

MINISTRY OF ENERGY Nairobi Republic of Kenya



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

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

Comprehensive Project Report (CPR) FOR THE PROPOSED LOCHWANGIMATAK OFF-GRID SOLAR PROJECT AT COORDINATES 2°36'11.0772"N 35°39'09.3672"E

2023





# 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 community members at Lochwaa, Turkana County as well as from primary and secondary sources. It is therefore, issued without any prejudice.

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

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# LIST OF ACRONYMS

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

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# **EXECUTIVE SUMMARY**

#### E1- Introduction and Project Brief

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

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

In Turkana County, one of the target counties, the Proponent is proposing to develop a number of mini grid facilities including Nakwamoru 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 Categorisation and Justification

In the World Bank context, there have been several projects supported by the organization that aim to provide electricity to communities located far from the national grid. These projects utilize off-grid approaches, meaning they are independent of a national or regional grid. The experience gained from these projects provides valuable guidance for designing sustainable off-grid electrification initiatives, particularly those targeting dispersed and economically disadvantaged communities. The Nakwamoru proposed site aligns with this category of projects that the World Bank has been involved in.

In the Kenyan context, the Environmental Management and Coordination Act (EMCA) of 1999, as amended in April 2019 through Legal Notice No. 31, classifies solar power farms and plants as medium risk projects. This categorization provides a framework for assessing and managing the potential environmental and social impacts associated with such projects. By categorizing the Nakwamoru site as a solar power facility, it falls within the medium risk project category as per the Kenyan legislative framework.

#### E- 3 Approach and Methodology

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

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

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

#### E-4 Proposed Project

The proposed Project site is located on unregistered community land measuring approximately 0.67Ha in Lochwaa Village, Lochwaa Sub-location, Lochwaa location, Lokichar ward, Turkana South Sub-County in Turkana County at GPS coordinates of Latitude 2°36'11.0772"N and Longitude 35°39'09.3672"E and 58km South of Lodwar town and 27Km North of Lokichar. The proposed project site is on an open space off Kapenguria-Lodwar road.

The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity. A Low Voltage Power Distribution Network will be established to distribute the power to customers. The estimated cost of the project is around **USD. 740,781.82** although this amount may change as more detailed plans are developed.

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

To develop the Mini Grid, approximately 0.67 Hectares of land will be compulsorily acquired by the NLC. This land is part of the community's designated public purposes area. The Proponent engaged with the community during the land acquisition process, and there were no objections to transferring 0.67 Hectares of land to Kenya Power and Lighting Company (KPLC) for the management of the solar mini-grid. In accordance with the World Bank's Operation Procedure 4.12 on Involuntary Resettlement, an abbreviated

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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 solar mini grid will contain Solar panels, batteries, invertors, perimeter fence and length of transmission line to cover a radius of approximately 3km. The project is expected to serve 361 consumers of which 352 are residential and 9 are non residential with an average of 30 shops as commercial and public facilities and two schools and one dispensary.

## E-5 Analysis of Alternatives

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

## E-6 Baseline Information

The project is located 58km South of Lodwar town and 27Km North of Lokichar on an unregistered community land measuring approximately 0.67Ha in Lochwaa Village, Lochwaa Sub-location, Lochwaa location, Lokichar ward, Turkana South Sub-County in Turkana County. The proposed project site is on an open space off Kapenguria-Lodwar road.

The project area in Lochaangimatak, Turkana County, exhibits a semi-arid climate with irregular rainfall patterns and scarce natural resources. Water scarcity poses a significant challenge, affecting both the local population and livestock. The vegetation predominantly comprises drought-tolerant shrubs, thorny bushes, and arid-adapted grasses. Overgrazing and deforestation have resulted in land degradation and soil erosion, further exacerbating the environmental issues. The area encompass scarce tree species.

Turkana County is traversed by the extensive Eastern African Rift System. The topography of Turkana varies between semi-arid and arid landscapes consisting of low-lying plains and isolated hills and mountain ranges (Opiyo et al., 2015). The altitude extends from 369m at Lake Turkana to the highest point at around 900m near the Ugandan border in the west. The topography of the project site is an open area and relatively flat with a general hilly eastward and westward. Historical, monthly temperatures in Turkana County between 20 and 40°C. South-eastern Turkana is significantly hotter than the rest of the county. The long rainy season is significantly wetter than the short rainy season. The dry season runs from the end December into February. April experiences the most rainfall (more than 50 mm per month). The county is prone to seasonal flash flooding during the rainy seasons which makes roads impassable. Much of the County's livestock population are indigenous sheep, goats, cattle and camel.

The area's ecological conditions are influenced by the soil type, altitude, vegetation, rainfall pattern and human activities. The surrounding rangelands is home to a variety of wildlife including Gazelles, Warthogs and Giraffes. A major threat to the vegetation cover is the destruction caused by human activities including

grazing, charcoal burning, extraction of wood fuel and cutting down of trees without replacement resulting in adverse ecological effects.

The topography of the project area is diverse, featuring vast plains, scattered low-lying hills, and occasional rocky outcrops. It is part of a semi-arid landscape with undulating terrain. The flat plains offer space for livestock grazing.

The area is characterized by high levels of poverty, unemployment, and limited access to essential services such as education and healthcare. Livestock herding and small-scale enterprises are the primary economic activities, but opportunities for economic growth are constrained. Gender disparities persist, with women having limited decision-making power and economic empowerment. Infrastructure development, including roads, electricity, and water supply, is insufficient to meet the needs of the community.

County: Turkana County Location: Lochaangimatak



# Figure 1: Project Location

## E-7 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 Enhancement Measuress.

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.

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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-8 Stakeholder Engagement

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

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

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

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

# E-10 – Impacts and Enhancement Measuress

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,

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improved living standards, and enhanced security and communication. Similarly, the decommissioning phase offers positive impacts such as local employment and sourcing.

On the negative side, the pre-construction phase involves minor impacts like land acquisition, while the construction phase encompasses various minor to moderate impacts such as vegetation clearance, soil erosion, dust emissions, and occupational health and safety concerns. Challenges related to stakeholder engagement, labor influx, child labor, and exclusion of vulnerable individuals are also anticipated. In the operation phase, negative impacts include waste generation, increased oil consumption, fire outbreaks, occupational health and safety concerns, and inadequate stakeholder engagement. Issues of exclusion, inadequate grievance management, and public health concerns may arise as well.

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

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

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

Table 0-1: Summary of Pre-construction Impacts

Impact	Significance Of Impact (pre- mitigation)	Residual Impacts (Post- Mitigation)			
Impacts on Local Economy and	Positive	Positive			
Employment					
Change in land use	Moderate	Negligible			
Topography	Minor	Negligible			
Soil environment	Minor	Negligible			
Air Quality	Moderate	Negligible			
Ambient noise	Minor	Negligible			
Visual intrusion and change in landscape	Minor	Negligible			
Waste generation and soil contamination	Minor	Negligible			
Impact on water environment	Minor	Negligible			
Impacts from hazardous materials	Minor	Negligible			
Fire hazards	Moderate	Minor			
Impacts of construction material sourcing	Moderate	Minor			
Energy consumption	Negligible	Negligible			
Occupational safety and health	Moderate	Minor			
Community safety and health	Moderate	Minor			
Labor influx	Minor	Negligible			
Child labor	Minor	Negligible			
Cultural heritage	Minor	Negligible			
Gender based violence, SEA and SH	Minor	Negligible			
Exclusion of VMGs, Vulnerable individuals	Major	Minor			
and households					
Risk of communicable diseases	Minor	Negligible			
Increased water demand	Negligible	Negligible			
Forced labor	Minor	Negligible			

Table 0-2: Summary of Construction Phase Impacts

Table 0-3: Summary	of Operation	Phase Impacts
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Impact	Significance Of Impact	Residual Impacts	
	(Pre-Mitigation)	(Post-Mitigation)	
Impact On Economy and Employment	Positive	Positive	
Quality, reliable power supply	Positive	Positive	
Reduction of pollution associated with thermal	Positive	Positive	
power generation, kerosine and wood fuel usage			
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	

Impact	Significance Of Impact	Residual Impacts		
	(Pre-Mitigation)	(Post-Mitigation)		
Increased oil consumption	Minor	Negligible		
Increased storm water flow	Minor	Negligible		
Fire outbreaks	Moderate	Minor		
Water demand	Negligible	Negligible		
Sanitary waste	Negligible	Negligible		
Flooding	Negligible	Negligible		
Noise and Vibration	Negligible	Negligible		
Electric and magnetic fields (EMFs)	Negligible	Negligible		
Dust Emission	Negligible	Negligible		
Vehicle Exhaust emission	Minor	Negligible		
Collision and electrical hazards from distribution	Minor	Negligible		
infrastructure				
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	Major	Minor		
households				
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		

Table 0-4: Summary of Decommissioning Impacts

Impact	Significance Of Impact (Pre- Mitigation)	Residual Impacts (Post- Mitigation)
Employment opportunities	Positive	Positive
Site rehabilitation	Positive	Positive
Soil environment	Minor	Negligible
Air quality	Moderate	Negligible
Ambient Noise	Minor	Negligible
Waste generation and soil contamination	Minor	Negligible
Occupational safety and health	Moderate	Minor
Gender based violence, SEA and SH	Minor	Negligible
Exclusion of VMGs, Vulnerable individuals	Major	Minor
and households		
Risk of communicable diseases	Minor	Negligible

# E-11 Environmental and Social Management and Monitoring Plan

A comprehensive set of Enhancement Measuress 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 Enhancement Measuress 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 Enhancement Measuress 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 Enhancement Measuress.

# E-12 Conclusion

Based on the assessment findings, the consultant concludes that there are no substantial reasons to hinder the proposed project from progressing to the next stage of planning and development. However, this progression is conditional upon the implementation of the recommended mitigations and the monitoring of potential environmental and socio-economic impacts as outlined in the ESMMP.

It is in the opinion of the Environmental expert that the anticipated negative impacts can readily and effectively be mitigated and on the whole the proposed project does not pose any significant threat to the Environment and may be licensed to proceed.

## **1 INTRODUCTION**

The Ministry of Energy (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. Turkana 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 Turkana county as one of the counties in Kenya that have been defined as "marginalized areas" based on the County Development Index (CDI) by the Commission on Revenue Allocation (CRA). According to the CRA as the communities in the marginalized areas have been excluded from social and economic life of Kenya for different reasons" (CRA, 2013).

Turkana County and other identified underserved counties, collectively represent 72% of the Country's total land area and 20% of the Country's population, including historically nomadic societies that even today continue to rely on pastoralism. The population in Turkana 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, Environmental (Impact Assessment And Audit) Amendment) Regulations, 2019 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 Overview**

The project is located 58km South of Lodwar town and 27Km North of Lokichar town in Lochwaa Village, Lochwaa Sub-location, Lochwaa location, Lokichar ward, Turkana South Sub-County in Turkana County at GPS coordinates of Latitude 2°36'11.0772"N and Longitude 35°39'09.3672"E. The proposed solar mini grid will be located on an approximately 0.67 Ha piece of land.



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 23Km.

# **1.3** Purpose and Scope of Work

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

# 1.4 ESIA Methodology

## **1.4.1** Screening and Scoping

#### 1.4.1.1 Screening Methodology

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

#### 1.4.2 ESIA TEAM

The ESIA Team comprised of the following Team members;

NAME	ORGANISATION
Samwei Olela	REREC
Samuel Ebei	MOE
Miss. Loise	Centric Africa Limited
Miss. Watiri	Centric Africa Limited
Mr. Martin Mbabu	Norken International Limited
Mr. Patrick Ngari	Centric Africa Limited

## 1.4.3 Data Collection

The approach and methodology applied during the study enabled collection of both primary and secondary data. Qualitative and quantitative methods of data collection were employed. Secondary data was obtained through literature reviews while primary data was obtained through physical observations, photography, interviews and stakeholders' consultation. During the ESIA process consultations were also undertaken to obtain the views of immediate community, interested groups and affected groups within the site's immediate area of influence. The consultation was done with the immediate neighbourhood of the proposed site.

#### 1.4.3.1 Kick-off Meeting

Norken and Centric team had a brief kick-off meeting with the Proponent on 12th July 2021 followed by subsequent online meetings and discussion on various aspects of the project up to 5th August, 2021 and 15<sup>th</sup> September, 2021. The meetings addressed varied deliverables and thresholds to be achieved and maintained during this assessment in terms of scope of work, deliverables, timeline and the methodology. All communication and meetings were done online. Courtesy call meeting to the county commissioner for Turkana was done on 13<sup>th</sup> January 2022 as the team disperse for field assessment.

#### 1.4.3.2 Desk based review and baseline assessment

A comprehensive description of the KOSAP Component 1: project includes a desktop review of all the existing project documentation including the Project Appraisal Document and the four main safeguard

framework documents prepared under KOSAP- these are Social Assessment, Vulnerable and Marginalized Group Framework, Resettlement Policy Framework and the Environmental and Social Management Framework.

# **1.4.4 Project Description**

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

# 1.4.5 Baseline Condition

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

# **1.4.6 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 Lochwangimatak area.

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

## 1.4.7 Environmental and Social Management Plan (ESMP)

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

The ESMMP has a detailed arrangement of responsibilities for managing and monitoring the implementation of Enhancement Measuress 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 Enhancement Measuress, monitor-able indicators, timeframe, responsibilities, and budget implications.

The ESMP include an implementation schedule and budget cost estimates for the Enhancement Measuress both capital and recurrent costs estimates and the financing entity. It also describes institutional arrangements regarding the implementation of the ESMP among the implementing agencies, and the minigrid 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 Enhancement Measuress that will be implemented in the event physical cultural resources are encountered during subproject implementation.

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

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

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# Figure 2: Summary of Environmental and Social Impact Assessment Methodology

# **1.5 Limitations**

The limitations experienced during the study are illustrated below.

- ✓ The risk of experiencing bandit attacks by the hostile community individuals. This was mitigated by having informed Kenya police and receiving escort where need be as the study was being conducted.
- ✓ 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.
- ✓ The risk of having mechanical failure due to poor roads. This was mitigated by making back up vehicles/plans when this happened.

SECTION	TITLE	DESCRIPTION
Section 1	Introduction	(This section) Introduction to the Project and ESIA scope and methodology
		adopted.
Section 2	Project Description	Technical description of the Project & related infrastructure and activities.
Section 3	Applicable Legal and	Discusses the applicable environmental and social regulatory framework
	Regulatory Framework	and its relevance for the Project. (The world bank safeguards and EMCA
		and environmental regulations)
Section 4	Environmental, Ecology	Outlines Environmental, Ecology and Social Baseline status in the study
	and Social Baseline	area of the Project
Section 5	Stakeholder	Provides an overview of the stakeholder engagement activities undertaken
	Engagement and	during the ESIA, stakeholder categorization and profiling Additionally, it
	Grievance Redress	details the provision of Grievance Redress Mechanism for the project
Section 6	Impact Assessment	This section includes details of identified environmental impacts and
	and Enhancement	associated risks due to Project activities, assessment of significance of
	Measuress	impacts and presents Enhancement Measuress for minimizing and /or
		offsetting adverse impacts identified.
Section 7	Environmental and	Outline of the ESMP considering identified impacts and planned
	Social Management	Enhancement Measuress and monitoring requirements.
	Plan	
Section 8	Impact Summary and	Summary of impacts identified for the Project and conclusion of the study.
	Conclusion	

Table 5. Structure of the ESIA Report

# **2 PROJECT DESCRIPTION**

# 2.1 Introduction

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

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

14510 0		
S/NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project is located 58km South of Lodwar town and 27Km North of Lokichar town in Lochwaa Village, Lochwaa Sub- location, Lochwaa location, Lokichar ward, Turkana South Sub- County in Turkana County at GPS coordinates of Latitude 2°36'11.0772"N and Longitude 35°39'09.3672"E. The proposed solar mini grid will be located on an approximately 0.67 Ha piece of unregistered community land.
2.	Land Size/Tenure	The proposed solar mini grid will be located on an approximate 0.7634 Ha piece of land near Lochwaa Shopping centre in an open space with very little vegetation. The land is an unregistered community land.

## Table 6. Component of the proposed Solar Mini-grid

S/NO.	PARTICULARS	DESCRIPTION
3.	Mini grid Power	PV Array (DC-kW) of 120kw; 82kWh Battery; with backup Diesel generator Diesel Prime Rating 82 kVA.
4.	Distribution line	LV Circuit of 23Km
5.	Target Consumers	361 (352 Residential and 9 Non-Residential) commercial and public facilities include two schools, one dispensary and an average of 30 shops.
6.	Climatic condition	The county experiences annual average relative humidity of 22 per cent. Monthly temperatures in Turkana County between 20 and 40°C. South-eastern Turkana is significantly hotter than the rest of the county. The long rainy season is significantly wetter than the short rainy season. The dry season runs from the end December into February. April experiences the most rainfall (more than 50 mm per month). The county is prone to seasonal flash flooding during the rainy seasons which makes roads impassable.
8.	Site Conditions	The side is generally in open area with minimal and scarce <i>fauna</i> and <i>flora</i> .
9.	Road Accessibility	Earth road joining Kapenguria and lodwar road(ongoing tarmacking)
10.	Nearest Airport	Lodwar International Airport at about 58km
11.	River/canal/nallah/ pond present in project footprint	None
12.	Protected areas (National Park/ Sanctuary)/ Forest land within 10 kms	None

# 2.2 Project Location

The project site is located in in Lochwaa Village, Lochwaa Sub-location, Lochwaa location, Lokichar ward, Turkana South Sub-County in Turkana County at GPS coordinates of Latitude 2°36'11.0772"N and Longitude 35°39'09.3672"E. The proposed power plant will be constructed on approximately 0.67 Ha.

The site soil is primarily sandy within the area. The project site is approximately 58km South of Lodwar town.



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



Figure 4: Project location

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# 2.2.1 Project site setting

The proposed Lochwangimatak mini grid is in Turkana County. It falls under cluster 1 with a total of 147 minigrids and lot 1 which has a total of 23 mini-grids in Turkana. Geographically, Lochwangimatak site falls on coordinates Latitude 2°36'11.0772"N and Longitude 35°39'09.3672"E.



# 2.3 Description of Project Facilities, Components and Activities

# **2.3.1 Project Components**

# 2.3.1.1 Solar PV modules

The project will use PV Array (DC-kW) 80 polycrystalline silicon module with three strings connected in series. Each string will have five sets of panels connected in series, with output converged at the six-way combiners. The life expectancy of the PV modules is estimated at 25-30 years.

# 2.3.1.2 Battery Energy Storage System

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

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## 2.3.1.3 Battery Inverters/ Chargers

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

## 2.3.1.4Distribution lines

The site will have a distribution line circuit of 23Km 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. An average of 30 shops, two schools, one medical facility and 352 residential, 9 non-residential homes and two other public facilities will be connected. The connection cables shall be rodent proof to reduce cables being chewed by rodents on that could lead to short circuiting

## 2.3.1.5 Project cost

Lochwangimatak project cost is estimated at USD. 740,781.82

Name	ID	Reside ntial	Nonresi dential	Circuit(k m)	Peak dema nd kW	PV(D C- KW)	Batte ry Capa city kWh	Generat or (kva)	Cost (USD
Lochwa angimat ak	Turkana	352	9	23	66	120	300	82	740,78 1.82

Lochwaangimatak solar Mini grid profiles

# 2.3.2 Project Phases and Activities

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

# 2.3.2.1 Construction Procedures

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

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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.

## 2.3.2.2 Construction Contractor

The construction contractor is responsible for building the physical infrastructure required for the mini-grid project. In this case, the infrastructure includes the installation of solar panels, battery storage systems, a diesel generator, inverters, and the low voltage power distribution network.

Their specific responsibilities will include site preparation, installation of solar panels, setting up the battery storage system, configuring the diesel generator, and laying down the distribution network.

The construction contractor will be responsible for ensuring that the components are installed correctly and meet the required standards for safety and performance. They may also manage the workforce, logistics, and project timeline to ensure that construction proceeds smoothly and is completed within the specified timeframe.

# **Operation and Maintenance (O&M) Contractor**

The O&M contractor will be responsible for the ongoing operation and maintenance of the mini-grid system once it is operational. The construction contractor will also double up as the O&M contractor

In this project, their responsibilities include monitoring the performance of the solar panels, battery storage system, and the diesel generator to ensure the continuous and reliable supply of electricity to the consumers. The O&M contractor must carry out regular maintenance tasks, such as cleaning and servicing solar panels, inspecting and maintaining the battery energy storage system, and ensuring the diesel generator is in good working condition for backup power needs. They are responsible for addressing any technical issues or faults that may arise, as well as responding to consumer complaints and inquiries related to the electricity supply. The O&M contractor plays a crucial role in maximizing the system's efficiency and longevity by ensuring all components operate optimally.

The contractor will be required to have their own Environment, Health, and Safety (EHS) policy and an EHS officer on site. In the context of the mini-grid project, it will outline the contractor's dedication to upholding safety standards, minimizing environmental impact, and adhering to legal requirements. The presence of

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an EHS officer on site will be equally essential. Their role will be to oversee and manage all EHS concerns directly at the project location.

## 2.3.2.3Land Tenure

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.

## 2.3.2.4Compensation Details

Compensation for the land for the proposed project will be in kind and the Proponent will undertake some projects for the community.

The main key area for development activities identified by the community for the proponent to undertake in Lochwaa included; water school and health. They are as listed.

- 1<sup>st</sup> Priority Specifically, the community gave priority to water reticulation by solarization of borehole water (Chinese road contractor's borehole) through pumping and distributing it to the community water kiosks.
- 2<sup>nd</sup> Priority The second priority was to provide access to better education by constructing classes and dormitories at Lochwaa Primary School.
- 3<sup>rd</sup> Priority The third priority was provision of better services in Lochwaa Dispensary by constructing laboratory, maternity wards and health workers shelter.

# 2.4 Resource Requirement

# **2.4.1 Workforce Requirement**

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

Approximately 5 unskilled workers will be involved during operation phase of the project for grass cutting and module cleaning. Also, two trained security guards will be engaged at the operations phase. The community members will be given the first priority in terms of employment.

# 2.4.2 Water Requirement and Source

## 2.4.2.1 Construction Phase

It has been estimated that approximately 50,000 liters of water will be required per day for civil works during construction stage. Further, water will be required for workers at project site. However, this quantity of water requirement will vary depending upon the mobilization of construction workers at site. The water for the construction phase will be sourced from the local water points, the nearest is spring borehole located at about 500m to the proposed site. The available water points within Lochwangimatak area are sourced from spring borehole which is about 500m and a Chinese contractor Borehole within the area for road construction. The rest is fetched from shallow hand dug wells in the nearby laggas which dry up on drought seasons. The proponent will also source water in other locations to reduce community conflict associated with community. Water conflicts will be reduced by the contractor by ensuring that he/she creates a

provision for supplying water to villagers to reduce their the distances covered for water collection.

## 2.4.2.2 Operation Phase

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

Approximately, 10 employees (direct and contractual) will be working during operation phase. For this workforce, approximately between 5,000 Liters of water will be required weekly for domestic consumption. The number of skilled/ unskilled will be selected taking into the account that the community should take the first priority. Majority will be sourced from local communities.

# 2.4.3 Raw Material Requirement

## 2.4.3.1 Construction Phase

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

## 2.4.3.2 Operation Phase

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

# 2.4.4 Power Requirement

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

# 2.4.5 Fire Safety and Security

## 2.4.5.1 Construction Phase

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

## 2.4.5.2 Operation Phase

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

The systems and equipment's will align to the Kenyan Fire Risk Reduction Rules of 2007. The Fire protection and fighting systems will be maintained and serviced after every 6 months. The team managing the site will be trained on Fire safety as per the requirement on Fire Risk reduction rules.

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Further the proponent will be required to undertake Annual OSH Audits, Fire audits and Risk assessment as per the requirement of OSHA 2007 and the relevant subsidiary legislation. The maintenance of the site will also involve vegetation and weed control due to the fact that undergrowth weeds can cause shading. This will mainly be controlled by mainly Mowing and spraying herbicides.

The solar panels might have hot spots that might cause fire. Some of the factors that could cause hot spots include the quality of PV cells, improper installations, and maintenances, shading situations or even bird excrement, etc. The damaged or blocked areas of a PV cell can heat up and cause fire. The key to preventing this fires is high quality design, installation and testing in accordance with applicable electrical codes and minimizing the combustible loading.

## 2.5 Pollution Streams during Construction Phase

## 2.5.1 Solid Waste Generation

## 2.5.1.1 Construction Phase

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

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

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

#### 2.5.1.2 Operation Phase

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

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

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

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## 2.5.2 Air Emissions

#### 2.5.2.1 Construction Phase

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

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

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

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

#### 2.5.2.2 Operation Phase

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

## 2.5.3 Waste Generation

#### 2.5.3.1 Construction Phase

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

#### 2.5.3.2 Operation Phase

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

#### 2.5.4 Noise Emissions

#### 2.5.4.1 Construction Phase

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

restricted to Day time only.

#### 2.5.4.2 Operation Phase

Under normal operations, none of the activities of solar power plant will generate noise. The only noise that can be generated at this phase is during the maintenance works and it will be restricted to daytime only. However, during cloudy periods and when solar energy is low, the backup generator that will be utilized will produce noise. Mufflers and silencers will be installed so as to minimize noise pollution from the backup generator. Annual noise surveys will be conducted according to the Noise prevention and control Rules of 2005 to ensure the noise levels are within permissible levels.

#### **ANALYSIS OF ALTERNATIVES AND PROJECT JUSTIFICATION** 3

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

# 3.1 Site Selection

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

The proponent identified one location for the proposed solar project which located south east of Lochwaa Village. The site was identified based on the location of settlement areas, commercial/ public facilities in Lochwangimatak. The site is within 300m to the shopping center and at a central location to the settlement areas within Lochwaa.

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 held in trust by the county on behave of the community;
- The project site has few scattered trees and shrubs.
- The project site land is on flat sandy ground where no agriculture is done.

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 27 km away, at Lokichar township

#### **PROPOSED PROJECT SITE & PROXIMITY TO CONSUMER SITES**

Commercial

Circuits

Canerator Site

# Loichangamatak Turkana - Turkana South

Commercia	1& public fa	cility consumers	
School	2	Security	0
Religious	1	Commercial	0
Industrial	0	Medical	1
Mixed	3	Other Public Facilities	2
Commercial & public facility consume Mobilization Of Government Work To Education Facility, Primary Education	rs list: Gener The Commu	ral Clinic, Commercial, Corn Mil inity, Water Pump, Worship C	ling, enter,
	Consume	ers	
TotalResidential	352	TotalNonresidential	9
Averageo	onsumption	in kWh/month	
AVG Residential (North West kWh/Month)	19.9	AVG Nonresidential (kWh/Month)	250.4
	Monthly k	Wh	
TotalResidential(kWh/month)	7,005	TotalNonresidential (kWh/month)	2254
Mini-g	rid design ch	a racteristics	
LV circuit (km)	11.15	Demand (kVA)	39
PV Array (DC-kW)	80	Battery (kWh)	180
Generator (kVA)	0		

School

Medical

Industrial

Public Facility (Other)

m

1

Mixed Commercial/Residential

Religious

Security 園

50

ID: Turkana-14 Lat: 2.60176 Lon: 35 65192 . Customer(s) Polygon n 700 1400 m

# 3.2 Power Scenario at Lochwangimatak

Lochwangimatak location has an estimate of 2,240 number of people with approximately 320 households within the area. The proposed solar off grid project is estimated to cover up to 361 residential and nonresidential consumers within the area. This will reach out to over 90% of the population within the area.

Most of the Turkana county households depend on wood fuel (Firewood and Charcoal) for cooking and others depend on kerosene lantern for lighting and others on electricity especially in grid connected towns which are very few. A huge percent of households use traditional stone fire for cooking.

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

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

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

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

## 3.2.1 Vision 2030

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

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

- Macroeconomic stability. •
- Continuity in governance reforms.
- Enhanced equity and wealth creation opportunities for the poor.
- Infrastructure.

- Science, technology and innovation (STI).
- Land reform.
- Human resources development. •
- Security; and •
- Public sector reforms.

Energy.

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

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distribution infrastructure, high cost of power, low per capita power consumption, and low electricity access countrywide.

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

# 3.3 Analysis of Alternative

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

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

## 3.3.1 Alternate Location for Project Site

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

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

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

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

**Proximity to consumer sites**: Lochwaa location has an estimate of 2,240 number of people with approximately 320 households within the area. The proposed solar offgrid project is estimated to cover up to 361 residential and non-residential consumers within the area. This will reach out to over 90% of the population within the area.

#### Land Identification Criteria

Minigrid Sites under KOSAP were selected based on a number of factors.

1. Geophysical Factors-Proximity to Hills-Shade effect, Soil erosion, Drainage of the area, Flooding etc.

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- 2. Land identified is free from any dispute on ownership or any other encumbrances
- 3. Proximity to public utilities-Schools, Dispensaries, Places of worship and community settlements
- 4. No squatters, encroachers or other claims to the land
- 5. The Size of the Minigrid to be constructed and the optimal coverage of a Minigrid in terms of the number of people to be reached.
- 6. The Land identified should be on spaces set aside for public use within the community centres.

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

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

## **3.3.2** Alternate Sources of Energy

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

The possible alternatives to solar energy include;

- Wind power: shortfalls associated with wind power includes; lack of time series data of wind, trained human resources to intricate design of wind power etc, providing wind power for Lochwaa residents is technically and financially challenging, expensive to install, dependent on wind pattern (not strong in Lochwaa). 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 Lochwaa). Besides coal and petroleum products used in thermal power processing are not readily available within Lochwaa area and may have to be sourced from far locations. Therefore, thermal power option based on coal and petroleum products is not a viable option for Lochwaa. 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 Lochwaa 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.

## 3.3.3 Zero or No Project Alternative

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

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

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

## 3.3.4 Analysis of Alternative Construction Materials and Technology

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

## 3.3.5 Conclusion

The proposed project site is the best alternative based on the community need assessment and should be upheld to support the local community based.

## 4 LAND REQUIREMENT AND PROCUREMENT PROCESS

## 4.1 Land Requirement and Procurement Process

#### 4.1.1 Land Requirement

The land on which the proposed Lochwangimatak mini grid will be constructed covers an approximate total of 0.67 Ha in size.

#### 4.1.1.1 Land Tenure

The entire county is categorized as community land. In Lochwangimatak, the site falls on Unregistered Communal land.

#### 4.1.1.2Compensation Details

The main key area for development activities identified by the community in Lochwaa included; water school and health. They are listed below.

- **1**<sup>st</sup> **Priority** Specifically, the community gave priority to water reticulation by solarization of borehole water (Chinese road contractor's borehole) through pumping and distributing it to the community water kiosks.
- **2<sup>nd</sup> Priority** The second priority was to provide access to better education by constructing classes and dormitories at Lochwaa Primary School.
- **3**<sup>rd</sup> **Priority** The third priority was provision of better services in Lochwaa Dispensary by constructing laboratory, maternity wards and health workers shelter.

# 5 APPLICABLE AND REGULATORY FRAMEWORK

## 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 Kenya Policy Provisions

#### 5.2.1 Kenya Energy Policy, 2014

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

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

The Policy strategizes the need to:

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

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

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## Table 7. 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) <sup>(1)</sup> .
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 2 <sup>nd</sup> 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.

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

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

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

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

#### 5.2.3 National Policy on Water Resources Management and Development, 1999

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

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

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

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

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

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

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

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

# 5.2.5 Kenya Off-grid Solar Access Project (KOSAP) Environmental & Social Management Framework, 2017

The World Bank is concerned about the environmental and social impacts of its activities and requires environmental assessments be done for all projects it finances. Its safeguard policies are aimed at preventing and mitigating undue harm to people and their environment in the development process also provide a platform for the participation of stakeholders in project design and implementation.

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 subprojects and in preparing the necessary environmental and social Enhancement Measuress for these subprojects.

#### The proposed project will consider all relevant guidelines as provided by the KOSAP- ESMF

## 5.2.6 Resettlement Policy Framework (RPF)

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. To develop a Resettlement Action Plan and propose an implementation framework for RAP to mitigate such effects. 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. PAPs will be meaningfully consulted and will participate in planning and implementing of the resettlement activities

There will be no displacement of people/crops/etc. as the land allocated for Minigrid construction in open public Land. The land is part of the wider parcel set aside by the community that they have allocated to the project. Compensation for the land will be in Kind.

## 5.2.7 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 during the development and operation of proposed sub projects and to ensure effective mitigation of potentially adverse impacts while enhancing sharing of benefits.

The project area is inhabited by predominantly by the Turkana Community. Their presence in the project's footprint was clear with the only other communities present in the area that will benefit from the project being the Turkana, Somali and the Rendile

The Turkana, Samburu, Somali and the Rendile falls under communities in Kenya who are categorized by

the World Bank's OP 4.10 and the Constitution of Kenya, 2010, as vulnerable and marginalized groups. Thus the VMGs that have been identified as those who would potentially be impacted by the project are mainly Samburu, Turkana, somali and the rendile who are mainly the minority.

## 5.3 National Legal Framework

## 5.3.1 Administrative Framework

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

Table 8. Administrative	e stakeholders	and their roles
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Stakeholders	Role
NEC	The <b>National Environmental Council</b> 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 <b>Public</b> <b>Complaints Committee</b> 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.

#### 5.4 Relevant statutes

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

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

## Table 9. National Policy Framework

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
	NATIONAL POLICY F	RAMEWORK	
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 industrialized, 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	<ul> <li>The NEMA does not approve a development project unless the impacts of the proposed project are evaluated and Enhancement Measuress proposed for incorporation in the project 's development plan, which is in line with the requirements of the NEAP.</li> <li>The project will be reviewed by NEMA for approval before implementation.</li> </ul>

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		environmental management and the conservation of natural resources forms an integral part of societal decision-making.
4.	Environmental and Development Policy (Session Paper No.6 1999)	<ul> <li>As a follow-up to the foregoing, the goal of this The proponent:</li> <li>policy is to harmonize environmental and developmental goals so as to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development.</li> <li>The Government will: <ul> <li>Ensure Strategic Environment Assessment (SEA), Environmental Impact Assessment, Social Impact Assessment, Social Impact Assessment, and Public participation in the planning and approval of infrastructural projects.</li> <li>Develop and implement environmentally-friendly national infrastructural development strategy and action plan.</li> <li>Ensure that periodic Environmental Audits are carried out for all infrastructural projects</li> </ul> </li> </ul>
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

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		lead agency for development of renewable energy resources.
6.	The Gender and Development Policy (Sessional paper no.2 2019)	<ul> <li>The overall goal of this policy is to achieve gender equality by creating a just society where women, boys and girls have equal access to opportunities in the political, economic, cultural and social spheres of life.</li> <li>The anticipated outcome of this policy as enshrined in the Constitution that aligns to the project include: <ul> <li>a) Equality and economic empowerment will be of both genders,</li> <li>b) Women and men will have equality of opportunity to participate in decision making and to contribute to the political, social, economic and cultural development agenda;</li> <li>c) Sexual and Gender based Violence will abate and men, women, boys and girls will live with dignity</li> </ul> </li> </ul>
7.	The HIV/ AIDS Policy 2009	<ul> <li>In summary, the policy aims at:</li> <li>I. Establishing and promoting programmes to ensure non-discrimination and nonstigmatization of the infected;</li> <li>ii. Contributing to national efforts to minimize the spread and mitigate against the impact of HIV and AIDS;</li> <li>iii. Ensuring adequate allocation of resources to HIV and AIDS interventions;</li> <li>The proposed project is to be implemented in a rural setting at 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.</li> </ul>

## LAWS AND LEGISTLATIONS

1	The Constitution of Kenya, 2010	The Constitution of Kenya promulgated in 2010 is The proposed project complies with the Constitution by proposing a the supreme law of the republic and binds all structure in its ESIA on how to deal with Social, Health, safety and persons and all State organs at all levels of environmental issues for sustainable development. 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.
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.
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 National Environmental Management Authority (NEMA). The EIA/EA Regulations also provide information to project proponents on the requirements of either an EIA or EA as required by the EMCA.

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for various environ	mental parameters into public
sewers and the en	vironment.
5 L.N. 121: WASTE These regulations MANAGEMENT REGULATIONS, 2006 the management Kenya. Generally, regulations that a waste (hazardous and then disposes acceptable manne requirement that vehicle that h Transportation Lic generated in Ken licensed disposal require annual undertaken by NE The regulation rea any hazardous undertake an EIA the NEMA. Labe mandatory under labelling requirem The treatment of	<ul> <li>are comprehensive and cover</li> <li>During the construction and operation phases, the proposed project will generate various streams of wastes. For the most part, it is expected that the wastes will be non-hazardous in nature and can be disposed of in accordance with these regulations.</li> <li>Under the regulation, it is a waste is transported using a as an approved "Waste ramse" issued by NEMA. Wastes a must be disposed of in a facility. Such a facility will environmental audits to be that prior to generating waste, a proponent shall Study and seek approval from ing of hazardous wastes is he regulation and the specific ents are provided in Rule 18.</li> </ul>

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disposal provided in Rule 19 include incineration or any other option approved by the NEMA.

<ul> <li>6 L.N. 61: NOISE AND The general prohibition of these regulations states</li> <li>• Rules 13 and 14 of the regulations define the permissible noise EXCESSIVE VIBRATION that no person shall make or cause to be made CONTROL any loud, unreasonable, unnecessary, or unusual REGULATIONS, 2009</li> <li>and it or person shall make or cause to be made of others and the environment. The regulations further provide factors that will be considered in determining whether or not noise and vibration is loud, unreasonable, unnecessary, or unusual.</li> <li>7 LICENSES AND PERMITS The subsidiary legislations under the EMCA are REQUIRED UNDER THE Partially monitored through the use of permits required to operational phase, all permits and licenses and operational phase, all permits and licenses of regulations 2006;</li> <li>and License function phase, all permits and licenses and contractors and their agents. During the responsibility of the proponent.</li> <li>AND SAFETY ACT, 2007</li> <li>8 OCCUPATIONAL HEALTH The Occupational Safety and Health Act (OSHA) AND SAFETY ACT, 2007</li> <li>8 OCCUPATIONAL HEALTH The Occupational Safety and Health Act (OSHA) AND SAFETY ACT, 2007</li> <li>8 OCCUPATIONAL HEALTH The Occupational Safety and Health Act (OSHA) weifare of persons employed in workplaces, and</li> <li>9 CCUPATIONAL HEALTH The Occupational Safety and Health Act (OSHA) weifare of persons employed in workplaces, and</li> <li>9 CCUPATIONAL HEALTH The Occupational Safety and Health Act (OSHA) weifare of persons employed in workplaces, and</li> <li>9 CCUPATIONAL HEALTH The Occupational Safety and Health Act (OSHA) weifare of persons employed in workplaces, and</li> <li>9 CCUPATIONAL HEALTH The Occupational Safety and Health Act (OSHA) weifare of persons employed in workplaces, and</li> <li>9 CCUPATIONAL HEALTH The Occupational Safety and Health Act (OSHA) weifare of persons employed in workplaces, and</li> <li>9 CCUPATIONAL HEALTH The Occupational Safety and Health</li></ul>				
<ul> <li>ILCENSES AND PERMITS The subsidiary legislations under the EMCA are The subsidiary legislations under the EMCA requires some or all the partially monitored through the use of permits following types of permits to be available for inspection during the and licenses. Subsequently all licenses and permits required during the construction phase ✓ Effluent Discharge License under Legal Notice 120: The shall be the responsibility of the individual contractors and their agents. During the operate the project will be the responsibility of the proponent.</li> <li>Waste Transport License under Legal Notice 121: The Environment Management and Coordination (Waste Management) Regulations 2006 for disposal of all types of wastes; and</li> <li>Noise Permit under Legal Notice 61: The Environment Management and Coordination (Noise and Excessive Vibration Control) Regulations, 2009.</li> <li>OCCUPATIONAL HEALTH AND SAFETY ACT, 2007</li> <li>CCUPATIONAL HEALTH AND SAFETY ACT, 2007</li> </ul>	6	L.N. 61: NOISE AND EXCESSIVE VIBRATION CONTROL REGULATIONS, 2009	The general prohibition of these regulations states that no person shall make or cause to be made any loud, unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health, or safety of others and the environment. The regulations further provide factors that will be considered in determining whether or not noise and vibration is loud, unreasonable, unnecessary, or unusual.	<ul> <li>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.</li> </ul>
8 OCCUPATIONAL HEALTH The Occupational Safety and Health Act (OSHA) The proposed project will be undertaken in compliance with the AND SAFETY ACT, 2007 was enacted to provide for the health, safety and OSHA-2007 during the construction, design, and operational phases. welfare of persons employed in workplaces, and During the construction phase, the contractors will be required to fully comply with the requirements of Legal Notice 40 titled: Building	7	LICENSES AND PERMITS REQUIRED UNDER THE EMCA	The subsidiary legislations under the EMCA are partially monitored through the use of permits and licenses. Subsequently all licenses and permits required during the construction phase shall be the responsibility of the individual contractors and their agents. During the operational phase, all permits and licenses required to operate the project will be the responsibility of the proponent.	<ul> <li>The subsidiary legislations under the EMCA requires some or all the following types of permits to be available for inspection during the construction and operational phases of the project:</li> <li>✓ Effluent Discharge License under Legal Notice 120: The Environment Management and Coordination (Water Quality) Regulations 2006;</li> <li>✓ Waste Transport License under Legal Notice 121: The Environment Management and Coordination (Waste Management) Regulations 2006 for disposal of all types of wastes; and</li> <li>✓ Noise Permit under Legal Notice 61: The Environment Management and Coordination (Noise and Excessive Vibration Control) Regulations, 2009.</li> </ul>
	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	The proposed project will be undertaken in compliance with the OSHA-2007 during the construction, design, and operational phases. During the construction phase, the contractors will be required to fully comply with the requirements of Legal Notice 40 titled: Building

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for matters incidental thereto and connected Operations and Works of Engineering Construction Rules, 1984 therewith. (BOWEC). Each contractor will develop and implement a formal

health and safety in the workplace. Such duties safety best practices.

include undertaking safety and health (S&H) risk assessments, S&H audits, notification of accidents, injuries and dangerous occurrences. A number of sections under this part shall be applicable to the proposed project.

Part IV deals with the enforcement provisions that Directorate of Occupational Safety and Health Services (DOSHS) has under the Act. It discusses the instances when Improvement and Prohibition Notices can be issued as well as the powers of Occupational S&H officers. This part of the Act will be mandatory for the occupier to comply with for the proposed project.

Part V of the Act requires all workplaces to be registered with the DOSHS. This part will be applicable for the proposed project as the Occupier will have to apply for registration of their project with the DOSHS on completion of the construction phase and before the operational phase of the project.

Part VI of the Act lists the requirements for occupational health provisions which include cleanliness, ventilation, overcrowding, etc. This section of the Act will apply to the Occupier during the operational phase of the project.

Part VIII of the Act contains provisions for general safety of a workplace, especially fire safety. This

Part II of the Act provides the General Duties to construction health and safety plan for the entire construction phase which the occupier must comply with respect to duration in alignment with the OSHA and international health and

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part of the Act will apply to the proposed project during the design, construction, and operational phases.

Part X of the Act deals with the General Welfare conditions that must be present during the construction and operational phase of the project. Such conditions include first aid facilities, supply of drinking water, accommodation for clothing, ergonomics, etc. This part of the Act will apply to the proposed project during the construction and operational phases.

Part XI of the Act contains Special Provisions on the management of health, safety, and welfare. These include work permit systems, PPE requirements and medical surveillance. Some sections of this part of the Act will be applicable to the proposed project during the construction and operational phase.

Part XIII of the Act stipulates various fines and penalties associated with non-compliance with the Act. It includes those fines and penalties that are not included in other sections of the Act and will be important for the Occupier to read and understand the penalties for non-compliance with S&H provisions.

Part XIV of the Act is the last section of the Act and contains miscellaneous provisions which are not covered elsewhere in the Act. Some sections under this part of the Act will apply to the proposed project and it is in the interest of the occupier to read, understand, and ensure compliance.

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

L.N. 10 24: Medical These rules provide for Occupiers to mandatorily Some construction activities such as metal cutting and grinding, Examination Rules, 2005 undertake pre-employment, periodic, and repair or maintenance of construction equipment could expose the termination medical evaluations of workers whose construction workers during construction phase and operations and occupations are stipulated in the Eighth Schedule maintenance workers during operation phase to physical and to the OSHA and the First Schedule to this Rules. chemical hazards The contractor should that the workers exposed to Workers that fall under the above two schedules such hazards undergo requisite medical examinations as required by are required to undergo medical evaluations by a these rules registered medical health practitioner duly registered by the DOSHS.

11 L.N. 25: Noise Prevention The rules set the permissible level for It is expected that during the construction phase of the project, there and Control Rules, 2005 occupational noise in any workplace (which may be plant equipment that exceeds the threshold levels of noise includes construction sites) as follows: stipulated under the Rules. It will therefore be incumbent on the 90 dB(A) over an 8-hour time weighted contractor and his or her sub-contractors to ensure that their average (TWA) period over 24-hours; and equipment is serviced properly and/or use equipment that complies

• time.

140 dB(A) peak sound level at any given with the threshold noise values given above. Alternatively, each contractor will be required to develop and implement a written Additionally, the rules set permissible limits for hearing conservation programme during the construction phase.

community noise levels emanating from a workplace as follows:

- 50 dB(A) during the day; and
- 45 dB(A) at night.

The Proponent is to ensure that

- any equipment brought to the site for use shall be designed or have built-in noise reduction devices that do not exceed 90 dB(A).
- those employees that may be exposed to continuous noise levels of 85 dB(A) are medically examined as indicated in Regulation 16. If found unfit, the occupational hearing loss to the worker

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		will be compensated as an occupational disease.
12	L.N. 59: Fire Risk Reduction Rules, 2007	<ul> <li>A number of sections of the rules apply to the proposed project as enumerated below.</li> <li>Regulation 5 requires Proponents to ensure that fire resistant materials are used for construction of new buildings. A number of minimum specifications of materials are provided in this rule.</li> <li>Regulation 6 requires that all flammable materials are to exploit the remaining risk.</li> <li>Regulation 6 requires that all flammable materials anticipated at the project site including; fossil fuel using running construction equipment and vehicles (during construction phase)</li> <li>Regulation 7 requires that all flammable storage tanks or flammable liquid containers be labelled with the words "Highly Flammable" in English or Swahili. It is therefore practical for the Proponent to consult the product's MSDS for appropriate labelling requirements.</li> </ul>

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- Regulation 8(3) requires a Proponent to have a Spill Prevention, Control, and Countermeasures (SPCC) plan. This may be important if there will be chemicals stored in the refueling area at the construction site.
- Regulation 16 requires Proponents to ensure that electrical equipment is installed in accordance with the respective hazardous area classification system. It is also a requirement that all electrical equipment is inspected every six months by a competent person and the Proponent is required to keep records of such inspections.
- Regulation 22 provides a description of the functions of a fire-fighting team.
- Regulation 23 requires Proponents to mandatorily undertake fire drills at least once a year.
- Regulation 33 requires Proponents to have adequate fire water storage capacity. As a minimum this regulation requires Proponents to have at least 10 cubic meters of dedicated fire water storage capacity.
- Regulation 34 requires Proponents to develop and implement a comprehensive written Fire Safety Policy. This policy should contain a Fire Safety Policy Statement signed by the CEO, a Fire

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	<ul> <li>Safety Policy Manual and a brief summary of the Fire Safety Policy of the company.</li> <li>Regulation 35 requires a Proponent to notify the nearest Occupational S&amp;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.</li> </ul>
13 THE ENERGY ACT, 2019	<ul> <li>The Energy Act deals with all matters relating to all forms of energy including the generation, transmission, distribution, supply, and use of electrical energy, as well as the legal basis for establishing the systems associated with these purposes. The Energy Act also established Energy and Petroleum Regulatory Authority (EPRA) in place of the Energy Regulatory Commission (ERC), whose mandate is to regulate all functions and players in the energy sector. One of the duties of the EPRA is to ensure compliance with environmental, health, and safety standards in the energy sector, as empowered by Section 99 of the Energy Act, 2019. In this respect, the following environmental issues will be considered before approval is granted:</li> <li>The proponent is in line with the Energy act regulations in the following environment and conserve natural</li> </ul>

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• The ability to operate in a manner designated to protect the health and safety of the project employees, the locals, and other potentially affected communities.

An ESIA approved by NEMA must support licensing and authorisation to generate and transmit electrical power.

- Part VI Section 121 (1a) stipulates that the EPRA shall, before issuing a license, take into account the impact of the undertaking on the social, cultural or recreational life of the community.
- Part VI Section 121(1b) stipulates that the EPRA shall, before issuing a license, take into account the need to protect the environment and to conserve natural resources in accordance with the Environmental Management and Coordination Act.
- Part VI Section 136 (1a) stipulates that it shall be the duty of a transmission licensee to operate, maintain (including repair and replace if necessary) and protect its

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		transmission grid to ensure the adequate, economic, reliable and safe transmission of electricity; and	
14	THE ENERGY (SOLAR PHOTOVOLTAIC SYSTEMS) REGULATIONS, 2012	These regulations shall apply to a solar PV system manufacturer, importer, vendor, technician, contractor, system owner, a solar PV system installation and consumer devices. The Regulations prohibits any person from designing or installing any solar PV system unless he/she is licensed by EPRA.	The Regulations regulates, the design and installation of PV systems. The Proponent will ensure that persons engaged in the designing and installation of the Mini-Grid are licensed by EPRA
15	THE PUBLIC HEALTH ACT (CAP. 242)	The Act prohibits the project proponents from engaging in activities that cause environmental nuisance or those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety.	The proponent will be in line with the regulations of this act and will ensure suppression of infectious diseases and maintain proper sanitation during all the phases of the project.
16	COMMUNITY LAND ACT, 2016	This Act is critical for the proposed project is within community land. Section 6(1) of the Act provides that 'county governments shall hold in trust all unregistered community land on behalf of the communities for which it is held'. Furthermore, Section 6(2) maintains that 'the respective county government shall hold in trust for a community any monies	The proposed project site falls on unregistered community land set aside by the community for development projects. The community has since offered to the land in kind for project use. The establishment of the minigrid will convert communal land to industrial use for long term. Further, based on community need assessment the proponent will undertake in kind development project to support the community and they have requested for improved water supply and improvement of the existing medical facility. The proponent should adhere to the provision of this legislation

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payable as compensation for compulsory acquisition of any unregistered community land'. Therefore, the proposed road project can access land or water resources in community land that may be unregistered and pay compensation to the County Government which the law authorizes to hold such monies in trust for the communities.

Section 30(1) states that 'Every member of the community has a right to equal benefit from community land'. Section 26(1) provides that 'a community may set aside part of the registered community land for public purposes' and Sub-section (2) holds that 'where land is set aside for public purposes under Sub-section (1), the (Land) Commission shall gazette such parcel of land as public land'. This provisions offer a window for the proposed project to acquire land for project works legally for communities as necessary and to convert the same into public land. This is useful for the project as once done powerful groups will not have opportunity to exclude them on account of their socio - economic statuses. In

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		<ul> <li>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;</li> <li>(b) For the benefit of the whole community including future generations;</li> <li>(c) With transparency and accountability; and</li> <li>(d) On the basis of equitable sharing of accruing benefits'.</li> </ul>	
		The concept of community land has been defined broadly enough to include VMGs. Women, children, old people and future generations have been thought of as beneficiaries and thus their rights secured in this Act	
17	HIV AIDS PREVENTION AND CONTROL (CAP 246A)	This Act is to promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS. It also seeks to positively address and seek to address conditions that aggravate the spread of HIV infection.	Like other projects, the proposed project is expected to attract new people to the project area seeking employment. This can lead to increased transmission of HIV/AIDS and other sexually transmitted diseases (STDs) as they engage in sexual relationships amongst themselves and/or local community members. In line with the requirements of this Act, the Contractors will create awareness and sensitize the workers and other persons on the risks of infections to foster prevention and control.
18	THE PHYSICAL AND LAND USE PLANNING ACT, 2019	This Act of Parliament makes provision for the planning, use, regulation and development of land and for connected purposes. The objects of this Act related to the project include;	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 – NarokCounty.

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(a) the principles, procedures and standards for the preparation and implementation of physical and land use development plans at the national, county, urban, rural and cities level;

(b) the procedures and standards for development control and the regulation of physical planning and land use; (d) a framework for the co-ordination of physical and land use planning by county governments;

(c) a framework for equitable and sustainable use, planning and management of land;

The Sexual Offenses Act This is a comprehensive law that criminalizes a Implementation of a project creates changes in a community in which 19 wide range of behaviours including rape, sexual it is implemented and is has potential to can cause shifts in power 2006 assault, defilement, compelled or induced dynamics between community members and within households. For indecent acts with child imbeciles or adults, gang instance, male jealousy is a key driver of Gender Based Violence rape, child pornography, child trafficking, child (GBV) which can be triggered by labor influx on a project when sex tourism, child prostitution, exploitation of workers are believed to be interacting with community women. prostitution, incest by male and female persons, Hence, abusive behavior can occur not only between project-related sexual harassment, deliberate transmission of HIV staff and those living in and around the project site, but also within or other life threatening sexually transmitted the homes of those affected by the project. disease, stupefying with sexual intent, forced sexual acts for cultural or religious reasons among others. The Act also has orders for medical treatment for victims including free HIV prophylaxis, emergency pregnancy pill and counselling. The Act provides stiff penalties in which most of the crimes attract minimum of ten

		years' imprisonment which can be enhanced to life imprisonment.	
20	The Children Act, 2012	Part 2 of the Act denotes the rights of the children and their welfare shall be protected from child labor and armed conflict i.e. Every child shall be protected from economic exploitation and any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development. The Act also notes that a shall be protected from sexual exploitation and use in prostitution, inducement or coercion to engage in any sexual activity, and exposure to obscene materials.	Sensitization to the community on the need to ensure the protection of children has been done and will continue throughout the project cycle. In addition, the contractor will sensitize workers against abuse and exploitation of children.
21	Persons with Disability Act, Chapter 133	This Act provides for the protection of the rights of people with disabilities ensuring they are not marginalized and that they enjoy all the necessities of life without discrimination. The Act guarantees that (1) No person shall deny a person with a disability access to opportunities for suitable employment. (2) A qualified employee with a disability shall be subject to the same terms and conditions of employment and the same compensation, privileges, benefits, fringe benefits, incentives or allowances as qualified able-bodied employees. (3) An employee with a disability shall be entitled to exemption from tax on all income accruing from his employment.	The Act will be adhered to in order to ensure that persons with disability are included in all decision making that affects their lives. This will be monitored to make sure they are not excluded from project benefits and exposed to negative impact from the project that could adversely affect them.

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23 Land Registration Act, Section 27 (2) provides that a transfer without Once the KOSAP PIU finalizes stakeholder engagements in a valuable consideration shall have the same effect identified counties, the transfer process shall be commence as a transfer for valuable consideration when registered. rights are secured. This gives the project the required land set to allow project implementation, which is in compliance with land regular methods.	22	Land Act 20	value amendr 19	nent	It aims at standardizing the value of land in Kenya for the primary purpose of enhancing efficiency and expediting the compulsory land acquisition process for public projects. It introduces Section 107A into the Land Act, which provides the criteria for the valuation of freehold and community land that is the subject of compulsory acquisition. Community Land, like freehold land, shall be valued based on the criteria outlined in Section 107A and the Land Value Index which will be jointly developed by the national government and county government. Section 5 introduces a list of the forms in which compensation can be made.	Land in Shantabak is community land. The project site land has been allocated by the community for the proposed mini-grid will be acquired for the project. The MOE will pay compensation in kind through implementation of projects in water, education and health sectors. The community will choose the project for purposes o compensation	1 2 1 1 F
legal requirement.	23	Land 2012	Registration	Act,	Section 27 (2) provides that a transfer without valuable consideration shall have the same effect as a transfer for valuable consideration when registered.	Once the KOSAP PIU finalizes stakeholder engagements in all the identified counties, the transfer process shall be commenced to ensure that the land rights are secured. This gives the project the required land security to allow project implementation, which is in compliance with thi legal requirement.	) / 5

# 5.5 Administrative Framework
## 5.6 National Administrative Requirements

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

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	The Energy Act establishes the EPRA to, among other functions: regulate production, conversion,
Petroleum	distribution, supply, marketing and use of renewable energy; collect and maintain energy data; ensure,
Regulatory	in collaboration with the Kenya Bureau of Standards, that only energy-efficient and cost-effective
Authority (EPRA)	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	The Energy Act establishes the Tribunal to hear and determine civil disputes and appeals from the EPRA
Petroleum Tribunal	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	The main purposes of the RERC are to spearhead development of renewable energy resources in Kenya
Electrification and	and to accelerate the pace of rural electrification in the country. The REREC is mandated under The
Renewable Energy	Petroleum Act to undertake feasibility studies and maintain data with a view to availing the same to
Corporation	developers of renewable energy resources and provide an enabling framework for the efficient and
(REREC)	sustainable production, conversion, distribution, marketing, and utilization of renewable sources in Kenya.
Renewable Energy	The Committee is intended to play an advisory role to the Cabinet Secretary for the Ministry of Energy
Resource Advisory	and Petroleum on the criteria for allocation of renewable energy resource, licensing of renewable energy
Committee	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.

#### Table 10: Relevant Enforcement agencies

#### 5.7 International Safeguard Requirements

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

#### Table 11. World Bank Safeguards

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 Safeguard Policies aims at improving decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted.

S.No.	Safeguard Policy	Objective		Applicabili	ty
1.	Environment	The objective of this p	olicy is to ensure	The policy	is applicable to this
	Assessment	that Bank-financed	projects are	project be	ecause there are

S.No.	Safeguard Policy	Objective	Applicability
	(Operational Policy, OP/BP 4.01)	environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is considered to be the umbrella policy for the Bank's environmental 'safeguard policies.	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.
2.	Natural Habitats (Operational Policy, OP/BP 4.04)	This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal, and marine ecosystems. They include areas lightly modified by human activities but retaining their ecological functions and most native species.	The proposed project will not significantly affect natural habitats due to its area of coverage. Additionally, caution will be taken to ensure minimum disruptions to habitats as guided by the ESMP.
3.	Indigenous Peoples (Operational Policy 4.10)	The objective of this policy is to (i) ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; (ii) ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and (iii) ensure that indigenous peoples receive	OP 4.10 will be applicable due to the known presence of indigenous peoples (IPs)/vulnerable and marginalized groups (VMGs) at the project area. Lochwaa area is overwhelmingly IP/VMG area and is inhabited mainly by the Somali nomadic pastoralist community. The Somali are the predominant

S.No.	Safeguard	Objective	Applicability
	Policy		
		culturally appropriate, gender and inter- generationally inclusive social and economic benefits.	inhabitant of Lochaa area. Further the proponent will continue to engage the PAPs in a culturally appropriate way and allow for decision making in a free, prior and informed consent manner throughout the phases of the project.
4.	Involuntary Resettlement (Operational Policy, OP/BP 4.12)	The objective of this policy is to (i) avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; (ii) assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them; (iii) encourage community participation in planning and implementing resettlement; and (iv) provide assistance to affected people regardless of the legality of land tenure.	The policy is applicable for the entire project because there is land acquisition for the Mini-grid, Wayleaves, contractor facilities and worker's camps.

## 6 BASELINE SETTINGS- ENVIRONMENT, ECOLOGY AND SOCIAL

## 6.1 Study Area

The project site is located in Lochwaa Village, Lochwaa Sub-location, Lochwaa location, Lokichar ward, Turkana South Sub-County in Turkana County. Based on the secondary information of the region, the following baseline information on environment, ecology and social has been discussed under the sections below.

## 6.2 Environment Baseline

#### 6.2.1 Geology and Soil

The county is generally covered with young sedimentary rocks with loamy soils in the north bordering the Sudan. The county has considerable deposits of Limestone and sand. The soils in the project location were predominantly sandy soil with patches of depressed land of loam and clay soil.

#### 6.2.2 Topography

Turkana County is traversed by the extensive Eastern African Rift System. The topography of Turkana varies between semi-arid and arid landscapes consisting of low-lying plains and isolated hills and mountain ranges (Opiyo et al., 2015). The altitude extends from 369m at Lake Turkana to the highest point at around 900m near the Ugandan border in the west. The topography of the project site is an open area and relatively flat with a general hilly eastward and westward. Historical, monthly temperatures in Turkana County between 20 and 40°C. South-eastern Turkana is significantly hotter than the rest of the county. The long rainy season is significantly wetter than the short rainy season. The dry season runs from the end December into February. April experiences the most rainfall (more than 50 mm per month). The county is prone to seasonal flash flooding during the rainy seasons which makes roads impassable.

#### 6.2.3 Hydrogeology and Drainage

The county is prone to seasonal flooding during the rainy seasons which makes roads impassable. The long rains occur between April and July and the short rains between October and November. Annual rainfall is low, ranging between 52 mm and 480 mm with a mean of 200 mm (Turkana County Investment Plan, 2016-2020). Rain patterns and distributions are erratic and unreliable. Rain usually comes in brief, violent storms that result in flash floods. The driest periods (akamu) are in January, February and September and the county is highly prone to drought. 80% of the county is categorised as either arid or very arid.

#### 6.2.4 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 two boreholes indicating presence of underground water. However, the water is slightly salty and very salty in some areas.

## 6.3 Ecological Conditions

The project area encompasses low trees, grass, and shrubs. Turkana County is a semi-arid area falling in the ecological zone V-VI. Zone V receives rainfall between 300-600mm annually, has low trees, grass, and shrubs. On the other hand, zone VI receives an annual rainfall of 200-400mm. Crop activity is carried out along river suguta. The main crops grown in the area are vegetables during rainy season.

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Lochwaa has drought tolerant flora tree species (Acacia spps including Vachellia reficiens and Commiphora Spps, Balanites aegyptiaca, Azadirachta indica (Mwarobaini), Salvadora persica) and gum tree. The Fauna: include the Avian Spps (Kite, Heron, Sacred Bird and Marabou Stork).



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

# 6.4 Climatic Conditions

The county experiences annual average relative humidity of 22 per cent. Monthly temperatures in Turkana County between 20 and 40°C. South-eastern Turkana is significantly hotter than the rest of the county. The long rainy season is significantly wetter than the short rainy season. The dry season runs from the end December into February. April experiences the most rainfall (more than 50 mm per month). The county is prone to seasonal flash flooding during the rainy seasons which makes roads impassable.

# 6.5 Socio-economic Environment

## 6.5.1 Community Profile

Lochwaa village is in Lokichar ward, Turkana South sub-county in Turkana County. The project is located 58km South of Lodwar town and 27Km North of Lokichar town. The top community development priorities are 1<sup>st</sup> water, 2<sup>nd</sup> health and 3<sup>rd</sup> education in that order. The village has been in existence over 60 years ago. Houses in the community mainly composed of thatched and/or polythene covered manyattas with a few that are roofed by iron sheet and brick walls. The community support mechanism includes emergency relief food/feed (for livestock and human). The main clans are Turkana clan present in the area. Christianity is the dominant religion. Below is a summary of demographic profile of Lochwangimatak.

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Attribute	Magnitude/Number
Approx. population	2,240
Households	320
Gender.	Male – 45%
	Female – 55%
Ave. No. per household	7 per household
Indigenous	Indigenous- 100%
	Settlers – 0%
Vulnerable classes	Elderly, PLWDs
Dominant ethnic group	Turkana
Primary religion	Christian
Other groups	None
Employment (formal/Informal)	Formal – Less than 2%
	Informal – 98%

Table 12:	Demographi	c profile of	f Lochwaa
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Plate 2. Comunity household at Lochwaa

6.5.2 Socio-economic status of Study Area

#### 6.5.2.1 Demographic Profile

The information shared on community profile by the area chief (Lochwaa location) showed that Lochwaa has a population of approximately 2,240, and with an estimated number of households to be 320 with an average of 7 people per household. Lochwaa has a gender ration that is currently estimated to be about 45% male and 55% female.

## 6.5.2.2 Educational Infrastructure

The village has one primary school and one secondary school - Lochwaa Primary School and Lochwaa Boys which is still under construction located within the location. The school has a total of 334 pupils (158 Boys and 176 Girls) with 9 teachers. The school completion rate among the girls is higher than that of the boys. Most pupils drop out at class 8 or Form 4 mainly due to lack of school fees, lack of food and child labor (Taking care of livestock).

#### 6.5.2.3 Occupation and Livelihood Profile

Lochwaa communities are mainly pastoralists moving with livestock in search of pasture and water. Major livestock kept are camel, cattle, sheep, goats, and local chicken. The community rely of livestock products for food at the household level and for income generation. Formal employment is 2%. Other sources of income in the society include sale of wood fuel/charcoal and firewood, building materials, retail shops a butchery and eateries. Due to the aridity of the county, food production (crop growing) is limited and contributes little to food security. Few farmers grow vegetables in kitchen gardens within their homes during the rainy season. All these harvests is for subsistence/household consumption which most of the

time is not enough.

#### 6.5.2.4 Land Use

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

#### 6.5.2.5 Health facilities

Lochwaa has only one public health unit known as Lochwangimatak dispensary with 1 nurse, 1 public health and 1 nutritionist. The facility has staff quarters and the main service provided is Out-patient services. The facility lacks water, electricity, emergency vehicle, beds, adequate toilet facility and other basic equipment. The dispensary is open between 0800hrs and 1700hrs but offers 24hrs emergency services.

#### 6.5.2.6 Social and Physical Infrastructure

**Water**: There are two sources of water in the village; Spring borehole and shallow hand dug wells from which is 2km away.

**Sanitation**: Private toilet facilities are provided in the school, dispensary, churches and few households within the area. Open

within the area. Open defecation (OP) also practiced in the village leading into poor waste management.

**Road Network**: Roads connectivity within the area is also poor and not regularly maintained. The main forms of transport within the area are



matatus, lories and Motor bikes while camels also provide alternative modes from the villages. The proposed site is off Kapenguria to Lokichar road along an earth road. The main road (Kapenguria to Lokichar road) was under construction that is being tarmacked as at the time of audit.

**Mobile Network Coverage:** *Safaricom* is the only Network coverage within the village and majority of people have access to the internet services. The service is relatively stable in the area.

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

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# 7 STAKEHOLDER ENGAGEMENT

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

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

## 7.1 Stakeholder Consultation and Disclosure Requirement for the Project

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

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

The respective minutes and list of participants for the public consultation undertaken at Lochwaa shopping centre is enclosed under appendices of this report. Further, an initial communication was shared with the county commissioner Turkana and Deputy County Commissioner for Lochwangimatak on 13<sup>th</sup> January 2022, prior to the public participation meeting held on 14<sup>th</sup> January 2022 near



the Baraza (Community members)

Lochwangimatak minigrid site at Lochwaa shopping centre. Background information document (BID) with project details was posted clearly on one of the regular shops at Lochwangimatak shopping center.

# 7.2 Stakeholder Characterization and Identification

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

- **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 Lochwangimatak the stakeholders have been identified and listed in the table given below.

## Table 13. Identified Stakeholders

Stakeholder Groups	Project affected Persons	Interested Parties
Community	Local Laborer's	Pastoralists
	Land sellers	
	VMG's	
	Local Community	
Institutions	Community & Faith Based Organizations	
	Education & Healthcare institutions	
Government Bodies	NEMA	
	County Government	
	District and local administration	

# 7.2.1 Stakeholder Mapping

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

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

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

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

## **Table 14: Stakeholder Significance and Engagement Requirement**

# 7.3 Stakeholder Analysis

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

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

The intermediary categories s of low to medium or medium to high primarily imply that their influence

and importance could vary in that range subject to context specific conditions or also based on the responses of the project towards the community.

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

## 7.4 KEY FEEDBACK RECEIVED DURING STAKEHOLDER CONSULTATION PROCESS

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

A detailed CPP and community engagement for Lochwangimatak Solar Mini Grid was held in Lochwaa village, at Lochwaa shopping centre on 14th January 2022 chaired by the Ward Admin and the Assistant Chief.

The general stakeholder consultation was done in a public meeting (Baraza) organized at Lochwaa shopping centre where 59 males and 18 women were in attendance. The meeting was chaired by the area ward administrator and the area assistant chief.

Stakeholder Category	Relevant Stakeholders	Magnitude of Influence/Impact	Urgency/Likeli hood of Influence	Overall rating of stakeholder rating
Project	Community land owners	Medium	Low	Minor
affected Persons	Local Labourers and subcontractors	Small	Medium	Minor
/Primary Stakeholder s	County Government of Turkana, District and local administration	Medium	Low	Minor
	FBOs, CBOs and Educational Institutions VMGS	Medium	Low	Minor
Interested	Local community	Small	Medium	Minor
Parties / Secondary Stakeholder s	Pastoralists	Small Medium	Medium Low	Minor Minor

#### **Table 15: Summary of Stakeholder Influence**

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## 7.4.1 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 national and county government officers and other interested parties, focused group discussions with the men, women and youth and a public baraza/meeting for the rest of the community members. A two weeks' notice was issued to the county leadership and the community in preparation for the consultations. Mobilization of the FGDs and the public baraza was done in coordination with the local leaders; youth, men and women leaders. Communication was via word of mouth and public announcements.

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

No	NAME	Organization/ Designation	Issues/comments discussed
1.	Mr. Silvester	Chairman- Lochwaa Primary School	Mr. Silvester said that the community has been waiting for the project. He asked when the project was starting since it had taken too long. He also asked if the community can choose the project or the project(Compesation in Kind) has to be choosen for them. He requested that the main contractor to choose a community subcontractor in service delivery. He reuested to be assigned as one when the project kick-starts.
2.	Rev. Cliffin Okoth	Pastor – Lochwaa	<ul><li>Mr. Okoth explained that the village is experiencing water problems.</li><li>He stated that thr government helps in the education sector and the county in the health sector.</li><li>He also stated that the community is benefiting from Chinese borehole constructed along the main road. He requested that the borehole water to be pumped to the secondary school to benefit more community members.</li><li>He further recommended a pastor to be added to the grievances redress committee team.</li></ul>
3.	Mrs. Margeret	Woman – Lochwaa Village	Mrs. Margeret expressed happiness for the purpose of the meeting. She asked if the project will be brought soon or will delay. She stated that the hospital has no lights and ladies have to give birth using touches. She requested that the group of ladies be given first priority during sub-contracting and job opportunities. He further suggested water for the compensation in kind project since they are currently relying on the Chinese boreholes waters.
4.	Mzee Hachan	Man – Village Elder	Mr. Hachan requested that the community members discuss amongst themselves on the compensation in kind project.
5.	Mr. William Emuria	Man	<ul><li>Mr. William stated that the community was fatigued due to the time it was taking to start.</li><li>He also said that the Turkana elders have to be consulted separately before the project is implemented.</li><li>He expressed that he would love the three projects being implemented at a go but in case all cannot at ones, he suggested water project to act as a dominant for compensation in kind.</li></ul>

6.	<ol> <li>Mr. Samuel Community Health Practitioner</li> </ol>		Mr. Samuel stated that during land a uisation, the proposed project was in health sector since the health facility did not have a ward or maternity wing.
7.	Mr. Pete Ewala	MCA Aspirant	Mr. Ewala how much the said project is capped at. He said that the community has water challenges since community buy water at Kshs.20 per 20 liter jerican. He also staed that the building at the school have collapsed and currently have 3 classes. He suggested building of classes and dormitories. He also suggested the main contractor to have a meeting with the locals before implementation. He raised a question concerning occupational accident and it was very well answered by the consultant team.

## 7.4.2 Positive Comments about the Project from the Participants

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

- Medical services will improve due to availability of refrigeration services as well as women will not have to give birth using torched any more.
- ✓ Learning will improve due to availability of lighting
- ✓ Security at Lochwaa will improve due to availability of lighting
- ✓ Business opportunities will improve since livestock farmers will be able to cool their milk, welding business will arise
- ✓ Employment opportunities will increase for the youth due to increase in business opportunities
- $\checkmark$  The electricity will assist in pumping of water from the boreholes to community members homes.

#### 7.4.3 The identified negative impacts of the project

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

- Employment Disputes: There was a concern over the possibility of disputes arising between the local communities with people of different cultures in the construction sites. The woman also felt they might not be considered. The community suggested that proponent should consider employing local construction workers including women.
- ✓ Security: some of the members raised concerns of the security of the area especially when the grid is installed. Community members were advised and encouraged to practice community policing to improve security.
- Accidents: some of the members raised concerns of possible occupational accidents as well as from falling poles, electrocution especially animals. The community was advised to take extra care while assigned to work in the site.
- Raw Material: Questions were also raised on whether the labor and raw materials will be sourced from the community. It was communicated to the community members that some of the materials will be sourced locally

## 7.4.4 Additional Responses from the Consultant

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

✓ Every resident, business or public facility will be connected to the electricity at an affordable cost

✓ All non-skilled labor will be sourced from the Lochwaa Community and not from outside unless the skill needed is not available within the area. The woman and the youth will be considered in the process.

## 7.4.5 Consent

The Community members present agreed unanimously accepted the Project Proposal.

## 7.4.6 Community Presentation

#### 7.4.6.1 Adult to youth Representation

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

#### 7.4.6.2 Gender Representation

#### Table 16. The consultative meeting had a wide representation

Category	Male	Female
Youth	17	0
Adult	28	16
TOTAL	45	16

#### 7.4.6.3 Heads of Households

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

# 7.4.7 Focused Group Discussions analysis

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

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

The consultative meeting had a wide representation as follows:

Category	Male	Female	Total
Youth	17	0	17
Adult	28	16	44
TOTAL	45	16	61

Table 17. The consultative meeting had a wide representation	tion
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The target groups of the FGD were Males, Females, Health sector, Education sector as well as and the Youths.

#### 7.4.7.1 Female Stakeholders' Consultation and Participation

The females' participants in the FGD were N=16 and between 18-35 years (Middle age-40%) and 35-60 years (60%) of age. The women stated they knew eight female headed household within the locality. The following were their responses.

#### The project perception

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

#### Women in Lochwangimatak community and their roles as reported by the FGD

- ✓ The challenges encountered by women include inadequate water causing hygiene issues, lack of proper sanitation.
- ✓ Women receive information about local issues and development or news through, phone calls, radios and from the local chief.
- ✓ Women are currently involved in provision of household, roles that were exclusively for men. They are also involved in decision making of various issues in the community
- ✓ Women feel safe in the community and level of crime is low. They stated they experience raids(Cattle rustling and tribal conflicts) from the Pokot community occasionally
- ✓ Women Build houses, fetch firewood and water.
- ✓ Cooking and other house chores are also their work.
- ✓ Women and men don't have equal opportunities in the community however, Women control household equipment while male control livestock, land, dowry and other major assets.

#### Institutions/community Development

- $\checkmark$  The women have Akisha- a group that encourages table banking.
- ✓ The main community development priorities/needs include.
  - Water Reticulation: Improvement of availability and accessibility of water especially on solalization and distribution of water from the said "Chinese boreholes"
  - Enhancement of health care services and facilities by constructing maternity ward and equipping it.
  - Improvement of education in the village to reduce illiteracy levels by expanding the primary school and constructing a secondary school.

#### Economy /income generation by women

- ✓ Women earn income from doing odd jobs, sale of milk from camel, cattle and goats, sale of food and charcoal/firewood
- $\checkmark$  At the household level, women contribute less income than men
- ✓ The women have no access to any bank/credit/saving accounts in Lochwaa. However, the women could access mobile banking.

#### Land use by women

- Community members are nomadic. However, only Morans move with their livestock in search of water and pasture during the dry seasons. The women stay at home with the children.
- The livestock (goats and sheep, cattle camels, and donkeys) are reared for both subsistence and income generation.
- ✓ Women collect natural resources like firewood for both domestic use and commercial purposes
- ✓ Land and tribal conflict has been experienced in the community.
- ✓ Some women in the FGD indicated that sometimes they experience gender-based violence (GBV) at household level. There are indications of intimate patner. To eliminate GBV the women suggested creation of awareness on reducing GBV among community members.



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

#### Education, literacy, and training of Women in Lochwangimatak

- ✓ The women denoted that they do access quality education. Girls have the potential of going up to university level.
- $\checkmark$  A few women can read and write in the community especially the young adults.

#### Health care for Women in Lochwangimatak

- ✓ The women access health care from the Lochwaa dispensary,
- $\checkmark$  The women have access to family planning.
- ✓ The main health problems/challenges facing women include inadequate medicine, healthcare education and sanitation.
- ✓ Environmental issues affecting health in the community is mainly poor sanitation because of inadequate water leading to water borne diseases.
- ✓ There are some people leaving with disabilities and lack specialized homecare due to lack of adequate facilities.
- ✓ Women prefer conventional health care as compared to traditional medicines as an alternative.

#### Access to Water by women

- ✓ The community has two sources of water. One is the Chinese borehole which is closed after 1200hrs on daily bases and community or spring bore hole located within.
- $\checkmark$  The water is very saline with dust particles and suspension.
- ✓ During dry season water is not sufficient

#### Transport and communication

- $\checkmark$  The main forms of transport are matatus or motorbikes.
- ✓ The village is served by an earth road that is impassable during dry and wet seasons. However, as at the time of audit, Kapenguria-Lodwar road was under construction.
- ✓ The area is severed with Safaricom service provider as the dominant means of communication. However, network is not always stable.

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#### Sanitation and hygiene for women

✓ The main type of toilet in the village are pit latrines in institutions and able homes. Open defecation was also reported by the FGD.

#### Hygiene and waste management by Women

- ✓ Some Women in Lochwaa do not access sanitary facilities and or products e.g., sanitary towels. This is due to low income and most of them cannot afford.
- $\checkmark$  Household waste is burnt in heaps or dumped in compost.

#### Access to Power as per the FGD

- ✓ Sources of energy and their uses in Lochwaa village include
  - For lighting use of solar powered lighting
    - For warming -wood fuel
  - Cooking -wood fuel
  - Charging mobile-a few uses portable solar
  - Cooling None
- $\checkmark$  The village has limited sources of power as the main challenge.

#### **Cultural heritage**

✓ The area has no cultural heritage. However, they have "Miti ya Wazee" which is 500m away where barazas and other traditional meetings are held.

#### 7.4.7.2 Male Stakeholders' Consultation and Participation

✓ The male participants were N=28 in number between 35-50 years (70%) and between 50-80 years (30%) of age. The male participants are household heads. The following were the response during the male FGD.

#### The project perception

 $\checkmark$  The men indicated that they have heard about the project since May 2021.

#### Role of Men as per the FGD

- ✓ The findings showed that the roles of men are mainly siring of children, herding, and watering of livestock, providing leadership and security at the household level.
- ✓ Currently, Men generally feel safe in the community. However, small insecurity concerns for individuals stealing cattle from community members.
- ✓ They indicated that women and men have equal opportunities in the community although women have more difficulties than men due to more responsibilities and challenges
- ✓ Men have more control over livestock than women
- ✓ The main challenges encountered by men in Lochwaa community mainly include drought which greatly affect the animals thus forcing them to trek for long distances in search of water and pasture.
- ✓ Men generally receive information about local issues and development or news through word of mouth and door to door, over phone calls to elders and sometime through radio thou rarely.
- Men do not have three cultural groups namely, Age-set groupings(For leadership), Tobonglore(For cultural maintainace) and Traditional Men Folk Dance(For Cultural protection)
- ✓ Their top three community development priorities include water, education & health.

#### Economy / income generation

- Men generally earn their income through sale of livestock and livestock products, retailing of goods and sale in shops.
- ✓ Men have greater economic opportunities than women due to their more control over livestock which they sell to get income

✓ They indicated that they do not have access to credit facilities, only one Mpesa (Mobile Banking platform) is available.

#### Land use

- ✓ Men keep livestock both as subsistence and income-generating activities. Livestock reared include sheep, goats, donkeys as well as few local chickens.
- Community members are nomadic- morans move with livestock in search of water and pasture especially during the dry seasons.
- ✓ The men are also involved in collection of some natural resources like herbs, and gum from the nearby vegetation covers.
- ✓ According to the men FGD, land-conflicts are experienced within the communities (Intra community conflicts) in completion of pasture and accumulation of livestock as a symbol of wealth.

#### Education, literacy, and training as per the FGD

- ✓ The area has 1 primary school and one secondary school (Under construction) within the location.
- ✓ Ability to read and write among the male population is generally average. The schools have 45% boys and 55% girls on average. This is due to child labour where the boys have to go and take care of the livestock.

#### Health care analysis by the male FGD

- ✓ The men access health care from Lochwaa Dispensary; the services provided are not satisfactory to all men needs. However, complicated cases are referred to Lodwar and/or Kitale.
- ✓ The dominant health issues among men include Urinary Infection (Mostly during drought), Tuberculosis malnutrition and HIV & AIDS.
- ✓ The PLWDs are present among the male population and are mostly managed at home and only taken to a health facility by use of motorbikes.

#### Access to Water analysis by the male FGD

- ✓ The men are responsible for searching water to be provided to the livestock while women collect water for both livestock use a domestic use.
- ✓ The men access water from the community/spring borehole which was constructed by the Catholic Church and equipped by World vision and Oxfam about 500m away from the village. The community gets its water from another borehole constructed by Chinese contractor. The waters are highly saline.

#### Sanitation and hygiene according to Male FGD

- $\checkmark$  The main type of toilets are pit latrines.
- Men indicated that open defecation is commonly practiced as an alternative where access to latrines is impossible. They also indicated that there is no public toilet available.

#### Hygiene and waste management

✓ Hand washing and general cleaning are done by use of basins

#### **Access to Power**

- ✓ Sources of energy for Lochwaa village
  - For lighting use of solar
  - For warming they use firewood
  - Cooking -firewood
  - Charging mobile-solar
  - Cooling None
- ✓ The village has limited sources of power since majority cannot afford

✓ The men suggested that the solar mini grid need to be developed soonest possible since it's a long awaited project

#### Transport and communication

- $\checkmark$  The main forms of transport are matatus and motorbikes.
- ✓ The village is served by an earth road (Kapenguria- Lokichar road) that is impassable during wet seasons. However the road was still under construction as at the time of assessment
- ✓ The area is severed with Safaricom service provider as the dominant means of communication. Connectivity is also reported to be unstable.

#### **Religious heritage**

- ✓ Churches are the main religious sites within Lochwaa community. However, the men have a prayer/blessing shrine located 500m under a tree.
- ✓ The main festivals undertaken by men include religious festivities e.g. Blessing ceremony, prayers. They are done under a specific tree assigned by elders as stated above.

#### 7.4.7.3 Youth Stakeholders' Consultation and Participation

✓ The youth participants were 17 in number, and consisted of 17 males. The following opinions were provided by the youth participants during the FGD.

#### The project perception

- ✓ The youth disclosed that they are now aware and understood the importance of the project to the community.
- ✓ They suggested that the project had positive impact since it will bring with it employment opportunities, and improve quality of education.
- $\checkmark$  They also indicated that they will be able to also charge their phones.

#### **Role of Youth**

✓ The youth indicated that main community decision making is undertaken by the elders. However, therefore their voices are generally heard.

#### Institutions/community Development

✓ The youth have several youth groups that have been established. These include; Kaaroge Youth Group, Meturan Youth Group, Kekam Youth Group and Oranyketer Youth Group which do business within the area.

#### **Economy /Income Generation/Employment**

- ✓ An estimate of twenty (20%) of the youth are self-employed while 3% of the youth have full-time salary jobs.
- ✓ The income-generating activities pre-dominant among youth in Lochwaa include selling livestock, grocery, bodaboda and retail shops.
- ✓ Other skills that enable them gain employment include IT, electricians, natural resource conservation skills, drivers, survey and social work.

#### Education, literacy, and training for youth FGD

✓ An estimate of 25-30% of the youth has completed secondary education while a further 10% have completed Vocational/College level education.

#### Key Priorities among the Youth & Issues

- $\checkmark$  The Youth top three priorities include provision of employment opportunities.
- $\checkmark$  They also stated that they would business support by funding business proposals.

#### 7.4.7.4 Education Stakeholders' Consultation and Participation

✓ The Education Stakeholder in Lochwaa was a deputy head master who have worked for 1 year and 2 months at Lochwaa Primary school. The following responses were recorded from the stakeholder.

#### The project perception

- ✓ He heard about the project before. He indicated it has been the long awaited project since it will improve lighting at night.
- ✓ The project will improve economic levels within Lochwaa area
- ✓ The respondent indicated that the project would have a positive impact to the school through access of electricity that will provide light especially in the evening study by students
- ✓ The project should install security lighting to minize crime rate within the centre.
- Provided various possible ways of mitigating negative impact from the solar project through fencing the project area, informing and properly educating the locals on negative effects of the projects and employing security personnel.
- ✓ Provision of better and cheaper equipment charging services
- ✓ He requested community awareness to be done to reduce negative effects.

#### Infrastructure/Resources

- ✓ Lochwaaa primary school has currently has 9 teachers.
- $\checkmark$  The school is performing well and was the 1<sup>st</sup> in the sub county.
- ✓ The challenges facing the school include lack of adequate water storage facilities and poor/no lighting system.
- ✓ UNICEF usually provide learning materials to the learners.
- ✓ The average walking distance of students to school is 1Km. The furthest distance a student walks to school is 5km
- ✓ The teacher indicated that the government provides for school feeding programme, though this has been suspended for now.
- ✓ Teachers receive their salaries from banks located in Lodwar town.

#### The School Curriculum

- $\checkmark$  The respondent indicated that the boys perfoms better than girls because of the socio-cultural norms at the area.
- ✓ The teacher indicated that learners faith to attend school due to lack of meals and the distance from the villages.

#### The School Attendance

- $\checkmark$  334 pupils: 158 boys and 176 girls.
- $\checkmark$  The completion rate for male students attending school is higher than that of female.



Figure 7. School Enrolment and School Completion rate

## 7.4.7.5 Health Stakeholders' Consultation and Participation

✓ The following were responses from the health worker (Nursing officer) at the Lochwaa dispensary during the KII.

#### The project perception

- ✓ The medical practitioner was aware of the implementation of the project. He got more information from the baraza.
- ✓ They noted that the project posed a risk workers by causing respiratory infections as a result of dust emanating from the site..
- ✓ The respondents further noted that the project shall have positive impacts that include boosting security due to lighting and improvement of economic standards of the community. They also indicated that it will improve provision of services at the healthcare facility as well as working on 24hrs base.

#### Facility Profile

- ✓ Lochwaa dispensary currently operates from 8:00am to 5:00pm and provides emergency and maternity services on 24hrs bases
- ✓ It serves the local community and the surroundings informal villages approximately 70KM coverage with a population of 7215 persons.

#### Infrastructure/Resources

- ✓ The health center has the following staff; 1 male nurse, 1 female Nutrition Officer and 1 female public health.
- $\checkmark$  The staff indicated that the infrastructure at the institution is at moderate condition.
- $\checkmark$  Adequate power supply and lack of water are the main challenges.

#### Prevalence Rates/Health Issues

- ✓ Malnutrition was the most prevalent among most vulnerable groups due to food insecurity among the community of Lochwaa as stated by men FDGs.
- The main health issues pre-dominant among the women in Lochwaa are urinary tract infection due to poor access to clean sanitation facilities, diseases of the respiratory infection, malaria and STDs and STIs as stated by the Female FDGs.
- ✓ The main health issues pre-dominant among the men in Lochwaa are urinary tract infection upper respiratory infection and malaria.

- ✓ The main health issues pre-dominant among the children in Lochwaa are malnutrition due to improper diet & skin infection and upper respiratory infection.
- ✓ Other matters that also posed health risks include domestic violence community conflicts due to limited resources like water during drought seasons among the community.
- ✓ There are cases of GBV attributed to excessive use of alcohol
- $\checkmark~$  The most vulnerable groups within the community are the mentally challenged, children and the elderly.



**Plate 6. Public Participation** 

Plate 5. Female FGD



Plate 7. Male FGD

Plate 10. Youth FGD

# 8.1 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.

# 8.2 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.

# 8.3 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.

## 8.4 County Grievance Redress Committees (CGRC)

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

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

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

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

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

# 8.5 Locational Grievance Redress Committee (LGRC)

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

At the time of assessment, the committee had already been 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 consisting of six (6) members. The members consisted of two (2) ladies, two (2) men and two (2) youth all identified and elected from each category of PAP except for the location Chief and village administrator who are automatic members of the team.

It was however identified that the LGRC was yet to formulate a leadership structure by electing their chairperson and secretary among themselves as at the time of assessment.

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.

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

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

#### The roles of LRCCs will include among others:

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



## Figure 8. KOSAP Grievance Redress Mechanism

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

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

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

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# 9 IMPACT ASSESSMENT AND ENHANCEMENT MEASURESS

# 9.1 Identification of Impacts

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

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

## 9.2 Impact Assessment Methodology

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

- Prediction of potential impacts and their magnitude (i.e., the consequences of the development on the natural and social environment);
- Evaluation of the importance (or significance) of potential impacts taking the sensitivity of the environmental resources or human receptors into account;
- Development of Enhancement Measuress 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:

## 9.3 Defining Impact

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

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

## 9.4 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 9-1* based on five levels described in table below;

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

Table 9-1: Categories of Significance

	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 9-2:

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

Table 9-2: Overall Significance Criteria for Environmental Impacts

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 Enhancement Measuress 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.

# 9.5 Magnitude of Impact

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

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

• where relevant (accidental or unplanned events), the probability of the impact occurring.

For social impacts, the magnitude considers the perspective of those affected by taking into account the likely perceived importance of the impact, the ability of people to manage and adapt to change and the extent to which a human receptor gains or loses access to, or control over, socioeconomic 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).

# 9.6 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.

# 9.7 Likelihood

Terms used to define likelihood of occurrence of an impact are explained in Table 9-3 below.

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	As far as possibly recurring
	(e.g., air emissions) or	impacts are
	slowly developing effects	concerned, such as accident or
	are concerned (e.g., impacts	unplanned events (e.g.,
	on local life	traffic accident,
	style)	fire)

Table 9-3: Explanation of Terms Used for Likelihood of Occurrence

# 9.8 Definition of Enhancement Measures

Enhancement 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 "Enhancement Measures" includes

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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 Enhancement Measuress such as engineering controls are often sufficient to reduce these impacts to ALARP ('as-low-as-reasonably-possible') levels. This approach takes into account the technical and financial feasibility of Enhancement Measuress. Potential impacts assessed to be of minor significance are usually sufficiently managed through good industry practice, operational plans and procedures.

In developing Enhancement Measuress, 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.

# 9.9 Positive Impacts During Construction Phase

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

# 9.9.1 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

# Mitigation

- 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

## 9.9.2 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

# 9.10 Positive Impacts during Operation Phase

## 9.10.1 Quality, Reliable Power Supply

There is no electricity in Lochwaangimatak. 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

# Mitigation

• KPLC should ensure that they have a functional customer support team and a field response team;

• KPLC should ensure that they communate power outages early to consumers

## 9.10.2 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 employe people to manage the substation

## Mitigation

- 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

# **9.10.3** 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 [eriof of time for manny households

## Mitigation

- 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 communate power outages early to consumers

## 9.10.4 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

# Mitigation

- 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

# 9.10.5 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 Measures**

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

# 9.10.6 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.

# 9.10.7 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.

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#### 9.10.8 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.

#### 9.10.9 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.

#### 9.11 Positive Impacts during Decommissioning Phase

#### 9.11.1 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.

#### 9.11.2 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.

#### 9.12 Negative Impacts during Pre-construction Phase

#### 9.12.1 Land Take

The identified site for the proposed Mini-grid is part of the land owned by the Yaqo community that they set aside. 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.

#### Way Leaves

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

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

#### **Enhancement Measuress**

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- 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

# 9.13 Negative Impacts During Construction Phase

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

# 9.13.1 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.

# **Enhancement Measures**

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

# 9.13.2 Soil Erosion Impact

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

# **Enhancement Measures**

• The contractor shall avoid groundbreaking during the seasons of high rainfall to avoid erosion.

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

## 9.13.3 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.

## **Enhancement 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.

## 9.13.4 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 Enhancement Measuress, 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.

## **Enhancement 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

### 9.13.5 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.

### **Enhancement 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<sub>X</sub>, SO<sub>X</sub> and suspended particulate matter;

# 9.13.6 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.

- 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

### 9.13.7 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 Yaqo area use an earth dam as the main source of water and care must be exercised to avoid any pollution to the water source.

#### **Enhancement 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,

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- 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

# 9.13.8 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. The site is on very close proximity to Yaqo dispensary and few residential houses nearby.

# Enhancement Measures for Noise and Vibration

These proposed Enhancement Measuress 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

# 9.13.9 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.

# **Enhancement Measures**

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

# 9.13.10 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.

### **Enhancement Measures**

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

### 9.13.11 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.

### **Enhancement 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.

### 9.13.12 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.

### **Enhancement 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.

# 9.13.13 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.

- 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.

#### 9.13.14 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.

#### **Enhancement 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.

#### 9.13.15 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.

- 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 Enhancement Measures appropriately
- Adherence to occupational Safety and Health Act 2007
- Establish Safety committees

• The contractor must acquire insurance for the workers-WIBA cover

### 9.13.16 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.

### **Enhancement 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

# 9.13.17 Spread of HIV/AIDS and STIs

HIV and AIDS remain a major challenge in Kenya as well as in Turkana County. The epidemic continues to adversely impact on all spheres of the County; economic, social and health sectors. Turkana County is ranked as a medium-epidemic county. With good number of People Living with HIV (PLHIV) in the county, it is of concern that two thirds of this population are women and 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 **Enhancement 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.

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• 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.

### 9.13.18 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 neigbouring 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.

#### **Enhancement Measures**

- Reduction of labor 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

#### 9.13.19 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 labor 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.

### **Enhancement Measuress**

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

### 9.13.20 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 Yaqo 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.

### **Enhancement Measuress**

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

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

# Key tasks will include:

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

# 9.13.21 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.

# **Proposed Enhancement 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.

#### w) 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.

#### **Enhancement Measuress**

• Construct/ install pit latrines for both genders clearly labelled

#### 9.13.22 Forced Labor

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

### **Enhancement Measures**

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

#### 9.13.23 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 Enhancement Measures the impact significance is minor.

#### **Enhancement Measuress;**

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- 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.

# 9.14 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 seven years and then hand over the plant to Kenya Power who is the implementing agency of the plant on behalf of the MOE. Therefore, Enhancement Measures against negative impacts during the first seven years will be the responsibility of the contractor after which KPLC will take over.

### 9.14.1 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.

# **Enhancement 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.

# 9.14.2 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.

### **Proposed Enhancement Measures**

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

### 9.14.3 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.

#### **Enhancement 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.

### 9.14.4 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.

### **Enhancement 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

### 9.14.5 Fire Outbreaks

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

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

#### 9.14.6 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.

#### **Enhancement 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

### 9.14.7 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.

#### Enhancement 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.

#### 9.14.8 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.

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

### 9.14.9 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.

### **Enhancement 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

### 9.14.10 Workers Occupation Health and Safety

Working within the Mini-grid can poses 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.

### **Enhancement 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

### 9.14.11 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.

- ✤ 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

#### 9.14.12 Noise and Vibration

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

### **Enhancement 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.

#### 9.14.13 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.

#### 9.14.14 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.

#### **Enhancement 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
  - o 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

#### 9.14.15 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.

# **Enhancement 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

### 9.14.16 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 Enhancement Measures the impact significance is minor to negligible.

### **Enhancement 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

### 9.14.17 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.

### **Enhancement Measures**

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

### Key tasks will include

- Community engagement to create awareness on GBV risk/ issues
- Creating awareness to workers on the need to refrain from GBV incidences
- Mandatory awareness creation for workers on required lawful conduct in the community and legal consequences for failure to comply with laws
- Mandatory signing and implementation of code of conduct for the workers
- Creation of partnership or liaison with specialized actors in GBV who can respond appropriately in case of any incidence (provide contacts to community)

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

### 9.14.18 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.

### **Enhancement 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

# 9.14.19 Public health Impacts -Covid 19 disease

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

- 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

#### 9.14.20 Dust emissions

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

#### **Enhancement Measuress**

- 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

#### 9.14.21 Vehicle exhaust emissions

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

#### **Enhancement 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

#### 9.15 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 Turkana to obtain approval for implementation.
- Implement the decommissioning plan including backfilling, revegetation, disposal of waste material, recycling of recyclable material among others

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

#### 9.15.1 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.

#### Enhancement Measures

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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 neighbors are out working.

### 9.15.2 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 TurkanaCounty Government regulations).

### **Enhancement Measuress**

- 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 nonhazardous 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

### 9.15.3 Dust Emissions

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

### **Enhancement Measuress**

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.

#### 9.15.4 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.

### 9.16 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 labor and child sexual exploitation. Additionally, the contractor will employ their skilled staff and apply unskilled construction labor from the local population as far as possible to minimize on influx of foreigners into the community.

#### 9.17 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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# 10 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

# 11 Environmental and Social Management and Monitoring Plan

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

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#### Table 4: Environmental and Social Management Plan

#### Social Impacts

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Potential Impacts	Recommended Enhancement Measuress	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	on worker and project grievance redress mechanisms.					
Local Sourcing	-Source materials from local businesses/communities, and where necessary give opportunities to businesses owned or operated by vulnerable individuals.	Construction Decomissioning	Proponent, construction, O&M Contractor	-Number and types of businesses sourced from, businesses owned and operated by vulnerable individuals, types and quantities of materials etc.	Quarterly	No additional cost
Land acquisition and compensation for land and assets on land	In line with the RPF provisions; -Prepare and implement an <b>Abbreviated Resettlement</b> <b>Action Plan (A-RAP)</b> to guide land acquisition for the mini-grid, and wayleaves for power distribution. Further, the proponent will fast-track A-RAP preparation to ensure that land acquisition and contractor mobilization to	Pre- Construction	Contractor- (contractors ' facilities, workers camps) Proponent- (project land for generation assets)	<ul> <li>-Land Acquisition and consultation report (consultation (minutes and lists of participants).</li> <li>-Type and amount of compensation paid to affected persons.</li> <li>Priority community project implemented and handed over to affected communities.</li> </ul>	Quarterly	Value of compensation in kind project will be equivalent to the value of land acquired as per NLC

<b>Potential Impacts</b>	Recommended	Project phase	Responsi	Monitoring	Frequency	Estimated	Cost
	Enhancement		bility	Indicator		(Ksh)	
	the site is undertaker after			Signad agreementsith			
	the A RAP is finalized			-Signed agreements with			
	cleared, and disclosed.			and restoration of their			
	-The contractor will			land.			
	implement and adhere to						
	agreements for temporal use						
	of land and restoration of						
	land after use.						
	-Compensate affected						
	(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.		<u> </u>				

Potential Impacts	Recommended Enhancement Measuress	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-Consultations with the community on the low voltage lines. -The design of the distribution line will utilize the existing road reserves. However, any damage to structures, crops, trees, community facilities and other assets will be compensated in line with the RPF provisions.					
Labor Influx and related impacts (SEA/SH, HIV/AIDs and other STIs)	-Tapintothelocalworkforce to theextentpossible toreducelaborinfluxRecruitlocalworkforce tothepossibleespeciallypossibleespeciallypossibleandskilledjobsConsultwithandinvolvelocalcommunityinprojectplanningandother	Construction Decomissioni ng	Proponent, construction, O&M Contractor	-Records of employees/updated employee register. -Number of local community employees and external employees/ updated employee register.	Quarterly	50,000.00

Potential Impacts	Recommended Enhancement	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	Measuress					
	-Raise awareness					
	among local community					
	and workers on the need					
	to have a good /cordial					
	working relation					
	-Sensitize workers					
	regarding engagement					
	with local community.					
	-Make provision to					
	provide resources					
	needed by the workers					
	if the need for such					
	resources may result to					
	competition e.g., water.					
	-Establish and					
	operationalize an					
	effective Grievance					
	Redress Mechanism					
	accessible to					
	community members.					
	-The contractor and the					
	project/community					
	grievance redress					
	committee to work					

Potential Impacts	Recommended Enhancement	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	Measuress					
	closely address complains raised on time. -Include gender considerations in employment opportunities. -Provide appropriate compensation for work done. -Respect for community values/culture. -Prompt payment of					
	workers as per the contractual agreements/terms.					
Child labor	<ul> <li>-Employ workers who are</li> <li>18 years and above, and</li> <li>with a valid national ID at</li> <li>the time of hire.</li> <li>-Implement and monitor</li> <li>the employment register</li> <li>regularly. Compliance</li> <li>with the national labor</li> <li>laws and labour</li> </ul>	Construction Decomissioning	Proponent, construction, O&M Contractor	-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

Potential Impacts	Recommended Enhancement Measuress	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
GBV- SEA and SH	management practices. -Put visible signage on site "No Jobs for children" -Do not allow children at the project site. -Prepare an SEA/SH Prevention and Response	Construction Operations	Proponent, construction,	-Minutes of awareness creation sessions for	Quarterly	50,000.00
	Action Plan, to manage the SEA/SH risks. -The Action Plan to be proportionate to potential SEA/SH risks, and to include measures such as awareness creation for communities and workers; identification of referral services for survivors and a GRM that ensures confidential reporting of GBV cases. -Implement a code of conduct signed by all those with physical presence on site.	Decomissioning	O&M Contractor	the community and workers on GBV- SEA/SH. -Code of conduct signed by all those with physical presence on site. -GRM that ensures confidentiality of GBV cases in place. Documented referral services for survivors. -Grievances raised, aggrieved persons and status on resolution etc		

Potential Impacts	Recommended Enhancement Measuress	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Forced Labor	<ul> <li>-Adhere to the Employment Act which outlaws any form of forced labor.</li> <li>-Report any form of forced labor at the site.</li> <li>-Ensure that all workers have a national ID card or documentation to show they are adults (above 18 years).</li> </ul>	Construction Decomissioni ng	Proponent, construction, O&M Contractor	-Number of reported cases of forced labor.	Quarterly	20,000.00
Risks related to Inadequate stakeholder engagement	<ul> <li>-Prepare a stakeholder engagement/consultatio</li> <li>n plan (SEP) that is proportionate to the subproject and the identified stakeholders.</li> <li>-Timely and prior disclosure of project all project information, including project instruments, the full rights and entitlements of project affected persons, sub-project positive and</li> </ul>	Construction Operations Decommissioni ng	Proponent, construction, O&M Contractor	-Availability of and implementation of the Stakeholder Engagement Plan. -# of stakeholder consultations held -Record of stakeholder consultations held (minutes of meetings and list of participants). -Information disclosed, to whom it was disclosed (men women, PWD, youth, vulnerable individuals and	Quarterly	30,000.00

Centric Africa Limited.

Potential Impacts	Recommended Enhancement Measuress	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	negative impacts and opportunities, proposed subproject budget. -In line with the SEP, undertake adequate consultations prior to construction and throughout the project cycle with all segments of the community and other relevant stakeholders. -Prepare and implement a grievance redress mechanism to deal with grievances. -The grievance redress committee to include representatives from the community. -Sensitize stakeholders on SEP and GRM.			households etc., methods and languages used in the disclosure (culturally appropriate and accessible), grievances raised and status on resolution etc. -Concerns raised andactons raised.		
Exclusion of VMGs and vulnerable individuals and households	In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following. • Early identification and inclusion of VMGs and	Pre-construction Construction Operations Decommissioni ng	Proponent, construction, O&M Contractor	Minutes of consultative meetings with all community segments including VMGs and vulnerable individuals and households,	Quarterly	No additional cost

Potential Impacts	Recommended Enhancement Measuress	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	<ul> <li>disadvantaged groups.</li> <li>Meaningful consultation to effectively participate in the project.</li> <li>Timely and prior disclosure of relevant project information to VMGs and disadvantaged groups.</li> <li>Adequate and ongoing consultations with VMGs and disadvantaged groups in line with the SEP.</li> <li>All concerns or grievances raised are fully resolved in a timely manner.</li> <li>Access to culturally appropriate project benefits and opportunities.</li> </ul>			grievances raised and status on resolution etc.		
Inaccessibility of project benefits to VMGs and other	-Consult VMGs and Vulnerable individuals and households on	Operations	Proponent, construction, O&M Contractor	-Interventions to enable those vulnerable access	Quarterly	No additional cost

Potential Impacts	Recommended Enhancement	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	Measuress					
vulnerable	charges for sub project			project benefits.		
individuals due to	services, and put in place			-Number of complaints		
affordability	specific interventions to			raised by		
challenges	ensure the vulnerable			VMGs/vulnerable		
	equally access project			individuals regarding		
	benefits.			access to project		
				services.		
				-GRM that is culturally		
				appropriate and		
				accessible.		
				Grievances raised and		
Imposta from	1 Maintananca of	Construction	Proponent	Drasanco of wall	Quartarly	100 000 00
Hozordous	1. Maintenance Of	Construction	construction,	maintained	Quarterry	100,000.00
matarials	vehicles will not be		O&M Contractor	recentacles and		
	done on site		Contractor	centralized collection		
	$2  \Delta ll \qquad hazardous$			points		
	products and waste			points		
	should be labeled					
	and handled					
	properly to avoid					
	contact with the					
	ground					
	3. Dispose hazardous					
	waste through a					

Potential Impacts	Recommended Enhancement Measuress	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	NEMA approved waste handler					
Sanitary waste	1. Construct/ install pit latrines for both genders clearly labelled	Construction	Proponent, construction, O&M Contractor	Presence of separate and clean washrooms for both the gents and ladies	Quarterly	300,000.00
Increased oil Consumption	<ol> <li>Efficient energy consumption</li> <li>Install an energy- efficient lighting system</li> </ol>	Operation	Proponent, construction, O&M Contractor	Energy consumption records	Quarterly	No additional cost
Risks related to poor or inadequate stakeholder engagement (Conflict)	<ol> <li>Employ from the community to the extent possible</li> <li>Engage the community members and other stakeholders in a timely manner</li> <li>Work closely with the GRM committee members in solving the conflicts</li> <li>Solve all conflicts/grievances</li> </ol>	Operation	Proponent, construction, O&M Contractor	Grievance records	Quarterly	20,000.00

Potential Impacts	Recommended Enhancement Measuress	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Condor Bogod	at the earliest time possible 5. Ensure all grievances are logged and closed 6. Monitoring the pattern of grievances to come up will long term measures	Operation	Proponent	SEA/SH Provention	Quarterly	20.000.00
Gender Based Violence –SEA and SH	the contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The plan will include the necessary measures for prevention and response and must ensure survivor-based approach	Operation	Contractor	-SEA/SH Prevention and Response Action Plan -Grievance records	Quarterly	20,000.00

Potential Impacts	Recommended Enhancement Measuress	Project phase	Responsi bility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	Total					4,380,000.00
No	Institution	Role/Function				
----	--	---				
1	The National Environment Management Authority (NEMA	<ul> <li>NEMA:</li> <li>Approve the ESIA Report</li> <li>Issue EIA License for project implementation</li> <li>Carry out independent Audit to determine compliance with ESMP</li> </ul>				
2	Directorate of Occupational Safety and Health Services (DOSHS)	<ul> <li>DOSHS:</li> <li>Provides OSH permits for workplaces of the project including campsites and quarries</li> <li>Conduct inspections to ensure conformance to OSHA</li> </ul>				
3	Water Resources Authority (WRA)	<ul> <li>WRA</li> <li>Provides necessary water abstraction permits for boreholes and surface water sources (rivers, streams etc.)</li> <li>Monitor water use in the region and provide guidance water use</li> </ul>				
4	National Land Commission (NLC)	<ul> <li>NLC</li> <li>Verify the identified land for the purposes of ascertaining land ownership</li> <li>Transfer of land ownership details to the proponent</li> </ul>				
5	National Gender and Equality Commission	<ul> <li>The Commission:</li> <li>Ensures that there is gender equality and equity throughout the implementation of the project.</li> <li>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</li> </ul>				
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 Turkana	County Governments will: • Provide approval for the project & project site • Approval of community land consent & verification • Provide support				
8	Supervision Consultant	<ul> <li>Supervising Consultant</li> <li>Will engage the following dedicated full-time safeguards staff to support risk management         <ul> <li>✓ Supervising Engineer (RE)</li> <li>✓ Social Safeguards Specialist</li> <li>✓ Environmental Safeguards Specialist</li> <li>Review and approval of the ESMPs and other plans</li> </ul> </li> <li>Day to day supervision of Contractor implementation of the ESMPs and other plans</li> <li>Regular reporting on the ESMP implementation</li> </ul>				

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

		<ul> <li>Has full time Environmental, Health and Safety and Social Specialists</li> </ul>
9	Contractor	Contractor
		<ul> <li>Will engage the following dedicated full-time safeguards staff;</li> <li>✓ Environmental Safeguards Specialist</li> <li>✓ Social Safeguards Specialist</li> <li>✓ Registered Occupational Health and Safety (OHS) Expert</li> <li>Will Prepare the CESMPs and other plans before commencing construction.</li> <li>Will Operationalize and implement the CESMPs.</li> <li>Has full time Environmental, Health and Safety and Social Specialists.</li> <li>Carries out day to day management of ES, H&amp; S risks.</li> <li>Reports on incidents and accidents to the Resident Engineer and regulators.</li> </ul>

#### 11.1 STAKEHOLDER ENGAGEMENT PLAN AND GRIEVANCE MANAGEMENT POST-ESIA

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

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

Communication is critical to transmission of clear concise and factually correct information, either through inter-personal communication or communication with a group of persons. Some of the key risks to poor communication for this phase of the project include:

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

#### **11.1.1** Principles/Objectives of Stakeholder Engagement Plan

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

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

#### **11.1.2** Approach for Stakeholder Engagement Plan

The first approach to an effective Stakeholder engagement is to determine who the stakeholders are, who will be adversely affected by potential environmental and social impacts of the Project, who are the most vulnerable among the potentially impacted and whether special engagement efforts would be necessary, at which stage of project development stakeholders will be most affected, what are the various interests of project stakeholders, their expectations and what level of influence they might have on the Project, which stakeholders might help to enhance the Project design or reduce Project costs.

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

#### 11.1.3 Monitoring

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

monitoring of this Plan.

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

Monitoring will be effected through internal inspections and performance audits. Information of stakeholder engagement activities will be recorded to track progress and establish relevant controls.

The Project shall conclude the procedures for participatory monitoring of the SEP based on the intended targets.

#### 11.1.4 Reporting

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

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

The table below outlines the outlines the stakeholder engagement activities for the project, the relevant actors and their related interests and grievance redress across the project life-cycle (ESIA Stage, construction, operation and decommissioning phase)

S/N	Organizatio n	Specific Stakeholder	Thematic Areas and Summary on Areas of interest	Key Message	Engagement / Grievance management	Expected Outcomes	Responsible	Timeline
1.	The National Government	<ul> <li>County Commissio ners</li> <li>Members of Parliament</li> <li>Chiefs</li> <li>Other national agencies</li> <li>Children Officer</li> <li>Social Developme nt Officers</li> <li>MoE</li> <li>REREC</li> <li>NLC</li> <li>Others eg EPRA and NEMA</li> </ul>	<ul> <li>Community development</li> <li>General socio -economic development e.g. construction safety, child protection, HIV/AIDS management, land and acquisition etc.</li> <li>Security</li> <li>Rule of law</li> </ul>	<ul> <li>Project GRM</li> <li>Labour</li> <li>Security</li> <li>Good political will</li> </ul>	<ul> <li>Consultative meetings</li> <li>Participation in public barazas as organised by the consultant / contractor</li> </ul>	<ul> <li>Provision of access to data necessary for follow-up on project implement ation as well as partners in project Support activities.</li> <li>Partners in dispute resolution and implement ation of the project.</li> </ul>	<ul> <li>Social Safeguards Specialists</li> <li>EHS Officer</li> <li>Contractor's Project Manager</li> </ul>	<ul> <li>Quarterly</li> <li>Monthly</li> </ul>
2.	County Government	<ul> <li>Governor and his office</li> <li>County Executive Members;</li> <li>Chief Officers;</li> <li>MCAs</li> <li>Ward administrat ors/sub- county</li> </ul>	<ul> <li>General County Development</li> <li>Ensuring county social and economic development</li> <li>Mobilization of local resources for development</li> <li>Infrastructure development</li> </ul>	<ul> <li>Project GRM</li> <li>RAP</li> <li>Security</li> <li>Good political will</li> </ul>	Consultative meetings	<ul> <li>Provision of access to data necessary for follow-up on project implement ation.</li> <li>Partners in dispute resolution and</li> </ul>	<ul> <li>Social Safeguards Specialists</li> <li>EHS officer</li> <li>Contractor's Project Manager</li> </ul>	<ul> <li>Quarterly</li> <li>Monthly</li> </ul>

#### Table 5: Stakeholder Engagement plan

S/N	Organizatio	Specific Stakeholder	Thematic Areas and	Key Message	Engagement /	Expected	Responsible	Timeline
	n	Stakenolder	interest		management	Outcomes		
		administrat ors			-	implement ation of the project activities.		
3.	Community	<ul> <li>Villages</li> <li>Elders</li> <li>Women</li> <li>Youth</li> <li>Opinion leaders</li> <li>Vulnerable groups</li> <li>VMGs</li> </ul>	<ul> <li>Construction Environmental and Social Management Plan (CESMP) and applicable project activities of relevance to the community</li> <li>General welfare for prosperity</li> <li>Participation, involvement and consultations in social economic development activities</li> </ul>	<ul> <li>Project GRM</li> <li>Labour</li> <li>Security</li> <li>Community health and safety</li> <li>Construction safety</li> <li>Project staff / community relations</li> <li>Good political will</li> </ul>	<ul> <li>Consultative meetings</li> <li>Participation in public barazas as organised by the contractor</li> <li>Notices on notice boards at accessible spaces / places</li> <li>GRM Hearings</li> <li>Phone calls and SMS where</li> </ul>	<ul> <li>Community to be engaged as required by the project documents eg. Stakeholde r's report, ESIA</li> <li>Engageme nt by Contractor</li> </ul>	<ul> <li>Social Safeguards Specialists</li> <li>EHS Officer</li> </ul>	<ul> <li>Quarterly</li> <li>Monthly</li> <li>As per GRM Processes</li> </ul>
4.	Kirimon market Centre	<ul><li>Hawkers</li><li>Retailers</li><li>Buyers</li></ul>	<ul> <li>General welfare for prosperity</li> <li>Participation, involvement and consultations in social economic development activities.</li> </ul>	<ul> <li>Project GRM</li> <li>Labour</li> <li>Security</li> <li>Good political will</li> </ul>	<ul> <li>applicable</li> <li>Awareness creation public events as organised under construction Safety Programs</li> <li>Door to door meetings as applicable</li> </ul>	as required in the Contract specificatio ns which also cover the activities as required in the Constructio n Environme ntal and Social Manageme		

S/N	Organizatio	Specific	Thematic Areas and	Key Message	Engagement /	Expected	Responsible	Timeline
	n	Stakeholder	Summary on Areas of		Grievance	Outcomes		
			interest		management			
						nt Plan (CESMP).		
5.	Vulnerable and marginalized groups	Community representati ves	<ul> <li>Have programs in</li> <li>Reproductive health</li> <li>Water program</li> <li>Peace building and conflict mitigation tied with natural resource management in Samburu County.</li> <li>Behaviour change communication in reproductive health</li> <li>Water harvesting.</li> </ul>	<ul> <li>Livelihood programs</li> <li>Good political will</li> </ul>	<ul> <li>One on one meetings</li> <li>Participation in discussions as organised by consultant / contractor's social safeguards experts</li> </ul>	<ul> <li>Discussions on and where applicable support on livelihood programs.</li> <li>Information sharing during investigatio n on relevant cases under GRM</li> </ul>	<ul> <li>Social Safeguards Specialists</li> </ul>	<ul> <li>As necessary to inform quarterly social safeguards performance report</li> </ul>
6.	Kenya Police	Officers at police front desk.	<ul> <li>Maintain Law and order.</li> <li>Prosecution of law breakers.</li> </ul>	Security	Filing of Reports at Police Station	<ul> <li>Filing of reports on law breaking as required by law</li> </ul>	<ul> <li>Aggrieved parties</li> </ul>	As necessary.
			<ul> <li>Traffic management and construction safety.</li> </ul>	Construction safety awareness	<ul> <li>One on one meetings</li> <li>Participation in discussions / events</li> </ul>	<ul> <li>Participatio         <ul> <li>n in discussions</li> <li>/ awareness</li> <li>programs</li> <li>as</li> <li>organised</li> <li>by</li> <li>consultant /</li> <li>constructor's</li> <li>constructio</li> </ul> </li> </ul>	Construction safety experts	<ul> <li>As necessary to inform quarterly social safeguards performance report</li> </ul>

S/N	Organizatio n	Specific Stakeholder	Thematic Areas and Summary on Areas of	Key Message	Engagement / Grievance	Expected Outcomes	Responsible	Timeline
			interest		management			
						n safety		
						experts		
7.	Local media	Contact persons in local FM stations / community radios to be determined	<ul> <li>Awareness creation on current issues.</li> <li>Means of communication to reach larger community.</li> </ul>	Advocacy	<ul> <li>Radio infomercials</li> <li>Radio discussion sessions</li> </ul>	<ul> <li>Awarenes s raising</li> <li>Informatio n dispersal to wider audiences within the project area.</li> </ul>	<ul> <li>As advised by MoE/KPLC on wider project communicatio n strategy</li> </ul>	<ul> <li>As advised by MoE/KPLC on wider project communicatio n strategy</li> </ul>

## **12.1 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 Lochwaa Village, Lochwaa sub-location lochwaa location, Lokichar ward, Turkana South sub-county in Turkana county. During the implementation of the project, there shall be some impacts both positive and negative. The negative impact shall be controlled through suggested Enhancement Measuress.

#### **12.2 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

## 12.3 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 Enhancement Measures during the project cycle, suggestions of possible alterations to the proposed design based on the assessment findings were made, public and stakeholder consultation and participation was undertaken, an environmental and social management plan (ESMP) and monitoring plan were developed. The project has been guided by World Bank safeguards regulations and EMCA 1999 *(amended 2015).* During the ESIA various stakeholders including VMGs were consulted, and their views incorporated in the report.

The proponent/contractor to consult all relevant service providers and authorities (i.e., County Administrators, NEMA, amongst others) to harmonize the projects infrastructural and socio-economic developments with existing facilities. The contractor will prepare and implement a C-ESMP informed by the proponent's ESMP. A qualified Social Specialist to oversee the C-ESMP implementation will be engaged as well. The contractor will engage a Community Liaison Officer to act as the link between the community and the contractor and support the Social Specialist.

**Note:** The Solar Mini-grid will be installed operated and maintained by the contractor for the first seve (7) years and then handed over to KPLC engineers and operators. So, for the seven years KPLC will be monitoring the operations of the contractor.

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

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

## **13 APPENDICES**

# 13.1 Appendices

No.	Apendix	Item
1	APPENDIX 1	THE MEETING LEADING TO LAND IDENTIFICATION AND GRC CONSTITUTION
2	APPENDIX 2	BARAZA ATTENDANCE LIST
3	APPENDIX 3	FDG'S LIST FOR THE ELDERS/MEN
4	APPENDIX 4	FDG'S LIST FOR THE WOMEN/FEMALE
5	APPENDIX 5	FDG'S LIST FOR THE YOUTH
6	APPENDIX 6	MINUTES OF THE EIA CONSULTATION MEETING
7	APPENDIX 7	FIRM AND LEAD EXPERT PRACTICING LICENCE
8	APPENDIX 8	A-RAP DOCUMENT

# **13.2** Appendix 1: The meeting leading to land identification and GRC Constitution Minutes

Minutes of Community Engagement Meeting Held in Regard to Kenya off Grid Solar Access Project (KOSAP): Proposed Solar Mini-grid at Lochwaangikamatak Village. **Venue of meeting:** Lochwaangikamatak Trading Centre/village.

## Date: 15/03/2021

#### AGENDAS

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

## Minute 1/KOSAP/2020: Preliminaries

The area chief- **Paulo Lokurchana** called the meeting to order at 11.40 a.m. and opening prayer was done by area elder. The chief then welcomed the project team and also members of Lochwaangikamatak Market and thanked all for attending the meeting. He told them "since the main project team is here, be keen on the information they have brought to us about the project and be free to participate through questions and comments in order to make the meeting fruitful.

Ward Administrator thanked the chief and the community members for turning up for the meeting. He explained that he had come with other officers to talk to the community on various issues in line with the proposed Mini-grid. He told the community that the visiting team would be given a chance to talk on specific areas in line with the project.

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

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

#### KOSAP Team

Table 1.1 KOSAP Team – Turkana

Minute 2/KOSAP/2020: Project Description

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

He informed the community that the project called - KOSAP is being implemented jointly by the Ministry of Energy, the Kenya Power and Lighting Company (KPLC) and the Rural Electrification and Renewable Energy Corporation (REREC) in partnership with the World Bank as a development partner, County Government and the communities in off-grid areas being the beneficiaries. Off-grid areas are those places where the national electricity grid has not reached, and whose electricity access has been very low. The current project is being implemented in fourteen (14) counties in Kenya.

The reason for choosing solar energy was because the area is far away from the national grid and the fact that the area is well endowed with natural sunlight on high temperatures. He explained that the government's target is to achieve universal access to electricity by 2022 using various sources and solar energy is one of the identified sources because it is also clean energy. He further explained that the proposed solar energy mini-grid will be put up and low voltage lines will also be constructed to enable connection of electricity to beneficiaries/customers.

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

He told them that connection of power will be involving passing of electrical lines along the roads in order to reach their house and the route for passing the lines is called way leave. He noted that once the designs are done, the community will be notified of the exact routes during future consultations and that they will be required to give consent.

The number of mini-grid sites in Turkana County will be 23 sites with Lochwaangikamatak being one of the site selected. The will also be 19no. of street lights installed in Lochwaangikamatak, the connectivity radius will be 3km and the community are requested to donate land for the process to go on.

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

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

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

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

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

**Samuel – KPLC.** Projects also have negative impacts. The proposed solar mini grid will have the following negative impacts and I will present them alongside their Enhancement Measuress.

Negative impact	Enhancement Measuress by contractor
Vegetation clearance	Clear only the areas that are needed to put up the mini grid
	After construction, do landscaping with grass to areas that
	have no electrical installation as opposed to living areas
	bare
Air pollution dust from	Fence off construction site to reduce dust going to the
construction activities	public
	Use of masks for workers
Air pollution dust from	Limit vehicle speed to minimum possible when passing
construction vehicles	residential areas
Air pollution from vehicle	Maintain vehicles/service vehicles
emissions	No idling of vehicles
Solid waste	Clear all solid waste and dispose appropriately
Land take- voluntary land	Compensation for land and or seek voluntary donation
donation will limit access to the	
land by community for grazing	

	To allow animal grazing (farm and wildlife), the proponent will only fence the section of the land where the plant shall be located.
Occupation safety and health hazards e.g. accidents, fall from heights, pricks by sharp objects	Use of proper Personal protective equipment like gloves, overalls, helmet, safety shoes Allocating work according to skills Toolbox talks to workers to identify hazards and risky activities
Social Risks Related to Labour Influx - With an increase in the population of the area boosted by the project employees the social set up of the area will be affected. This change may be in the form of loose morality, an increase in school drop-out due to cheap labour, child labour, and increased incidences of HIV/AIDS and other communicable diseases.	Conduct periodic sensitization forums for employees on ethics, morals, general good behavior and the need for the project to co-exist with the neighbours; offer guidance and counseling on HIV/AIDS and other STDs to employees; provide condoms to employees; and ensure enforcement of REA's policy on sexual harassment and abuse of office.
HIV/AIDS, communicable and sexually transmitted diseases (STDs).	HIV/AIDs awareness to community
Gender-based violence These are potential impacts of a project related to labour influx or project workers	-Awareness to community -All cases should be reported to chief or the grievance redress committee members or to community elders -contractor to have code of conduct for the workers
Sexual exploitation and abuse by contractors and workers	-Awareness to community -Report any incidence of sexual exploitation to the grievance redress committee members or to community elders -contractor to have code of conduct for the workers contractor to have code of conduct for the workers
Unwanted pregnancies and school dropouts	Awareness on this impact to schools
Child abuse	Employment of children is illegal Report any case to the chief's office
Demand for Material/resources e.g water	Contractor to consult with elders before using the water resources in the community to avoid conflicts
Oil Spill Hazards	Contractor not to repair vehicles or equipment on site Maintain vehicles and equipment in good state
Storm water and erosion	Contractor to put measures to harvest rainwater and control erosion during construction
Wastewater/ effluent	Provide sanitation facilities for workers

Noise resulting from excavation	Work only during the day
machinery, vehicles and workers	In case of blasting contractor to give notice to community
	through the village elders and chiefs office
Visual and Aesthetic Landscape Impacts	The visual negative impacts can be mitigated through putting up a wall round the facility to keep off/screen the project stacks, poles, cables and transformers by the project proponent. Proper siting decisions can help to avoid aesthetic impacts to the landscape.
Hazardous materials from damaged Panels- Photovoltaic panels may contain hazardous materials, and although they are sealed under normal operating conditions, there is the potential for environmental contamination if they were damaged or improperly disposed upon decommissioning.	Proper planning and good maintenance practices can be used to minimize impacts from hazardous materials.
Fuel storage on site	Proper maintenance fuel storage tanks and dispensing
	system
	Budded wall 1.5 times the fuel storage tank

Table 1.2 Negative impacts of the project

## Public safety in regards to electricity

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

- Engage a certified technician to do wiring in your premises;
- Use quality materials while wiring;
- Do not engage in individual illegal extensions of power lines to other houses;
- Don't touch sockets and switches with wet hands or wipe with wet cloths;
- Do not tie your livestock on electric poles;
- Do not cut earth wires that run along some electric poles;
- Do not touch any electric wire if you find it fallen on the ground;
- Report any incident regarding electricity at the local office –staff in charge of operating the Minigrid;
- Vet all new people coming to the village by checking whether they registered their presence with the office of the chief;
- In case of a black out do not open sockets or switches;

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

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

Consolata explained to the public forum that the proposed project will require an average of 3 acres of land. She asked them the nature of ownership of the land in the area and they answered that the ownership is communal where by the entire land belongs to the community and not individuals with individual title deeds. They also noted that the land is not formally sub divided (implying not adjudicated). She explained to them that based on the ownership of land they had explained, their land falls under the category of community land and its use and management is governed by the Community Land Act 2016.

She educated the community on the following issues;

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

She noted that the government of Kenya had secured a loan from its development partners i.e. World Bank to implement the KOSAP project. The government through the Ministry of Energy proposes to use World Bank guidelines on voluntary land donation for the project. She informed them that for voluntary land donation, there is a criterion which need be fulfilled to allow for voluntary donation to be acceptable. She explained the criteria as follows;

• The impacts must be minor, that is, involve no more than 10 percent of the area of any holding and require no physical relocation.

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

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

#### Survey of the land and request for advance possession.

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

Consolata told the community that connection of power will involve passing of electrical lines along the roads in order to reach their houses, business premises and public facilities and the route for passing the lines is called way leave. She noted that once the designs are done, the community will be notified of the exact routes during future consultations and that they will be required to give way leave consent (allowing the service lines to pass through their land in the extreme cases). She noted that the project may seek freeway leaves due to budget constraints and requested the community to consider this and make an informed decision when the time comes.

	WORLD BANK VOLUNTARY LAND DONATION CRITERIA	ASSESSMENT ON FULFILMENT OF THIS CRITERIA
1	Land donations can be voluntary only if the infrastructure is not location specific.	The proposed project is not site specific

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

					possession at the appropriate time. The community agreed to allow advance possession.
8	Grievance available	mechanisms	must	be	The community deals with grievances through council of elders. The need to set up a grievance redress mechanism was explained to the community and they elected the persons who will form the project committee/grievance redress committee.

Table 1.3 Land Donation Criteria

## Minute 6/KOSAP/2020: Grievance Redress Mechanism

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

#### Project GRM:

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

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

S/No	Name	Identification No.	Category
1	Paulo Lolimo	38.9320	Men
2	Peter Engola	2266223	Youth
	Lawrence Eripon	24834674	
3	Margaret Eyangan Ekal	21334418	Women
	Rachel Nachi	25046875	
4	Mary Amoni Lokope	21835922	Chief

#### **Project Committee Members/grievance redress committee.**

Table 1.4 grievance redress committee

#### **Plenary session**

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

Name	Question/ Comment	Remark/Response
Peter Ewalan	How will the community sustain	(Nicholas)
	the project after the contractor	The implementation of the project
	has left the site?	has already started, Advert and
	The implementation period of	award will be done in 7-8 months.
	the project – when will it start?	Skilled and unskilled labour, the
	If the community give the land	community will be given the first
	that is a bit far from the Centre,	priority hence job opportunity will
	will they still get the power	be available.
	since the close land is almost	On theft – will huge the community
	owned by individuals?	to take full responsibility of the
	Employment – during the	project since its community based.
	construction will the	The connectivity radius is 3km hence
	community gets jobs	emphasis on the area to be selected
	Street light – the county	in order to achieve the radius.
	government implemented	
	some in lokichar, what	
	measures will be in place to	
	sustain them from theft?	
Lawrence Eripon	We will agree to give the land	Noted. (Nicholas)
	through the chief since almost	The ministry has done the
	land is individually owned. This	engagement and it's also important
	will be done through chief and	for the contractor to do the same by
	nis committee.	use of chiefs
	Employment – since the project	James -NLC
	Is long, it will change the life of	Emphasis on the importance of land
	iobs to its members	land acquisition mothods to be
	The contractor to involve the	and acquisition methods to be
	chief and his office to help in the	projects to be depated by the
	implementation of the project	community not county government
	and reduce delay that can be	or the chief himself
	caused e.g. payment of	or the chief himsen.
	workers failure by the labourer	
Peter engolangi (vouth	Baduis -3km, there are other	Noted ( <b>Nicholas</b> )
representative)	centres outside the 3km radius.	power will be within the centre.
· ····································	is it possible to connect these	Other centers will benefit from the
	centres also to improve their	stand-alone systems.
	economy?	
	GRM – signing of the land	
	donation form should be done	

	after agreement community	of	the	
Anda Samuel	Incase of accident a who will take the resp	t the oonsib	site, ility?	Samuel – the project is insured. This will help for the purpose.

Table 1.5 Plenary

## Focus Group Discussion with the women Lochwangikamatak (lochwaa) solar mini grid

Consolata Hongo opened the meeting with emphasis on the importance of the proposed project, especially to women, since they are home managers in most set ups. She informed the women that they too had a critical role to play before, during and after implementation of the project and urged them not to look back. She reminded them that it was for this reason that the women were given an opportunity to meet on their own and freely deliberate further on issues that may affect them. The women were further reminded to prepare to participate fully in the project to enable them reap the most benefits.

Consolata reminded the women to remember the discussed negative project impacts and take necessary precautions. She also reminded the women to always liaise with their representatives and local administration for help where necessary. She urged the women to always follow the right procedures in ensuring that their issues are resolved adequately.

## Plenary Session

**Margaret Eyangan Ekal** – 'I fully support this project. I am also willing to rally all women to convince their men to provide land for the project'.

#### Elections

**Margaret Eyangan Ekal** and **Rael Nachi** were proposed and elected to represent the women. There being no other business, the members were allowed to break for refreshments.

No.:	Name:	Question or Comment asked:	Response:		
1.	Mr. Hosea (Ward	This is a good project and those	Muigai: Thank you. Since we are here		
	Administrator)	in attendance do represent the	all day I know more will attend as the		
	(Sentiment made	community interests.	meeting progresses		
	as we are about to				
	start the meeting)				
2.	Aris Etyanga	My only concern is can the	Muigai: Thank you.		
		employment opportunities of	As I mentioned during the plenary		
		non-technical and those with	session with the entire community, I		
		Certificate and Diploma that	would like to reiterate that the		

## Focus Group Discussion: MEN

			•
		arise in the life of this project should be a preserve of the community.	employment opportunities that arise here in Lochwaa will consider the locals. These will be for example watchmen, cooks and those with some electrical knowledge.
3.	Samuel Auda	I want to say that this village also has learned persons so if the opportunities arise for them to be absorbed, that would be a great thing	Muigai: Thank you for the sentiments and that is well noted.
4.	Peter Etyang	My concern is with the proposed street lights. We have seen some that were installed in Lokichar and now are not functional one year later. Some are even vandalized. How can we avoid this pitfall?	Muigai: Thank you. It is worth noting that the Contractor who will be procured will have the materials inspected before shipment so as to ascertain quality. Secondly the same materials will be re inspected when they arrive on site before installation commences. Thirdly, the Contractor will be here for ten years to oversee the Operations and Maintenance phase of the project. Finally, it will also be expected as responsible citizens and through the Nyumba Kumi initiative to see to it that we all guard over this massive investment. This response elicited widespread applause
5.	Mzee Lolimo (Elder of the Area Chief)	Can this project commence as soon as today?	Muigai: Thank you. We shall see to it that the processes prior and conducted and concluded soonest s that implementation can start.

The men were all in agreement to give land for the project and did not have any further questions and gave all their blessings.

# Focus Group Discussion: Youth

No.:	Name:		Question or Comment asked:	Response:
1.	Mr.	Losuron	I came late, what is the agenda	Samwel: Thank you for making time for
	Narita		of the meeting?	this meeting, albeit late. The main agenda
				of this meeting is to is to seek land to
				establish a project, Solar Mini-grid plant
				to bring Electricity to the community so

			as to make life comfortable and spur
	Bendiktas Ikaru	How is the power bapafitting	economic development.
2.	Dentiktas ikai u	the youth?	As I mentioned during the plenary session with the entire community, there are so many benefits. Specifically, for youth, they will be able to open and expand enterprises eg barber shops, welding businesses, storage of perishable food items, cooling of water and other soft drinks, cyber cafes for photocopying and printing services and employment opportunities to some youth who will be deemed qualified for some tasks in the project, Longer study hours for students etc
3.	John Emtono.	I would like to know whether neighbouring sublocations will benefit fom the project.	Samwel: Thank you for the question, A company called ENREKA, had previously carried out the demand /load profile and its against the load profile that the project would be established, hence if the neighbouring sublocations weren't considered they wouldn't benefit. Again, the project beneficiaries must be within a 3km radius from the solar minigrid plant.
4.	Lawence Eripon	I would like to request that when the project begins the youth be considered for employment because they can cause sabotage of the project if they feel left out. Additionally, the contractor/developer should build good relations/rapport with the community as this will lead to success. It has been the experience that some highended contractors in some other development projects in neighbouring location has had a project stall, because of this scenario.	Samwel: Thank you, your concerns are highly appreciated. Indeed, there will be a Grievances redress Mechanism committee formed. The committee will comprise of chosen leaders from the Men, youth and from the women. This will form the main focal point where project related matters of concern or grievances will be raised.
5.	Morris Losinyoro	I am Requesting that the project to absorb locals in	Samwel: That one will be considered it has already been discussed in the main plenary. Without doubt locals will be the

		employment opportunities as much as possible.	first ones to be considered in employment opportunities for tasks that they can be able to do.
6.	Peter Engola	I am anticipating that if there is a problem in the work area between management and a local worker, warning should be sounded before summary dismissal	Samwel: That's taken into account and is the reason we have the conflict resolution mechanism committee. Besides it is the case that if the misdemeanor is not big it is inorder that an employee is given warning.
7.	Peter Engola	The contractor should come to the ground with the team from the ministry for reconnaissance, bonding and introductions on ground breaking day	Samwel: Thank you for your comment and that is in the plan so once the contractor has been awarded the works, The team from the ministry will come with the contractor on ground breaking day and lay the rules for engagement to all parties and there will be regular visits from the ministry to come supervise the works and address any arising issues as the project moves on.

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

Youth Leaders choosen:

Peter Engola	Cell:	0798173065	ID	NO:	2266223
Lawrence Erip	on Cell: 07	7175926060	ID NO:	2483	34674

## Vulnerable and Marginalized Groups

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

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

## Grievance Redress Mechanism

A grievances redress mechanism (GRM) will be put in place and operationalized to provide a forum and opportunity for the community to lodge complaints or concerns at the earliest time

possible and with no cost. During the meeting, Nicholas explained that the community is allowed to raise any complaints or make requests for information in regarding the project. The first point of getting information or raise complaint will be the project committee which will act as the grievance redress committee. The community chose the project committee and training of the committee is important to enable operationalize the GRM. The project will have a three-tier grievance redress mechanism as follows.

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

The community in Lochwangimatak 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)

#### Site specific Environmental and social Aspects

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

Table 6: Environmental and social aspects, observations and recommendations for Lochwa Mini-grid site

ENVIR	ONMENTAL ANI	O SOCIAL ASPECTS	
	ASPECT	OBSERVATIONS	RECOMMENDATIONS/ REMARKS
GENEI	RAL		
1	Project	Area will be supplied through Mini-	Proper installation of solar system to
	technology	grids comprising of solar photovoltaic	ensure maximum protection to the
		generation plant.	public
2	List of Materials	Batteries, Panels, Transformers, sand,	The locally available materials should
	to be used	stones, gravel, conductors, poles,	be sourced from the local community
	during	cements etc	hence benefiting the community.
	construction/		
	operation		

ENVIR	ENVIRONMENTAL AND SOCIAL ASPECTS											
	ASPECT	OBSERVATIONS	RECOMMENDATIONS/ REMARKS									
SOCIA	L ASPECTS											
3	Land uses	There are few residential houses adjacent the site.	Project to ensure that Enhancement Measuress are incorporated from the design stages to ensure the project does not adversely affect the existing land uses but instead coexists and enhance service delivery.									
4	Land uses on or near the project likely to be negatively affected	The site is currently not in use but the site close few residential houses	Contractor to sprinkle water and work during the day to mitigate against noise and dust.									
5	Sensitive areas/ community facilities	No sensitive areas were observed in or near the proposed project area	None will be affected									
6	Site Ownership use, and land take	Currently the site is community owned	Once all the conditions are met, KPLC will engage in the transfer of the proposed parcel of land to ensure ownership as construction of the Solar Mini-grid continues									
7	Population Density	The area adjacent the site is sparsely populated and the village about one KM from site is moderately populated	Create clear buffer zone to avoid people settling within the proposed site.									
8	Job opportunities	It was noted that job opportunities will be there during the construction and operation, of the proposed Mini- grid. The jobs will be both direct and indirect to the community members. Indirect jobs include barber shops, saloon, phone charging, welding, eateries/hotels and IT businesses.	Local population should have the priority in accessing job opportunities, – i.e. men, women and youth including PLWD During consultation it was agreed that the contractor can consider the locals with specialized knowledge for skilled jobs like masonry, drivers, wielding and wiring among others									
9	Effect of project on people's access to land and	There will be no effect on peoples access to land and natural resources and the lands currently not in use	None will be affected									

ASPECT OBSERVATIONS RECOMMENDATIONS/ REMARKS	
natural	
resources	
10 Compensation The proposed project site is vacant, Land acquisition is implement	ed in
to property and Lochwaa community did not line with the provisions in the K	DSAP
damage demand any form of compensation RPF and the WB guidelines	on
and they voluntarily donated it for the Voluntary land Donation as we	ell as
project KOSAP Land Acquisition strategy	
11 Effects of Increase in incomes due to business Educate the public on ecor	omic
project on that will be set up and existing ones activities diversification due	to
incomes, land will be enhanced due to access to availability of electricity	
value and electricity.	
economic Land value will increase	
activities Economic activities will be enhanced	
due to long hours of business	
12 Public Exposure There will be likelihood of spread of Sensitization and awareness cre	ation
to diseases communicable diseases due to labor of the public and contractor wo	rkers
influx, as well as the risk of GBV/SEA on impacts of labor influx incl	ıding
and Sexual Harassment. spread of communicable dise	ases;
focus on local employment	to
minimize impacts of labor influx	etc.
13 Occupational It was observed that the project site The site will need to be cond	oned
Health and is relatively in a rural settlement area. during construction; the approp	riate
Safety The site has no existing power line use of PPE's will need to be obse	rved.
network. Public awareness on safety The Sentry house and its ut	lities
is key and hence need to be cautious should be secluded from the	Main
when working at heights and Substation. Sensitization	and
consider recommended standards awareness on HIV/AIDs wil	be
It was observed that there will be required for the contra-	tors'
potential risk of occupational personnel, the public and other	Staff
accidents and hazards during the especially during the constru	ction
construction and operation phases of phase.	
the proposed project	
14         Public         • Land donation         Continuous engagement of the provided of t	ublic
engagement • Participation in meeting /and awareness creation on role	and
and roles of the awareness forums responsibilities of the communiti	es.
community/	
beneficiaries	

ENVIR	ONMENTAL AND	SOCIAL ASPECTS	
	ASPECT	OBSERVATIONS	RECOMMENDATIONS/ REMARKS
		<ul><li>fees</li><li>Payment of power bills</li><li>Signing of way leave consents</li></ul>	
15	Community expectations	It was observed that there is need to engage and consult stakeholder at all phases of the project, to disclose information and manage community expectations. E.g. jobs, Engagement was done during screening	Public engagement be part of the project cycle because it will minimize grievances that might arise from the construction and operation of the proposed Mini Grid and improve on ownership mentality of the project.
16	Public risks to shocks and electrocution	It is possible especially during operation stage of the project	Safety awareness on the safe use of electricity
17	Public awareness on use of the service (electricity) and Public risk to shocks and electrocution	It was observed that the community has not had much interaction with electricity and they requested further education and awareness once electricity is installed.	The community and all beneficiaries of this project need awareness and training on the safe use of electricity to avoid electrocution incidents
ENVIR	ONMENTAL ASP	ECTS	
Physic	al Features		
18	Topography and Landscape	The topography of the site is relatively flat	Proper civil works will be necessary to avoid any flooding issues on site or soil erosion to the lower part as water is drained from the site. Barricading the site during excavation need to be done to ensure public safety
19	Soils	Soils on proposed site are sandy soils with moderate water retention capacity and good drainage. The soil are mixed small rocks making water percolate easily hence no flooding anticipated	Excavated soils during foundation setting would be used in backfilling, leveling and landscaping and any excess will be disposed in NEMA approved dump sites. Proper soil and geotechnical analysis should be

ENVIF	ONMENTAL AND	D SOCIAL ASPECTS					
	ASPECT	OBSERVATIONS	RECOMMENDATIONS/ REMARKS				
			carried out to determine the civil				
			works to be involved and electrical				
			characteristics of the soil.				
20	Hydrology	No streams or water channels	The proposed development should				
	(Surface,	observed to be passing through site.	have proper landscaping to ensure no				
	subsurface and	seasonal river Kanyungimoe passes	flooding issues are encountered in				
	Ground water)	200M from site.	case of excess storms.				
			Water Contamination should be				
			avoided by ensuring no oil/fuel				
			spillages throughout all the phases of				
			the project.				
			ESIA will elaborate on Enhancement				
			Measuress				
21	Air quality (any	No environmental and air pollution	Watering of site during construction				
	Pollution issue	noted on site except mild dust during	will be recommended since the site is				
		windy periods. Some sections of the	close to some residential houses				
		proposed site is bare hence may	r				
		experience dusty conditions due to					
		lose soils.					
22	Drainage	The proposed site is relatively flat and	Proper drainage and landscaping will				
		civil works should be designed in a	need to be done. Storm water will				
		way to ensure proper drainage	need to be harvested while excess and				
			surface runoff will be directed into a				
			soak pit to allow for infiltration into				
			the ground.				
			Any water leaving the project site has				
			to pass through a well-done drainage				
			system				
23	Proximity to	No public institution is in close	ESIA study will establish any other				
	Public	proximity of the site. Lochwa Primary	institutions and advice on the				
	institutions	school is about 1 KM from site	Enhancement Measuress if necessary,				
			for harmonized co-existence.				
24	Accessibility	The access road is not marked	There is no marked public road				
			bordering the proposed parcel of land.				
			Acquisition of the proposed parcel of				
			land need to take consideration				
			availability of an access before				

ENVIR	ONMENTAL ANI	D SOCIAL ASPECTS						
	ASPECT	OBSERVATIONS	RECOMMENDATIONS/ REMARKS					
			construction of the proposed Solar					
Biolog	ical features							
25	Flora	The project site is dotted with acacia	During Ground preparation the trees					
2)	(vegetation	trees traditional Ewoi tree and	will be cut off and removed especially					
	including trees	traditional Ekurichanait tree Species	along the access road					
	and shrubs)	inductional Examenantial and the Species.	Any Open grounds of the constructed					
			Solar Mini-grid can be planted with					
			suitable grass and ornamental					
			vegetation to minimize soil erosion					
			and promote green cover.					
		A CONTRACTOR						
26	Wotlands and	No wotlands of aquatic acceptions	ESIA to invoctigato further					
20	Fich and fich	wore observed on site but seesonal	ESIA to investigate fui thei					
	habitat	were observed on site but seasonal						
	IIdDItat	site.						
27	Fauna	No wild animals were observed at the	ESIA will interrogated further the					
	(mammals)	site. The area and its environs is not a	existence of any wildlife in the area					
		known breeding site for any						
		endangered species. The site is						
		mainly grazing land with no natural						
		ecosystem for wildlife habitation.						
28	Avifauna / Birds	No migratory birds were observed on	Monitoring of any affected wild					
		the site. The area and its environs are	migratory birds will be in progress					
		not a known breeding site for any	throughout the project life.					
		endangered bird species						
		Small birds were noted in the area	ESIA study will interrogated further					
		including weaver and doves	the existence of any wild migratory or					
			endangered species in the area					
29	Sensitive	There are no special and sensitive	ESIA process will determine if any					
	habitats	habitat within and around the	exists					
		proposed site that were observed.						
30	Visibility and	The area is relatively flat. The site is	Install proper perimeter wall fencing					

ENVIR	ONMENTAL AND	D SOCIAL ASPECTS	
	ASPECT	OBSERVATIONS	RECOMMENDATIONS/ REMARKS
	site intrusion	adjacent to few residential houses.	to minimize visual and safety impacts
		There will be Visual intrusion	of the Solar mini-grid.
		occasioned by the project.	Plant some short trees a lot the
			perimeter to reduce the reflective
			action of the solar panels
31	Protected Area	The area and its surrounding vicinity	The EIA process will help to identify if
		are not within a protected area under	there is any protected area during
		international, national or local	consultation with Key stakeholders.
		legislation for their ecological,	There is no known or gazetted habitat
		Landscape, cultural or other value	for endangered, rare, protected or
		which will be affected by the project	special species within the site for the
			mini grids.
32	Features of	No historic features or archeological	In case of any chance finding of the
	historic or	articles were observed on site	features and articles the national
	cultural	because the place is fully agricultural	museum should be contacted
	importance	grazing land	immediately.
33	General	The area relatively Flat.	As a precautionary measure the
	environmental	It has hot climatic conditions almost	proponent should put in place
	conditions	throughout the year.	appropriate Enhancement Measuress
		The area has stable soils and ground	to eliminate or minimize any adverse
		and thus almost no chances of	impacts on Environment.
		landslides, but this will be	
		conclusively determined upon soil	
		and geotechnical surveys	
		The vicinity of the proposed site is	
		characterized by scant vegetation	
		cover of acacia trees and River	
		Kanyungimoe passes 200metres	
		from site.	

## Photographic illustrations of the proposed KOSAP site



Sparsely distributed vegetation within the site dominated by Acacia trees



Site Land demarcation and assessment in Seasonal river Kanyungimoe approximately progress with Elders of the community 200 metres from site



Public Consultation and engagement for Lochwa primary school located about a proposed sites kilometer from site

# 13.3 Appendix 2. Baraza Attendance List-Land allocation

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MELANIST HUMAN	PLDER	W	07/072/6933	1

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## 13.4 Appendix 5: FDG's List for the Women/Female

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Page 2 of 6

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The with will also have a marony wall that 3.2 will protoch the project components. At the projection there will be a prove workers. the purter explormed that the land use donatival during the land acquisition process and to maning was good for the piper of land. the explanated the compensation in kind project as a token of appreciation as the land donated. The project must beness all the members as the community and likely to from any of the three sectors below rader, education and health. The community idential argume on the project. Patrix le 33. Patrot explained that every preject has negative and Aluciona; pasitive impricts. Ngori the istational the paintime impact to be job creation but thes could also lead to Occupational thealth ispaty towever this will be mitigebid by the conhection providing adreparte TPE, The project routed also lead to increase in solid white generation however to conhecter will dispose our the white cometty. The project could also lead to contamination of water however the contractor will intright this by preventing most of contenninghed water. . Not will be mitigated by frequent when hilling of wather

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Ministry of I	Margy and Petroleure
84	Samuel explaneolthe compensation in kind San Project further and institud that the Oh Community unould choose the project throws
91	have well-considently question and animaled the company to also atome the companyation in kincid
Min 4/22	Construs / Issues/Recommendations from participants
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Committee.

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The assistant drives studied that the walks problem 5.3 had already been withouthed to the rough opping 54. She expressed happiness for the purpose of the methy Magnet the seal . The actual is the project will be bright over or will delay. Stratistical flat the haspital has no lights and looking have to give Jorth Wing tarches The regustral that the group of locking be given frict priority during sub contracting and job apparentition. what approximities ishould be given to the lends first if they have the consideration Sto Further suggished worker pro the compensation in Kind preject unice they are compatily relying on the Chinese contector torthe. 5.5 te invested the community discus among thousake these 56 the chird stakeholder patige due to the time taken William Employing between the visits the Glabral that among the Turkana community the project is implemented the expressed that they would like all the thoreas comprising projects to be implemented, however is not policide of the money can be drudlard among the three projects the purther suggested water or the compendations project to it must be one Some 5.7. He colored that during the land arguestion process they chose land as the community. the suggested hearth actor for compriseding property

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is a linear of ethologony, the grevance comittee will be used to report to the contraction. Elegithing the contractor above the committee will be evolved.

Min 6/22	Asseptance/Rejection of the project	-
61	The community all accepted the project.	All.
Min 7/12	Adjournment	
1+1	The meeting was adjourned at The meeting was adjourned at 12.2716 and the members to prove group discussions	Lan.
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#### 1. Lochwaangimatak Sub-project Site

The Lochwaangimatak sub-project site is on unregistered community land and held in trust by the County Government of Turkana on behalf of the community, in line with the Community Land Act 2016. The proposed site is uninhabited, has no structures, community facilities, or encumbrances, and is part of the land utilized by the community for grazing. Consultations leading to the identification and selection of the sub-project site are captured in the Environmental and Social Screening report for Lochwaangimatak *Refer to Chapter 6 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 2,240 (approximately 320 households). The land acquisition-related impacts are loss of land and pasture. Enhancement Measuress include in-kind compensation for loss of land and pasture, and designing power distribution lines to avoid impacting trees, crops, structures, and community facilities. No physical displacement is anticipated; however, there is minimal loss of pasture occasioned by the acquisition of land utilized by the community for grazing. The 0.67 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 Lochwaangimatak community proposed the following projects: -

- Water Reticulation: Improvement of availability and accessibility of water especially on solarization and distribution of water from the said "Chinese boreholes"
- Enhancement of health care services and facilities by constructing maternity ward and equipping it.
- Improvement of education in the village to reduce illiteracy levels by expanding the primary school and constructing a secondary school

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	Compensation/Entitlement/Be	Responsible
	for Compensation	nefits	organization
1. Loss of Land			
Loss of unregistered	Community.	Compensation in-kind as	REREC
community land.		prioritized by the community.	
Loss of land in	Group ranch members.	Compensation in-kind as	
unregistered group		prioritized by the community.	
ranches.			
Loss of land in registered	Group ranch members.	Compensation in-kind as	
group ranches.		prioritized by the community.	
Loss of land owned by the	Government agencies.	No compensation for public land	
National Police, county		allocated to another government	
		body.	
governments and the			
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Ministry of Interior			
Loss of land owned by the	Government agencies.	No compensation for public land	
Kenya Forest Service		allocated to another government	
(KFS) and Kenya Wildlife		body. However, payment of	
Service (KWS).		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	Communities utilizing public	Communities do not own public	REREC
(e.g., grazing, farming	land.	land; however, they utilize	
etc.).		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	
Loss of use on unregistered	Communities utilizing	Compensation in-kind as	
community land	unregistered community land	prioritized by the community	
unregistered group ranches	unregistered group ranches	promuzed by the community.	
and registered group	and registered group ranches		
ranches (e.g. grazing	and registered group fanenes.		
forming etc.)			
a Logg of /Domogo			
3. Loss of /Damage			
to Assets of			
	Community, monthem, or	During datailed design fammanen	DEDEC
Trees	Community members on	distribution lines and	KEKEU
Crops	unregistered community land;	distribution lines and	
Structures	community members utilizing	construction of the mini grid and	
	public land; members of	community project, any crops,	
	registered and unregistered	structures, trees, and community	
	group ranches and	facilities shall be avoided to the	
	government entities.	extent possible. However, loss	
Community facilities e.g.,	Community members on	or damage to the above will be	
water sources (earth pans,	unregistered community land,	compensated/restored at full	
boreholes etc.).	community members utilizing	replacement cost, <sup>2</sup> in line with	
	public land, and members of	the provisions of the RPF.	
	registered and unregistered		
	group ranches.		

<sup>&</sup>lt;sup>2</sup> A cost basis that will yield compensation sufficient to replace assets, plus necessary transaction costs associated with asset replacement).

# 4. Consultations with PAPs About Acceptable Compensation Options and Alternatives that have been Considered

Detailed consultations with PAPs on land acquisition and compensation, including the modalities of acquiring land and compensation options, were undertaken during the Environmental and Social Screening, Environmental and Social Impact Assessment, and the NLC land valuation process. The following sections provide a summary of the consultations.

#### 4.1 Engagement of Project -Affected Persons (PAPs)

Local administration and County Renewable Energy Officers (CREOs) supported the proponent and implementing agency (IA) to mobilize community members and other stakeholders for public consultations and engagement activities. National and county government entities, community segments (men, women, youth, elders, persons with disability, vulnerable and marginalized groups, etc.), NGOs, and local leaders were engaged through key informant interviews, community meetings, and focus-group discussions. The proponent and IA implemented appropriate measures to ensure PAPs effectively participated in the consultations. *Refer to Chapter 7 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 Lochwaangimatak 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 8 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.

•				
Objective	Implementing	Land Acquisition	Key Issues Raised	Responses
	Entities	and Compensation		Given
		Aspects		
		Discussed		
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).	The initial site identified by the Consultant was about 3 km from the targeted beneficiaries of the project. The community was asked to identify an alternative site closer to the beneficiaries.	The community identified land which is nearer to the target beneficiaries (businesses, public facilities, and residential areas The land should be near the centre as much as possible because the project is designed in such a way that power can only be supplied within a readius of 2 km
	Objective Environmental and Social Screening. Voluntary land donation (VLD). Constitution of the Locational Grievance Redress Committee (GRC).	ObjectiveImplementing EntitiesEnvironmental and Social Screening. Voluntary land donation (VLD). Constitution of the Locational Grievance (GRC).Ministry of Energy (MoE) Kenya Power (KPLC) Rural Electrification and Renewable Energy Corporation (REREC)	ObjectiveImplementing EntitiesLand Acquisition and Compensation Aspects DiscussedEnvironmental social Screening. Voluntary donation (VLD). Constitution of the Locational Grievance (GRC).Ministry 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).	ObjectiveImplementing EntitiesLand Acquisition and Compensation Aspects DiscussedKey Issues RaisedEnvironmental social Screening. Voluntary donation (VLD). Constitution of the Locational Grievance (GRC).Ministry of Energy (MoE) Kenya Power (KPLC) Rural Electrification and Renewable Energy (GRC).Site identification and land allocation for the sub-project. Criteria for VLD. Community entitlements (forms 

#### 4.3 Summary of Consultations on Land Acquisition and Compensation Options

				We will agree to give the land through the chief since almost land is individually owned. This will be done through chief and his committee.	Noted.
January 14 <sup>th</sup> 2022	Environmental and Social Impact Assessment.	Consultants MoE KPLC REREC	Land acquisition through compulsory acquisition (not voluntary land donation). Selection of three priority community projects, whereby one is to be implemented as in- kind compensation for land.	Water Reticulation: Improvement of availability and accessibility of water especially on solarization and distribution of water from the said "Chinese boreholes" Enhancement of health care services and facilities by constructing maternity ward and equipping it. Improvement of education in the village to reduce illiteracy levels by expanding the primary school and constructing a secondary school	The proponent has set aside KES 1 million to implement the priority in- kind compensation project. The value of the project will be proportional to or greater than the value of land. NLC will determine the value of land.
May 2023	Compulsory Land Acquisition.	NLC	Site inspection and inquiries. Land valuation. Award of compensation.		

# 5. Institutional Responsibility for Implementation of the ARAP

Entity	Role
Ministry of Energy	• Coordinate A-RAP implementation and provide budget for in-kind compensation.
National Land	• Implement the statutory process for compulsorily land acquisition, including site
Commission	gazettement and inspections, inquiries, valuation, and award of compensation.
REREC	<ul> <li>Monitor all land acquisition and compensation aspects (including A-RAP closure), complemented by a third-party monitor.</li> <li>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.</li> </ul>
Mini-grid	• Implement in-kind compensation concurrently with the solar mini-grid project.
Contractor	
Supervising	• Monitor and report on implementation of in-kind compensation, and overall
Consultant	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 time bound 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.

#### 13.8 APPENDIX 10- FIRM AND LEAD EXPERT PRACTICING LICENCE



(r.15(2))

#### NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA) THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

> License No : NEMA/EIA/ERPL/18263 Application Reference No: NEMA/EIA/EI/23929

M/5 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

FORM 7

Expiry Date: 12/31/2023

Signature.....

(Seal)

**Director General** The National Environment Management Authority





(r.15(2))

## NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA) THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/ELA/ERPL/18279 Application Reference No: NEMA/ELA/EL/23951

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

FORM 7

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

registration number 1893

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

Issued Date: 12/30/2022

Expiry Date: 12/31/2023

Signature.....

(Seal) **Director General** The National Environment Management Authority

