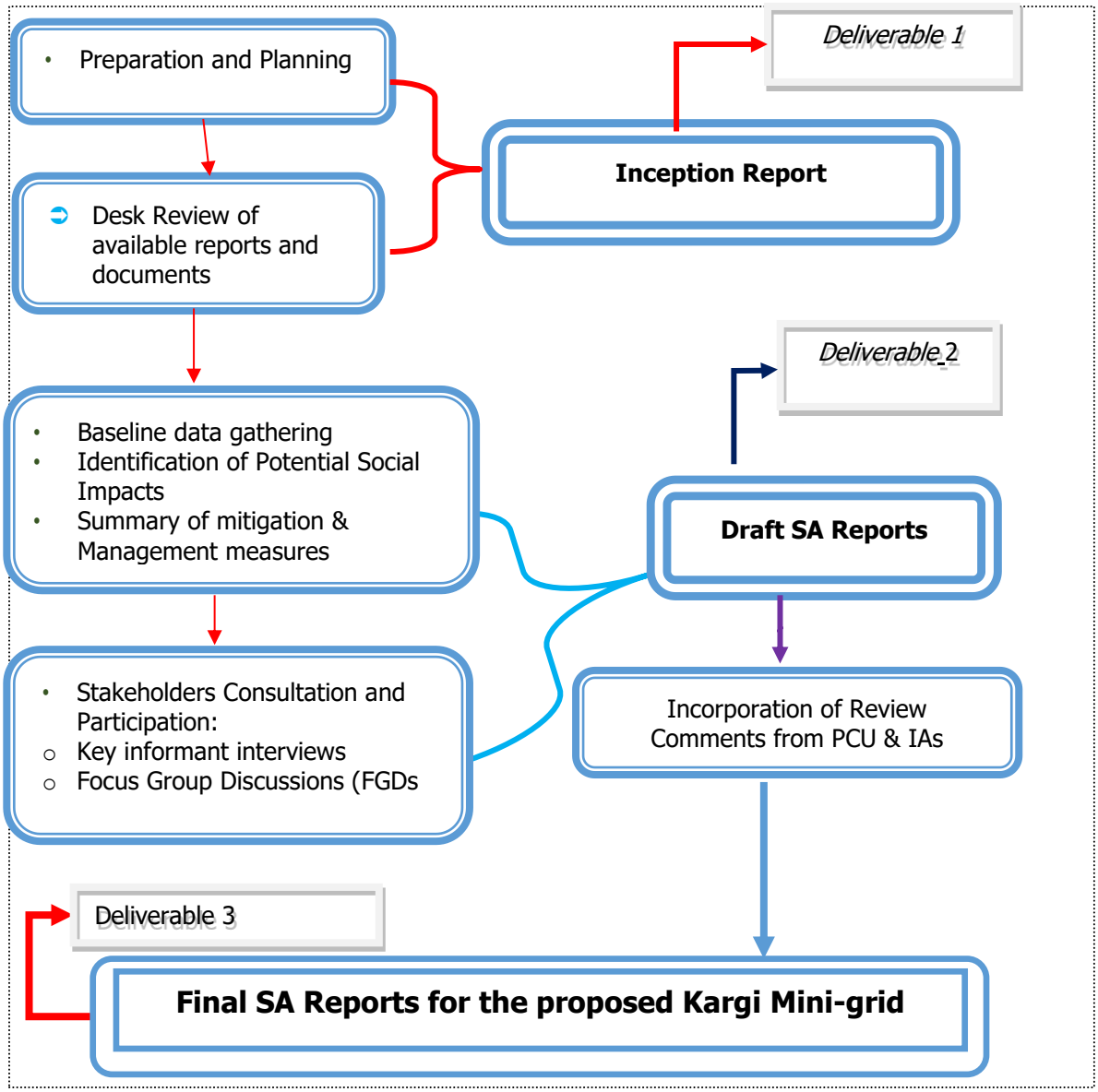


Figure 2: Summary of Environmental and Social Impact Assessment Methodology

1.8.6 Stakeholder Consultations 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 beneficiaries, 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, Key Informant Interviews incorporating questionnaires for social risks assessment with an aim of giving the community a platform to express their environmental and social concerns in relation to the project.

The public (local community members, laborer's and VMG's at the Kargi) were consulted through a public baraza held at Kargi community baraza point on 17th January 2022 where 50 males, 55 women and 10 youths were in attendance including the area senior assistant chief as well as elders were engaged through face-to-face discussions as well as engagement walks on the proposed project site. The meeting was held in accordance with the requirements of NEMA and the WB OP. 4.01 policy and guidelines for conducting an ESIA. The specific objectives of this public consultation were to: Disseminate information on the proposed project to the community members; Collect views and issues to be considered in the ESIA; Evaluate perceptions about positive and negative impacts of the project and; Receive concerns about environmental and social impacts and other implementation challenges.

Stakeholder Identification and mapping

Stakeholder engagement and participation was carried out at different levels and with different stakeholders. Stakeholder's identification and mapping was done based on the following criteria that is affected/project beneficiaries and interested persons or parties. The stakeholders include;

- Beneficiaries of the proposed project who largely are the community members living within 3km radius of the proposed project:
- Interested parties include:

County government of Marsabit various departments including the office of the governor, land and environment, survey and public administration such as ward and village administrators. In addition is the county commissioner and officers under his administration such as chiefs.

Approach and Methodology used in carrying out the Public Participation

Owing to the different categories of the stakeholders, the ESIA team opted to employ various methods in engaging them. The methods included; face to face discussions for the government officers, focused group discussions with the men, women and youth and a public baraza/meeting for the community members

Mobilization for the community meeting

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

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

The key activities undertaken during the assessment were:

- Continuous discussions with the stakeholders and accessing other sources of information on the proposed project details, the site planning and implementation plan,
- Physical inspection of the proposed site, photography, and interviews with project affected persons and interested stakeholders in the project area.

- Evaluation of the activities around the site and the environmental setting of the wider area. This was achieved through existing information, literature and physical observations
- Review of available documentation
- Reporting, review and submissions

Public Forum/meeting

The project team undertook community engagement forums with the target beneficiaries and the communities where the solar Mini-grids will be set. The main objective was to explain the project details including need for land identification and solicit broad community support and acceptability of the project. One open meeting with all the community members was held. The KOSAP team explained to the community members about the project and other related information as discussed in the minutes. The meeting was then opened up for a plenary session.

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.

Focus Group Discussions

After the meetings the community members were told of the need to have focus group discussions to discuss the project further and allow the different groups 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 and the need to have a grievance redress mechanism and committee with representation from all groups in the community. The Focus Group Discussions were also used as a form of baseline data collection. The respondents were able to give feedback on socio-economic status of their community i.e. education, healthcare, economic activities, cultural practices etc.

Key Informant Interviews

Key Informants were identified both at the county and locational levels and they were interviewed to obtain baseline information in regard to the proposed project

1.8.7 Limitations

The limitation experienced during the study are illustrated below.

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

1.9 Target Group for the ESIA Report

The ESIA Report has been prepared for use by different stakeholders to be involved in the construction and operation of the proposed solar mini-grid site. This report contains useful information on policies and procedures to be adhered to, implementation modalities, analysis of potential environmental and social impacts and suggested mitigation measures at various stages of project activities. The information will be useful in planning, implementation, management and maintenance of the plant. In this regard, the report is useful to the following stakeholders:

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

1.10 Assumptions

The Experts made the following assumptions in preparing this ESIA

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

1.11 Uncertainties in Compiling Information

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

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

1.12 Layout of the Report

Table 6. Structure of the ESIA Report

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

Section 9	Environmental and Social Management and Monitoring Plan	Outline of the ESMP considering identified impacts and planned mitigation measures and monitoring requirements.
Section 10	Impact Summary and Conclusion	Summary of impacts identified for the Project and conclusion of the study.

2 PROJECT DESCRIPTION

2.1 Introduction

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

This will entail generation of electricity from solar, distribution of power within a 3-kilometer radius using wooden or concrete poles and retailing the same to the community. The total length of LV distribution network will be 16.7 Km. The community members will pay a connection fee of KES. 1000 once they apply for electricity

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

Table 7. Component of the proposed Solar Mini-grid

S/NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project is located within Kiwanja village in Kargi Sub Location, Kargi South Horr Ward, Laisamis Subcounty, Marsabit County on unregistered community land set aside for public use. Geographically, the site is located on Latitude 2°30'27.7" N and Longitude 37°34'46.4" E, at altitude of 436 metres above the sea level.
2.	Land Size/Tenure	The proposed solar mini grid will be located on 1.494ha ofundeveloped piece of land neighbouring Manyattas to the South East, Kargi primary school approximately 100m to the North East and access road to the North West. The land is an unregistered community land set aside for public use
3.	Mini-grid Power	PV Array (DC-kW) of 160kw; 400kWh Battery; 130kVA backup generator
4.	Distribution line	LV Circuit of 17.77km
5.	Target Consumers	629 (620 Residential and 9 Non-Residential)
6.	Climatic condition	The county has arid climatic condition with the exception of the areas around Mt. Marsabit, Mt. Kulal, Hurri Hills and the Moyale-Sololo escarpment which represent typical semi-arid condition. The temperature ranges from a low of 15^0C to a high of 26^oC, with an annual average of 20.5^0C (World Weather and Climate information, 2015). It has a bi-modal rainfall pattern. The long rain season fall between April and May while the short rain season falls between November and December. Rainfall ranges between 200mm and 1,000mm per annum and its duration, amount and reliability increases with rise in altitude. North Horr (550m) has a mean annual rainfall of 150mm; Mt. Marsabit and Mt. Kulal experience 800mm while Moyale receives a mean annual rainfall of 700mm.
8.	Site Conditions	The side is generally in open area with minimal and scarce *fauna* and *flora*.
9.	Road Accessibility	Earth road joining Korr and Kargi
10.	Nearest Airport	Marsabit Airport at about 70km
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 proposed Project site is located on unregistered community land within Kiwanja village in Kargi Sub Location, Kargi South Horr Ward, Laisamis Subcounty, Marsabit County at GPS coordinates of Latitude

2°30’27.7” N and Longitude 37°34’46.4” E. at altitude of 469m above the sea level as shown in the map. Kargi boarders Korr to the south, olturot to the west and Bubisa to the north east. The project site neighbours Manyattas to the South East, Kargi primary school approximately 100m to the North East and access road to the North West.

The site soil is primarily sandy within the area. The project site is approximately 61km north of Korr town.

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

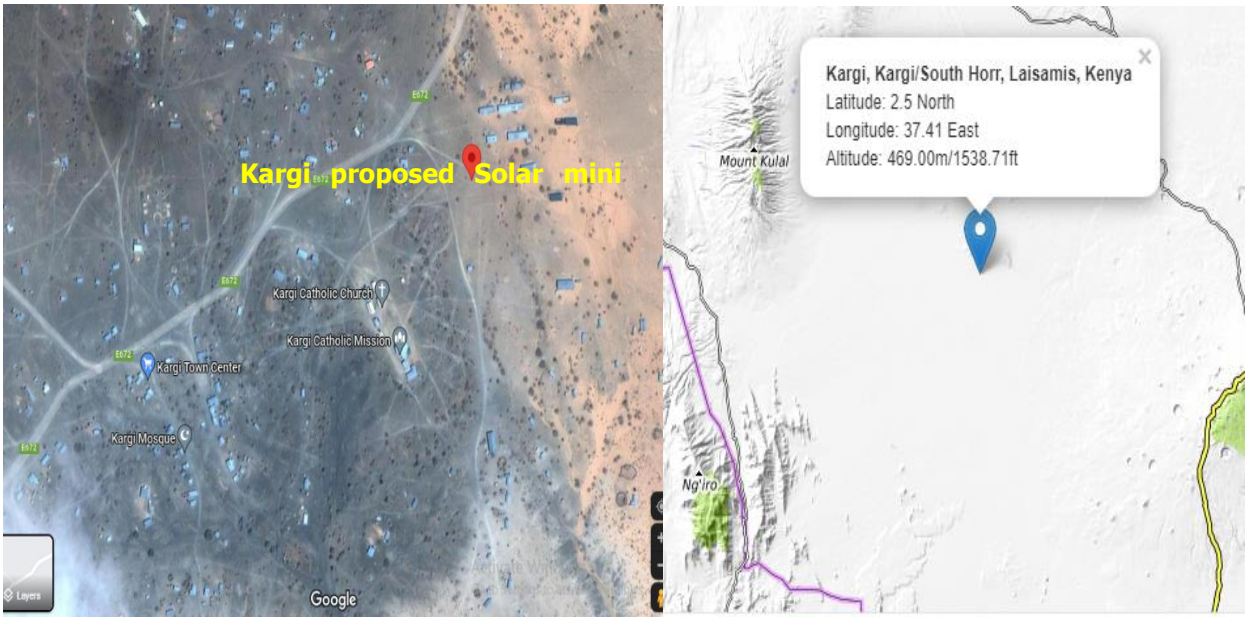


Figure 4: Project location (Google map)

2.2.1 Project site setting

The proposed Kargi mini grid is in Marsabit County. It falls under cluster 3 with a total of 48 mini-grids and lot 2 which has a total of 15 mini-grids characterized as Subproject sites in overwhelming/majority VMG counties (mostly pastoralist counties) with unregistered community land. Geographically, Kargi site falls on coordinate’s latitude 2°30’27.7” N and Longitude 37°34’46.4” E.

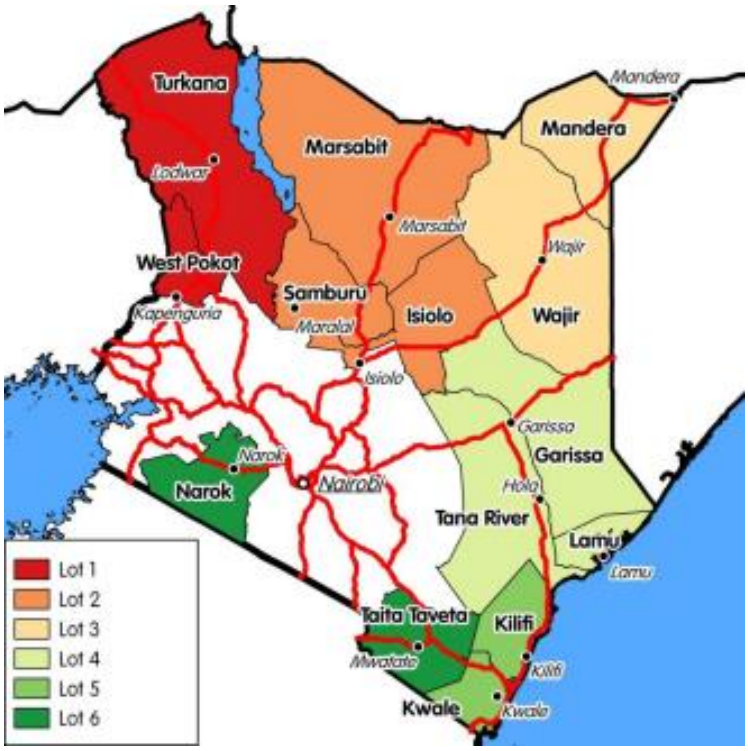


Figure 5: Map Showing the KOSAP Counties Lot 2

2.3 Land Requirement and Procurement Process

The land on which the proposed Kargi mini-grid will be constructed is within Kargi center near Kargi Primary school. The proposed project site is approximately 1.494ha, which is unregistered community land set aside for public use.

2.3.1 Land Tenure

The entire county is categorized as trust land. In Kargi, the site falls on Unregistered Communal land set aside for public use. The County government of Marsabit is the custodian/owner of the land. Further, community land within Marsabit County is yet to be registered. Nonetheless, The County government has already submitted an inventory of community lands to the ministry in which North Horr have been captured.

2.3.2 Compensation Details

Compensation will be done in kind. The main key area for development activities identified by the community in Kargi included; health, roads and electricity.

2.4 Description of Project Facilities, Components and Activities

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

2.4.1 PV Hybrid Mini-Grid Sizing

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

- The proposed Residential & Non-Residential Users available
- The PV Capacity in kilo Watt peak.

- The storage battery Capacity
- The Inverter capacity in (kW)

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

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

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

2.4.2 Architecture and Basic Design Specifications

This hybrid power generation site is projected to generate 160KW and is meant to serve approximately 620 households (customers). The proposed mini-grid installations will be built to comply with the International Electro technical Commission (IEC) standards. It will have an installation of solar panels of with a capacity of 160 (kWp) and battery house with 400 kWh. The solar panels will have a connection to the batteries through underground cables. The Solar PV hybrid system is based on a centralized photovoltaic plant connected to a 3-phase 415V AC busbar line, where the multi-mode battery inverter and the diesel generator are also connected.

The standby generator will also be connected to the system as a backup. This generator will have a capacity of 130 kVA capacity with a fuel tank with a capacity of 2000l. To optimize this hybrid system the HOMER software will be used. The goal of the hybridization of diesel systems is to reduce fuel consumption by switching off diesel generator set(s) for several hours a day, in order to reach a PV energy, share in the final mix of at least 60% or more. The power will be distributed to the customers by overhead lines. The project site is expected to serve clients within a radius of 6km from the site (generation source).

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

The Solar PV hybrid system is based on a centralized photovoltaic plant connected to a 3-phase 415V AC busbar line, where the multi-mode battery inverter and the diesel generator are also connected.

The plant is configured such that a significant portion of daytime loads is fed directly from the solar generator (grid-tie inverter) without intermediate battery storage usage. The solar PV power plant is also equipped with a Diesel Generator, which is normally used as reserve power. The diesel generator switches on automatically whenever the battery state of charge reaches a certain defined DOD (Depth of Discharge). The diesel generator comprises of 130 kVA unit in three-phase operation and it's equipped with automatic startup function controlled by the battery inverter charger.

2.4.2.1 Key Components of the Project

- **Solar Photovoltaic Panels**: The project utilizes solar panels with a total capacity of 160 kWp to harness solar energy. Solar power is a clean and renewable energy source that will provide a significant portion of the electricity needed for the project.

- **Battery Energy Storage System**: A 400 kWh Battery Energy Storage System is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions.
- **Diesel Generator:** A 130 kVA diesel generator is included to serve as a backup power source for periods of low solar generation or in case of battery depletion. It provides reliability and backup in the event of extended periods of cloudy weather or high demand.
- **Fuel Tank for Diesel Generator**: A 2,000-liter fuel tank is provided to store diesel fuel for the generator, ensuring continuous operation during extended periods of low solar or high demand.
- **Inverters and Chargers:**

  PV Inverter: A 160kW solar PV inverter is used to convert the direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use.

  Battery Inverter Charger: A 130 kW battery inverter charger is employed to manage the energy flow to and from the battery storage system. It ensures efficient charging and discharging of the battery, maximizing the system's overall performance.
- **Transformers:** The solar mini- grid site will be equipped with one step up transformer with a rating of 200KVA and 2 step down transformers with a rating of 50 KVA.
- **Low Voltage Power Distribution Network:**

  A 17.77-kilometer Low Voltage (LV) power distribution network is established to distribute the generated electricity to the residential and nonresidential consumers. The LV network is designed to efficiently transmit power while minimizing losses, ensuring a stable supply to the customers.
- **Project Metrics:**

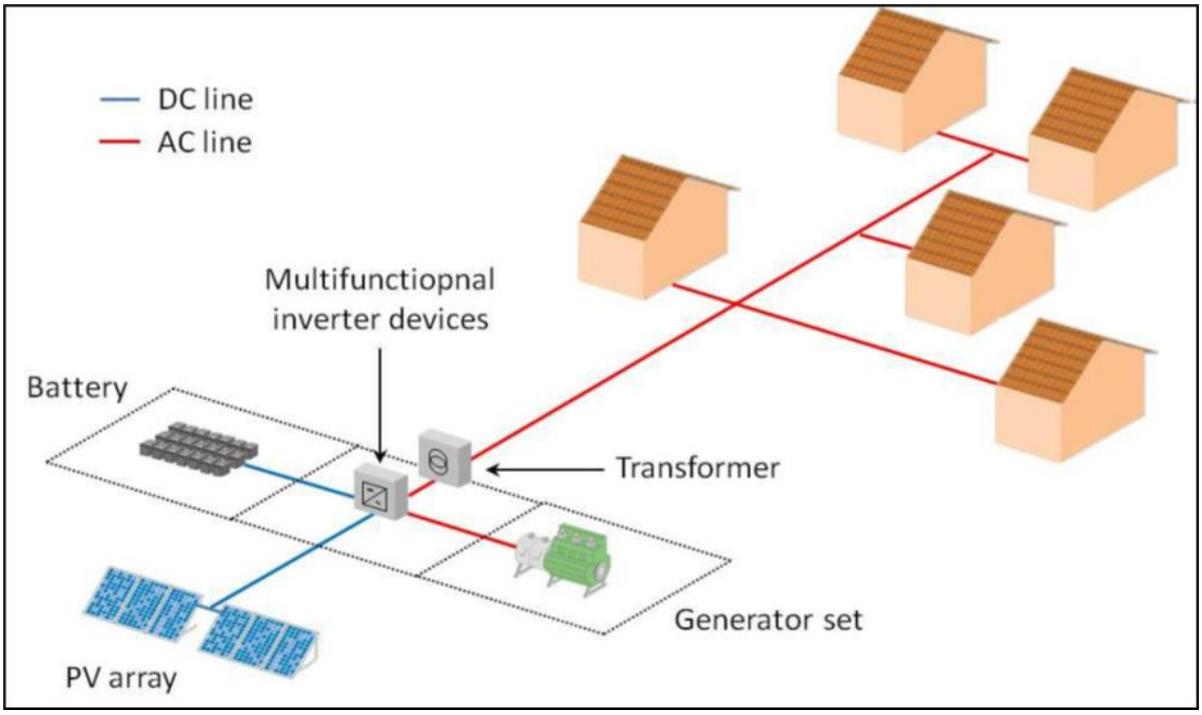
  Monthly Energy Demand: The project is expected to meet a total monthly energy demand of 16,000 kWh.

  Daily Energy Demand: The average daily energy demand is approximately 533 kWh, ensuring a consistent supply for the consumers.

  Peak Demand: The peak demand of the system is 99 kW, which is the maximum power requirement during any given moment.
- **PV Capacity**: The solar photovoltaic panels have a total capacity of 160 kWp.
- **Estimated Project Cost:** The estimated cost of the Kargi Mini Grid project is approximately USD 628,806. 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.

The figure 5 below illustrates the preliminary data for the mini-grid in Kargi.

Figure 6: Illustration sketch of the proposed design of the proposed project



2.4.3 PV Generator

The PV generator consists of Silicon Crystalline Photovoltaic modules of capacity at STC of 160 kWp or more. The PV modules should comply with the norms IEC 61215 and IEC 61730. The outside junction box with the positive and negative terminals shall incorporate bypass diodes that have the function of preventing any possibility of the electrical circuit inside the module being broken due to the partial shading of a cell and shall be at least IP 65 and UV resistant.

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

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

2.4.4 PV Inverter Charger

A 160 kWp 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.

2.4.5 Battery

- **Battery Energy Storage Systems**

The Battery Energy Storage System (BESS) will comprise of Lithium-ion Battery pack that conforms to IEC standards with warranty of 10 years, 3,000 cycles minimum. The Lithium-ion Battery Power Packs will be used to cater for required energy capacity, or equivalent as per approved design, minimum 80% DOD for Lithium-Ion. Batteries will be capable of at least C/4 charge and discharge rate. Batteries will be charged by Battery Inverter / Charger. The project will use 400kwh batteries.

- **Battery Inverters/Chargers**

A 130-kW battery inverter charger is employed to manage the energy flow to and from the battery storage system. It ensures efficient charging and discharging of the battery, maximizing the system's overall performance

The Inverters/charges shall be designed for nominal voltage of 415V AC 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.

- **Battery Rating**

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

- **Battery Performance**

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

- **Lifetime**

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

- **Battery Cabling and Protections**

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

2.4.6 Diesel Genset

The Diesel Generator Set shall have a capacity of 130 kVA. The rated consumption will follow a 0.25 L/h/kW curve at stand-by power. It should include a highly corrosion resistant enclosure, control panel and monitoring, fuel tank and circuit breaker protections. The Diesel Genset shall be suitable for indoor or outdoor installation and shall perform accordingly with Multi-mode Inverter and the mentioned architecture model. The Diesel Genset shall be working in a fully automatic manner with the above stated components. The diesel gensets will have base mounted fuel tanks that will be factory tested for leaks. There will also be an external reserve fuel tank with a capacity of not less than 500 liters. The proponent, through the operating entity will have regular inspection by the manufacturer. The noise rating for the generator set will be 85-90dBA @ 1 meter at 75% load under free field conditions. The generator sets will have a high-quality noise absorbent and fire-retardant grade acoustic insulation material complying to IS 8183.
The mini-grid site will have a 200-kVA transformer that will allow stepping up of the voltage before it is connected to the distribution line.

2.4.7 Distribution lines and Energy Meters

The site will have a distribution line circuit of 17.77km 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.

The electricity distribution from the generation plant to the end consumers will be done by means of a distribution line formed by low voltage (LV) line at 415V for three phase and 240V for single phase. All lines shall be over-head mounted on concrete poles or eco poles. The project implementing agency and KPLC will seek way leaves for the LV lines which will run along road reserves and boundaries within the supply area.

2.4.8 Transformers

The solar mini- grid site will be equipped with one step up transformer with a rating of 200KVA and 2 step down transformers with a rating of 50 KVA.

2.5 Project Phases and Activities

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

2.6 Construction, Operations and Maintenance Arrangements

REREC will be responsible for the implementation of the Solar Mini-grid during construction while KPLC will be in charge of Operations and Maintenance (O&M). In addition, REREC will have overall responsibility for safeguards, due diligence, and implementation. The County Government of Marsabit is also working in liaison with the Ministry of Energy in implementation of the project.

The Solar Mini-grid will be operated, and maintained by the Operations & maintenance contractor for the first seven (7) years and then handed over to KPLC. So, for the seven years KPLC will be monitoring the operations of the contractor.

2.6.1 Pre-Construction/Project Design

As part of the pre-construction stage, the Project is implemented jointly by the Ministry of Energy, Kenya Power and Lighting (KPLC) as well as Rural Electrification and Renewable Energy Corporation (REREC) who have conducted a feasibility study aiming at providing universal access to electricity in Kenya by 2022, universal access to modern energy services for cooking by 2030, as well as the impetus for growth in achieving Vision 2030. A conceptual design has been developed and will be taken forward for detailed design and implementation including the projects described in the previous section. This ESIA report forms part of the feasibility study.

The MOE is currently applying for various permits and licenses including land acquisition for generation assets, wayleaves, contractor facilities and worker's camps. The procurement of various goods and services and contracting of private sector contractors and other consultants will begin after completion of the EIA process.

2.6.2 Construction Activities

Construction Procedures

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

The project inputs will include the following.

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

Construction activities will include the following:

- Contractor mobilization.
- Site Preparation.
- Procurement of construction material from approved dealers and transport to the site.
- Storage of PV modules delivery and their installation.
- Laying of internal electrical connections.
- Installation of inverters, Battery Energy storage system and transformers.
- Post construction clean–up, restoration and landscaping of site
- Load testing
- Remedying of defects after functional tests
- Solid waste collection and commissioning of the plant.

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

2.6.2.1 Soil Excavation

Soil will be excavated to pave way for the construction of the Solar Mini-grid. Soil excavation process shall be done with utmost care to ensure that the excavated soil is not improperly heaped or not carried away by any surface flows to any nearby surface waters causing siltation. The excavated soil will be used to backfill, and any remainder shall be disposed appropriately in accordance with the environmental

management plan. Company safety and environmental policy and other established local environmental protection regulations/standards shall guide the contractor. This will include appropriate safety wear at all times and the contractor will appoint a safety officer on site during all construction activities.

2.6.2.2 Mini-Grid Components

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

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

2.6.2.3 Land Tenure

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

2.6.2.4 Compensation Details

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

2.6.3 Operational Activities

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

2.6.4 Project's Decommissioning Activities

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

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

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

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

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

2.7 Resource Requirement

2.7.1 Workforce Requirement

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

2.7.2 Water Requirement and Source

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

2.7.2.1 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 a hand dug well within Kargi town. The available water points within Kargi area are sourced from shallow wells and Borehole approximately 7km from the proposed project area.

2.7.2.2 Operation Phase

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

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

2.7.3 Raw Material Requirement

2.7.3.1 Construction Phase

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

- **Input Materials and Equipment and Machinery**

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

Lorry	Concrete mixers
Plumbing equipment	Welding machines, wheelbarrows
Electrical equipment	Excavators

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

2.7.3.2 Operation Phase

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

2.7.4 Road Access Requirement

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

2.7.5 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.

2.7.6 Fire Safety and Security

2.7.6.1 Construction Phase

Appropriate firefighting system and equipment shall be provided throughout the construction period. The fire extinguishers will be well distributed according to the fire risks and will be available in areas such as the site office, installation of a shut-off switch to disconnect the solar panels from the electrical system, security area, storage yard etc. A comprehensive emergency response plan with all the emergency numbers will be well displayed at the site and on the fence. Signage, danger plates and name plates will also be displayed at the site.

2.7.6.2 Operation Phase

- **Site security**

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

- **Fire safety**

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

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

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

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

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

2.8 Pollution Streams during Construction Phase

2.8.1 Solid Waste Generation

2.8.1.1 Construction Phase

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

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

2.8.1.2 Operation Phase

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

The hazardous wastes will be stored onsite at separate designated covered area provided with impervious

flooring and secondary containment. The storage containers/ bins/ drum will be clearly marked, and color coded for their hazards. The waste will then be collected by a NEMA approved waste handler.

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

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

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

2.8.2 Air Emissions

2.8.2.1 Construction Phase

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

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

The high dust emissions arising from various activities such as piling, transportation of material (loading and unloading), vehicular movement (on unpaved roads) should be minimized through sprinkling of water and maintaining vehicular speed to 10-15 km/hr. All the vehicles and the Diesel generator should be well maintained and serviced to reduce the rate of exhaust emissions.

2.8.2.2 Operation Phase

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

2.8.3 Liquid Waste Generation

2.8.3.1 Construction Phase

The liquid effluents generated during the construction phase will include domestic sewage from temporary site 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.

2.8.3.2 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.

2.8.4 Noise Emissions

2.8.4.1 Construction Phase

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

2.8.4.2 Operation Phase

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

2.9 Safety of the Facility

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

a) Natural Disasters

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

b) Malicious Damage or Theft

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

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

c) Hazard Risk Assessment

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

- Safety regulations
- Scope of the safety emergency plan
- Notification of local authorities
- Details of the proposed project
- Aim of the safety emergency plan
- Objectives of the study emergency plan
- Emergency arrangements, procedures and plans
- Roles and responsibilities in the event of an emergency
- Evacuation of people
- The role of local communities
- Regular testing of the safety emergency plan
- The risk assessment will include as a minimum:
    - A general process of the project being investigated

- A description of the potential major incidents associated with that type of installation and the consequences of such incidents
- An estimation of the probability of a major incident
- A copy of the site emergency plan
- An estimation of the damages in the case of an explosion or fire
- An estimation of the effects of toxic gas releases.
- The potential effect of an incident on the project or part thereof or an adjacent project or part thereof.
- The potential effect of a major incident on any other installations, members of the public and residential areas.
- Meteorological tendencies
- The suitability of existing emergency procedures for the risks identified.
- Any requirements laid down in the OSHA 2007 and EMCA 1999.
- Recommendations regarding any organizational measures

3 BASELINE SETTINGS- ENVIRONMENT AND SOCIAL

3.1 Study Area

The project site is located within Kiwanja village in Kargi sublocation, Kargi Location, Kargi South Horr Ward in Laisamis subcounty, Marsabit County. Based on the secondary information of the region, the following baseline information on environment, ecology and social has been discussed under the sections below.

3.2 Environment Baseline

3.2.1 Geology and Soil

Most predominant geological formation in the county is volcanic rocks. These volcanic rocks are interrupted in a few areas by pockets of quaternary sediments and Mozambique belt. Other geological formations are associated with the old lake beds of Lake Turkana and Lake Chalbi. The south western and north eastern parts of the county are underlain by old, metamorphic rock of pre-Cambrian origin. These are covered by tertiary and Pleistocene sheets and cones of volcanic rock in the Central and North Eastern parts, especially in and around the central volcanic centres of Mt. Kulal, Hurri Hills and Mt. Marsabit.

The South Western plains are covered by quaternary sediments washed out from the higher areas in more recent geological times. Between the hills of Mt. Marsabit, Mt. Kulal, Hurri Hills, the bed of the seasonal Lake Chalbi is also covered by recent sediments. The rest of the county is covered by rocky, stony and rugged lava plains with poor soil development. Some of these soils in the western part of the district have acidic moisture and are saline as in Chalbi Desert.

The area below 700m above sea level is a low potential range land and forms about 75 per cent of the total land area. As a result of low, unreliable rainfall and high rates of evaporation, the soils are shallow and poor. The areas at the foot of the mountains comprise of Moyale-Sololo escarpment, the slopes of the Hurri Hills, the lower slopes of Mt. Marsabit and the middle slope of Mt. Kulal.

The proposed project area, Kargi at 469m above sea level.

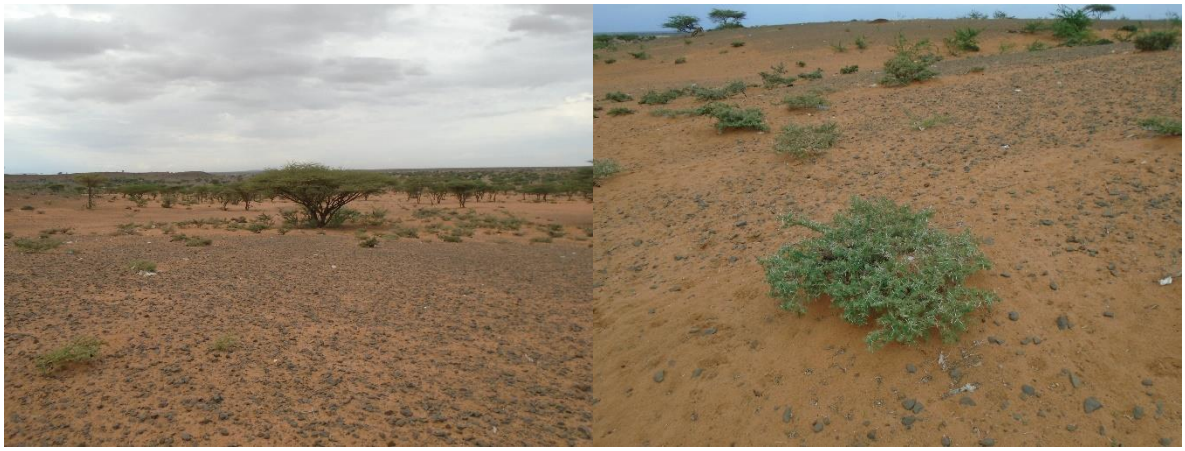


Plate 1. Section of the Proposed project area

3.2.2 Topography

The majority of the county is made up of an extensive plain that rises between 300 and 900 meters above sea level and gently dips to the south east. To the west and north of the county, the plain is bordered by hills and mountain ranges, and is broken up by volcanic cones and calderas. Ol Dongo Ranges in the south west, Mt Marsabit in the middle section, Hurri Hills in the north east, Mt. Kulal in the north west, and Sololo-Moyale escarpment in the north east are some of Marsabit County's major topographical features.

3.2.3 Hydrology and Drainage

Occurrence of surface water is very rare in the project area. Only after heavy rains, shallow pools and seasonal water courses may be filled with water for a few and probably up to a maximum of a few weeks. The drainage ways in the project area are dry river beds referred to as laggas. There are a variety of sources of water for the population and livestock in the project area including boreholes and hand dug wells. Permanent surface water is found on the top of Mt. Kulal but this source of water is outside the project area.

3.2.4 Ground Water Development

The ground water resources were majorly identified during the site assessment by means of observation and selected data hydrological model of the area. The site has a borehole indicating presence of underground water. however, the water is slightly salty.

3.2.5 Ecological Conditions

Marsabit County lies in four main ecological zones. They include: sub-humid, semi-arid (mainly woodlands), arid (predominantly bushlands) and very arid (scrublands). The project site area falls under Ecological zone VI. This zone comprises the most extensive in the county and includes all the hills and plains below 700m above sea level. The typical vegetation is dwarf-shrub grassland or a very dry form of bushy grassland. These areas have extremely short grazing season, mostly lasting not more than two months after the rain seasons. In extreme period of rainfall failure, the only vegetation available in this area is dwarf-shrub, which mainly supports goats and camels.

Plate 2. View of site locality with some of the tree species present

The project area suffers from paucity of wildlife. This is mainly due to increasing population with

subsequent increase in poaching activities especially for the big game. For example, Elephants (Loxodonta africana) and black rhinoceroses (Diceros bicornis) were once plentiful on the lower slopes of Mt. Kulal until 1976 but have now been exterminated by poaching. Other wildlife species including Greater kudu (Tragelaphus strepsiceros) Oryx (Oryx beisa), Gerenuk (Litocranius walleri), Grant's gazelle (Gazella granti), Giraffe (Giraffa camelopardalis) and Grevy's zebra (Equus grevyi) occurred on the middle and upper slopes of Mt. Kulal. The last buffaloes (Syncerus caffer), which lived in the higher levels of the montane forest, were seen in 1976 and the species is apparently extinct on Mt. Kulal now. During the field study, we were only able to see an occasional dikdik and hare within the project area. However, the team saw gerenuk, stripped hyaena, jackal and ostrich between the project area and Marsabit (outside the project area). The exceptionally low densities of wildlife especially the mega fauna within the project area is attributed to poaching and intense competition between the wildlife and livestock.

3.2.6 Climatic Conditions

The project site is located in Marsabit County, which is categorized as a dryland county because it falls within an arid and semi-arid area. Most parts of the county are arid, with the exception of high potential areas around Mt. Marsabit such as Kulal, Hurri Hills and the Moyale Sololo escarpment. The county experiences extreme temperatures ranging from a minimum of 10.1^0C to a maximum of 30.2^0C, with an annual average of 20.1^0C. Rainfall ranges between 200mm and 1,000mm per annum and its duration, amount and reliability increases with increase in altitude. North Horr (550m) rainfall of 150mm; Mt. Marsabit and Mt. Kulal 800mm while Moyale receives a mean annual rainfall of 700mm. Land-use in the county is mainly livestock rearing and nomadic pastoralism is the major way of life. The soil distribution is influenced by intensive variation in relief, climate, past volcanic activities and the underlying rocks. Marsabit County is arid with low and unreliable rainfall ranging between 75 and 400 mm annually.

The average temperatures range between 26 and 32°C. These temperatures are higher within the Chalbi Desert. The desert is rocky and devoid of vegetation, except for few scattered Acacia species. It has a mean annual rainfall of 200 mm in the lowlands and 800 mm in the highlands.

Monthly maximum and minimum wind speeds of 23.8Kph and 17.4Kph are normally experience in August and December respectively. Mean monthly value is 20.366Kph

3.3 Socio-economic Environment

3.3.1 Community Profile

The proposed Kargi solar mini-grid is located near Kargi Primary school in Kargi Sub location, Kargi South Horr Ward, Laisamis subcounty in Marsabit County. It is located 61 km from Korr town. The top community development priorities are 1st health, 2nd roads 3rd electricity in that order. The village has been in existence for 50 years. Houses in the community composed of both concrete and iron sheets within Kargi town centre and thatched and/or polythene covered manyattas. The community support mechanism includes Hunger safety net, emergency relief food/feed (for livestock and human). The main clans are Rendille clan with also Somali clans present in the area. The primary religions are Christian 50%, Islam 40% and others 10%. Below is a summary of demographic profile of Kargi.

Attribute	Magnitude/Number
Approx. population	15,000
Households	2300
Gender.	Male – 40% Female – 60%

Ave. No. per household	6 per household
Vulnerable classes	Orphans, PLWDs
Vulnerable Households	Female households- 200 Child households- 100 Elderly- 500 PLWD- 200
Dominant ethnic group	Rendille
Other groups	Somali
Primary religion	Islam and Christian
Employment (formal/Informal)	Formal – 10% Informal – 90%

Table 8. Demographic profile of Kargi

Plate 3. Manyatta household at the immediate southeast of the site

3.3.2 Socio-economic status of Study Area

3.3.2.1 Demographic Profile

The information shared on community profile by the area assistant chief (Kargi location) showed that Kargi has a population of approximately 15,000, and with an estimated number of households to be 2300 with an average of 6 people. Kargi has a gender ration that is currently estimated to be about 40% male and 60% female.

3.3.2.2 Educational Infrastructure

The village has four pre-schools/kindergartens located a kilometer to 15km from Kargi town center. There are also four primary schools including approximately 100m north east of the proposed project. In addition, Kargi has one secondary school. Kargi Primary school has a total of 257 pupils (186 girls and 71 boys) a ratio of 3:1. The school has with 7 teachers in total. The school completion rate among the boys is higher than that of the girls with boys achieving higher grades. Among the girls' education is not a priority due to early marriages and pregnancies affecting their studies only half of the girls successfully complete their studies. At least ¾ of the boys complete their education with the others dropping out to take care of livestock (especially 1st born). Constraints to accessing education are cultural practices i.e., circumcisions, lack of school uniforms and fees and unrecognition of the disabled, visually impaired and female students.

Marsabit County in general has a total number of 252 ECDE Centres, 231 primary schools, 43 secondary schools and 4 polytechnics. There no o colleges and no universities. This means that majority of youths

cannot acquire technical skills within the county. There is thus need for the establishment of more polytechnics, tertiary colleges and universities.

3.3.2.3 Occupation and Livelihood Profile

Kargi community are mainly pastoralists with a few moving with livestock in search of pasture and water. Major livestock kept are camel, cattle, sheep, goats, and poultry. The community rely of livestock products for food at the household level and for income generation. Formal employment is 10%. Other sources of income in the society include sale of wood fuel/charcoal and firewood, building materials and business enterprises. Due to the aridity of the county, food production (crop growing) is limited and contributes little to food security.

Marsabit is an arid and chronically food deficient county. Recurrent droughts occur every one to three years. They are a major challenge for the development of the county, resulting in significant losses for the

population and resources being required for emergency relief rather than longer term development. Drought reduces the availability of and access to water, leading to loss of livestock, shortage of food and loss of biodiversity. In recent years, lack of water has resulted in loss of approximately 20 percent of livestock in the county. Limited pasture has led to overgrazing and forest encroachment, further exacerbating environmental degradation.
Community conflicts between the Rendille and Gabbra due to pasture and water are common in Kargi.

3.3.2.4 Land Use

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

Land in Kargi is mainly communal with only 1% of the land rented. The land is used for homesteads, public infrastructures (schools, dispensary, shopping centers etc.), worship centers and mainly for livestock grazing, underground water is also harnessed from the land. Sacred places within Kargi include: Naabo and Awatho, Fare &Algas 10kms from kargi town center and Korole approximately 20kms away.

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

3.3.2.5 Health facilities

Kargi has four public health centers, one dispensary, one health centre and two clinics located <1km from the proposed project site. Kargi dispensary has one clinical officer and a male nurse. Main service provided is Out-patient services, maternity, laboratory, consultation, admissions, HTC, nutrition and family planning. The facility's maternity and outpatient ward are poorly. Due to lack of power to light up the facility and run equipment operations and capacity are not met. The facility also lacks an ambulance and staff.

3.3.2.6 Social and Physical Infrastructure

Water: There are main sources of water in the Kargi; boreholes and hand dug wells. Borehole water is supplied to the community through a common water point stationed near the town center. The boreholes were constructed by the county government over 7 years ago. The quality of water has not changed since installation.

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

Road Network: Road connectivity within the area is also poor and not regularly maintained. The main forms of transport within the area are Motor bikes, taxis and Matatus while donkeys and camels also provide alternative modes of transport. The community accessed via Korr-Kargi earth road.

Mobile Network Coverage: *Safaricom* and *Airtel* are 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 while only wealth families have installed power panels in their homes.

4 ANALYSIS OF ALTERNATIVES AND PROJECT JUSTIFICATION

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

4.1 Site Selection

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

The proponent identified one location for the proposed solar project which located to the approximately 100m north east of Kargi primary school. The site was identified based on the location of settlement areas, commercial/ public facilities in Kargi. The project site is approximately 300m South west to Kargi Catholic mission and 500m Kargi town center.

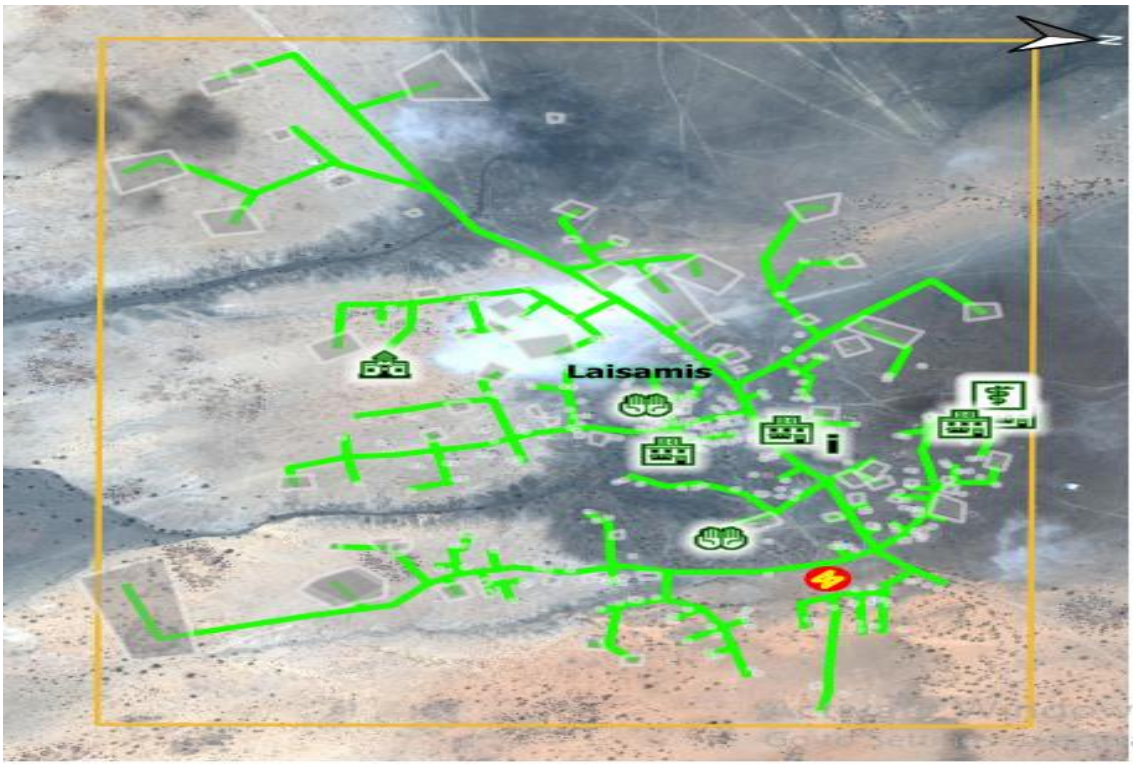
Further details on the other locations identified were not available.

- No settlement present in the project site;
- The project site land is predominantly unregistered community land;
- The project site has few scattered trees and shrubs and located between school and community settlement area (manyattas);
- The project site land is a very arid and characterized by shrubland, no crop is cultivated throughout the year;

The proposed project site has the following location advantages:

- The land is unoccupied and does not have any ecological sensitive receptor such as national parks, Wildlife Sanctuary within 10 km radius;
- No cultural property of archeological importance within 5 km radius and
- The closest available power from National grid is located at about 70 km away, at Marsabit town

PROPOSED PROJECT SITE & PROXIMITY TO CONSUMER SITES



4.2 Power Scenario at Kargi

Kargi location has an estimate of 15,000 number of people with approximately 2300 households within the area. The proposed solar off-grid project is estimated to cover up to 629 residential and non-residential consumers within the area. This will reach out to over 27% of the population within the area.

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

The existing sources of energy at Kargi include solar powered appliances supplied by private enterprises such as D-light. The current energy availability provided by the solar appliances is insufficient and does not meet the objective of the aim of project and only the wealthy can afford to install it in their households. Solar energy is mainly utilized for lighting and charging mobile phones. Whereas wood fuel and kerosene are utilized for cooking, heating water and providing for warmth.

The use of wood fuel 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 as firewood.

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

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

4.2.1 Vision 2030

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

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

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

- Human resources development.
- Security; and
- Public sector reforms.

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

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

4.3 Analysis of Alternative

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

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

4.3.1 Alternate Location for Project Site

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

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

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

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

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

The community in Kargi unanimously agreed to set aside land for Mini-grid construction. A Land Identification form was signed by the representative of the community, the county government and the Implementing Agencies summarizing the process of land identification and the agreements reached with the community. (Attach the Land Identification Form).

4.3.2 Alternate Sources of Energy

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

The possible alternatives to solar energy include;

- **Wind power:** shortfalls associated with wind power includes; lack of time series data of wind, trained human resources to intricate design of wind power etc., providing wind power for Kargi residents is technically and financially challenging, expensive to install, dependent on wind pattern. However, generation is cheap, low emissions & insignificant pollution levels.
- **Thermal power**: High fossil consumption, high emissions levels, high water consumption levels (water highly scarce in Kargi). Besides coal and petroleum products used in thermal power processing are not readily available within Kargi 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 Kargi. 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 Kargi on environmental as well as economic grounds

Solar energy was a desirable option because:

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

4.3.3 Zero or No Project Alternative

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

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

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

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

4.3.4 Analysis of Alternative Construction Materials and Technology

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

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

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

4.3.5 Solid Waste Management Alternatives

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

4.3.6 Analysis of Alternative Solar Sites

The identification of potential Mini-grid site for the proposed Kargi Solar Mini-grid involved site visits to the study area, preliminary site assessments and consultations among the concerned departments of the KPLC, MOE and REREC. 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.

4.3.7 Conclusion

Based on the project alternatives discussed above, the proponent chose the location based on the best appropriate choice of technology, energy source and project design. The solar mini grid project has most benefits with negative impacts mitigation measures. The proposed project should be upheld to support the local community based.

5 POLICY AND LEGISLATIVE FRAMEWORKS

5.1 Introduction

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

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

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

5.2 Environmental Policy Framework

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

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

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

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

5.3 Institutional, Regulatory and Legal Framework

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

a) National Environment Management Authority (NEMA)

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

b) County Environment Committees

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

c) National Environmental Complaints Committee

The Committee performs the following functions:

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

d) National Environment Action Plan Committee

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

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

e) Standards and Enforcement Review Committee

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

f) National Environment Tribunal

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

g) National Environment Council (NEC)

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

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

5.4 Kenya Policy Provisions

5.4.1 Kenya Energy Policy, 2014

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

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

The Policy strategizes the need to:

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

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

Table 9. Kenya power stakeholders and their roles

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

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

5.4.2 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.

5.4.3 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.

5.4.4 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.

5.5 National Legal Framework

5.5.1 Administrative Framework

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

Table 10. 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.*

5.6 Relevant statutes

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

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

Table 11. Regulatory Framework

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

6	The Gender and Development Policy (Sessional paper no.2 2019)	The overall goal of this policy is to achieve gender equality by creating a just society where women, men, boys, and girls have equal access to opportunities in the political, economic, cultural, and social spheres of life.	In the absence of appropriate measures, the project can exacerbate gender inequalities and sexual and gender-based violence. In adherence to this policy, measures will be put in place to: ✓ ensure gender inclusivity in decision making, employment opportunity and access to the energy generated from the Mini-Grid ✓ mitigate social risks including sexual and gender-based violence, and any form of discriminations
7	Sexual Offences Act No.3 of 2006	The Act defines sexual offences and makes provisions for prevention and the protection of all persons from harm from unlawful sexual acts. The Act describes the types of sexual offences punishable by law and this includes rape, attempted rape, assault, defilement, gang rape, and indecent act with a child or adult, promotion of sexual offence with children, child trafficking, child sex tourism, and child prostitution, child pornography, and sexual harassment, cultural and religious sexual offences among others.	The Act empowers the community members to take legal action in the event of a sexual offence. The code of conduct for proposed solar mini-grid project workers should uphold the provisions of this law
8	Gender and Sexual Based Violence policy, 2017	The purpose of this policy is to put in place a framework to accelerate implementation of laws, policies and programmes for prevention and response to sexual and gender-based violence. The overall objective of the policy is to progressively eliminate sexual and gender-based violence through the development of a preventive, protective, supportive and transformative environment	This ESIA has outlines measures that the Proponent will put in place to prevent sexual and gender-based violence. The Proponent will develop and implement a Sexual and Gender-Based Violence Action Plan with an Accountability and Response Framework as part of the construction ESMP. The Proponent will put in place a framework to accelerate implementation of laws, policies and programmes for prevention and response to sexual and gender-based violence.
9	Children Act, 2001 Sub-section 10 (1)	This section is on protection of children from child labour and armed conflict states that 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.	• This ESIA has put in place measures to ensure protection of children rights through the development and implementation of a Children Protection Strategy that will ensure minors are protected against negative impacts associated with the project including sexual abuse, child labour etc. The contractor(s) and the Proponent will comply with all relevant local legislation, including labour laws in relation to child labour specifically provisions of Kenya's Employment Act, 2007 (Cap. 226) Part VII on protection of children against exploitation. Children or persons under the age of 18 years will

			not be hired by the proposed sub-project as provided by Child Rights Act (Amendment Bill) 2014.
10	Persons with Disability Act, No.14 of 2003 (Cap. 133)	Part III of the act provides the rights and privileges of the persons with disability. Including employment where it states that "No person shall deny a person with a disability access to opportunities for suitable employment"	• 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
11	The HIV/ AIDS Policy 2009	In summary, the policy aims at: i. Establishing and promoting programmes to ensure non-discrimination and non- stigmatization of the infected. ii. Contributing to national efforts to minimize the spread and mitigate against the impact of HIV and AIDS. iii. Ensuring adequate allocation of resources to HIV and AIDS interventions;	The proposed project is to be implemented in the rural setting at Kargi area. The area is not economically empowered hence few HIV/AIDS prevention resources are available. This policy shall provide a framework to both the project proponent and contractor to address issues related to HIV/AIDS during the entire project phase.
	NATIONAL LAWS		
1	The Constitution of Kenya, 2010	The Constitution of Kenya promulgated in 2010 is the supreme law of the republic and binds all persons and all State organs at all levels of government. The Constitution provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectoral legislative documents are drawn.	The proposed project complies with the Constitution by proposing a structure in its ESIA on how to deal with Social, Health, safety and environmental issues for sustainable development.
2	Environmental Management and Coordination Act, 1999 (And the Amendments Of 2015)	The EMCA is a framework environmental law in Kenya. This Act (assented to on January 14, 2000) provides a structured approach to environmental management in Kenya. With the EMCA coming into effect, the environmental provisions within the sectoral laws were not superseded; instead, the environmental provisions within those laws were reinforced to better manage Kenya's ailing environment.	The proposed project will be undertaken in accordance with relevant sections of the EMCA, specifically Clauses 58 – 63. These sections of the Act are operationalised by subsidiary legislation promulgated under the Act and specifically Legal Notice (L.N.) 101: Environment (Impact Assessment and Audit) Regulations, 2003.
3	L.N. 101: EIA/EA Regulations, 2003 And 2016 Amendments	These regulations provide the framework for undertaking EIAs and EAs in Kenya by NEMA licensed Lead Experts and Firms of Experts. An EIA or EA Study in Kenya is to be undertaken by a firm duly licensed by the NEMA. The EIA/EA Regulations also provide information to project proponents on the requirements of either an EIA or EA as required by the EMCA.	The proposed project is subject to relevant provisions of these regulations and subsequently, the ESIA has been undertaken in accordance with the requirements.
4	L.N. 120: Water Quality Regulations, 2006	This regulation provides for the sustainable management of water used for various purposes in Kenya. The regulation contains discharge limits for various environmental parameters into public sewers and the environment.	The contractor will be required to properly manage the effluent from construction activities in accordance with the above regulations prior to discharge into the environment.
5	L.N. 121: Waste Management Regulations, 2006	Generally, it is a requirement under the regulations that a waste generator segregates waste (hazardous and non-hazardous) by type and then disposes them in an environmentally acceptable manner.	Waste to be disposed in accordance with these regulations.

6	L.N. 61: Noise and Excessive Vibration Control Regulations, 2009	The general prohibition of these regulations states that no person shall make or cause to be made any loud, unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health, or safety of others and the environment.	Rules 13 and 14 of the regulations define the permissible noise levels for construction sites. These noise limits will be applicable to the proposed project.
7	Licenses and Permits Required 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.
8	Occupational Health and Safety Act, 2007	The Occupational Safety and Health Act (OSHA) was enacted to provide for the health, safety and welfare of persons employed in workplaces, and for matters incidental thereto and connected therewith.	The contractors will be required to fully comply with Legal Notice 40 titled: Building Operations and Works of Engineering Construction Rules, 1984 (BOWEC). Each contractor will develop and implement a formal construction health and safety plan.
9	L.N. 31: The Safety and Health Committee Rules, 2004	These rules came into effect on April 28, 2004, and require that an Occupier formalise a S&H Committee if there is a minimum of 20 persons employed in the workplace. The size of the S&H Committee will depend on the number of workers employed at the place of work	The contractor will be required to constitute Health and Safety Committee to oversee safety and health at the construction site
10	L.N. 24: Medical Examination Rules, 2005	These rules provide for Occupiers to mandatorily undertake pre-employment, periodic, and termination medical evaluations of workers whose occupations are stipulated in the Eighth Schedule to the OSHA and the First Schedule to this Rules. Workers that fall under the above two schedules are required to undergo medical evaluations by a registered medical health practitioner duly registered by the DOSHS.	The contractor should ensure that the workers exposed to hazards and or accidents undergo requisite medical examinations as required by these rules
11	L.N. 25: Noise Prevention and Control Rules, 2005	The rules set the permissible level for occupational noise in any workplace (which includes construction sites) The Proponent is to ensure that ✓ any equipment brought to the site for use shall be designed or have built-in noise reduction devices that do not exceed 90 dB(A). ✓ those employees that may be exposed to continuous noise levels of 85 dB(A) are medically examined as indicated in Regulation 16. If found unfit, the occupational hearing loss to the worker will be compensated as an occupational disease.	The contractor to ensure that equipment is serviced properly and/or use equipment that complies with the threshold noise values provided in the act. Alternatively, each contractor will be required to develop and implement a written hearing conservation programme during the construction phase.

12	L.N. 59: Fire Risk Reduction Rules, 2007	Several sections of the rules apply to the proposed project as enumerated below. ✓ Regulation 16 requires Proponents to ensure that electrical equipment is installed in accordance with the respective hazardous area classification system. It is also a requirement that all electrical equipment is inspected every six months by a competent person and the Proponent is required to keep records of such inspections. ✓ Regulation 22 provides a description of the functions of a fire-fighting team. ✓ Regulation 23 requires Proponents to mandatorily undertake fire drills at least once a year. ✓ Regulation 34 requires Proponents to develop and implement a comprehensive written Fire Safety Policy ✓ Regulation 35 requires a Proponent to notify the nearest Occupational S&H area office of a fire incident within 24 hours of its occurrence and a written report sent to the Director of DOSHS within 7 days.	The proponent is expected to comply with the requirements of L.N. 59: Fire Risk Reduction Rules, 2007 by i. Carrying out, and record, a fire risk assessment identifying any possible dangers and risks. ii. Reducing, or where possible remove, the risk of fire and take precautions to deal with the remaining risks. iii. Developing an emergency plan should a fire occur which includes evacuation procedures etc
13	The Energy Act, 2019	The Energy Act of 2019 deals with all matters relating to all forms of energy including the generation, transmission, distribution, supply and use of electrical energy as well as the legal basis for establishing the systems associated with these purposes. The Act also established the Energy and Petroleum Regulatory Authority (EPRA).	The proponent is in line with the Energy act regulations in the following ways. ✓ The proponent has identified an available site ✓ alignment of the Mini-Grid Project to County development plans. ✓ the Mini-Grid proponent has the technical and financial capability to conduct the project ✓ The proponent has conducted the necessary engagement with the community.
14	The Energy (Solar Photovoltaic Systems) Regulations, 2012	These regulations shall apply to a solar PV system manufacturer, importer, vendor, technician, contractor, system owner, a solar PV system installation and consumer devices. The Regulations prohibits any person from designing or installing any solar PV system unless he/she is licensed by EPRA.	The Regulations regulates the design and installation of PV systems. The persons engaged in the designing and installation of the Mini-Grid shall be licensed by EPRA
15	The Public Health Act (Cap. 242)	The Act prohibits the proponents from engaging in activities that cause environmental nuisance or those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety.	The proponent will be in line with the regulations of this act and will ensure suppression of infectious diseases and maintain proper sanitation during all the phases of the project.
16	Community Land Act, 2016	This Act is critical for the proposed project is within community land. Section 6(1) of the Act provides that 'county governments shall hold in trust all unregistered community land on behalf of the communities for which it is 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'.	✓ The proposed project site falls on community land and the land belong to the Rendille community pastoralist in Kargi with minority Somali tribe. 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

		Section 30(1) states that 'Every member of the community has a right to equal benefit from community land'. Section 26(1) provides that 'a community may set aside part of the registered community land for public purposes and Sub-section (2) holds that 'where land is set aside for public purposes under Sub-section (1), the (Land) Commission shall gazette such parcel of land as public land'. These provisions offer a window for the proposed project to acquire land for project works legally for communities as necessary and to convert the same into public land. This is useful for the project as once done powerful groups will not have opportunity to exclude them on account of their socio - economic statuses. In any event, Section 35 holds that, 'subject to any other law, natural resources found in community land shall be used and managed- (a) Sustainably and productively. (b) For the benefit of the whole community including future generations. (c) With transparency and accountability; and (d) On the basis of equitable sharing of accruing benefits. The concept of community land has been defined broadly enough to include VMGs. Women, children, old people, and future generations have been thought of as beneficiaries and thus their rights secured in this Act	will undertake in kind development project to support the community water needs. ✓ The proponent should adhere to the provision of this legislation
17	The Physical and Land Use Planning Act, 2019	This Act of Parliament makes provision for the planning, use, regulation, and development of land and for connected purposes.	The proposed site is not in contravention of any Zoning regulations. The project site is within unregistered community land; necessary county approvals will be sought by the proponent e.g., Project design approval and change of use. The approvals shall be issued by the Physical planner in the department of Lands, Housing and Urban Development – Marsabit County.
18	The National Land Commission Act	Section 5 of the Act, the Commission's functions are to manage public land, recommend national land policy, advise the Government of Kenya on a land registration program, conduct research on land use and natural resources, and monitor and oversee land use planning throughout the country. The same section goes on to stipulate that the NLC ensure that state owned land is managed sustainably for future generations.	The project will be subjected to this act by ensuring the land used for the project is a communal land and has no encumbrances to be used for development of the solar mini grid.
19	Land Act, 2012	This is an Act of Parliament intended 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. Section 110(1) of the Act provides that land may be acquired compulsorily under this if the Commission certifies, in writing, that the land is required for public purposes or in the public interest as related to	The proposed site will be developed on communal land and no resettlement of people will be done.

		and necessary for fulfilment of the stated public purpose. In such an acquisition, this Act, in section 111(1) provides that just compensation shall be paid promptly in full to all persons whose interests in the land have been determined. The procedure for land acquisition is laid out in Part VIII of the Act	
20	Land Registration Act No.3 of 2012	This is an Act of Parliament intended to revise, consolidate and rationalize the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes.	Proposed project site is located on a communally owned land.
21	Land Value Amendment Act	Section 107A stipulates that valuation of freehold land and community land for purposes of compensation under this Act shall be based on the provisions of this part and the Land value index developed for the purpose by the cabinet secretary in consultation with the county governments and approved by the National Assembly and the senate. Section 107B (1) states, Where the lessee of a public land is in breach of any term or condition of the grant, the land shall revert back to the national or county government as provided for under this Act. Part 2 gives guidance on the value of the leasehold land and determining the just compensation to be awarded. While Part VIIIA section 133A highlights the establishment of a land acquisition tribunal.	Compensation for the land for the proposed project will be in kind; as a token of appreciation for the land offered in-kind by the community, the Proponent will undertake some projects for the community.
22	The Employment Act No 11 of 2007	This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the energy sector.	With the Contractor and the Project Proponent being primary employers during the construction and operational phases of the Project, respectively, they are bound by this law to abide to its stipulations on employee management and relations
23	The Work Injury Benefit Act, 2007	This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment	The Proponent and Contractor will maintain an insurance policy cover for its employees, record of accident, carryout proper accident investigations; organize for pre-employment and regular medical examinations for staff.
24	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
25	Kenya National Youth Policy, 2006	The policy aims to ensure that the youths play their role alongside adults in the development of the country. It visualizes a society where youth have an equal opportunity as other citizens to realize their fullest potential.	The proposed sub-project will provide direct employment to the youths as required by this Policy

5.7 National Administrative Requirements

A brief description of the relevant enforcement agencies with respect to the institutional framework is described in the table 13 below.

Table 12: Relevant Enforcement agencies

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

5.8 International Safeguard Requirements

The objective of the World Bank's environmental and social safeguard policies is to prevent and mitigate undue harm to people and their environment in the development process. These policies provide guidelines for the bank and borrower staffs in the identification, preparation, and implementation of programs and projects. Safeguard policies have often provided a platform for the participation of stakeholders in project design and have been an important instrument for building ownership among local population.

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

Table 13. World Bank Safeguards

OP	TITLE	APPLICABILITY	Descriptions
4.01	Environmental and Social Impact Assessment	The policy is applicable to this project because there are environmental and social concerns associated with the construction and operation of the proposed project. In response, the KPLC has commissioned and Environmental impact assessment in order to identify and address the potential impacts to a level that is acceptable	The objective of OP 4.01 is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate environmental and social screening, analysis of actions and mitigation of their likely environmental and social impacts and monitoring. The consultants have identified that the overwhelming majority of project beneficiaries in Kargi area are considered vulnerable and marginalized. Therefore,

OP	TITLE	APPLICABILITY	Descriptions
			OP 4.01 is applicable, and in line with this operational policy, the environmental and social screening process for the mini-grid project.
4.10	Indigenous People	The policy is applicable because the inhabitants of Kargi who are the Rendile are classified as a marginalized group in Kenya. The Rendile are main inhabitants of Kargi and the sole beneficiaries of the proposed solar mini-grid. Further the proponent will continue to engage the beneficiaries in a culturally appropriate way and allow for decision making in a free, prior and informed consent manner throughout the phases of the project.	The objective of this policy is to (i) ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; (ii) ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and (iii) ensure that indigenous peoples receive culturally appropriate and gender and intergenerational inclusive social and economic benefits.
4.04	Natural Habitats	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 Kargi that may not negatively affect diverse flora, fauna, and avifauna. The area is dependent on pastoralism.	This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work.
4.12	Land Acquisition and Involuntary Settlement	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	The objective of this policy is to (i) avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; (ii) assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them; (iii) encourage community participation in planning and implementing resettlement; and (iv) help affected people regardless of the legality of land tenure.

5.8.1 World Bank Policy OP 4.01 Environmental Assessment

World Bank requires environmental assessment for projects proposed for the Bank financing to help ensure that they are environmentally sound and sustainable, and thus improve on decision making. Projects are screened and assigned categories (A, B, C or FI) depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

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

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

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

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

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

(ii) Compares environmental pros and cons of feasible alternatives

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

(iv) Proposes monitoring indicators to implement mitigation measures

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

The assessment considers: the natural environment (air, water, and land); human health and safety) social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources); and transboundary and global environmental aspects.

OP 4.01 is triggered because the project is likely to have adverse environmental and social impacts that are considered in this ESIA report.

5.8.2 World Bank Policy OP 4.04 Natural Habitats

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

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

5.8.3 World Bank Policy OP 4.12 Involuntary Resettlement

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

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

Involuntary resettlement is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The objective of this policy is to avoid or minimize involuntary resettlement, though participation in resettlement planning and implementation and, where this is not feasible, to assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the

beginning of project implementation, whichever is higher. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.
The project site is located within a communal land in Kargi. This policy is thus is triggered since there is land take and take procedures will align to the RPF prepared under this project.

5.8.4 World Bank Policy OP 4.10 Indigenous Peoples

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

5.8.5 Alignment of WB and GoK policies to this project

- Both the World Bank safeguards policies and GoK laws are generally aligned in principle and objective: Both require Environmental and Social Assessment before project design and implementation (which also includes an assessment of social impacts).
- Both require public disclosure of ESIA reports and stakeholder consultation during preparation.
- While OP 4.01 of World Bank stipulates different scales of ESIA for different category of projects, Kenya's EMCA requires environmental screening to be undertaken for new projects. In the event that notable environmental impacts will occur as a consequence of the sub- project, then an EIA will be undertaken for those sub-projects. If there would only be minimal impacts for a sub-project then the results of the environmental screening will be prepared and submitted to NEMA and the World Bank.
- Where EMCA requires Strategic Environmental Assessments, OP 4.01 requires that an Environmental Assessment be conducted, the complexity and nature of which depends on the project category.
- EMCA recognizes other sectorial laws while WB has safeguards for specific interests.
- The Bank requires that stakeholder consultations be undertaken during planning, implementation and operation phases of the project which is equivalent to the EMCA requirements. Additionally, statutory annual environmental audits are required by EMCA.

In Kenya, it is a mandatory requirement under EMCA 1999 for all development projects (Schedule Two) to be preceded by an EIA study. Thus, under the Laws of Kenya, environmental assessment is fully mainstreamed in all development process consistent with World Bank safeguard policies on EA. Further, in order to fully insure against triggers to WB safeguard policies, individual investments will be screened against each policy as part of the EIA project report requirements.
The objective is to find out any gaps and propose a recommendation.

Table 14: 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

World Bank safeguard Policies	Kenyan laws	Comparison	Recommendation
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 refers to WB safeguard policies
O.P 4.12 **Land Acquisition and Involuntary resettlement should be avoided wherever possible or minimized and exploring all alternatives**	The Government and any other organization shall prevent internal displacement linked to development projects to the extent possible by exploring other alternatives.	Similar- displacement in projects should be avoided to the extent possible by exploring alternatives.	WB policy is more elaborate than the Kenyan Law.
O.P 4.10 **on indigenous people seeks to promote the inclusion of these group in development project and especially through consultation to ensure they also share in the project benefits and ensure negative impacts do not disproportionately fall on them** **The policy requires these groups to be consulted separately to enhance their participation**	The Constitution of Kenya 2010 article 56 provides for the right of marginalized communities and the importance of their input in decision making that regards them. National Gender and Equality Act and the Children's Act and Persons with disability Act seeks to promote the inclusion of these persons in all issues as they are often overlooked and left out. Emphasis is also on consulting with them	Similar-both seek to promote inclusion of these group so that they do can share the projects benefits and ensure that negative impacts of the project do not fall on them disproportionately WB needs a social assessment to be conducted	WB policy more elaborate and the two are being used to compliment
Project affected persons should be meaningfully 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

5.9 Environmental and Social Management Framework (ESMF) for KOSAP

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

The framework was prepared because the geographic coverage for KOSAP was generally known but the exact locations for the sub projects had not been identified. The ESMF provides guidelines for MoE, KPLC & REREC in determining the appropriate level of environmental and social assessment required for the sub-

projects and in preparing the necessary environmental and social mitigation measures for these sub-projects.

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

5.10 Resettlement Policy Framework (RPF) for KOSAP

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

The Framework seeks to avoid, manage, and/or mitigate potential risks arising out of damage to assets, disruption to work, temporary negative impacts on livelihoods and/or in the unlikely case of displacement. The RPF proposes guidelines to develop a Resettlement Action Plan and propose an implementation framework for RAP to mitigate such effects. The RPF states that involuntary resettlement and land acquisition will be avoided where feasible, or minimized or compensated where it cannot be eliminated. Where involuntary resettlement and land acquisition are unavoidable, resettlement and compensation activities will be conceived and executed as sustainable development programs, providing resources to give PAPs the opportunity to share project benefits.

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

5.11 Vulnerable and marginalized Groups Framework (VMGF) for KOSAP

As noted above the KOSAP project trigged O.P 4.10 policy on Indigenous People and therefore a Vulnerable and Marginalized Groups Framework (VMGF) was prepared for use by the Ministry of Energy (MOE) and the implementing agencies KPLC and REREC and other stakeholders. The framework was prepared then because was known that IPs are present in all the 14 target project counties. However, at that stage of project preparation, the exact sub-project sites were not yet identified and the exact impacts of the project on VMGs were not yet completely known. The VMGF describes the policy requirements and planning procedures that during the preparation and implementation of components especially those identified as occurring in areas where VMGs are present.

The purpose of the VMGF is to guide management of issues related to Vulnerable and Marginalised Groups (VMGs) during the development and operation of proposed sub projects and to ensure effective mitigation of potentially adverse impacts while enhancing sharing of benefits.

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

6 STAKEHOLDER ENGAGEMENT

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

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

6.1 Legal Requirement for Stakeholder Engagement

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

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

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

6.2 Objectives of Public Participation

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

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

Part of the key project information that was shared with the stakeholders to enable them to understand the project included; positive and negative impacts of the project including potential opportunities. The information specifically focused on; the objective, nature and scale of the project, potential risks and

impacts of the project on local communities, mitigation measures to the negative impacts, need for future consultations and means of raising and addressing impacts.

6.3 Stakeholder Consultation and Disclosure Requirement for the Project

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

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

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 Kargi shopping center is enclosed under appendices in page 11-185 of this report. Further, an initial communication was shared with the county commissioner Marsabit and Chief for Kargi location on 3rd January 2022, two (2) weeks prior to the public participation meeting held on 17th January 2022 at Kargi shopping centre. Background information document (BID) with project details was posted clearly on one of the regular shops at Kargi shopping center.

6.4 Stakeholder Characterization and Identification

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

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

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

Table 15. Identified Stakeholders

Stakeholders		Consultation Tool
Project affected Persons	Project Affected Persons i.e., Community Members of Kargi	**Public Meeting** ✓ Public meetings were held at Kargi community baraza point on 17th January 2021. ✓ The first meeting was held with attendance of 115 community members (50 males, 55 women and 10 youths). **Focus Group Discussions (FGD)** ✓ For the first consultations the FGDs were conducted with the men, women, youth while the second consultation was with the men, women, youth and VMGs. 13 males, 65 women and 12 youths represented each group. **Key Informant Interviews (KII)** ✓ During the second round of consultations, the KII for Kargi Primary school and Carey health clinic was conducted through a one-on-one interview. ✓ The assistant chief was also interviewed on the Community Profile of Kargi.
Interested Parties	Interested Parties: • County Government of Marsabit	**Meeting** During the first consultation a meeting was held with the County Governor and county officials

6.4.1 Stakeholder Mapping

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

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

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

Table 16: Stakeholder Significance and Engagement Requirement

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

6.5 Stakeholder Analysis

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

both been primarily rated as:

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

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

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

6.6 Summary of Community Consultation meeting leading to Land Identification and GRC Constitution- (Screening Level)

Project: Proposed Kargi Solar Mini-grid

Venue of meeting: Kargi shopping centre, Kargi sub location in Kargi location of Marsabit County

Date: 18/10/2021

The ward administrator called the meeting to order at 1.55 p.m. The meeting began with a word of prayer. The ward administrator spoke in Kiswahili as one of the community members translated to the local dialect because not all the community members could understand the Kiswahili language. The administrator welcomed all in attendance to the meeting and asked the community to participate adequately during the consultation session and told the community that the chief was to join them in the meeting. He called the CREO (County Renewable Energy Officer) to welcome the project team. The CREO (Jalle) greeted the people and notified them that the KOSAP project was still on course. He also asked the community to participate during the meeting as the communities input into the project was very crucial. He noted that the national government is the one funding the project through a loan facility and the county government is also a key stake holder in the implementation. He told them that since they had been in the community before, the KOSAP team had now come to find out whether the community had identified land for the project alongside creating more awareness and screening the identified site to make sure it is environmentally, socially and technically suitable

He then welcomed the Director (Lands and Energy) to proceed with the meeting. The director introduced the officers from the County government while Rebecca (MOE) introduced the team from KPLC and MOE. The KOSAP team is as shown below.

KOSAP Project Team

S/No	Names	Position
1	Ramati Ibrae	Director Lands- Marsabit
2	Rebecca Muniu	Communications officer Ministry of Energy-MOE
3	Samuel Mbugua	Environmentalist-KPLC
4	Suleyman Gavawahle	Physical Planner - Marsabit
5	Gideon Jalle	County Renewable Energy Officer-Marsabit
6	Jacob Chepkwony	Engineer -MOE
9	Said Malko	Surveyor-Marsabit

10	Roseline Njeru	Socio Economist-KPLC

Land requirements for the project

Samuel told the community that one of the agendas of the project team's visit was to check the land/site that the community had or would identify for the project. The project team together with the community would undertake an environmental and social screening to determine whether it is appropriate for the proposed solar Mini-grid project. He then emphasized the aspects to consider while identifying the land for the project. He explained to the public forum that the land identified need to meet certain criteria to ensure it is suitable for the Mini-grid. He listed the criteria as follows; the land need to be relatively flat, not prone to flooding, stable soils, not resided by families, ability to receive maximum sunlight, land which has no conflicts and one that is central to residents and public facilities so that it will be possible to supply more people in the target community. He added that the project needs about 2-3 acres of land.

Rebecca told them that land falls under the category of community land and its use and management is governed by the Community Land Act 2016. The community was told that land under this Act is owned by the community but is held in trust for them by the County Government of Marsabit because the community is not registered. She noted that the government of Kenya had secured a loan from its development partners i.e. World Bank to implement the KOSAP project. She explained that the government was seeking partnership with the community in the KOSAP project where by the community would identify land for setting up the solar mini-grid while the government would provide the money for setting up the solar mini-grid.

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

Rebbeca educated the community on the following issues;

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

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

Survey of the land and request for advance possession.

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

Selection of the community projects

The ward administrator thanked the community for continued fruitful engagements. He asked the community to discuss on the issue of land and also on projects and the following were selected in order of priority.

- Equipping of the maternity ward at Kargi dispensary
- Class rooms at Kargi primary

Plenary session

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

	Name	Questions/suggestions	Response	Response by agency on how feedback will be used or acted upon
1	Somiso Lmongoi	We welcome the project as we have heard it will be beneficial to us. Land is available and we shall identify land for the project	Noted	-
	Rose Nanni	The project is good and it is welcome. We are also happy about the community project to be done for the community	Noted	-

Photo of the community Meeting at Kargi

Grievance Redress Mechanism (GRM)

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

Existing grievance redress mechanism in the village.

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

KOSAP Project GRM:

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

1. Locational grievance redress committee. This is the lowest level (forum) where the community will get project information and also ask questions. At this level you the community will choose project committee members who will also double as grievance redress committee. The membership will comprises; elders/men representatives, representatives from women, youth, special needs (persons with disability), and the office of the chief as Ex-officials. This will be the first stop for receiving information and raising grievances. The members to be chosen should possess leadership skills and it is hoped that most of the grievances will be resolved at this level.
2. The second level of grievance redress will be the County Grievance Redress Committee comprising members of the County working group. This committee is at the county level and will resolve complains or issues that are unable to be resolved at the locational/project level. The chairman of the project grievance redress committee at the community will forward issues/ complains to the county grievance redress committee through CREO who will also be responsible for giving feed back to the local committee.
3. The third level will be the National grievance redress committee comprising of KOSAP Project Implementation Unit at the Ministry of Energy and the implementing agencies. Matters that not resolved at the County level will be escalated to this National GRC by the CEC-Energy
4. The last level of the GRM for the community or project affected persons will be arbitration or legal redress in a court of law once all the three levels have been exhausted.

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

S/No	Name	Representative of	Contacts
1	Somiso Lmongoi	Men	0793554902
2	Gabab Elsimbaitor	Men	0703359618
3	Rose Nanni	Women	0716715112
4	Abdirahman Somo	Youth	0714238753
5	Nomiran Phillip	Youth	0790606973

6.7 Key Feedback of Further Stakeholder Consultation Process Carried out During 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.

The MoE representative assisted by the KPLC representative gave a description of the KOSAP project and clarified that its objective was to electrify Kargi because the area is not connected to the national grid. They also informed the community that they would access the electricity at a subsidized cost and that the public facilities such as the schools, hospitals and public boreholes would also be connected at the same cost (one thousand shillings). The environmental and social experts shared with the community the ESIA process and discussed the potential impacts associated with the project and the proposed mitigation measures that would reduce the significance of the adverse impacts.

It was also explained that compensation for the land identified by the community for the proposed project will be done in-kind; as a community project chosen from education, health or water sector. The Ministry of Energy through its implementing agency (KPLC) would undertake a project for the community in water, health or education sector up to a cost of the value of the cost of the land taken and informed by the NLC valuation criteria. The community was to choose the project of their own choice in the three sectors. Other methods compensation for community land is payment in cash and land for land

A detailed CPP and community engagement for Kargi Solar Mini Grid was held in Kargi, at Kargi shopping center on 17th January 2022 chaired by the area assistance chief. The general stakeholder consultation was done in a public meeting (Baraza) organized at Kargi community baraza point where 50 males, 55 women and 10 youths were in attendance. The meeting was chaired by the area assistant chief assisted by the community elders.

The purpose of the meeting was to: 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 community of Kargi unanimously agreed to set aside land for Minigrid construction. A Land Identification form was signed by the representative of the community, the county government and the Implementing Agencies summarizing the process of land identification and the agreements reached with the community. (*Attach the Land Identification Form*)

The feedback received during the stakeholder consultation process have been summarized below.

No	NAME	Organization/ Designation	Issues/comments discussed
1.	Mr. Ehele	Community member – Kargi	Mr. Ehele seek to know what measures were to be put in place to reduce fire risk noting some households are thatched. He also asked when the proposed project will commence. Mr. Manemo MoE Representative clarified that there are rules and regulations that govern the risk of flammability in regards to electric installation which should be adhered too. Electric specialist to be involved in the project will ensure that proper protocols are followed to minimize such risks. Further he explained wiring of the households will be done at the cost of the owner and it is advised that an electric specialist is engaged. In regard to project commencement Mr. Manemo informed them procedures to implement the project are underway and will commence as soon as compliance is met including acquiring a NEMA licence for the proposed project.
2.	Mr. Rousso	Community member- Kargi	Mr. Rousso noted the proposed project will provide lots of benefits to the community including creating job opportunities. He suggested priority be given to the locals when seeking out labour force.
3.	Mrs. Mary	Woman- Kargi	Mr. Mary echoed that the project highly anticipated within the community as it will impact the living standards of the locals positively

6.7.1 Positive Comments about the Project from the Participants

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

- ✓ Learning will improve due to availability of lighting. Students can extend to evening classes.
- ✓ Business enterprises will be boosted especially running refrigerators throughout the day and night. Business such as petrol stations, welding, Mpesa kiosks will thrive.
- ✓ Employment opportunities will increase for the youth due to increase in business opportunities during the solar mini-grid installation and operational phases.
- ✓ Kargi shopping center will be well lit, therefore secure at night.
- ✓ Medical services will improve due to availability power enough to run medical equipment and machinery. The maternity ward will also improve due to lighting

6.7.2 The identified negative impacts of the project

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

- ✓ **Accidents (Electrocution and fires)**: some of the members raised concerns of possible accidents and injuries from shock, electrocution, and electrical fire hazards following poor wiring. The community mentioned need to educate the community on the dangers of electricity and safe precaution measures to mitigate these accidents. Skilled electricians should also be recommended to ensure quality wiring works.
- ✓ **Vandalism:** A few community members were concerned about the project security fearing it could be destroyed. The community suggested a fence be erected around at the project site to help keep off unauthorized persons and animals.

Other concerns

- Emphasis was made on need to educate the locals on possible risks from the project, noting this would reduce/eliminate accidents.

- Some members asked what happens when the project batteries expired. The consultant informed them regular maintenance works help determine the batteries lifespan and when needed they are replaced by the maintenance contractor.
- The health center and Kargi shopping center is in need of power urgently therefore the community members requested to fastened installations.

6.7.3 Additional Responses from the Consultant

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

- ✓ Resident, business or public facility will be connected to the electricity at an affordable cost. Every household would pay Kshs 1,000 for power installation
- ✓ That the proponent will rehabilitate and plant trees after the construction phase of the project
- ✓ All non-skilled labor will be sourced from the Kargi Community and not from outside
- ✓ He assured the community that the project will commence soon after ESIA
- ✓ That noise forming Machinery and especially the generator will be within the set regulatory standards.

6.7.4 Consent

The Community members present agreed unanimously accepted the Project Proposal.

6.7.5 Community Presentation

6.7.5.1 Adult to youth Representation

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

6.7.5.2 Gender Representation

Table 17. The consultative meeting had a wide representation

Category	Male	Female
Youth	10	0
Adult	50	55
TOTAL	**60**	**55**

6.7.5.3 Heads of Households

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

6.8 Focused Group Discussions analysis

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

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

The consultative meeting had a wide representation as follows:

Table 18. The FGD representation

Category	Male	Female	Youth
	13	65	12
TOTAL	**90**		

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

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

6.8.1 Female Stakeholders' Consultation and Participation

The female participants in the FGD were 65 and between 25-60 years of age. There was 8 female headed households in the meeting following their husbands' death. The following were their responses.

The project perception

The women indicated that they 1st heard about the project in 2021 during a public baraza. They noted the project would positively impact their lives through job creation, provision of improved maternity care at the health center with possibility of the health center providing incubators and ICU services.

Roles of Women in Kargi community as reported by the FGD

- ✓ Taking shoats for pasture
- ✓ Cooking, cleaning and other house chores.
- ✓ Women noted men have more opportunities in the community with the women controlling only household equipment.
- ✓ Women feel safe in the community with crime rate being very minimal. Some of the conflicts experienced by the community is cattle rustling.
- ✓ Challenges encountered by women include inadequate anemia during maternity and lack of lighting within the health center. Female held households in addition do lack finances (fee) and food to sustain them and their children.
- ✓ Women do receive information about local issues and development or news however, there is little or no action by women.
- ✓ Women roles are changing with them becoming breadwinners for instance in female headed households, roles that were exclusively for men.

Institutions/community Development

- ✓ Women are involved in decision making, decisions to prepare food and buying of household equipment.
- ✓ Some of the NGO works within Kargi community include the Red Cross for emergency responses and Concern Worldwide who support the health facilities.
- ✓ The main community development priorities/needs include.
    - Scholarships for needy students
    - Shelter for the elderly
    - Support for the PLWDs including children with special needs.

Economy /income generation by women

- ✓ Women earn income from sale of animals & animal products and casual labor. On average they felt women contribute more to household income.
- ✓ To have greater economic opportunities, women should participate more in development activities through decision making and equal representation in leadership.
- ✓ The women have no access to any bank/credit/saving accounts in Kargi however they have access to mobile banking services such as Mpesa.

Land use by women

- ✓ The main land-based activities women undertake is grazing animals. Agriculture is not practiced within Kargi.
- ✓ The most common livestock kept by the community are camels.
- ✓ Community members move with their livestock most frequently in search of water and pasture.
- ✓ Women collect natural resources approximately 30km from Kargi shopping center for both domestic use and commercial purposes
- ✓ Women participate in building traditional huts through sharing of labour. The community also hires labor from Marsabit town.
- ✓ Conflict has been experienced in the community. Bandits frequent the area and is a threat to the women security.
- ✓ Gender-based violence (GBV) is experienced at household level. The most cases are rape cases. There no support centers for GBV cases. To eliminate GBV the women suggested culprits be identified and jailed.

Education, literacy, and training of Women in Kargi

- ✓ The women have access quality education in addition they also attend adult classes approximately 1km from the proposed project site.
- ✓ A few women can read and write in the community especially the young adults.

Plate 4. Women FGD meeting in progress at the time of assessment

Health care for Women in Kargi

- ✓ The women access health care from the Kargi health center. They however the services provided by the facility do not meet their needs noting delivery services at night are very difficult due to lack of power at the facility, the health center lacks an ambulance and there are no incubators.
- ✓ Environmental issues affecting health in the community is mainly water scarcity affecting sanitation.
- ✓ The women have access to family planning but limited to only depo
- ✓ If someone is ill within a household medication given are pain killers
- ✓ Women at Kargi prefer going to the hospital than traditional medicine

Access to Water by women

- ✓ Water used for drinking, cooking, washing, bathing and livestock is sourced from borehole located approximately 8km away. The quality of water from this borehole is good. Other sources are shallow wells.
- ✓ The water is turbid with dust particles and suspension.
- ✓ During dry season and when the pipes are faulty water is insufficient

Sanitation and hygiene for women

- ✓ Some households and public facilities have toilets. Open defecation was also reported by the FGD.

Transport and communication

- ✓ The main forms of transport are vehicles. Transportation within Kargi is of good quality and its accessible.
- ✓ The area is serviced with Safaricom and Airtel service provider as the dominant means of communication

Hygiene and waste management by Women

- ✓ Women in Kargi access sanitary facilities and or products e.g., sanitary towels. However, due to low income most of them cannot afford.
- ✓ Household waste is burnt in heaps or dumped in compost.

Access to Power as per the FGD

- ✓ Sources of energy and their uses in Kargi include
  - For lighting use of torches'
  - For warming -firewood
  - Cooking & heating water - firewood
  - Charging mobile-a few uses portable solar
- ✓ The village has limited sources of power, it was noted those who can afford to install solar in their homes are the wealthy.

Cultural heritage

- ✓ They noted Naabo (centre of manyatta) as a cultural practice

6.8.2 Male Stakeholders' Consultation and Participation

- ✓ The male participants were 13 in number. The demographic of the group was of Rendille ethnicity. 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 through a previous baraza meeting held in Kargi center.
- ✓ They men all agreed the proposed project has a lot of positive potential in the area. Including creating employment opportunities, developmental growth of the area and provision of sufficient lighting at the shopping centre.
- ✓ To minimize the negative impacts, they suggested locals be educated regarding possible risks anticipated therefore preventing accidents.

Plate 5. Men FGD meeting in progress at the time of assessment

Role of Men as per the FGD

- ✓ The findings showed that men are the sole providers in their households. They manage and maintain households. Men are also in charge of security.
- ✓ Men have more control over livestock (camels, goats, sheep, cattle & donkey) than women. Land was noted to be communally owned.

- ✓ Men generally don't feel safe in the community due to rebels from neighbouring communities that pose a threat as they are armed. Cattle rustling is common by the Gabbra community within the project area.
- ✓ The men felt they lacked support and their rights not sensitized enough.
- ✓ Men generally receive information about local issues and development or news through media services including radios, television and mobile phones.

Institutions/Community Development

- ✓ Men's traditional practices are *Lkiseku*- age group traditional circumcision and *Lmecki*- circumcision of men
- ✓ The top community development priorities are health and water. They noted the health center lacked adequate medicine supply and need for more water projects to curb the current inadequacy supply of water in the area.

Economy /income generation

- ✓ Men generally earn their income through sale of livestock and livestock products mainly selling meat.
- ✓ Men contribute more compared to women through control of most of the assets.
- ✓ To contribute to greater opportunities men suggested they be provided with bank loans as startups
- ✓ They indicated that they have no access to credit facilities.

Land use

- ✓ Men keep livestock both as subsistence and income-generating activities. Livestock reared include cattle, camels, sheep and goats.

Education, literacy, and training as per the FGD

- ✓ Within a radius of 4km Kargi area has 4 primary schools, 1 secondary school and 4 ECDEs. Kargi primary school is near the proposed project site.
- ✓ Of the male students that attend school approximately 90% complete higher education up to university/collage levels. Factors preventing education among the men was school fees.
- ✓ Ability to read and write among the male population is generally very good.

Health care analysis by the male FGD

- ✓ The men access health care from Kargi health center located approximately 300m from Kargi centre.
- ✓ The dominant health issues among men include urinary infections (UTI), cancer and malaria whose cases are higher during the rainy seasons.
- ✓ If one feel ill they are taken to Kargi Health centre for treatment. The PLWDs are present among the male population.

Access to Water analysis by the male FGD

- ✓ The men access water from the community borehole located approximately 7km from Kargi centre. The quality of water hasn't changed since installation.

Sanitation and hygiene according to Male FGD

- ✓ Men indicated that open defecation is commonly practiced since access to latrines is limited only to a few with toilets in their households.

Hygiene and waste management

- ✓ Handwashing and general cleaning are not done

Access to Power

- ✓ Sources of energy for Kargi
  - For lighting use of solar power at Kargi centre

- Cooking and heating water -firewood sourced approximately 15km from Kargi
- Charging mobile-solar power

✓ The men suggested the area need have a reliable power source by installation of solar grids and electricity.

Religious heritage

✓ Sacred sites within Kargi are *Fare* and *Algas* located 10kms away and *Korole* 20kms.
✓ The main festivals undertaken by men include *Sorio*- sacrifices livestock (household slaughtering), and *Almatho*- milk sacrifice in *Nabo*.

6.8.2.1 Youth Stakeholders' Consultation and Participation

✓ The youth participants were 12. The following opinions were provided by the youth participants during the FGD.

The project perception

✓ The youth disclosed that they were aware of the project citing they heard about it before December 2021. They felt the project was beneficial to Kargi community
✓ They noted that the project would create employment opportunities and eradicate poverty among the PLWDs, orphaned youths and themselves.
✓ They however noted that negative impact as likely injuries through electrocution, shocks and fires.

Education, literacy, and training for youth FGD

✓ An estimate of 50% of the youth have completed secondary education while a further 10% have completed Vocational/College level education.
✓ Major skills among the youth are music and football

Key Priorities among the Youth & Issues

✓ There are over 20 youth groups within Kargi Community. They include sports, environmental, nursing, livestock trading among other groups
✓ Key priority among the youth is support through funding.
✓ Youths in Kargi play a role in decision making and their voice is heard.
✓ There are no fully salaried youths in the area. <1%of the youth are self-employed.
✓ Main jobs run by the youth are operation of boda-boda, volunteer in school and manual jobs.
✓ During their free time the youth just relax

6.8.3 Education Stakeholders' Consultation and Participation

✓ The Education Stakeholder from Kargi Primary school was a teacher. Kargi Primary School is a government sponsored institution. The teacher has worked at the school for 21 years. The following responses were recorded from the stakeholder.

The project perception

✓ He heard about the project when he visited Maikona and experienced their site July 2021.
✓ The project will improve economic levels within Kargi area through boosting businesses, health centres &dispensary, schools &administrative offices and faith-based places.
✓ Students in Kargi Primary school have enough light to study in the evening. Employment opportunities will be created and movements within Kargi centre will be easier due to sufficient lighting.
✓ To minimize the negative impacts from the project, a fence should be erected at the project site, a guard should also be employed at the site and settlements near the proposed site be relocated.
✓ The teacher felt the proposed project would benefit the school through lighting, students and their families at household level will also benefit from power supplied.

Infrastructure/Resources

- ✓ Kargi Primary School currently has 7 teachers. The teachers are paid through the bank located approximately 76km away from Kargi area
- ✓ The school's current solar panels provided by the Ministry of Health are working well. Since installation the school performance has improved and theft cases have also reduced.
- ✓ The school is under the FHK programme run by the ministry of health. The programme is aimed at improving quality and sustain coverage of high impact nutrition interventions within the area.
- ✓ The average walking distance of students to school is 58kms. Noting the furthest student walks 60kms to get to school.
- ✓ The teacher indicated that students are provided with meals occasionally.

The School Curriculum

- ✓ The respondent indicated that cultural practices such as circumcision, first born lack the chance to go and study.
- ✓ The PLWDs, visually impaired and women lack education. To address these challenges, he suggested workshops and public gatherings be used to sensitize the locals on need for inclusion.
- ✓ It was noted that boys achieve higher grades compared to the girls. Education isn't considered a priority for the community's girls.
- ✓ A few of the challenges faced by the students are lack of school fees and being called out of school to take care of livestock. Among the female students' early marriages and early pregnancies are common too.

The School Attendance

- ✓ 257 pupils: 71 boys and 186 girls.
- ✓ The completion rate for male students attending school is 75% compared to 50% of female.

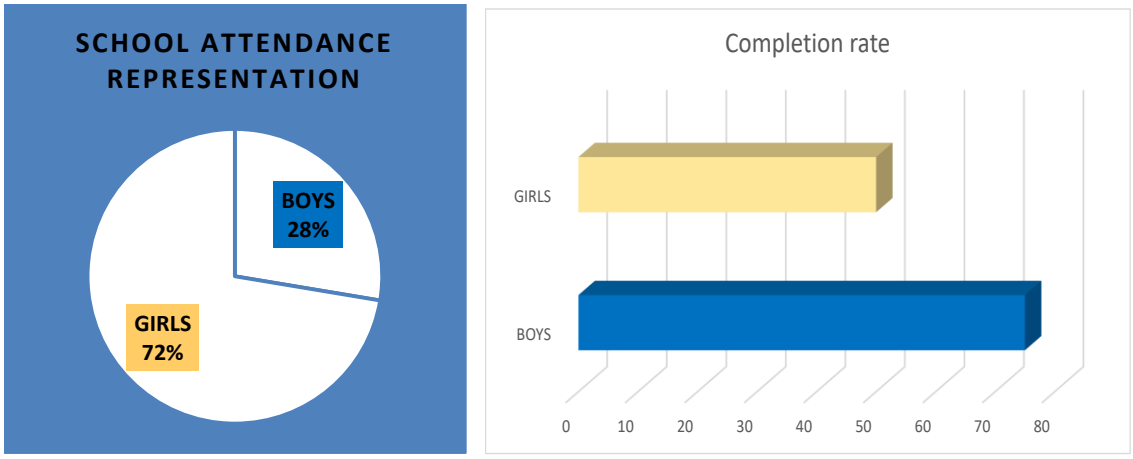


Figure 7. School Enrolment and Completion rate

6.8.4 Health Stakeholders' Consultation and Participation

- ✓ The following were responses from Mr. John a nurse at Carey health centre during the KII.

The project perception

- ✓ The project was made known to him by the area chief.
- ✓ He noted the project would promote health activities majorly by providing enough power to run their high current medical equipment and machinery. The ward would be lit up.
- ✓ He was concerned on whether the proposed project would sustain their livelihood and boost security

- ✓ The respondents would support the project during project planning and implementation. He suggested the installation process be fastened.

Facility Profile

- ✓ The health center currently operates from 8:00am to 5:00pm for outpatient services and provides emergency and maternity services at night.
- ✓ It serves the local community mainly the Rendille community stretching up to 25km from Kargi centre. A population of approximately 1500 people.
- ✓ Health services offered at the facility include; Outpatient, maternity, laboratory, consultations, HTC, family planning, nutrition and admission services.

Infrastructure/Resources

- ✓ The health center has one clinical officer and a male nurse.
- ✓ The Nurse indicated that the health facility has equipment not currently being used due to lack of power supply.
- ✓ He noted that the maternity and outpatient block ward was in poor condition, while the laboratory' was moderate. The maternity ward lacks lighting therefore a challenge especially at night.
- ✓ The facility does not have an emergency vehicle.
- ✓ They have not had outreaches for the past year. The current running educational service is school health programme.
- ✓ Some of the challenges faced by the centre are shortage of staff & drugs and insufficient power supply.

Prevalence Rates/Health Issues

- ✓ The main health issues pre-dominant among the children in Kargi are pneumonia, malnutrition, respiratory infection and diarrhea due to drought and poor sanitation.
- ✓ Health issues pre-dominant among the women are cancer and poor referral systems for maternity services.
- ✓ Pre-dominant health issues among the men in Kargi are joint pains, cancer and adult malnutrition.
- ✓ Malnutrition was the most prevalent among most vulnerable groups. A typical diet consists of maize, bean and flour.
- ✓ Other matters that also posed health risks include HIV/AID however its very low and cultural practices.

Plate 6. On-going public Participation

- ✓ The reported average life expectancy for men and women is 60 years
- ✓ GBV cases are very rare strict cultural practices helps with any such incidents.
- ✓ The most vulnerable groups within the community are children under 5 years and the elderly.

6.9 Disclosure of ESIA to the Stakeholders

The final ESIA report will be shared with the stakeholders by way of making it available to the target beneficiaries and other interested parties. The ESIA report will be shared through the county headquarters (a copy will be availed) or will be accessible through the CREO office and KPLC website. In addition, a copy of the ESIA should be availed by CREO to the chief's office for access by the local community and other stakeholders.

The findings of the ESIA will be shared or disseminated to the target community in a culturally appropriate format such as using local language and through public meetings and focus group discussions.

6.10 Stakeholder Engagement and Grievance Management Post ESIA

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

Objectives and Principles of Stakeholder Engagement

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

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

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

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

7 GRIEVANCE REDRESS MECHANISM

7.1 Introduction

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

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

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

7.2 Grievance Mechanism

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

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

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

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

7.3 National Grievances Redress Committee (NGRC)

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

7.4 County Grievance Redress Committees (CGRC)

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

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

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

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

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

7.5 Locational Grievance Redress Committee (LGRC)

Since counties are large, further decentralized Grievance Redress Committee for Kargi has been established and will handle the grievances arising from Kargi 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 MoE, KPLC and REREC (County Renewable Energy Officer). They held a consultative forum with the community and constituted an LGRC. The members consisted of women, men and youth representatives 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

7.6 Available Grievance Redress Mechanism - Maslaha

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

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

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

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

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

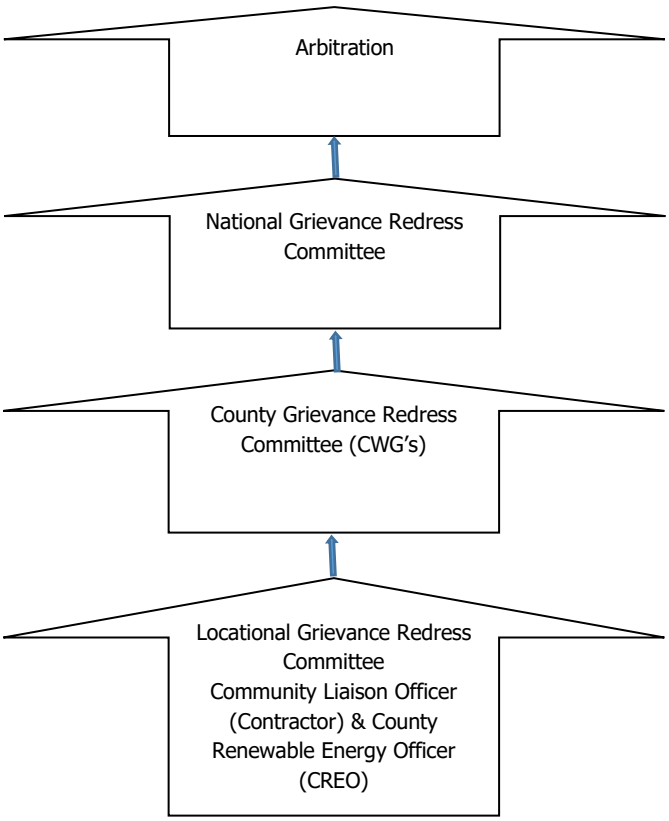


Figure 8. KOSAP Grievance Redress Mechanism

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

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

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

8 IDENTIFICATION AND ASSESSMENT OF POTENTIAL IMPACT AND PROPOSED MITIGATION MEASURES

8.1 Identification

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

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

8.2 Assessment Methodology

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

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

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

8.3 Defining Impacts

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

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

8.4 Assessment of Significance

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

- Status of compliance with relevant Kenyan legislation, policies and plans and any relevant Kenyan or industry policies, standards or guidelines, as well as international best practice standards and guidelines
- The magnitude (including nature, scale and duration) of the change to the natural or socioeconomic environment (e.g. an increase in coastal erosion, or an increase in employment opportunities), expressed, wherever practicable, in quantitative terms. The magnitude of all impacts is viewed from the perspective of those affected by considering the likely perceived importance as understood through stakeholder engagement;

- The nature and sensitivity of the impact receptor (physical, biological, or human). Where the receptor is physical, the assessment considers the quality, sensitivity to change and importance of the receptor. For a human receptor, the sensitivity of the household, community or wider societal group is considered along with their ability to adapt to and manage the effects of the impact; and
- The likelihood (probability) that the identified impact will occur. This is estimated based upon experience or evidence that such an outcome has previously occurred.

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

For this assessment, significance has been defined in table 20 based on five levels described in table below;.

Table 19: 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 table 21.

Table 20: Overall Significance Criteria for Environmental Impacts

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

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

8.5 Magnitude of Impact

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

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

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

8.6 Sensitivity of Resources and Receptors

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

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

8.7 Likelihood

Terms used to define likelihood of occurrence of an impact are explained in Table 22 below.

Table 21: 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)

8.8 Definition of Mitigation Measures

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

- Changes to the design of the project during the design process (e.g., changing the development approach);
- Engineering controls and other physical measures applied (e.g., 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 considers the technical and financial feasibility of mitigation measures. Potential impacts assessed to be of minor significance are usually sufficiently managed through good industry practice, operational plans and procedures.

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

8.9 Positive Impacts – Construction phase

8.9.1 Creation of Employment Opportunities

Various employment opportunities will be available during construction. The opportunities will be both skilled and unskilled. Majority of the unskilled and semi-skilled jobs will be taken up by the local community. Employment of the locals will increase skill transfer from the contractors.
The approximate number of workers to be employed by the proposed project is not yet known, however, this will contribute to easing unemployment level in the area. There will be a trickledown effect to the economy at large resulting from new income revenues as well as services provided through this project.

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

Enhancement

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

8.9.2 Improving local economy

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

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

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

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

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

8.10 Positive Impacts during Operation Phase

8.10.1 Quality, Reliable Power Supply

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

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

Enhancement

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

8.10.2 Employment Creation

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

The impact significance is low as it will employee people to manage the substation

Enhancement

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

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

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

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

Enhancement

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

8.10.4 Improvement of Local and National Economy

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

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

Enhancement

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

8.10.5 Education

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

Enhancement

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

8.10.6 Health Benefits of the Project

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

8.10.7 Improved Standard of Living

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

8.10.8 Security

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

8.10.9 Communications

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

8.11 Positive Impacts during Decommissioning Phase

8.11.1 Employment Opportunities

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

8.11.2 Site Rehabilitation

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

8.12 Negative Environmental and Social Impacts during Pre-Construction Phase

Pre-construction activities pertain mostly to land acquisition, permitting, recruitment & award of contract, project design and planning and stakeholders' engagement. Majority of these activities are done at a desktop level except during site visit and stakeholders' engagement.

8.12.1Impact on Land Acquisition

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

The proposed site falls within Kargi village. 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

Mitigation measures

In line with the RPF provisions;

- Prepare and implement an Abbreviated Resettlement Action Plan (A-RAP) to guide land acquisition for the mini-grid, wayleaves for power distribution. Further, the proponent will fast-track A-RAP preparation to ensure that land acquisition and contractor mobilization to the site is undertaken after the A-RAP is finalized, cleared, and disclosed.
- The contractor will implement and adhere to agreements for temporal use of land and restoration of land after use.
- Compensate affected communities in-kind (priority F) 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.

8.12.2Impact on Wayleaves

Supply of electricity will involve passing of low voltage (LV) lines to connect the customers to power. It is estimated that a total of 3.08 kms of LV circuit will be constructed mainly along the road reserve and along the boundaries to supply power. A way-leave trace of 10 meters will be required along the entire power line network. The project contractor will use existing access roads to set up the low-voltage power distribution lines and will seek access from beneficiaries and clients in whose property they will undertake electricity connection to the power grid.

Mitigation measures

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

8.12.3Stakeholder Identification and Consultation

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

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

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

Mitigation measures

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

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

Mitigation Measures

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

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

Mitigation measures

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

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

Mitigation measures

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

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

Mitigation measures

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

8.12.4 Other negative impacts at Pre-Construction Phase

The following are possible negative impacts:

1. Delay in implementation of the project due to objections and stop orders
2. Conflicts/ community agitations arising from dissatisfaction with compensation payment, and employment issues
3. Influx of people (migrant workers, sub-contractors and suppliers) and increased pressure on existing social infrastructure
4. Community agitations over land disputes, wrong stakeholder identification, leadership tussles, etc. Issues/ dispute on memorandum of understanding with project proponent

Embedded/In-built Control

The Contractor shall:

- Ensure that all pertinent permits, certificates and licenses have been obtained prior to any activities commencing on site and are strictly enforced/ adhered to;
- Maintain a database of all pertinent permits and licenses required for the contract as a whole and for pertinent activities for the duration of the contract.
- Encourage personnel to participate in community development affairs

The proponent shall:

- Establish an efficient grievance management mechanism
- Ensure early stakeholders' engagement sessions are held, and all agreed issues properly documented, signed, and implemented in timely manner.
- Engage in due consultation with relevant groups within host community at all phases of the project
- Provide opportunities for all groups (women, men, youth/associations, elders, leaders etc) to participate in consultations and ensure that all concerns are duly addressed.

Significance of Impacts

The overall impact significance at pre-construction phase has been assessed as moderate.

Additional Mitigation measures

- The Contractor shall develop a Solid Waste Management Plan in accordance with the guidelines
- All Project staff will be trained on this plan and attendance will be recorded
- All project staff will undergo training by local services providers identified by the Project implementers on prevention of HIV/AID and GBV-SEA/SH
- Develop a Code of Conduct (Project Implementers) for all Workers (local and overseas) to sign detailing the expected behaviors of Project staff, ESHS requirements, Cultural respect, OHS requirements, Community Health and Safety considerations

- Contractor required to develop and implement a Construction Environmental Management Plan (CEMP) meeting the conditions set out in the environmental authorization, as well as this ESIA and World Bank requirements

The significance of residual impacts has been reduced to minimal considering the recommended mitigation measures.

8.13 Negative Environmental and Social Impacts – Construction phase

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

8.13.1 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

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

8.13.2 Soil Erosion Impact

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

Mitigation Measures

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

- Areas compacted by vehicles during site preparation and construction should be scarified (ripped) by the contractor in order to allow penetration of plant roots and the re growth of the natural vegetation

8.13.3 Contamination of Soil from Fossil Fuels

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

Mitigation Measures

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

8.13.4 Dust Emissions

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

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

Mitigation Measures

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

8.13.5 Vehicle Exhaust Emissions

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

Mitigation Measures

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

8.13.6 Pollution from Solid Waste Generation

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

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

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

Mitigation Measures

- Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is top soil last;
- Segregate waste and dispose of appropriately using a licensed waste handler
- Provide litter collection facilities such as bins and create awareness campaigns to segregate as early as possible, using the appropriate bins
- Contractor to put in place and comply with a site waste management plan
- The contractor should comply with the requirement of OSHA ACT 2007 and Building rules on storage of construction materials
- Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time
- Recovery of materials remains and return to stores
- Re-use of materials where possible
- Proper budgeting to avoid waste generation

8.13.7 Impacts on Water Resources and Water Quality

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

Mitigation Measures

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

- Clear the necessary areas only.
- Appropriate remedial measures shall be implemented by the contractor in the event of erosion.
- Infrastructure shall be designed to ensure that contaminated run-off does not reach watercourses.

- In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect.
- No vehicle maintenance and service shall be done at project site but in approved garages or service stations to avoid any possible oil and fuel spills that could contaminate soils and possibly ground water quality.
- Ensure that potential sources of petro-chemical pollution are handled in such a way to reduce chances of spills and leaks.
- Construction activities to avoid any unchanneled flow of water at the site
- Storage areas that contain hazardous substances should be bundled with an approved impermeable liner and provision for a pit to be made in case of oil spill.
- The excavation and use of rubbish pits during construction should be strictly prohibited.
- A waste disposal area should be designated within the active construction area and this should be equipped with suitable containers i.e., skips or bins of sufficient capacity and designed to contain and prevent refuse from being blown by wind,
- Areas contaminated by spilled concrete and/or fuels and oils leaking from vehicles and machinery should be cleaned immediately.
- The contractor to source for alternative source of water for construction purposes to avoid potential conflict with the community

8.13.8 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

8.13.9 Impacts from Hazardous Materials

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

Mitigation Measures

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

8.13.10 Accidental Oil Spills or Leaks

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

Mitigation Measures

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

8.13.11 Fire Hazards

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

Mitigation Measures

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

- Create awareness to the construction workers on potential fire hazards
- Provision of firefighting equipment (extinguishers) on site during construction.
- No smoking shall be done on construction site
- 'No smoking' signs shall be posted at the construction site

- A fire evacuation plan must be posted in various points of the construction site including procedures to take when a fire is reported.

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

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

Mitigation Measures

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

8.13.13 Increased Water Demand

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

Mitigation Measures

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

8.13.14 Energy Consumption

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

Mitigation Measures

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

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

8.13.15 Occupational Health and Safety Impacts

There are several activities involved during construction. These activities can pose potential health and safety risks to the workers. The activities include excavation, backfilling, civil works, pole erection, stringing

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

Mitigation Measures

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

8.13.16 Community Safety -Access to Site by General Public

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

Mitigation Measures

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

8.13.17 Spread of HIV/AIDS and STIs

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

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

Mitigation measures include:

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

8.13.18 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

8.13.19 Child Labor

Implementation of the project will lead to increased opportunities for the host community to sell goods and services to the incoming workers. This can lead to child 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.

8.13.20 Gender Based Violence- SEA and SH

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

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

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

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

There is no incident of gender-based violence in Kargi 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

refer 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 cantered approach in responding to SEA/SH incidences i.e., decision to report lies with the survivor or the guardian in case of a minor.
- Contractor to provide established referral pathway including police station with a gender desk for handling SEA/SH cases and also free toll numbers/hot lines for reporting GBV
- The contractor will also facilitate any survivor who decides to take legal action by referring them to the nearest established legal support facility that offers legal support to GBV survivors.
- Ensure Confidential reporting and responding to SEA/SH cases if reported;
- Encourage reporting of all SEA/SH incidences to the chief or the grievance redress committee members or community elders; and
- Ensure all complaints on SEA/SH or harassment are reported directly through CREO - county renewable energy officer.

8.13.21 Public Health Impacts

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

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.

8.13.22 Public Health Impacts Sanitary Waste

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

Mitigation Measures

- Construct/ install pit latrines for both genders clearly labelled

8.13.23 Forced Labor

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).

8.13.24 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.

8.14 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 KPLC will take over.

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

8.14.2 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.

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 uses of fuels for the operators of the Mini-grid.
- In the event of accidental leaks, contaminated top soil should be scooped and disposed of in accordance to the law

8.14.3 Increased oil Consumption

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

Mitigation Measures

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

8.14.4 Increased Storm Water Flow

The panels, building roofs and pavements of the proposed Mini-grid will lead to increased volume and

velocity of storm water or run-off flowing across the area covered by the solar panels during operation phase. This will lead to increased amounts of storm water entering the drainage systems. The impact will be of minor significance.

Mitigation Measures

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

8.14.5 Fire Outbreaks

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

Mitigation Measures

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

8.14.6 Visual Impacts

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

Mitigation Measures

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

8.14.7 Water demand

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

Mitigation Measures

- There is need to source for a sustainable water source for use
- Install water-conserving automatic taps
- Encourage water harvesting from rooftops and storage for cleaning purposes (washing the panels

off dust)
- Any water leaks through damaged pipes and faulty taps should be fixed promptly.

8.14.8 Sanitary waste

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

Mitigation Measures

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

8.14.9 Flooding

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

Mitigation measures

- Ensure drainage channels are free of any obstruction at all times i.e., not blocked
- Construct more channels and or expand existing ones
- Raise foundations of the solar panels and ensure a proper and firm concrete base
- Create flooding diversions and or spill ways to divert water from getting into the solar power facility

8.14.10 Workers Occupation Health and Safety

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

Mitigation Measures

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

8.14.11 Hazardous waste

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

Mitigation Measures

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

8.14.12 Noise and Vibration

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

Mitigation Measures

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

8.14.13 Electric and magnetic fields (EMFs)

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

8.14.14 Shocks and electrocutions to the beneficiaries

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

Mitigation Measures

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

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

8.14.15 Community safety -Access to the facility by general public

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

Mitigation Measures

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

8.14.16 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
- Gender Based Violence- SEA/ SH
- Gender based violence risk is also possible during operation phase although the labor force will be smaller. the impact is assessed as minor due to the low magnitude and medium receptor sensitivity. Therefore, measures must be put in place to address GBV risks.

Mitigation Measures

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

Key tasks will include

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

8.14.17 Public Health Impacts –HIV/AIDs

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

Mitigation Measures

- Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually

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

8.14.18 Public health Impacts -Covid 19 disease

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

Mitigation Measures

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

8.14.19 Dust emissions

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

Mitigation Measures

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

8.14.20 Vehicle exhaust emissions

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

Mitigation Measures

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

8.15 Negative impacts during decommissioning phase

Preparation for decommissioning

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

- Prepare a Decommissioning Plan and submit to NEMA and the County Governments of Marsabit to obtain approval for implementation.

- Implement the decommissioning plan including backfilling, revegetation, disposal of waste material, recycling of recyclable material among others

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

8.15.1 Noise and Vibration

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

Mitigation Measures

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

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

8.15.2 Solid Waste Generation

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

Mitigation Measures

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

8.15.3 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.

8.15.4 HIV/AIDs awareness and prevention

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

8.16 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.

8.17 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.

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9 ENVIRONMENTAL AND SOCIAL MANAGEMENTAND MONITORING PLAN (ESMMP)

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

9.1 Purpose and Objectives of ESMMP

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

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

9.2 Auditing of ESMMP

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

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

9.3 Incident Reporting

In line with the requirement of the Occupational Health and Safety Act (OSHA) 2007, EMCA 1999 and its 2015 revisions, and World Bank EHS guidelines, all ESHS incidents, accidents, dangerous occurrences including occupational diseases shall be promptly reported to the respective regulatory institutions in the prescribed manner and template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank.

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

9.4 Management Responsibility of ESMMP

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

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

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

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

9.4.2 National Environment Management Authority (NEMA)

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

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

9.4.3 Contractor

The persons/firms contracted to put up the proposed water Projects plant will be required to comply with the requirements of the ESMMP within this report. To ensure strict compliance environmental specifications and social risk mitigation measures that address project related SEA and GBV at the community level and SH of this ESMMP should form part of the contract documents.

The contractor will be required under the contract to engage a competent Environment Safety Health and Safety Advisor/officer to advise them on the ESMP compliance; Undertake risk assessments and prepare project specific Construction ESMPs for review and approval and implement the approved C-ESMP.
Records and reports on the following environmental, health and social issues of the proposed project should be kept.

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

9.4.4 Consultant

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

9.4.5 County Government of Marsabit

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

9.5 Environmental and Social Management Plan

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

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

9.5.1 Management Plan during Construction Phase

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

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

9.6 Institutional Implementation

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

9.6.1 Proponent- Ministry of Energy

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

9.6.2 KOSAP Project Implementation Unit

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

9.6.3 The Implementing Agencies

REREC will be responsible for the construction while KPLC will be in charge of operation and maintenance of the project on behalf of the MOE. Some of the key responsibilities include but not limited to are:

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

Note: *The Solar Mini-grid will be installed, operated, and maintained by the O&M contractor for the first seven (7) years and then handed over to KPLC.*

9.6.4 County Government of Marsabit

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

9.6.5 National Environment Management Authority

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

9.7 Management Plan during Operational Phase

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

- Inspections
- Corrective action
- Reporting

A detailed Environmental and social management plan for preconstruction, construction and decommissioning phase is well illustrated in tables below. (See overleaf).

Table 22: Environmental and Social Management Plan (ESMP)

Potential Impacts	Recommended Mitigation Measure	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	Contractor REREC O&M Contractor/KPLC	• Fair and transparent local recruitment plan in place. • Recruitment processes (job adverts, interviews, selection etc.). • Number of locals employed based on gender, vulnerability, ethnic group, clan etc. • Type of employment (skilled, semi-skilled and unskilled). • Grievances raised, those aggrieved, status of resolution.	Quarterly	Contractor's cost
Local Sourcing	• Source materials from local businesses/communities, and where necessary give opportunities to businesses owned or operated by vulnerable individuals.	Construction Decommissioning	Contractor REREC	Number and types of businesses sourced from, businesses owned and operated by vulnerable individuals, types and quantities of materials etc.	Quarterly	No additional cost
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	Pre- Construction	Contractor-(*contractors' facilities, workers camps*)	• Land Acquisition and consultation report (consultation (minutes and lists of participants).	Quarterly	Value of compensation in kind project will be equivalent to

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	acquisition for the mini-grid, wayleaves for power distribution. Further, the proponent will fast-track A-RAP preparation to ensure that land acquisition and contractor mobilization to the site is undertaken after the A-RAP is finalized, cleared, and disclosed. • The contractor will implement and adhere to agreements for temporal use of land and restoration of land after use. • Compensate affected communities in-kind (priority project) for the loss of land. • The construction activities will be restricted to within the 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		Proponent- (*project land for generation assets and wayleaves*)	• 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.		the value of land acquired as per NLC

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	structures, crops, trees, community facilities and other assets will be compensated in line with the RPF provisions.					
Labour Influx and related impacts (SEA/SH, HIV/AIDs and other STIs)	• Tap into the local workforce to the extent possible to reduce 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.	Construction Decommissioning	Contractor REREC	• Records of employees/updated employee register. • Number of local community employees and external employees/ updated employee register.	Quarterly	50,000.00

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

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

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	rights and entitlements of project affected persons, sub-project positive and negative impacts and opportunities, proposed subproject budget. • In line with the SEP, undertake adequate consultations prior to construction and throughout the project cycle with all segments of the community and other relevant stakeholders. • Prepare and implement a grievance redress mechanism to deal with grievances. • The grievance redress committee to include representatives from the community. • Sensitize stakeholders on SEP and GRM.			meetings and list of participants). • Information disclosed, to whom it was disclosed (men women, PWD, youth, vulnerable individuals and households etc., methods and languages used in the disclosure (culturally appropriate and accessible), grievances raised and status on resolution etc. • Concerns raised 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 Decommissioning	Contractor REREC	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

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• 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	O&M Contractor KPLC	• 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. • Grievances raised and status on resolution etc	Quarterly	No additional cost
Inadequate grievances management	• Constitute a Local Grievances Committee is in consultation with all community segments and incorporates the existing	Construction Operations	Contractor/REREC O&M Contractor/ KPLC	• Local Grievances Committee in place, composition of committee, awareness of	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	local dispute resolution mechanism. • Implement a worker's 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.	Decommissioning		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.		
Environmental Impacts						
Vegetation clearance	• Clear only the necessary areas • Ensure proper demarcation and delineation of the project area to be affected by construction works. • Specify locations for vehicles and equipment, and areas of the site which should be kept	Construction	Contractor REREC	• Number of trees cleared • Planted trees	Once off	50,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	free of traffic, equipment, and storage. • Designate access routes and parking areas • Re-vegetation including planting of trees around the plant/facility					
Soil erosion	• Avoid ground breaking during the seasons of high rainfall to avoid erosion. • Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled. • 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 stock piles • Landscaping with grass on areas without electrical installation (lower areas) • Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled.	Construction	Contractor REREC	• Assess size of rills or Gulleys forming from accelerated run off from compacted areas	Quarterly	Part of contractor's fee

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
Contamination of soil from fossil fuels	• Ensure waste water generated is discharged or drained into approved drainage facilities • 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. • No servicing vehicles on site	Construction	Contractor REREC	Records of any leakages from construction equipment/ vehicles.	Quarterly	50,000.00
Dust emissions	• The construction area should be fenced off to reduce dust to the public • Suppress dust during dry periods by use of water sprays; • Stockpiles of excavated soil should be enclosed/covered/watered during dry or windy conditions to reduce dust emissions. • Burning of woody debris & construction waste to be prohibited • Use of personnel protective equipment (PPE) -masks should be provided to all personnel in areas prone to dust emissions	Construction	Contractor REREC	• Visual Observation of dust • Provision of PPEs especially masks	Daily	100,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• Restrict speed on loose surface roads during dry or dusty conditions • Keep stockpiles and exposed soils compacted and re-vegetate as soon as possible. • Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas • Plant short trees to break speed of wind					
Vehicle exhaust and emissions from Generator	• 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, NOX, SOX and suspended particulate matter • Maintain equipment in good running condition – no vehicles to be used that generate excessive black smoke	Construction	Contractor REREC	• Engine maintenance records • inspection of stacks	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• Use of diesel which is Sulphur- free to run the power producing generators to be encouraged • The stack chimney of the generators will be increased from its normal height of 3 meters to 6 meters					
Solid waste generation	• 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 • Provide litter collection facilities such as 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	Construction	Contractor REREC	• Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• Recovery of materials remains and return to stores • Re-use of materials where possible • Proper budgeting to avoid waste generation • Proper disposal of waste in line with solid waste regulation • Construction wastes to be managed in accordance with construction standards in Kenya					
Impacts on Water Resources and Water Quality	• 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 water source i.e., earth dam. • Contractor to develop an oil-spill containment plan as part of the emergency response plan. In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect.	Construction	Contractor REREC	• Oil spill containment plan. • Provision of fuel/oil drip and spill trays	Quarterly	150,000

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• No vehicle maintenance and service shall be done at project site • Ensure that potential sources of Petro-chemical pollution are handled in such a way to reduce chances of spills and leaks.					
Noise & vibration	• Construction activities to avoid any unchanneled flow of water at the site • 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. • 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	Construction	Contractor REREC	• ***Noise levels***- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Quarterly	150,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	should be cleaned immediately					
Impacts from Hazardous materials -	• Maintenance of construction vehicles will not be done on site • All hazardous products and waste should be labelled and handled properly to avoid contact with the ground • Dispose hazardous waste through a NEMA approved waste handler	Construction	Contractor REREC	• Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00
Accidental Oil Spills or Leaks	• In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately. • Refuelling and maintenance of vehicles will not take place at the construction site. • Create awareness for the employees on site on procedures of dealing with spills and leaks • 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.	Construction	Contractor REREC	• Records of all accidental spills and number of litres	Quarterly	150,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• All chemicals should be stored within the bunded areas and clearly labelled detailing the nature and quantity of chemicals within individual containers.					
Fire Hazards	• Create awareness to the construction workers on potential fire hazards • Provision of firefighting equipment on site during construction. • No smoking shall be done on construction site • 'No smoking' signs shall be posted at the construction site • 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. • Designate an assembly point	Construction	Contractor REREC	• Records of any Fire incidences • Fire equipment and evacuation plan	Quarterly	100,000.00
Impacts of construction material sourcing (e.g., quarrying)	• 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.	Construction	Contractor REREC	• Sources of raw materials (from local community)	Quarterly	Part of contractor's cost

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
Increased water demand	• Prudent use of available water • Consultations with the project local committee on use of water in the community to avoid conflicts with the community • Source and utilize a sustainable and reliable water supply for both construction and operation phase.	Construction	Contractor REREC	• Water usage records	Quarterly	Part of contractor's cost
Energy Consumption	• 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. • Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. • Complementary to these measures, they monitor energy use during construction and set targets for reduction of energy use.	Construction	Contractor REREC	• Energy consumption records	Quarterly	No additional cost
Occupational Health and safety Impacts	• Use skilled personnel for activities which demand skills/technical tasks	Construction	Contractor REREC	• Records of any near misses, incident, and accidents.	Quarterly	1,000,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• Awareness creation/Tool box talks on safety to workers while at construction site • Workers coming to the site should be knowledgeable on safety precautions to take • Appropriate PPE (helmet, safety harness, boots, masks, climbing irons) • Proper general house keeping • Close supervision of workers • Risk assessment by contractor of the construction activities and implement mitigation measures appropriately • Adherence to occupational Safety and Health Act 2007 • Availability of equipped first aid box on site • Provide safe drinking water for workers • Engagement of trained first aider on site • Ensure the WIBA cover is taken for the staff • Establish safety committees			• Records of corrective actions implemented if there was an accident.		
Community safety –access	• Proper barricading • Hazard communication. • Controlled access to the site by designated personnel • Maintain records of any person who comes to site	Construction	Contractor REREC	Presence of a controlled access and records of every person accessing the site	Daily	20,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
Public Health Impacts	• 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	Construction	Contractor REREC	• Number of awareness creation sessions conducted. • Availability of and distribution of condoms	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	individual measures at the workplace.					
Sanitary waste	• Construct/ install pit latrines for both genders clearly labelled	Construction	Contractor REREC	• Presence of separate and clean washrooms for both the gents and ladies	Quarterly	300,000.00
Solid Waste Generation	• Provide waste handling facilities such as labelled waste bins • Emphasis on prudent waste generation and give priority to reduction at source • Solid waste management awareness to operators • Operator to contract a NEMA licensed waste handler to collect and dispose solid waste	Operation	O&M Contractor KPLC	• Presence of well-maintained receptacles and centralized collection points	Quarterly	50,000.00
Liquid Waste/Oils Generation	• Proper storage of the oil is required to ensure no leakages • 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 appropriately. • Proper training for the handling and use of fuels for the operators of the Mini-grid.	Operation	O&M Contractor KPLC	• Engine maintenance records • Oil spill containment plan	Quarterly	200,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately.					
Increased oil Consumption	• Efficient energy consumption • Install an energy-efficient lighting system	Operation	O&M Contractor KPLC	• Energy consumption records	Quarterly	No additional cost
Increased storm water flow	• 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 water harvesting system on the control buildings/office and harness into storage tanks for use	Operation	O&M Contractor KPLC	• Provision of a drainage system and a rain water harvesting system	Quarterly inspections	200,000.00
Fire Outbreaks	• 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 and installed • A fire evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported.	Operation	O&M Contractor KPLC	• Provision of serviced fire equipment, evacuation plan and safety signages • Records of fire safety training	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• Workers especially operators of the plant must be trained on fire management • 'No smoking' signs shall be posted within the Mini-grid area • A fire Assembly point should be identified and marked					
Visual Impacts	• Fence round the solar Mini-grid to keep off/screen the solar panels.	Operation	O&M Contractor KPLC	• Presence of a perimeter fence	Quarterly inspections	No additional cost
Water demand	• Ensure prudent use of water. • Install water-conserving automatic taps. • Any water leaks through damaged pipes and faulty taps should be fixed promptly.	Operation	O&M Contractor KPLC	• Water usage records	Quarterly	20,000.00
Sanitary waste	• Provide sanitary waste facilities for both genders clearly marked • Disposal of waste through septic tanks	Operation	O&M Contractor KPLC	• Presence of separate and clean washrooms for both the gents and ladies	Quarterly	No additional cost
Flooding	• 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 from concrete base • Create flooding diversions and or spill ways to divert	Operation	O&M Contractor KPLC	• Provision of drainage system • Raised foundations for the structures	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	water from getting into the solar power facility					
Occupation health and Safety	• 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	Operation	O&M Contractor KPLC	• Provision of PPEs and WIBA cover • Environmental audit reports	Quarterly	100,000.00
Hazardous waste-damaged panels	• Segregation from other waste streams • Proper disposal through a NEMA approved/licensed handler	Operation	O&M Contractor KPLC	• Presence of well-maintained receptacles and centralized collection	Quarterly	200,000.00
Noise and Vibration	• Generator room should be sound proof to ensure no noise of a nuisance level will be produced. • Monitor noise levels	Operation	O&M Contractor KPLC	• ***Noise levels***- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Quarterly	Part of contractor's cost
Shocks and electrocutions	• Inspect the wiring of the houses before connecting power	Operation	O&M Contractor KPLC	• Records of awareness sessions conducted • Incidences report	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• 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					

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	• 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)	• 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	Operation	O&M Contractor KPLC	• Presence of a controlled access and records of every person accessing the site	Daily	Part of contractor's cost
Risks related to poor or inadequate stakeholder engagement (Conflict)	• 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	Operation	O&M Contractor KPLC	• Grievance records	Quarterly	20,000.00
Gender Based Violence (SEA and SH)	• To manage GBV risks, the contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The	Operation	O&M Contractor KPLC	• SEA/SH Prevention and Response Action Plan • Grievance records	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	plan will include the necessary measures for prevention and response and must ensure survivor-based approach					
Public Health Impacts (HIV/AIDs)	• Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff awareness and awareness campaigns for the community • Provision of condoms to workers • Allowing migrant workers time to be with their families	Operation	O&M Contractor KPLC	• Number of awareness creation sessions conducted. • Availability of and distribution of condoms		20,000.00
Public health Impacts (COVID 19 disease)	• Social distance must be observed • Provision of hand wash facilities before access • Temperature check and monitoring of the temperature of workers and any other person coming to site • Enforce wearing of masks • Make provision for testing and treating especially of workers • Provision of contact numbers for the nearest health facility for testing and treatment • Adhering to any other measures from the ministry	Operation	O&M Contractor KPLC	• Availability of hand washing facilities • Utilization of hand washing facilities • Number of Covid-19 cases reported	Quarterly	30,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	of health which may be issued from time to time					
Dust Emission	• Trees can be planted around the plant/facility provided they do not cast shadows to the solar panels to act as wind breakers and hence decrease dust pollution • Ensure planting of grass around and within the facility compound	Operation	O&M Contractor KPLC	• Visual inspection	Quarterly	50,000.00
Vehicle Exhaust Emissions	• 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	Operation	O&M Contractor KPLC	• Engine maintenance records	Quarterly	No additional cost
Noise and Vibration	• 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	Decommissioning	O&M Contractor KPLC	• ***Noise levels***- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Once off	20,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
	off vehicle engines whenever possible. • Demolish mainly during the day when most of the neighbours are out working					
Solid Waste Generation	• 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	Decommissioning	Contractor	• Presence of well-maintained receptacles and centralized collection points	Daily	700,000.00
Dust Emissions	• Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard	Decommissioning	Contractor	• Visual inspection	Daily	20,000.00

Potential Impacts	Recommended Mitigation Measure	Project Phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (ksh)
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**

9.8 Monitoring

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

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

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

9.9 ESMP Monitoring Plan

The aim of environmental and social monitoring is to evaluate the effectiveness of the Environmental and Social Management Plan implementation by periodically monitoring the important environmental and social parameters within the impact area, so that any adverse effects can be detected and action taken in a timely manner. Throughout the project's operation, environmental monitoring is performed to detect changes in key environmental quality parameters that can be attributed to the project. The monitoring plan specifies the parameters to be monitored; the monitoring requirements; and the frequency and duration of monitoring for each of the environmental components. The monitoring plan also specifies the performance indicators, as well as the implementation and supervision responsibilities.

The monitoring plan shall be required during construction and operational phases and records kept. The schedule for monitoring ambient air quality, ambient noise quality, ground water quality, and wastewater quality both during the construction and operation phases of the project is given in Table 44 and Table 45 below.

It is recommended that the monitoring program be reviewed and revised following the first year of operations to consider the findings from the additional surveys and information recommended.

Table 23: Environmental and Social Monitoring During Construction Phase

ENVIRONMENTAL/ SOCIAL COMPONENT	MONITORING REQUIREMENTS	PERFOMANCE INDICATOR	FREQUENCY OF MONITORING	RESPONSI-BILITY
CONSTRUCTION PHASE				
Air Pollution - Exhaust emissions Fugitive dust	• Physical inspection • Interview residents including workers • Liaise with other stakeholders • Carry out air quality measurements (SOx, NOx, PM10 and HC)	• Level of dust generated. • Compliance with existing air quality standards issued by NEMA ✓ Sulphur Oxides (SOx) - 60µg/m3 ✓ Oxides of Nitrogen (NOx) - 60µg/m3 ✓ Respirable Particulate Matter (RPM) - 50µg/m3 ✓ Total Volatile Organic Compound (VOC) - 600µg/m3.	• Use of portable equipment to monitor air pollution on regular and ad hoc basis. • Monitor daily near settlement centres and institutions like mosques, hospitals and schools	• Contractor's EHS Supervisor • IA's Environmental Supervisor
Noise Environment (including vibration)	• Documentation on complaints about noise • Carry out noise measurements • Zone out elevated noise areas for mandatory use of PPE (ear muffs). Physical Inspection • Field measurement of vibration level and distance of influence.	• Level of noise generated. • Provision of PPE • Compliance with existing noise standard issued by NEMA. ✓ Residential Outdoor Day - 50 dB(A), Night – 35 dB(A) • Place of Worship Day – 40dB(A), Night - 35dB(A). • Establish baseline of existing structures neighbouring the road • Compliance with existing noise standard issued by NEMA.	• Use of portable equipment to monitor noise levels on regular and ad hoc basis • Monitor daily during active operation	▪ Contractor's EHS Supervisor IA's Environmental Supervisor
Wastes and Effluents	• Water quality monitoring of borehole water and nearby water wells. • Physical inspection of construction machinery, equipment and vehicles for oil leaks.	• Lab analysis results • Leakage free working area	• Use of Portable equipment to monitor hydrocarbon pollution on regular and ad hoc basis	• Contractor's EHS Supervisor • IA's Environmental Supervisor
Hazardous wastes	• Availability of solar panels and batteries. • Records of changed solar panels and batteries.	• Proper records in place • Availability of hazardous waste collection log	Monthly	• Contractor's Environmental Supervisor
Avifauna	• Records of uprooted trees • Physical observation	• Amount of vegetation removed	Quarterly	• Environmental Supervisor

ENVIRONMENTAL/ SOCIAL COMPONENT	MONITORING REQUIREMENTS	PERFOMANCE INDICATOR	FREQUENCY OF MONITORING	RESPONSI-BILITY
CONSTRUCTION PHASE				
	• Discussions with KWS.	• Change in animal behavioural pattern		
Increased Social Disturbance Factors	• GRC in place with proper GRM procedures for local communities • Site fenced off and access restricted • Implementation of induction programme, with Code of Conduct, for all workers. • Availability of disciplinary procedures for workers who contravene the Code of Conduct. • Control access to the Project Site. • Interview & employee records. • 24-hour security at the site.	• Record of employee induction • Recorded community grievances • A copy of the Code of Conduct signed by each Project worker. • Fence & security on site	Monthly & regularly	• Contractor's EHS Supervisor • IA's Environmental Supervisor
Traffic Impacts	• Physical inspection of the road under construction to ensure flagmen are active and road signs are in place • Maintaining speeds recommended by KWS due to presence of livestock/wildlife.	• Incident records • Records of complaints • Traffic Management Plan • Incident records • Minimal accidents and road kill • Availability of GRM Log records on traffic incidents.	Daily	Project Proponent/ Contractor
Visual Impacts	• Limit site offices and structures to single story and site them appropriately. • All areas used temporarily during the construction phase restored • Use neutral colour fencing materials. • Customers' switchyard as low as possible. • Implement good housekeeping.	• Visual inspection of the facilities under construction	Weekly	Project Proponent Contractor
Soils	• Implementation of soil conservation measures such as stockpiling topsoil or gravel for the remediation of disturbed areas. • Vegetate/appropriately cover stockpiles. • Rehabilitation of disturbed areas as soon as possible. • Clearly define and where necessary demarcate work areas. • Minimize creation of additional access roads.	• Visual audits/spot checks • Project activities limited within project footprint • Areas used for temporary construction activities fully restored •	Monthly	Contractor
Disease Transmission	• Use of HIV/AIDS/Malaria policy and information document. • Condoms to employees and all contractor workers. • Code of Conduct applicable to all project workers. • As part of the worker Code of Conduct, explicitly forbid all Project personnel from engaging in illegal activities including engaging in commercial sex.	• HIV/AIDS and malaria policy • PPEs available • Worker Code of Conduct	Monthly	Project Proponent Contractor

ENVIRONMENTAL/ SOCIAL COMPONENT	MONITORING REQUIREMENTS	PERFOMANCE INDICATOR	FREQUENCY OF MONITORING	RESPONSI-BILITY
CONSTRUCTION PHASE				
	• Disciplinary procedures for workers who contravene the workers Code of Conduct. • Provide accommodation to external workers in accordance with IFC standards. • Proper drainage system to avoid water stagnation at the Project Site. • Provide insecticide-impregnated bed nets to all the workers accommodated on site.	• Disciplinary procedures for workers who contravene the Code of Conduct		
Health, Safety and Security	• Review of records • Interviews with staff and local community • Maintenance of equipment to ensure they remain efficient and effective. • Construction works only during daytime. • Billboards at the construction site gates notifying people of the construction activity and timings. • Speed limits within the project site access roads and vicinity. • Grievance procedure for noise complaints. • Construction emergency plan. • PPE use by workers at site. • Firefighting equipment & trained site personnel. • Use of workers' grievance mechanism.	▪ Number of reported crimes ▪ Number of complaints ▪ A well-maintained grievance registers ▪ Health and safety plans in place ▪ Billboards erected ▪ Firefighting equipment in place ▪ Workers with PPEs ▪ Safety training records available ▪ Firefighting equipment training records ▪ Speed limit signages ▪ Health and Safety Plan ▪ Availability of workers' grievance mechanism	Monthly & continuously	▪ IA's Social Supervisor ▪ Contractor's Social Supervisor ▪
Gender Empowerment	• Review of company staff records. • Physical Inspection	▪ Number of female employees ▪ Number of male and female toilets	Quarterly	▪ IA's Social Supervisor
Labor and Working Conditions	• HR Policy and Labor & Employment Plan (LEP), including worker Grievance Mechanism • Contracts abide by Kenyan Labor Laws /World Bank Standards • Acceptable standard of accommodation facilities to workers who cannot return home daily.	▪ Employment records and other KPIs for worker rights ▪ A record of workers' grievances ▪ Induction documentations for all workers to include necessary items	Monthly	Contractor

ENVIRONMENTAL/ SOCIAL COMPONENT	MONITORING REQUIREMENTS	PERFOMANCE INDICATOR	FREQUENCY OF MONITORING	RESPONSI-BILITY
CONSTRUCTION PHASE				
GBV, Sexual Exploitation and Abuse	• Review of grievance redress forms. • Interviews with local community	▪ Number of complaints	Monthly	▪ IA's Social Supervisor ▪ Local GRC & chief's office
HIV/AIDs & GBV Training	• Staff training prevention of HIV/AID and GBV. • Code of Conduct (Project Implementers) for all Workers (local and overseas) to sign detailing the expected behaviors of Project staff, ESHS requirements, Cultural respect, OHS requirements, Community Health and Safety considerations	▪ Signed attendance list showing training was done ▪ Code of conduct developed	Preconstruction and construction phase	▪ Contractor
Labour influx	• Interviews with local administration on influx and conflicts • Complaints log • Interviews with grievance committee members	▪ Number of grievances ▪ Incidences of conflicts	Monthly	▪ IA's Social Supervisor
Child labour	• Review of records • Interviews with staff and local community	▪ Record of employees including IDs	Monthly	▪ IA's Social Supervisor

Table 24: Environmental and Social Monitoring During Operation Phase

ENVIRONMENTAL/ SOCIAL COMPONENT	MONITORING REQUIREMENTS	PERFOMANCE INDICATOR	FREQUENCY OF MONITORING	RESPONSIBILITY FOR IMPLEMENTATION
OPERATION				
General	▪ Keep EHS Management Plan meeting the conditions set out in the environmental authorization, as well as this ESIA and World Bank requirements.	▪ Have EHS Plan	Once	Implementing Agency (IA) – MoE, KPLC
Disposal of hazardous Materials (broken/ decommissioned solar panels, batteries)	▪ Solid Waste Management Code of Practice will be integrated into SOP ▪ Collection of waste solar panels and batteries in the covered 10ft container. ▪ Transfer of hazardous items to a facility licensed to handle hazardous waste.	▪ Well-disposed hazardous materials ▪ Presence of storage container for the hazardous waste	Continuous	IA – MoE, KPLC
Solar Panel inspections	▪ Weekly monitoring of the condition of the individual solar panels to detect any damage. ▪ Regular inspections to be carried out on solar array foundations by Contractor and EPA staff.	▪ No damages on the panels	Continuous	IA – MoE, KPLC
Hydrology and Hydrogeology	▪ All oil-based maintenance/repair liquids will be adequately contained to prevent leakage into the ground. ▪ All repair works with potential for spill or leakages of oil-contaminated fluids will have drip trays or HDPE-type lining on the ground underneath to collect any leaked fluids.	▪ Visual audits/spot checks ▪ Good housekeeping at the project site ▪ Well drained project site ▪ Areas used for temporary construction activities fully restored	▪ At the start of operational phase ▪ Twice a year	IA – MoE, KPLC

ENVIRONMENTAL/ SOCIAL COMPONENT	MONITORING REQUIREMENTS	PERFOMANCE INDICATOR	FREQUENCY OF MONITORING	RESPONSIBILITY FOR IMPLEMENTATION
OPERATION				
	▪ All contaminated materials used during the repairs will be carried of site and disposed of in designated disposal sites. ▪ Laydown or infrastructure assembly areas not required during the operational phase of the Project will be re-vegetated with to prevent erosion immediately after these areas are no longer required for construction. ▪ Vegetation will be maintained around the Project Site to reduce the rate of run-off. ▪ Appropriate vegetation will be allowed to grow between and under the PV modules to minimize the area from which dust can be raised. ▪ Only approved mild, biodegradable, and non-abrasive detergents will be used during the periodic cleaning of the solar panels. ▪ The drainage channels constructed during the construction phase will be maintained throughout the operations phase. ▪ Harvest and store rainwater for use during the PV panel cleaning exercise.			
Soils	▪ Limited Vegetation around the project site ▪ All oil-based maintenance/repair liquids adequately contained. ▪ All repair works with potential for spill or leakages of oil-contaminated fluids with drip trays or HDPE-type lining on the ground underneath to collect any leaked fluids. ▪ All contaminated materials used during the repairs will be carried off-site and disposed of in designated disposal sites.	▪ Percentage of paved area to vegetated area ▪ Restoration audits and monitoring ▪ Availability of drip trays at the site.	Quarterly in the first year of operational phase and thereafter annually	IA – MoE, KPLC Maintenance Contractor
Avifauna	▪ Insulate all the electrical wire. ▪ Monitor avifauna mortality within the Project footprint. If significant mortalities are noticed, seek additional mitigation measures.	▪ Monitoring record for avifauna mortality ▪ All electrical wires insulated	Quarterly in the first year of operational phase and thereafter annually	IA – MoE, KPLC Maintenance Contractor
All impacts	▪ Decommissioning plan when appropriate, specifically addressing how electrical equipment will be recycled or reused and include provisions already identified for the construction phase	▪ A fully developed decommissioning plan	Prior to decommissioning	IA – MoE, KPLC

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

No	Institution	Role/Function
1	The National Environment Management Authority (NEMA	NEMA: ▪ Approve the ESIA Report ▪ Issue EIA License for project implementation ▪ Carry out independent Audit to determine compliance with ESMP
2	Directorate of Occupational Safety and Health Services (DOSHS)	DOSHS: ▪ Provides OSH permits for workplaces of the project including campsites and quarries ▪ Conduct inspections to ensure conformance to OSHA
3	Water Resources Authority (WRA)	WRA ▪ Provides necessary water abstraction permits for boreholes and surface water sources (rivers, streams etc.) ▪ Monitor water use in the region and provide guidance water use
4	National Land Commission (NLC)	NLC ▪ Verify the identified land for the purposes of ascertaining land ownership ▪ Transfer of land ownership details to the proponent
5	National Gender and Equality Commission	The Commission: ▪ Ensures that there is gender equality and equity throughout the implementation of the project. ▪ Representatives will monitor and evaluate gender quality and equity with regards to job provision and harassment cases on site to ensure compliance with the law
6	Department of Community Development	Work with poor, marginalized, vulnerable and disadvantaged communities as its primary target group will ensure that this group is supported and is not left out of the project implementation
7	County Government of Marsabit	County Governments will: ▪ Provide approval for the project & project site ▪ Approval of community land consent & verification ▪ Provide support
8	Supervision Consultant	**Supervising Consultant** ▪ Will engage the following dedicated full-time safeguards staff to support risk management ✓ Supervising Engineer (RE) ✓ Social Safeguards Specialist ✓ Environmental Safeguards Specialist ▪ Review and approval of the ESMPs and other plans ▪ Day to day supervision of Contractor implementation of the ESMPs and other plans ▪ Regular reporting on the ESMP implementation ▪ Has full time Environmental, Health and Safety and Social Specialists

No	Institution	Role/Function
9	Contractor	**Contractor** ▪ Will engage the following dedicated full-time safeguards staff; ✓ Environmental Safeguards Specialist ✓ Social Safeguards Specialist ✓ Registered Occupational Health and Safety (OHS) Expert ▪ Will Prepare the CESMPs and other plans before commencing construction. ▪ Will Operationalize and implement the CESMPs. ▪ Has full time Environmental, Health and Safety and Social Specialists. ▪ Carries out day to day management of ES, H& S risks. ▪ Reports on incidents and accidents to the Resident Engineer and regulators.

10 IMPACT SUMMARY AND CONCLUSION

10.1 Introduction

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

10.2 Impacts Requiring Detailed Assessment

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

10.3 Conclusion

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

During the preparation of this report for the proposed development, it is observed and established that most of the negative social and environmental impacts can be mitigated and have potentially short term low significant effects. The positive impacts are highly rated and will benefit the community at Kargi 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 Kargi community members. However, despite the outlined positive impacts, the proposed development will cause

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

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

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

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

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

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

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

County Administrators, NEMA, amongst others) to harmonize the projects infrastructural and socio-economic developments with existing facilities.

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

10.4 Recommendations

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

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

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

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

This assessment also provides the following:

1. The **Bid Documents** prepared for the Project incorporates the Environment, Social Health and Safety Provisions discussed under Chapter 8 (Environment and Social Impact Assessment and Mitigation Measures).
2. The Project **Contract Document** should include provisions for the contractor preparing and implementing site specific **Environment and Social Management Plan** (ESMP), appendices to the ESMP will include:
    - ✓ Stakeholder Engagement plan
    - ✓ Health, Hygiene and Safety Plan
    - ✓ Labour Management Plan
    - ✓ Child Protection Strategy
    - ✓ Waste Management Plan
    - ✓ Contractors Code of Conduct including provisions on Violence Against Children (VAC), SEA, and SH

- ✓ Gender Based Violence and Sexual Harassment Prevention Plan
- ✓ Grievance Redress Mechanism
- ✓ GBV Action Plan, including:
    - SEA Prevention and Response Strategy
    - SH Policy
    - GBV Mitigation Plan
    - SEA Redress Mechanism
    - SH Redress Mechanism
- ✓ HIV/Aid & Communicable Diseases Prevention Strategy
- ✓ Local Recruitment plan
- ✓ Labour influx management plan

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

6. Diligence on the part of the contractor and proper supervision by the KPLC is crucial for mitigating the potential impacts and ensuring structural strength, safety, and efficient operation of the project.

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

Authorization Opinion

In terms of NEMA requirement the environmental practitioner is required to provide an opinion as to whether the activity should or should not be authorized. The expert is reticent to venture such an opinion since we are not an elected entity mandated to make decisions on behalf of authority. Nevertheless, in this section a qualified opinion is ventured and in this regard the Lead expert believes that sufficient information is available for NEMA to take a decision. The fundamental decision is whether to allow development which brings socio-economic advantages and is consistent with planning and certain development and social

responsibility and upliftment of policies, but which may impact on an area as a result of negative impacts identified. The Lead Expert believes that the ESIA have shown that the applicant's preferred alternative and technological alternatives are generally acceptable. The ESIA has also assisted in the identification of essential mitigation measures that will mitigate the impacts associated with the project to within acceptable limits.

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

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- The Energy Act, 2019
- The Constitution of Kenya, 2010
- Marsabit County Integrated Development Plan 2018-2022

12 APPENDICES

Table 25: List of Appendices

No	Appendix	Item
1	Appendix 1	Minutes of EIA consultation meeting
2	Appendix 2	List of attendance
3	Appendix 3	Minutes of Land acquisition meeting
4	Appendix 4	Lists of Attendance for Land Acquisition Meeting
5	Appendix 5	A-RAP Document
8	Appendix 7	Firm and Lead expert EIA practising licences

1. Minutes of EIA Consultation Meeting

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MINUTES OF EIA CONSULTATION HELD AT ..... KARGI .....

Date: 17/1/2022	**Time:** 4:45 pm
Venue: KARGI Centre	

PRESENT

List is attached

AGENDA

1. Introduction
2. Opening Remarks
3. Remarks by the consultant
4. Concerns/ Issues from participants
5. Responses given by the consultant
6. Project Acceptance/Rejection of the proposed project
7. Adjournment

Item No	Description	Action by
Min 1/22	**Introduction**	
	- The Meeting was called to order by the area Chief at 4:45 pm. - One of the village elders gave a prayer to Commence the Meeting	Moses Galoro Asst. Chief Kargi Location
Min 2/22	**Opening Remarks**	
2.1	- The Chief welcomed the Members and went ahead to introduce the Consultancy team (Centric Africa)	Moses Galoro Asst Chief Kargi
2.2	- Further, he briefly explained the objective of the Meeting to the Members of Kargi Centre.	

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Min 3/22	Remarks by the Consultant	
3.1	Mr. Daniel Chumo an Environmentalist from Centric Africa informed the attendees that the Government of Kenya, via Ministry of Energy, Kenya power & REREC, and in Conjuction with the World Bank are planning to install a Solar-Minigrid at Kargi for the Supply of electric power. He informed the participants of the Scope of the Proposed Project and the various Sub Components.	Daniel (Environmentalist) Centric Africa)
3.2.	The Environmentalist further informed the Members the NEMA guidlines as Stipulated under Environmental Impact assessment and Audits) Regulations 2003 that requires a public Participation to be done before Commencing any Proposed Project. Public Consultation Should be done for immediate neighbours and other relevant Stakeholder to the Project. This is an aim to Consider the adverse impacts that may arise to the Proposed Project.	
3.3	The Environmentalist further explained the Anticipated impacts, both negative and positive, during the Project Cycle. He went and assured the Members that Proper Mitigation Measure will be inplace to during the project Cycle to Curb & Minimise the anticipated impacts	

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Min 4/22	Concerns / Issues from participants	
Q1.	Where are the measures put in place to ensure the risk of flame outburst as a result of the installed electricity. Considering most of the households are thatched with vegetative material.	Mr. EHELE
Q2.	When will the project start?	Mr. Oromo
Comment & Suggestion	The proposed project will provide lots of benefits to the community. Such as job opportunities. However, priority should be given to the locals when seeking out labour force.	Mr. Rousso
Comment	The project is highly anticipated as the positives will help improve the standards of living at Kargi	Mrs. Mary

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Min 5/22	Responses given by the consultant	
Q_1	Clarified that there are rules & regulations that govern the risk of flammability in regards to electric installation which should be adhered to. Electric Specialist will be involved in the project who will ensure that proper protocals are followed to minimize such risks. • Wiring of the households will be done at the cost of the owner and it is advised that an electric specialist is engaged to carry out the wiring.	MoE Dep. Mr. Maneno
Q_2	Procedures to implement the project are underway and the project will start as soon as Compliance is met including acquiring a NEMA Licence for the proposed Project.	MoE Dep Mr. Maneno.

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Min 6/22	**Acceptance/Rejection of the project**	
	All the issues of Concern having been Properly addressed, all the Members demonstrated acceptance of the project.	
Min 7/22	**Adjournment**	
	The Meeting was adjourned at 6:30 pm.	

Minutes Prepared by: Matthew Kasiva Mutua Date 17/1/2022

Position Environmentalist Centric Africa

Signature

Minutes Confirmed by: Moses Galord Date 17/01/2022

Position Snr Ass Chief

Signature

MOSES GALORD
ASSISTANT CHIEF
KARGI LOCATION

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REREC

Kenya Power

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

Venue: KARGI

Date: 17/01/2022

Time: 4.18 pm

#	Name EHELE EARAKHOLE	Position/Institution/ Location/Village	Phone No.	
1.	Kabal.		0715206256	
2.	Kabale wagara	KARGI	0745586562	
3.	Ahmed hussein	Kargi	0758277146	
4.	Gaisugo Garawahle	Kargi	0717917436	
5.	Dere Sambaiyah	Kargi	0768308870	
6.	Khakhuma Elsimrdana	Kargi	0713927946	
7.	Simiti Morsa	Kargi	0716614364	
8.	Francis Ichobacha Lito	Kargi	0791415833	
9.	Gangeisa Sigirte Mosir	Kargi	20877004	
10.	Ltalakwan Sanget	Kargi	30200073	

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REREC

Kenya Power

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

Venue: Karga Shanty Camp

Date: 17/01/2022

Time: 4:15pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	DOKHE TITUS GUMATHI	Youth.	0792906865	
2.	NASIR LEBA	YOUTH	0797955385	
3.	Billow Mohammed Galgarde	YOUTH	0711791463	
4.	Ahmed Hussein	Youth	0758277146	
5.	Khobocha obeile	Youth	07578 20656	
6.	Pius Malamo dayo	Youth	0742612750	
7.	Ntomiran E. Mirdana	Youth	0790606973	
8.	Salat Burra	Youth	0757608346	
9.	Abubakar Ahmed	Youth	0715360095	
10.	Khobocha Jilbogale	Youth	0702510406	

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Baraza

Kenya Power

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

Venue: KARGI

Date: 17/01/2022

Time: 4:12 PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	FOZIH LEBA	Kargi	0725002877	
2.	LEBAN Barako	Kargi	0746079549	
3.	WABOYA SILAMO	KARGI	0758277237	
4.	Duana Sawen	Kargi	0714206394	
5.	Anzer Nkolei	Kargi	0707478206	
6.	Harkena Russo	Kargi	0701744831	
7.	Abdinoor Abdullahi	Kargi	0715904545	
8.	Abdirahman Idhoro	Kargi	0714238753	
9.	Bullow Mohammed	Kargi	0711791463	
10.	JAMAH BUROYA	Kargi	0716698990	

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Kenya Power

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

Venue: .....

Date: 17/01/2023

Time: 4:12 PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Leverti Lebolse	Kargi	0727222773	
2.	Abdalad Ranger	Kargi	0705349874	
3.	Rashid Buroja	Kargi	0725170286	
4.	Il maseyan Russo	Kargi	0725243346	
5.	KHANDEWA BUROJA	Kargi	0797793425	
6.	Galagatha Ozom	Kargi	0742569325	
7.	Algo Orkhelam	Kargi	0791540731	
8.	LETIWA MATHACHO	Kargi	0790666634	
9.	Irana Mirkalkona	Kargi	07 02986811	
10.	Chimale	Kargi	0746502354	

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

Venue: .....

Date: 17/01/2022

Time: 4:08pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Wadenel Galgesa Orre	Kargi	0792341686	
2.	Worano E. Galboran	Kargi	0796763.58	
3.	FATUMA DALACHA	KARGI	0743679733	
4.	GOCHE MATHEW KOJIBO	KARGI	0740831242	
5.	ARIGELLE MATHEW MACAPELLO	KARGI	0702388767	
6.	JAMILA CHOYA	KARGI	0769745452	
7.	DEBELICHO LOKUMEK	KARGI	0797992938	
8.	RABHAYO PETER	KARGI	0719408535	
9.	NABORU ACI BODICHA	KARGI	0703253789	
10.	Samuel Mirkel Kona	Kargi	0796714541	

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

Venue: ..... Date: .....

Time: .....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Daniel Chuma	Centric Africa Ltd	0718068577	
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REREC Buraza Kenya Power

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

Venue: KARGI Date: 17/1/22

Time: 4:01pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	BARAKA BUROYA	KARGI	0742113621	
2.	GEYFULE - DOMLE	KARGI	0705301746	
3.	Halkanyame Isandap	Kargi	0791526938	
4.	Halowa Rabbayo	Kargi	0721280055	
5.	Hussein Turya	Kargi	0706923394	
6.	Joseph JILOTE SILAMO	KARGI	0700580381	
7.	Nasir LEBA	KARGI	0797955385	
8.	Hawa BUROYA	KARGI	0757820656	
9.	Abubakar Ahmed	KARGI	0715360095	
10.	Wario Elmimidana	Kargi	0701127781	

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REREC WOMEN Kenya Power

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

Venue: KARGI Date: 17/01/2022

Time: 3:50 PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Sabthiyo Gargorowle	Kargi	0795226889	
2.	NKoror Leiborkwe	Kargi	0794413975	
3.	Najito Galboran	Kargi	0114281295	
4.	FOZIA LEBA	Kargi	0725002877	
5.	Elizabeth Ogom	Kargi	0746672925	
6.	soLoya baLLo	Kargi	0705583109	
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WOMEN

REREC

Kenya Power

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

Venue: KARGI

Date: 17/01/2022

Time: 3:50 pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Deraso Ilmothi	Kargi	0743 910 429	
2.	Sibiryan Galboran	Kargi	0714 514 868	
3.	Kuruke bullo	0708730937	Kargi	
4.	Ejereya Lafte.	0745440822 ~~0708730937~~	Kargi	
5.	Ntebes Galoro	0704 98 19 34	Kargi	
6.	Nchulug ELemo	0704 855388	Kargi	
7.	Buro Larabi	0741381739	Kargi	
8.	Nolaso ELEMO	Kargi	0797398216	
9.	LESIGIRA ELSINWORO	Kargi	0740442922	
10.				

ASSISTANT CHIEF KARGI LOCATION

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DAMON

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

Venue: KARGI

Date: 17/01/2022

Time: 3:50 PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Nabeheya adichareh	Kargi	/	
2.	Sabthiyo Adichareh	"	0715767149	
3.	Kolothe Arathithe	"	0707089528	
4.	Woroso ElsimEkalo	"	0690106 45	
5.	Wahareya Choya	"	0710425354	
6.	NKimoroi Nayaba	"	0764235 23	
7.	Diramo Isandap	"	0745440571	
8.	Talaso Nayaba	"	0743864678	
9.	Nihimo burcha	"	0740951322	
10.	Tiliye Kele	"	0743232675	

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RAREC

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

Venue: KARGI

Date: 17/01/2022

Time: 3:50PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Uricha furo	Kargi	0700913524	
2.	Silango Elsimworo	Kargi	0795161661	
3.	Kulamo baro	Kargi	0795091562	
4.	Mary mogor	Kargi	0797595184	
5.	Midisayo Elsimkele	Kargi	0706922529	
6.	Kulamo Ogom	Kargi	0724922106	
7.	Koreya Elsimharawo	Kargi	0796079431	
8.	Naray mogor	Kargi	0711790825	
9.	Garimeo Arathithe	Kargi	0796079602	
10.	Kabale magara	Kargi	0745586562	

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

Venue: KARGI Date: 17/01/2022

Time: 3.50 PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Nakuti Cheya	Kargi	0727048525	
2.	Lucia Leiber	"	0715435761	
3.	Khobaso Dokhe	"	0769010653	KhoBaSo
4.	Khoboso Sawen	"	0704552780	
5.	Netisai Sarai	"	0725131588	
6.	Ogoga Gurleyo	"	0711790938	
7.	Hiroya Wambile	"	0769752557	
8.	Robeya Esymwore	"	0726754935	
9.	Gurgura Isandap	"	0792235085	
10.	Seleyan Lito	"	0706390241	

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

Venue: KARGI

Date: 17/06/2022

Time: 3:50PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Deraso Arbele	Kargi	0712534974	
2.	Hawo buroya	kargi	0706719500	
3.	Mary Elbahle	kargi	0711790446	
4.	Wahareya Khemo	kargi	0746887376	
5.	Mary mifo	kargi	0719231639	
6.	Sabthiyo Idris	"	0717518408	
7.	Asha galmagaleh	"	0725930822	
8.	Asia Isandap	"	0704560527	
9.	Sabthiyo Lafte	"	0727650492	
10.	Safi Wambile	"	0715061615	

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

Venue: .....KARGI.....FGD.....MEN.....

Date: .....17/1/22.....

Time: .....10:15 PM.....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	PURKEL	Kargi Centre	0707185635	
2.	EHELE E. ARAKHOLE	Kargi	0715206256	
3.	AF BALAd-EISMGAR	KARGI	0705 349814	
4.	III WORONO ECCALBORAN	KARGI	0797676358	
5.	DUANA SAMBEN	KARGI	0714 206394	
6.	LEZIMUU BUROYA	KARGI	0743650430	
7.	ALGO DRUITULAM	KARGI	0791540731	
8.	LETIWA MMARITO	KARGI	0790606638	
9.	DEBELICHO WAMBALE	KARGI	0797929938	
10.	LEKUBU CHOYA ABATO	KARGI	0716446287	

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

Venue: ....FGD Tent....

Date: ....17/1/2022....

Time: ....16:15 PM....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	SULSULE HAMBULE	KARGI	0105423433	
2.	MAIR CHIMA	KARGI	0706297660	
3.	Sogure ngusa	Kargi	0716619734	
4.	guyoo kelle	kargi	0729691184	
5.	MOSES I GALOLO	Kargi	0725949978	
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MOSES GA... ASSISTAN... KARGI LO...

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REREC FGD FEMALE Kenya Power

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

Venue: KARGI Date: 17/1/22

Time: 4.05pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Haldayan Ersimtarawo	KARGI	0748920079	
2.	Galken Buroya	KARGI	0717620021	
3.	Hanfa Busofa	KARGI	0718858365	
4.	DAY. PIUS MALIMO	KARGI	0742612750	
5.	SOMO Sambakah	KARGI	0757608346	
6.	SOMO Abelle	KARGI	—	
7.	LEBURTA	KARGI	0111697662	
8.	Magara Kiuto	KARGI	0790241248	
9.	Orkofo Baro	KARGI	0796391809	
10.	DOKHE TITUS DOKHE	KARGI	0792906865	

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REREC Kenya Power

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

Venue: KARGI

Date: 17/01/2022

Time: 3:50 PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Bora Kiyere	Women	0741205312	
2.	Bordakhan Gobanai	Women	0708259474	
3.	Natadawa Mogor	Women	0799130830	
4.	Afgabo Ilimo	Women	0795536986	
5.	Nemeri Jalle	Women	0702752507	
6.	Lugayo galsaracho	Female	0707827811	
7.	Malgiseya orguba	Female	0706237590	
8.	Deraso Alyaro	Female	0792401269	
9.	Silvana Lelbor	Woman	0769483653	
10.	Bore mogor	Female.	0742073348	

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REREC FGD YOUTH Kenya Power

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

Venue: KAREI Date: 17/01/2022

Time: 4:11pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Somo Ittoro	YOUTH	0714238753	
2.	Irana Mirkaltona	Youth	0702486811	
3.	ELIAS GICHO ISAUDAP	YOUTH	0741469402	
4.	EMMANUEL LAFTE HALDAMA	YOUTH	0792-960285	
5.	Barako Liban	Youth	0746079569	
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3. COMMUNITY ENGAGEMENTS AND SOCIAL SCREENING EXERCISE FOR KARGI SOLAR MINI-GRID IN MARSABIT COUNTY

KOSAP: FINDINGS OF COMMUNITY ENGAGEMENTS AND SOCIAL SCREENING EXERCISE FOR KARGI SOLAR MINI-GRID IN MARSABIT COUNTY

BASELINE INFORMATION

1. Identified Land/Site

- The identified site for the proposed Kargi Solar Mini-grid is in Kargi sub location, Kargi location of Marsabit County
- The land is owned by the community and its status is unregistered community land.
- The County Government of Marsabit holds the land in trust for the community
- The site was identified by the community and is part of land set aside by the community for community social service projects
- Land in the area is not adjudicated and not surveyed
- No activity was ongoing at the site during the site visit

2. Socio Economic Baseline Information

1. The main economic activity in the area is pastoralism involving rearing of livestock such as goats, camels, sheep, cows and donkeys. Other livelihood activities include; businesses and employment of people in the schools, government offices and health centres
2. The public facilities in the area include; three primary public schools. One private/church based primary school, a day secondary school, ward administrator and Chiefs office, three churches and one mosque. Other community facilities/utilities include a water kiosk, police post, Catholic Church health centre, government health centre and two boreholes.
3. No activity (business or residentials) were on site at the time of site visit on the identified site
4. There will be no relocation of people, private assets or community assets at the site

3. Vulnerable and Marginalized Groups

1. The community living in Kargi are the Rendilles. The Rendilles are recognized under Kenya law as part of marginalized group in Kenya and they meet the World Bank OP 4.10 (indigenous People) criteria.
2. The family set up is patriarchal where the men are the heads of households
3. The religion practiced in Kargi is Christianity and Islam
4. The proposed project is set to supply power to people living in Kargi village and the public facilities
5. Being the overwhelming majority, and the main beneficiaries of the project benefits, the Rendille community will not require further support from the project
6. In Kargi there are vulnerable households and individuals comprising the very poor, special needs people, the elderly, poor female headed households and these will need extra support in enhancing their ability to share in the project benefits.

4. Grievance Management Systems

1. Grievances in Kargi are solved and managed by elders who are drawn from heads of households
2. Grievances that cannot be solved by the elders and religious leaders are referred to the Chiefs office
3. A grievance redress committee was constituted and the community members elected the members to deal with KOSAP project grievances

STAKEHOLDER ENGAGEMENT

Stakeholder engagement was carried out during the site identification exercise at two levels namely at the County Government of Marsabit and at the community level i.e. with the direct beneficiaries of the proposed solar mini-grid at Kargi village.

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

Project: Proposed Kargi Solar Mini-grid

Venue of meeting: Kargi shopping centre, Kargi sub location in Kargi location of Marsabit County
Date: 18/10/2021

Agendas

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

Minute 1/KOSAP/2021: Preliminaries

The ward administrator called the meeting to order at 1.55 p.m. The meeting began with a word of prayer. The ward administrator spoke in Kiswahili as one of the community members translated to the local dialect because not all the community members could understand the Kiswahili language. The administrator welcomed all in attendance to the meeting and asked the community to participate adequately during the consultation session and told the community that the chief was to join them in the meeting. He called the CREO (County Renewable Energy Officer) to welcome the project team. The CREO (Jalle) greeted the people and notified them that the KOSAP project was still on course. He also asked the community to participate during the meeting as the communities input into the project was very crucial. He noted that the national government is the one funding the project through a loan facility and the county government is also a key stake holder in the implementation. He told them that since they had been in the community before, the KOSAP team had now come to find out whether the community had identified land for the project alongside creating more awareness and screening the identified site to make sure it is environmentally, socially and technically suitable

He then welcomed the Director (Lands and Energy) to proceed with the meeting. The director introduced the officers from the County government while Rebecca (MOE) introduced the team from KPLC and MOE. The KOSAP team is as shown below.

KOSAP Project Team

S/No	Names	Position

1	Ramati Ibrae	Director Lands- Marsabit
2	Rebecca Muniu	Communications officer Ministry of Energy-MOE
3	Samuel Mbugua	Environmentalist-KPLC
4	Suleyman Gavawahle	Physical Planner - Marsabit
5	Gideon Jalle	County Renewable Energy Officer-Marsabit
6	Jacob Chepkwony	Engineer -MOE
9	Said Malko	Surveyor-Marsabit
10	Roseline Njeru	Socio Economist-KPLC

Minute 2/KOSAP/2021: Project Description

Rebbeca (MOE) explained that the national government is implementing KOSAP in partnership with County Government in 14 Counties in areas that are far away from the national electricity grid. He 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 beneficiaries. Off-grid areas are those places where the national electricity grid has not reached, and whose electricity access has been very low. The reason for choosing solar energy was because the area is far away from the national grid and the fact that the area is well endowed with natural sunlight with high temperatures.

She further expounded that the proposed Solar Mini-grid being implemented under KOSAP is part of the government's effort towards universal access to power. She said the proposed Kargi solar Mini-grid is one of the sixteen Solar Mini-grids to be funded through KOSAP in Marsabit County. She told the community that the project was in the preliminary implementation stages which requires public participation of various stakeholders.

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

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

Rebecca then welcomed the Director from Marsabit to address the community.

The Director noted that the County government of Marsabit is in support of the project as it is key in speeding up development in the County. He added that the ministry of lands and planning in the county will assist in the necessary processes in regard to land to ensure the project complies with the relevant requirements. He said that the County Government of Marsabit is in support of the KOSAP project. The director noted that most of the land in the area is community land and much of it is not registered nor adjudicated. He said the county government of Marsabit is ready to support the MOE in the KOSAP project to ensure land identified for the project will comply with the requirements of the community land Act and other relevant laws and especially that land identified for the Solar Mini-grid will be used for public purpose only i.e. to supply power to the community.

Minute 3/KOSAP/2021: Technical aspects of the project

Chepkwony explained that the technical aspects of the Mini grids will entail; the installation of solar PV panels, battery, and thermal diesel backup unit (generator) to support solar and street lights. He explained to them that once constructed the Solar mini-grid will be operated by the implementing agency REREC and the beneficiaries/those interested will be expected to pay for connection of electricity (one thousand

shillings) and do wiring in their houses. He told them that connection of power will involve passing of electrical lines along the roads in order to reach their houses, business premises and public facilities and the route for passing the lines is called way leave. He noted that once the designs are done, the community will be notified of the exact routes during future consultations and that they will be required to give way leave consent (allowing the service lines to pass through their land boundaries. He added that distribution or supply lines will cover a radius of 1-1.5km from the mini-grid for quality supply.

He told them that once connected, the beneficiaries will be expected to pay for electricity consumed and that the tariff employed will be the same as what other Kenya Power customers pay.

Minute 4/KOSAP/2021: Positive Impacts/Benefits of the Project

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

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

lighting puts off opportunistic criminals who take advantage of darkness.

11. Communications- improved communication due to availability of electricity to charge phones, opportunities to set up information communication and technology related business-like cyber cafes, access to E-government services among others.
12. Presence of electricity will also attract other business investors to invest in the area

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

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

1.	**Negative impact**	**Mitigation measures to be implemented by contractor**
2.	Vegetation clearance	• Clear only the areas that are needed to put up the mini-grid according to designs • After construction, do landscaping with grass to areas that have no electrical installation as opposed to living areas bare • Re-vegetation by planting of trees
3.	Air pollution linked to dust from construction activities	• Water active areas to suppress dust • Fence off construction site • Use of masks by workers • Limit vehicle speed to minimum possible when passing residential areas and the centre
4.	Air pollution from vehicle emissions	• Maintain and service vehicles • No idling of vehicle's engines
5.	Solid waste	• Clear all solid waste and dispose in line with NEMA guidelines
6.	Land. As you had been briefed before, the site identified should; -must not result in displacement of community members - We must avoid land that is currently settled or which has squatters.	• The MOE is going to give compensation in kind for the land identified for the project.
7.	Occupation safety and health hazards e.g. accidents, fall from heights, pricks by sharp objects	❖ Use of proper personal protective equipment like gloves, overalls, helmet, safety shoes ❖ Allocating work according to skills ❖ Toolbox talks to workers to identify hazards and risky activities and putting mitigation measures

		❖ Close supervision of work
8.	Labor influx. The nature of the project will require technical skills that are not all available in this community. This will require movement of construction workers (labour influx) into this community. There are some risks that are involved with labor influx and we need to mitigate them as follows to avoid negative impacts on our community.	❖ Reduction of labor influx by recruitment of local workforce to the extent possible especially unskilled and semi-skilled jobs by the contractor as much as possible.
9.	Risk of social conflict due to competition for resources and opportunities	❖ ❖ We shall establishment and operationalize an effective Grievance Redress Mechanism accessible to community members where your grievances can be sorted ❖ Awareness-raising among local community and workers on the need to have a good /cordial working relation ❖ Consultations with and involvement of local communities in project planning ❖ Provision of cultural sensitization awareness for workers regarding engagement with local community. ❖ Contactor shall make provision to provide resources needed by the workers if the need for such resources may result to competition and conflicts e.g. water ❖ Working closely between contractor and the project grievance redress committee to address complains on time.
10.	Increased illicit behavior and crime (including prostitution, theft and substance abuse)	❖ Sensitization campaigns both for workers and local communities against such social evils (like we are doing) ❖ Enforcement of sanctions (e.g., dismissal) for workers involved in criminal activities
11.	Spread of diseases (including STDs and HIV/AIDS)	❖ Education/awareness about transmission of diseases ❖ Awareness creation on STDs among the workers and local community on ethics, morals, general good behavior and the need for the project to co-exist with the neighbours during the community and worker engagement forums. ❖ Provide condoms to employees
12.	Public health issues such as spread of diseases like Covid 19	❖ Adherence to ministry of health protocols issued ❖ Avail hand washing facilities –water and soap ❖ Keeping social distance to the extent possible ❖ Use of face masks

		❖ Encourage workers to be vaccinated
13.	Gender-based violence i.e. sexual exploitation and abuse of the community members by workers	❖ Information and awareness raising campaigns to you community members and specifically women and girls on need to be on the look-out and raise such issues/complaints ❖ Mandatory awareness creation for workers by contractor on required lawful conduct in the community and legal consequences for failure to comply with laws ❖ Requirement of contractor to have code of conduct for the workers and to implement them ❖ Working closely with chiefs and local law enforcement to act on community complaints on time
14.	Gender-based violence i.e. sexual harassment among workers	❖ Requirement of contractor to have code of conduct for the workers and to implement them ❖ Inclusion of GBV specific mitigation measures in the environmental and social management plan of contractor
15.	Child labour	• Ensuring that children and minors are not employed directly or indirectly on the project. • Enforcement of Employment Act that requires contractor to adhere to minimum age • Allowing your children to be employed is illegal and punishable by law because it interferes with the children's right to education • Report any case to the chief's office
16.	Demand for Material/resources e.g water, sand, ballast	Contractor to consult with elders before using scarce resources in the community like the water to avoid conflicts.
17.	Oil Spill Hazards	• Contractor not to repair vehicles or equipment on site • Maintain vehicles and equipment in good state of repair
18.	Storm water and erosion	• Contractor to put measures to harvest rainwater and control erosion during construction
19.	Wastewater/ effluent	Contractor will provide sanitation facilities for workers
20.	Noise resulting from excavation machinery, vehicles and workers	• Contractor to work only during the day • In case of blasting contractor to give notice to community through the village elders, grievance committee and chiefs office
21.	Visual and Aesthetic Landscape Impacts	• The visual negative impacts can be mitigated through putting up a wall round the facility to keep off/screen the project stacks, poles, panels • Proper siting decisions can help to avoid aesthetic impacts to

		the landscape.
22.	Fuel storage on site	• Contractor will undertake proper installation of the fuel storage tanks for the back-up generator. • Have a budded wall 1.5 times the fuel stored to allow controlled collection in case of a spill. • During operation implementing agency will ensure proper maintenance of the solar panels
23.	Public safety –potential risk of shocks and electrocution	As explained below in details

Public safety in regards to electricity

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

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

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

Samuel told the community that one of the agendas of the project team's visit was to check the land/site that the community had or would identify for the project. The project team together with the community would undertake an environmental and social screening to determine whether it is appropriate for the proposed solar Mini-grid project. He then emphasized the aspects to consider while identifying the land for the project. He explained to the public forum that the land identified need to meet certain criteria to ensure it is suitable for the Mini-grid. He listed the criteria as follows; the land need to be relatively flat, not prone to flooding, stable soils, not resided by families, ability to receive maximum sunlight, land which has no conflicts and one that is central to residents and public facilities so that it will be possible to supply more people in the target community. He added that the project needs about 2-3 acres of land.

Rebecca told them that land falls under the category of community land and its use and management is governed by the Community Land Act 2016. The community was told that land under this Act is owned by the community but is held in trust for them by the County Government of Marsabit because the community is not registered. She noted that the government of Kenya had secured a loan from its development

partners i.e. World Bank to implement the KOSAP project. She explained that the government was seeking partnership with the community in the KOSAP project where by the community would identify land for setting up the solar mini-grid while the government would provide the money for setting up the solar mini-grid.

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

Rebbeca educated the community on the following issues;

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

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

Survey of the land and request for advance possession.

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

Selection of the community projects

The ward administrator thanked the community for continued fruitful engagements. He asked the community to discuss on the issue of land and also on projects and the following were selected in order of priority.

1. Equipping of the maternity ward at Kargi dispensary
2. Class rooms at Kargi primary

Minute 7/KOSAP/2021: Plenary session

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

	Name	Questions/suggestions	Response	Response by agency on how feedback will be used or acted upon
	Somiso Lmongoi	We welcome the project as we have heard it will be beneficial to us. Land is available and we shall identify land for the project	Noted	-
	Rose Nanni	The project is good and it is welcome. We are also happy about the community project to be done for the community	Noted	-

Photo of the community Meeting at Kargi

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

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

Existing grievance redress mechanism in the village.

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

KOSAP Project GRM:

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

5. Locational grievance redress committee. This is the lowest level (forum) where the community will get project information and also ask questions. At this level you the community will choose project committee members who will also double as grievance redress committee. The membership will comprises; elders/men representatives, representatives from women, youth, special needs (persons with disability), and the office of the chief as Ex-officials. This will be the first stop for receiving information and raising grievances. The members to be chosen should possess leadership skills and it is hoped that most of the grievances will be resolved at this level.
6. The second level of grievance redress will be the County Grievance Redress Committee comprising members of the County working group. This committee is at the county level and will resolve complains or issues that are unable to be resolved at the locational/project level. The chairman of the project grievance redress committee at the community will forward issues/ complains to the county grievance redress committee through CREO who will also be responsible for giving feed back to the local committee.
7. The third level will be the National grievance redress committee comprising of KOSAP Project Implementation Unit at the Ministry of Energy and the implementing agencies. Matters that not resolved at the County level will be escalated to this National GRC by the CEC-Energy
8. The last level of the GRM for the community or project affected persons will be arbitration or legal redress in a court of law once all the three levels have been exhausted.

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

S/No	Name	Representative of	Contacts
1	Somiso Lmongoi	Men	0793554902
2	Gabab Elsimbaitor	Men	0703359618
3	Rose Nanni	Women	0716715112
4	Abdirahman Somo	Youth	0714238753
5	Nomiran Phillip	Youth	0790606973

Minute 9/KOSAP/2021: Focus Group Discussions

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

a) Focus Group Discussion with the women

Roseline (KPLC) explained to the women that it was important to hold a separate discussion with them so that they have opportunity to freely express themselves. One focus group discussion was held with the women. She explained the agenda of the visit by the officers from national government and county government i.e. was to undertake an environmental and social screening of the identified site to check suitability in terms of environmental, technical, social and health requirements. The second objective was to undertake community engagement to sensitize the community on the project. The third objective was to explain the land requirements for the project and the need for a project grievance redress mechanism. She then gave a summary of the project in terms of its positive and negative impacts and their mitigation measures and the requirements for identifying land for the project. She also explained the need for the women to select a representative to the project committee who would represent their views/issues to the committee for redress.

The discussion went further to bring out issues on how the women can take advantage of the project benefits rather than taking a back seat. She then explained to them that women would benefit more from the electricity because there are the ones who are more exposed to unclean energy as they are the ones who take more time in the kitchen. They would also benefit from access to information through use of radios and TV that are powered by electricity enabling them to make informed choices on different issues such as nutrition, health among others. They were also set to benefit if they could set up small businesses like salons, cold drink kiosks, children will have time to study and enhanced security due to the fact that the area will be well lit among other benefits.

Gender based violence issues were also discussed and emphasized because women and girls are more affected by gender-based violence due to the subordinate status of women in many societies, discrimination against them and their higher vulnerabilities to violence. She noted Gender-based violence takes many forms, including sexual, physical, and psychological abuse. Other issues discussed were the importance of addressing GBV incidences and the need to report and document any complaints against workers, while ensuring survivor centred approach (respect for the choices, wishes, rights and dignity of the survivor). The women were told to be more vigilant to ensure young girls do not fall prey to GBV incidences (sexual exploitation and abuse). The women were requested to keep talking to the girls on GBV risks and the need to raise alarm in case of risk factors to ensure prompt redress.

<u>Plenary Session</u>

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

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**

	We welcome the project. Will the project employ women	Yes -in case they are able to do the jobs available	
	How much is the electricity token	Electricity tokens to be bought will depend on ones consumption. The tariff to be employed is the same as the one be paid by other Kenya power consumers which is less than 20 Kenyan shillings per unit	

Photo of Focus Group discussion with the women

b) Focus group discussion with the youth

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

Plenary Session

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

Question, Suggestions, feedback and response for Focus group discussion with the youth.

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

	We have no objection to the project. How many job opportunities will be available	We may not give an exact number now. Jobs will be allocated to people in line with their skills. For unskilled jobs priority will be given to the local community. For skilled jobs community members can also be employed if they have the skills	-
	How much is the connection fee	Ksh 1000	-
	How affordable is the power because we have heard of other communities that have mini-grids and the people have been complaining because of the cost	The cost of the power is affordable because the solar mini-grid installation is being funded by the government and not a private investor. The tariff will be as the one paid by Kenyans who are connected to the national grid	-
	What is the quality of supply of this mini-grid	Quality of supply is fine, it is as the one in the national grid provided we are not more than one kilometre to the mini-grid.	-

Photo of the Focus group discussion with the Youth

c) Elders/men discussions

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

Gender based violence issues were also discussed including; forms of GBV, rationale for addressing GBV, ways in which a project can worsen existing GBV risks or create new risks, the need to report and document any complaints against workers and report incidences of GBV. The men were told to be more vigilant to ensure young girls do not fall prey to GBV incidences. All the Men were in agreement for the project to be brought to the area

The elders/men said they welcome the project and that they had already agreed on the portion of land where the project would be implemented i.e. part of the land which had already been set aside by the community for public utilities. They were also given opportunity to air their issues/ questions and or /give suggestions to make the project implementation process better.

Plenary Session

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

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team	Response by agency on how feedback will be used or acted upon
Algore Ruso	We the people of Kargi are very happy with the project. We ask that it be implemented immediately	-	
Van Galo Lito	We welcome the project but we request because our people have not interacted with power there be awareness campaigns on safe use of electricity before implementation	Noted	

Photo of Focus Group discussion with the Men

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

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

CONCLUSION

1. The community welcomed the project and is in support of the project.
2. No residential houses and no economic activity or business premises were on site during the site screening

3. Land identified belong to the community and is communally owned, representatives of the community signed the land forms as a sign of commitment
4. There will be no physical or economic displacement because the site identified was already set aside for community social projects
5. In terms of consultations one public meeting was held with the residents of Kargi. In addition, focus group discussions were held separately with the men, the women and the youth to enhance the stakeholder engagements. The engagements were fruitful and the community identified land for the proposed Mini-grid.
6. The need for a grievance redress mechanism (GRM) was explained to the community including the need and roles of a grievance redress committee (GRC). A GRC was chosen with representatives from the men, women and youth.
7. The need for advance possession of the land as the process of survey and registration progresses was explained to the community and the community agreed to the request.
8. It was explained to the community that it will be their responsibility to pay for connection to power, wiring of their premises and to pay for power consumed
9. The community choose a priority project as compensation in kind which is equipping of the maternity ward at Kargi health centre

The meeting ended at 4.07 p.m.

Recommendations

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

ANNEX
List of Attendance of the Community Engagements meetings
Main Meeting

REPUBLIC OF KENYA

MINISTRY OF ENERGY

MARSABIT

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 KARGI MINI GRID

MEETING VENUE KARGI SHOPPING CENTRE

DATE 18/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	SELEMU DOKHE		0794413994	MALE	URAN EN	
2.	GABAR ECHMBARTOR		0703359618	MALE	GABANA	
3.	SUPPORT HIRENA BULTAR	28024144	0751602379	MALE	DUPSAHAI	
4.	DUFANKHARO LITO		0725173811	MALE	GABANA	
5.	JAMAL BUROYA	32959551	0716698990	MALE	NEBEI	

6.	ALI Hero bodicha	28218319	0703259789	MALE	Town	
7.	IKTINGA LAFTE	0634249	0702234655	MALE	GABANA	
8.	SOMISO LMONGOY	0630724	0793554902	MALE	ENGELI	
9.	LARABASI ARBELE			MALE	RONGOMO	
10.	NARATE BULOBORE SABAKAH	0063463	0715762287	MALE	GALE	
11.	MBONO ADICHAREH		0795720914	MALE	GATINELAN	
12.	BICHOWLO SAMBAKAH		0713829302	MALE	SALLE	
13.	NORGOT LITO	20876224	0711793909	MALE	GABANA	
14.	ARBOLE LEKARGI AUSSO	0026912	0718255912	MALE	RONGINO	
15.	MATAHNEN GOBANAY	9847457	0710101429	MALE	SALE	
16.	JARAMAN ARIGELE		0768137216	MALE	URAWEN	
17.	LODUNGU OGOM		0798094665	MALE	URAWEN	
18.	GARBEITU ECHIRIBANA			MALE	NBEI	
19.	KOLALO ZIENTHUROLO			MALE	GABANA	

20.	AKAT ISOLE			MALE	NAHGAN	
21.	Safi Kimogor	21508158	0727915294	female	Sale	
22.	Hiroya – E. afgalbaho		0721605290	Female	Rengumo	
23.	NANIGETA EISMIRDANA	0632518	0716715112	FEMALE	NEBEI	
24.	BILISO KURE	9691238	0721987078	FEMALE	BOPSAHAI	
25.	NAKOTI CHOYA		0727048525	FEMALE	GOBORRE	
26.	SABTHIYO GALORO		0790008794	FEMALE	GALORO	
27.	KOLOTHE ARANDDE	28982088	070708828	FEMALE	BUPSAHAI	
28.	MARY DERASO MOHOR	34115243	0797595584	FEMALE	URAWEN	
29.	FATHE MOGOR	21219389	0704331547	FEMALE	URAWEN	
30.	LEITI GURLEYO			MALE	DUPSAHAI	
31.	GUYO GALORO	0024604	0726313060	MALE	GALORO	
32.	PETER KULMICHA OBEILE	29593187	0717231056	MALE	ELEGELA	
33.	Paul Duba Ogom	29705486	0704788670	MALE	Bagasi	

34.	Ahmed Khadhiro Isandap	30005126	0722263391	MALE	Urawino	
35.	KHOBOCHA BARO	22977480	0712522207	MALE	GARTHEILAN	
36.	Pius Malimo Dayo	34491976	0722612750	Male	Otholo	
37.	Suleyman Garawale	28884708	0713663871	Male	Staff - County	
38.	Said Nyaiko	29640655	0726480199	Male	Staff - County	
39.	Ramat Ibrae	27882047	0726121720	Male	County	
40.	Jacob Chepkwony	22569704	0722945714	male	MOE	
41.	Samuel Mbugua	22288108	0720986314	Male	Kplc	
42.	ROSEMARIE NJERU	14676394	0720857017	Female	KPlC	
43.	Isandap H. Hirbena	24685340	0712732813	male	CGM	
44.	Adawo Qilamo	26830196	0710191407	Male	Urawen	
45.	Moses I Galaro	20874365	0725945578	Male	Chief	
46.	Gideon Gesile Jille	29758031	0716819494	Male	MOE	
47.	Samuel Mbugua	22288108	0720862314	M	KPlC	

48.	Rebecca Munia	11307776	072342[illegible]	F	Mc	[illegible]
49.						
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List of Attendance for the Men Focus Group Discussion

REPUBLIC OF KENYA

MINISTRY OF ENERGY

MARSABIT

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 ...KARGI MINI GRID

MEETING VENUE...KARGI SHOPPING CENTRE

DATE 18/10/2024

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD MEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	Galab Gumbalto	—	0703595902	Male	Town	[signature]
2.	Mboro Adichaneh	—	—	Male	Town	
3.	Nolacho Sambakah	—	—	Male	Town	
4.	Galbetu Eisimmidana	—	—	Male	Nebei	
5.	Leiti Guleyo	—	—	Male	Dubsahai	
6.	Horgut Lito	—	—	Male	Bagasi	
7.	Samson Lmorgoi	0630724	0793554902	Male	Town	[signature]
8.	Larabari Arbelle	—	—	Male	Town	
9.	Alat Isole	—	—	Male	Ririma	
10.	Sallamo Dokhe	—	—	Male	Uawan	
11.	Lodungi Ogom	—	—	Male	Uawan	
12.	Bichoole Sambakah	—	—	Male	Gangeisa	
13.	Algale Russo	—	—	Male	Gangeisa	
14.	Samuel Mbugua	—	—		KPLC	[signature]
15.	Gideon Gesile Jalle	29758031	0768794994	Male	MOE	[signature]
16.	Sulayman Garawahle		0713663581		County	[signature]
17.	Ramat Ibrae	27882047	0726171720	Male	County	[signature]
18.						
19.						

List of Attendance for the Women Focus Group Discussions

REPUBLIC OF KENYA

MINISTRY OF ENERGY

MARSABIT

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 KARGI MINI-GRID

MEETING VENUE KARGI SHOPPING CENTRE

DATE 18/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD WOMEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	Safi Kimogol	21508158	0727915294	Female	Sale	[signature]
2.	Falke mogor	21219389	0704331547	f	Urawen	[signature]
3.	Hiraya E. Afgalbale			f	Renguma	—
4.	Rose - G. mirdany			f	Nebey	
5.	Humatto Arbelle	~~0902~~	0707484777	f	Renguma	
6.	Nakuti - Choya	~~[illegible]~~	0727046525	F	Gobore	
7.	Sabkiyo E. ngalaja			F	Galoro	
8.	Kolothe - Isandap		0708089538	F	urawen	
9.	Guyo - Galoro	0024624	0726813060	male	Galoro	[signature]
10.	Barkso - Kure	9691238 ~~[illegible]~~	0721987078	f		
11.	Deraso - mogor		0791595884	f		
12.	Rosene Njeri			F	Kpic	[signature]
13.	Rebecca Muiru	0728922608		F	MSE	[signature]
14.	Nabore Horgule		0714715431	F	Town	[signature]
15.						
16.						
17.						
18.						

List of Attendance for the Youth Focus Group Discussion

REPUBLIC OF KENYA

MINISTRY OF ENERGY

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

SITE ...KARGI...

MEETING VENUE..KARGI....SOCIAL HALL

DATE.18/10/2021.

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD YOUTH

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	JAMAH BUROYA	32959551	0716698940	Male	Nebei	[signature]
2.	Ardano Olmo	26830190	0710091682	Male	Lowen	[signature]
3.	Khotobe Ban.	23974980	0712522207	Male	Bosghalam	[signature]
4.	ABDIRAHMAN SOMO Idhoro	35677004	0714258753	Male	Ongeli	[signature]
5.	Support Hirkena Bulyabe	28024144	0751602375	Male	Dubsahai	[signature]
6.	Ali Haro Bodicha	28216519	0703259789 Male	Male Town	Town	[signature]
7.	Peter Kulmicha Obeile	25593187	0712287056	MALE	Elegela	[signature]
8.	Ahmed Khadhir Isandap	30005126	0722263391	MALE	Urweino	[signature]
9.	Billow Galsaracho	29016374	0711791465	MALE	Mlimani	[signature]
10.	SHABAN Isandap	35302988	0705584512	MALE	TOWN	[signature]
11.	Arobo Gambale	30055585	0703575704	MALE	GALTHEYLAN	[signature]
12.	GISEWA OBEILE	24076307	0723474678	MALE	ELEGELA	[signature]
13.	Jacob Chepkwony	22589704	0722945714	M	MoE	[signature]
14.						
15.						
16.						
17.						

ABBREVIATED RESETTLEMENT ACTION PLAN (A-RAP)

1. Kargi Sub-project Site

The Kargi sub-project site is on unregistered community land and held in trust by the County Government of Marsabit on behalf of the community, in line with the Community Land Act 2016. The proposed site is uninhabited, has no structures, community facilities, or encumbrances. Consultations leading to the identification and selection of the sub-project site are captured in the Environmental and Social Screening report for Kargi. *Refer to Chapter 4 of the ESIA for the comprehensive socio-economic profile.*

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

The number of project-affected persons (PAPs) is 3700 (approximately 620 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 1.494 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 Kargi community proposed are Equipping of the maternity ward at Kargi dispensary, and classrooms at Kargi primary 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	Government agencies.	No compensation for public land allocated to another government body.	

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

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

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

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 Kargi 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
18th October 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).	None	None
17th January 2022	Environmental and Social Impact Assessment.	Consultants MoE KPLC REREC	Land acquisition through compulsory acquisition (not	The community proposed the equipping of the maternity	The proponent has set aside KES 1 million to implement the priority in-kind compensation project.

			voluntary land donation). Selection of three priority community projects, whereby one is to be implemented as in-kind compensation for land.	ward at Kargi dispensary 2. Classrooms at Kargi primary.	The value of the project will be proportional to or greater than the value of land. NLC will determine the value of land.
May 2023	Compulsory Land Acquisition.	NLC	Site inspection and inquiries. Land valuation. Award of compensation.		

5. Institutional Responsibility for Implementation of the ARAP

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

6. Procedures for Grievance Redress

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

7. Implementation Timetable and Budget for the ARAP Implementation

7.1 Timelines

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

7.2 Budget

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

5. Firm and Lead Expert's EIA Practicing License

FORM 7 (r.15(2))

nema
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NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/18263

Application Reference No: NEMA/EIA/EL/23929

M/S **Norken International Limited**
(individual or firm) of address
P.O. Box 9882 - 00100 NAIROBI

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

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

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

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified

FORM 7 (r.15(2))

nema
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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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registration number **1893**

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

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

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001 BUREAU VERITAS Certification UKAS

ISO 9001:2015 Certified