

**MINISTRY OF ENERGY**

**REPUBLIC OF KENYA**

**KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP)**

**WAJIR COUNTY**



**ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED ATHIBOHOL OFF-GRID SOLAR PROJECT**

**DRAFT REPORT, JUNE 2023**

# CERTIFICATION

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

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

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Abbreviations

**ACRONYM DEFINITION**

**ADR** Alternative Dispute Resolution

**AoI** Area of Influence

**CBOs** Community Based Organizations

**CoK** Constitution of Kenya

**CDI** County Development Index

**CEMP** Construction Environmental Management Plan

**CGRCs** County Grievance Redress Committees

**CRA** Commission on Revenue Allocation

**CSR** Customer Social Responsibility

**CIDP**  County Integrated Development Plan

**CPS** Country Partnerships Strategy

**DOSHS** Directorate of Occupational Safety and Health Services

**EHS** Environment Health and Safety

**EIA** Environmental Impact Assessment

**EPRA** Energy Petroleum Regulatory Authority

**EPT** Energy and Petroleum Tribunal

**EPRA** Energy and Petroleum Regulatory Authority

**ESI** Electrical Supply Industry

**ESIA** Environmental and Social Impact Assessment

**ESMF** Environmental and Social Management Framework

**ESMP**  Environmental and Social Management Plan

**ESMMP** Environmental and Social Management and Monitoring Plan

**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

**KP** Kenya Power

**LEP** Labour and Employment Plan

**LGRCs** Local Grievance Redress committee

**MGs** Mini Grids

**MOE** Ministry of Energy

**MSDS** Material Safety Datasheet

**NEMA** National Environmental Management Authority

**NGOs** Non-Governmental Organizations

**NLC** National Land Commission

**NTSA** National Transport and Safety Authority

**OHS** Occupational Health and Safety

**OM** Operation and Maintenance

**OP** Operational Policies

**PAD** Project Appraisal Document

**PAPs** Project Affected Persons

**PCU** Project Co-ordination Unit

**PPAs** Power Purchase Agreements

**PPEs** Personal Protective Equipment

**PV** Photo-voltaic

**REREC** Rural Electrification and Renewable Energy Corporation

**RPF** Resettlement Policy Framework

**SA** Social Assessment

**SEA** Strategic Environmental Assessment

**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

# EXECUTIVE SUMMARY

**E-1- Introduction and Project Brief**

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

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

In Wajir County, one of the target counties, the Proponent is proposing to develop 32 No. mini grid facilities including Athibohol Mini Grid discussed in this report. In order to adhere to both national and donor requirements, the Proponent engaged the services to the consortium of Norken International Limited and Centric Africa Limited to undertake the ESIA. The ESIA has been conducted following the requirements outlined in the Environmental Management and Coordination Act (EMCA) 1999 and its amendments, as well as international environmental and social policies such as the World Bank's OP 4.01 on environmental assessment.

**E-2- Project Categorization and Justification**

In the World Bank context, there have been several projects supported by the organization that aim to provide electricity to communities located far from the national grid. These projects utilize off-grid approaches, meaning they are independent of a national or regional grid. The experience gained from these projects provides valuable guidance for designing sustainable off-grid electrification initiatives, particularly those targeting dispersed and economically disadvantaged communities. The Athibohol 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 Athibohol site as a solar power facility, it falls within the medium risk project category as per the Kenyan legislative framework.

**E-3 Approach and Methodology**

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

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

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

**E-4 Legislative Regulatory Framework**

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

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

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

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

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

**E-5 Environmental Setting**

The project area in Athibohol Sub-location, Wajir 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. Agricultural practices face hurdles due to limited fertile soils and inadequate irrigation infrastructure. The region is also prone to natural hazards like flash floods and sandstorms.

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, while the hills provide some relief and shelter. However, the irregular topography poses challenges to agriculture and water management, influencing water runoff and drainage patterns. Overall, the project site is relatively flat.

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.

**E-6 Project Description**

The Athibohol Mini Grid project aims to provide electricity to approximately 553 residential and 6 nonresidential consumers in Athibohol Village at Athibohol Sub-location, Athibohol Location, Hadado Ward in Wajir County. The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity.

A Low Voltage Power Distribution Network will be established to distribute the power to customers. The project utilizes solar panels with a total capacity of 132 kWp to harness solar energy. Solar power is a clean and renewable energy source that will provide a significant portion of the electricity needed for the project. A 89 kWh Battery Energy Storage System is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions. A 65 kVA diesel generator is included to serve as a backup power source for periods of low solar generation or in case of battery depletion. It provides reliability and backup in the event of extended periods of cloudy weather or high demand. A 2,000-liter fuel tank is provided to store diesel fuel for the generator, ensuring continuous operation during extended periods of low solar or high demand. Additionally, PV Inverter: A 110 kW solar PV inverter is used to convert the direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use.

The estimated cost of the project is around USD 650,550, 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 0.94 hectares of land will be compulsorily acquired by the Proponent from the community. 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 0.94 hectares of land to Kenya Power (KP) for the management of the solar mini-grid. In accordance with the World Bank's Operation Procedure 4.12 on Involuntary Resettlement, an abbreviated Resettlement Action Plan (A-RAP) was prepared, outlining the principles and procedures for land acquisition and compensation. This plan is annexed to the project report. (Appendix 4)

**E-7 Project Alternatives**

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

**E-8 Stakeholder Engagement**

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

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

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

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

**E-9 – Impacts and Mitigation Measures**

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

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

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

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

*Table 0‑1: Summary of Pre-construction Impacts*

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

*Table 0‑2: Summary of Construction and Decommissioning Phases Impacts*

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

*Table 0‑3: Summary of Operation Phase Impacts*

| **Impact** | **Significance Of Impact (Pre-Mitigation)** | **Residual Impacts (Post-Mitigation)** |
| --- | --- | --- |
| Impact On Economy and Employment | Positive | Positive |
| Quality, reliable power supply | Positive | Positive |
| Reduction of pollution associated with thermal power generation, kerosine and wood fuel usage | Positive | Positive |
| Education | Positive | Positive |
| Health benefits | Positive | Positive |
| Improved standard of living | Positive | Positive |
| Security | Positive | Positive |
| Communication | Positive | Positive |
| Soil environment | Minor | Negligible |
| Waste generation and management | Minor | Negligible |
| Water environment | Negligible | Negligible |
| Landscape and visual impacts | Minor | Negligible |
| Increased oil consumption | Minor | Negligible |
| Increased storm water flow | Minor | Negligible |
| Fire outbreaks | Moderate | Minor |
| Water demand | Negligible | Negligible |
| Sanitary waste | Negligible | Negligible |
| Flooding | Negligible | Negligible |
| Noise and Vibration | Negligible | Negligible |
| Electric and magnetic fields (EMFs) | Negligible | Negligible |
| Dust Emission | Negligible | Negligible |
| Vehicle Exhaust emission | Minor | Negligible |
| Collision and electrical hazards from distribution infrastructure | Minor | Negligible |
| Occupational safety and health | Moderate | Minor |
| Community safety and health | Moderate | Minor |
| Gender based violence, SEA and SH | Minor | Negligible |
| Exclusion of VMGs, Vulnerable individuals and households | Major | Minor |
| Risk of communicable diseases | Minor | Negligible |
| Shocks and electrocution to the PAPs | Moderate | Minor |
| Risks related to poor and inadequate stakeholder engagement (conflict) | Minor | Negligible |

**E-10 Environmental and Social Management and Monitoring Plan**

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

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

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

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

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

**E- 11 Conclusion**

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

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

# 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. Mandera, Wajir, Garissa, Tana River, Samburu, Isiolo, Marsabit, West Pokot, Turkana, Taita Taveta, Kwale, Kilifi and Lamu.

K-OSAP 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 Wajir 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).

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

## Context

This ESIA report has been prepared based on Site visit baseline survey, desktop survey, documentation review, consultation with stakeholders and in accordance Environmental Management and Co-ordination Act (EMCA), 1999 and its amendments; the Environmental Management and Coordination (Amendment) Act, 2015 and World Bank’s Environmental and Social Operational policies. The study has also assessed the requirement of the project with respect to the local and national regulations relevant to the project.

Norken International Limited in Joint Venture with Centric Africa Limited were appointed by Ministry of Energy to undertake consultancy services for the Environmental and Social Impact Assessment (ESIA), Social Assessment (SA) and Vulnerable and Marginalized Groups Plan (VMGP) as per the standard TOR and NEMA and WB Operational policies. The two firms are licensed by National Environment Management Authority (NEMA) to undertake environmental impact assessment studies. As reported, land acquisition has not resulted in any economic or physical displacement and no resettlement is envisaged for the proposed project.

Due to the remoteness and sometimes dispersed nature of the target populations and considering the lifestyles and socio-economic status of those residing in underserved Counties, the Project is designed to address low affordability of the potential users, and sustainability of service provision. Therefore, sustainability of the proposed approach to energy access expansion beyond the Nationally owned power network is predicated on 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 K-OSAP.

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 (KP) and the Rural Electrification and Renewable Energy Corporation (REREC).

## Project Overview

The project site is located in AthiboholAthibohol Village at Athibohol Sub-location, Athibohol Location, Wajir West subcounty and in Wajir County at latitude 1° 41'57.12" and longitude 39°12' 46.62"E. The proposed solar mini-grid will be located on a 0.940 hectares piece of land on a community land set aside for public use. The solar mini grid will comprise Solar panels, batteries, inertors, perimeter fence and 9.2 kilometers distribution line to cover a radius of approximately 1.5 km. The project is expected to serve 559 consumers of which 553 are residential and 6 are non residential. The Non-residentials comprise of business premises within the project area .

## Purpose and Scope of Work

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

## ESIA Methodology

### Kick-off Meeting

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

### Screening and Scoping

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 OPs underpin and demonstrate this commitment. The main aim of this is to enhance positive social opportunities and benefits as well as ensure that adverse social and environmental risks and impacts are avoided, minimized, and mitigated.

### Desk based review and baseline assessment

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

Other documents that were reviewed included Wajir County Integrated Development Plan 2018-2022, various Kenyan legal legislations, World Bank safeguard policies, topographical maps, google earth/maps, and Kenyan government publications among others.

### Project Description

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

### Baseline Condition

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

### Impact Assessment (IA) Prediction

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

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

### Public Consultations

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

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

### Stakeholder Identification and Mapping

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

* PAPs of the proposed project who largely are the community members living within 3km radius of the proposed project
* Interested parties include
  + County government of Wajir various department including the office of the governor, land and environment, survey and public administration such as ward and village administrators. In addition is the county commissioner and officers under his administration such as chiefs.
  + Members of parliament and members of county assembly

#### Mobilization for the Community Meeting

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

#### Public Forum/Meeting

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

Community engagement proceedings and resolutions are presented in form of minutes taken/written during the meetings. The meeting was well attended by all people including men, women, youth and persons with special needs.

#### Focus Group Discussions

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

#### Key Informant Interviews

Key Informants were identified both at the county and locational levels and they were interviewed to obtain baseline information in regard to the proposed project. The key informant interviewed was from the education and health sectors.

#### Stakeholder Engagement Schedule

The ESIA team identified four categories of stakeholders namely; government officials, opinion leaders at local level, elders and the general community. Stakeholder engagement began early in the planning phases of the project. The stakeholder consultations were undertaken on the 23rd October 2021. During these meetings, project information in terms of preliminary design, positive impacts, negative impacts, mitigation measures among others were discussed with various stakeholders. The stakeholders gave their views in regard to the project.

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

* Land use aspects,
* Neighborhood issues,
* Project acceptability,
* Social, cultural and economic aspects,
* Environmental Impacts
* Physical impacts,
* Biological impacts,
* Legal Compliance.

### Environmental and Social Management and Monitoring Plan (ESMMP)

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

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

The ESMMP include an implementation schedule and budget cost estimates for the mitigation measures. It also describes institutional arrangements with regard to the implementation of the ESMMP among the implementing agencies, and the contractor(s). This has specific responsibilities, procedures and resources required by each institutional actor engaged in implementing the ESMMP.

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

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

Figure 1‑1 is a summary of the methodology the consultant adopted in undertaking environmental and social impacts assessment for the proposed Athibohol ESIA project.

* Preparation and Planning
* Desk Review of available reports and documents

**Inception Report**

* Stakeholders Consultation and Participation:
  + Baraza
  + Key informant interviews
  + Focus Group Discussions (FGDs)

**Draft ESIA Reports**

Incorporation of Review Comments from Proponent/WB

*Deliverable 1*

*Deliverable*2

**Final ESIA Reports for the proposed Athibohol Mini-grid**

Deliverable 3

* Baseline Environmental and social data gathering
* Identification of Potential Impacts

Summary of mitigation & Management mmeasures

## Limitations/Uncertainties

Figure 1‑1: *Summary of Environmental and Social Impact Assessment Methodology*

The limitation experienced during the study are illustrated below.

* Some data which the consultants sought from the community could not be assertained eg. the number of the VMG’s, orphans, rate of HIV infections, number of cases of GBV etc.
* Limited information on some environmental aspects e.g. acquifers, rivers etc.
* Communication barrier with the community i.e. some people do not understand Swahili or English. This was mitigated by use of a translator.

## Layout of the Report

Table 1‑1 *Structure of the ESIA Report*

|  |  |  |
| --- | --- | --- |
| **SECTION** | **TITLE** | **DESCRIPTION** |
| ***Section 1*** | Introduction | Introduction to the Project and ESIA scope and methodology adopted. |
| ***Section 2*** | Project Description | Technical description of the Project & related infrastructure and activities. |
| ***Section 3*** | Applicable Legal and Regulatory Framework | Discusses the applicable environmental and social regulatory framework and its relevance for the Project. |
| ***Section 4*** | Baseline Setting- Physical and Socio-Economic Environment | Outlines Environmental, Ecology and Social Baseline status in the study area of the Project |
| ***Section 5*** | Stakeholder Engagement and Grievance Redress | Provides an overview of the stakeholder engagement activities undertaken during the ESIA, stakeholder categorization and profiling. Additionally, it details the provision of Grievance Redress Mechanism for the project |
| ***Section 6*** | Impact Assessment and Mitigation Measures | This section includes details of identified environmental impacts and associated risks due to Project activities, assessment of significance of impacts and presents mitigation measures for minimizing and /or offsetting adverse impacts identified. |
| ***Section 7*** | Environmental and Social Management and Monitoring Plan | Outline of the ESMMP taking into account identified impacts and planned mitigation measures and monitoring requirements. |
| ***Section 8*** | Impact Summary and Conclusion | Summary of impacts identified for the Project and conclusion of the study. |
| ***Section 9*** | Refferences | List of References |
| ***Section10*** | Appendices |  |

## Study Team

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

**Team - 23/10/2021 - progressed the ESIA study.**

|  |  |  |
| --- | --- | --- |
| **S/No** | **Names** | **Position** |
| **1** | Ahmed Abdi | Director Environment |
| **2** | Lydia Komen | Norken International Limited /Centric Africa Limited- EIA/EA Expert |
| **3** | Daniel Chumo | Norken International Limited /Centric Africa Limited- EIA/EA Expert |
| **4** | Wilfred Koech | Kenya Power Company |
| **5** | Peter Maneno | Ministry of Energy |
| **6** | Patrick Watete | Norken International Limited /Centric Africa Limited- EIA/EA Expert |

# PROJECT DESCRIPTION AND ALTERNATIVES

## Introduction

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

Table 2‑1 below provides a summary of the pertinent information of the proposed Athibohol solar mini grid;

*Table 2‑1: Summary Information of the proposed Athibohol Solar Mini-grid*

| **S. NO.** | **PARTICULARS** | **DESCRIPTION** |
| --- | --- | --- |
| 1. | Project location | The project is located at coordinates 1° 41'57.12" and longitude 39°12' 46.62"E |
| 2. | Proponent | Ministry of Energy |
| 3. | Administrative location | Athibohol Sub-location, Athibohol Location, Hadado Ward, Wajir West Sub- County and Wajir County |
| 4. | Mini-grid Capacity | PV Array (DC-kW) of 132kw; 428kWh Battery |
| 5. | Mini-grid Power | LV Circuit of 9 km |
| 6. | Climatic condition | Given the arid nature of the county, temperatures are generally high throughout the year and range from 20°C to 39°C. The average temperature is however 36°C. The hottest months are September and January to March, while the months of April to August are relatively cooler. The humidity averages 60g/m3 in the morning and 55 g/m3 in the afternoon. An average of 9.5 hours of sunshine is received per day. Strong winds are also experienced between April and August with the rest of the months getting calm winds. |
| 7. | Average Elevation | 66 m |
| 8. | Site Conditions | The site is generally in open area with minimal fauna and flora. |
| 9. | Road Accessibility | Murram road. |
| 10. | Nearest Airport | Wajir Airport about 157 km |
| 11. | River/canal/nallah/ pond present in project footprint | None |
| 12. | Protected areas (National Park/ Sanctuary)/ Forest land within 10 kms | None |

## Project Location

The project site is located in Athibohol Village at Athibohol Sub-location, Athibohol Location, Hadado Ward in Wajir County at coordinates of latitude 1° 41'57.12" and longitude 39°12' 46.62"E. The proposed power MG will be constructed on approximately 0.940 hectares of land on a community land set aside for public use. The proposed project is situated about 30 km from Ijara. Figure 2-1 below present the location of the proposed project site.

|  |
| --- |
|  |
|  |
| https://lh3.googleusercontent.com/pw/AM-JKLV4MsuXvjECT2QEZ-T3BKtx6eAi0CPi5e_L31ss_QvL6q5LVaCjHQQ_XaTAUtx43YzBk6EzwBh16VkvA-RTEomFZJ7XInAwqEUc9p4M3B1H24SxogKcEmcEjb3PP253KJLX9dLoh0Uc7jEKrpF-WAaIvA=w1299-h600-no?authuser=0 |

Plate 2‑1: Project Location

## Description of Project Facilities, Components and Activities

* + 1. **Architecture and Basic Design Specifications**

This hybrid power generation site is projected to generate 132(kWp) and is meant to serve between 500-700 households (customers). The proposed mini-grid installations will be built to comply the International Electro technical Commission (IEC) standards. It will have an installation of solar panels of with a capacity of 132 (kWp) and battery house with 428 kWh. The solar panels will have a connection to the batteries through underground cables.

This generator will be a capacity of 65 kVA capacity with a fuel tank of 2000ltrs capacity To optimize this hybrid system the HOMER software will be used. The goal of the hybridization of diesel systems is to reduce fuel consumption by switching off diesel generator set(s) for several hours a day, in order to reach a PV energy, share in the final mix of at least 60% or more. The power will be distributed to the customers by overhead lines. The project site is expected to serve clients within a radius of 1.5km from the site (generation source).

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

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

The plant is configured such that a significant portion of daytime loads is fed directly from the solar generator (grid-tie inverter) without intermediate battery storage usage. The solar PV power plant is also equipped with a Diesel Generator, which is normally used as reserve power. The diesel generator switches on automatically whenever the battery state of charge reaches a certain defined DOD (Depth of Discharge). The diesel generator is equipped with automatic startup function controlled by the battery inverter charger. The table 2 below illustrates the preliminary data for the mini-grid in Athibohol.

*Figure 2: The preliminary Data for Athibohol Solar Mini-grid*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name | Residential | Nonresidential | Circuit(km) | Peak demand (kw) | Daily demand (KW) | Monthly demand (kWh) | PV(DC-KWp) | Genset fuel Tank | | Batteries | Generator (kva) | Cost (USD |
| Athibohol | 553 | 6 | 9 | 52 | 511 | 15,317 | 132 | 2000 | 428 | | 65 | 650,550 |

**Key Components of the Project:**

**Power Generation Sources**:

1. **Low Voltage Power Distribution Network:**

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

1. **Monthly Energy Demand:** The project is expected to meet a total monthly energy demand of 15,317 kWh.
2. **Daily Energy Demand:** The average daily energy demand is approximately 511 kWh, ensuring a consistent supply for the consumers.
3. **Peak Demand:** The peak demand of the system is 52 kW, which is the maximum power requirement during any given moment.
4. **PV Capacity**: The solar photovoltaic panels have a total capacity of 132 kWp.
5. **Battery Capacity**: The Battery Energy Storage System has a capacity of 428 kWh, providing energy storage and ensuring a continuous power supply.
6. **Generator Capacity**: The diesel generator has a capacity of 65 kVA, serving as a backup power source.
7. **LV Network Length**: The low voltage distribution network spans a length of 9 kilometers, connecting consumers to the power source.
8. **Estimated Project Cost**:

The estimated cost of the Athibohol Mini Grid project is approximately USD 650,550. It's important to note that this cost may be subject to change as more detailed plans and implementation phases are developed. The investment is expected to provide long-term benefits to the local community, improving their quality of life, economic opportunities, and access to modern amenities.

### Nature of the Project

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

#### PV Hybrid Mini-Grid Sizing

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

* The proposed Residential & Non-Residential Users available
* The PV Capacity in kilo Watt peak.
* The storage battery Capacity
* The Inverter capacity in (kW)

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

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

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

#### Solar PV modules

The project will use PV Array (DC-kW) 132 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.

#### Powerhouse

The Battery, Multi-mode inverter and all monitoring equipment will be installed indoors with adequate air ventilation accordingly to the manufacturer’s recommendations. Thus, a powerhouse or a containerized solution, considering the equipment manufacturer’s recommendations shall be installed. All electrical boards and LV protections will also be installed indoors. The batteries will be installed in the powerhouse in a separate room, specifically for their use and meeting the electrical safety requirements according to its voltage class.

#### Battery

A 428 kWh Battery Energy Storage System is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions.

The battery considered is lead-acid, deep discharge type with a permissible repeated deep discharge without damage. Automotive or starting type batteries are not acceptable. It shall be of the open “vented” OPzS type with recombination caps and transparent enclosure for easy inspection of electrolyte level.

OPzS stands for:

O = Ortsfest (stationary)

Pz = PanZerplatte (tubular plate)

S = Flüssig (flooded).

Other batteries can be considered:

1. OPzV type, “gel” lead-acid batteries are “maintenance less” but the unit weight is higher and the lifetime is sensitive to high temperatures.
2. Li-ion batteries, have longer lifetime, are lighter and smaller. But they have a higher investment cost and are not adapted to high air temperature so that an additional active cooling system is needed.

The batteries must be manufactured according DIN 40736-1: “Stationary batteries with tubular positive plates. Capacities, measurements and weights”. The battery array will have 12 batteries.

##### Battery Rating

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

##### Battery Performance

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

##### Lifetime

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

##### Battery Cabling and Protections

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

#### Multi-mode Inverters

**Inverters and Chargers:**

PV Inverter: A 132 kW solar PV inverter is used to convert the direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use.

**Battery Inverter Charger:** A 65 kW battery inverter charger is employed to manage the energy flow to and from the battery storage system. It ensures efficient charging and discharging of the battery, maximizing the system's overall performance.

The Inverters shall be designed for continuous, reliable power supply as per specification and shall have internal protection arrangement against any sustained fault in the feeder line and against lightning strikes in the feeder line. The inverters shall be capable of complete automatic operation including wake-up, synchronization & shut down independently & automatically.

#### Cable Requirements

The cables used in the site shall fulfil these requirements:

* The cables shall be suitable for laying on racks, in ducts, trenches, trestles, conduits and under-ground buried installation with chances of flooding by water.
* All cables of module area if laid on cable trays shall be covered. If cables are to be laid underground, laying shall be as per latest relevant code.
* Cables with Copper conductor on DC side & that with aluminum conductor in AC side to be used as power cables shall have tensile strength as per relevant standards. Conductors shall be stranded.
* Cables with XLPE insulation, PVC sheathed & armored suitable for a continuous conductor temperature of 900C and short circuit conductor temperature of 2500C shall be used.
* PVC insulation shall be suitable for continuous conductor temperature of 700C and short circuit conductor temperature of 1600C.
* Only terminal cable joints shall be accepted. No cable joints to join two cable ends shall be accepted.
* Cables inside the control room shall be laid in suitable Cable Trays of approved type.
* Cable terminations for LT cables shall be made with suitable cable lugs & sockets etc. crimped properly and passed through brass compression type cable glands at the entry and exit point of the cubicles.
* The panels’ bottoms shall be properly sealed to prevent entry of snakes / lizard etc. inside the panel.
* The terminal end of cables and wires are to be fitted with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.

#### Diesel Genset

A 65 kVA diesel generator is included to serve as a backup power source for periods of low solar generation or in case of battery depletion. It provides reliability and backup in the event of extended periods of cloudy weather or high demand.The he Diesel Generator Set shall have a capacity as per KPLC requirements/specifications. It should include a highly corrosion resistant enclosure, control panel and monitoring, fuel tank and circuit breaker protections. The Diesel Genset shall be suitable for indoor or outdoor installation and shall perform accordingly with Multi-mode Inverter and the mentioned architecture model. The Diesel Genset shall be working in a fully automatic manner with the above stated components. The diesel gensets will have base mounted fuel tanks that will be factory tested for leaks. There will also be an external reserve fuel tank with a capacity of 2000 litres. The proponent, through the operating entity will have regular inspection by the manufacturer. The noise rating for the generator set will be 75dBA @ 1 meter at 75% load under free field conditions. The generator sets will have a high-quality noise absorbent and fire-retardant grade acoustic insulation material complying to IS 8183.

#### Substation

The mini-grid site will have a 200 kVA transformer that will allow stepping up of the voltage before it is connected to the distribution line.

#### Distribution lines

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

#### Project Activities

The main activities during the pre-construction phase will be land acquisition for generation assets, wayleaves, contractor facilities and workers‘ camps. During the construction phase, there will be site clearance and leveling, civil works and construction of utilities and structures for the facilities, installation and connection of the power plant.

##### Construction Procedures

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

The project inputs will include the following;

-Construction of raw materials will include solar modules, inverter, wires, metals, among others. All these will be obtained from licensed dealers and especially those that have complied with the environmental management guidelines and policies.

-Construction machines will include machinery such as trucks, and other relevant construction equipment. These will be used for the transportation of materials, clearing of resulting construction debris.

- A construction labour force of both skilled and non-skilled workers will be required.

**Construction activities will include the following:**

**-** Contractor mobilization;

**-** Site Preparation;

**-** Procurement of construction material from approved dealers and transport to the site.

**-** Storage of PV modules delivery and their installation;

**-** Laying of internal electrical connections;

**-** Installation of inverters, Battery Energy storage system and transformers;

#### Project Cost

Athibohol project cost is estimated at USD. 642,277

#### Land Requirements

The proposed works will be carried out on a 0.94 ha proposed site which the community identified for setting up the project. Stakeholder engagement with the community on this matter has been conducted. The proposed site land falls in athibohol Community Land owned by the Athibohol community. The sub-project site will be acquired by NLC compulsorily and affected communities compensated in-kind through their community project of choice.

Athibohol site will have a distribution line (DL) circuit of 9.25 km in total. Construction of the distribution line will involve the acquisition of land. It is likely that the DL will pass through communal land. Additional information is required on the routing of the DL to enable a proper impact assessment of the wayleave acquisition. At the time of the study, the consultants did not have this information. Additionally, it is recommended that extensive consultations should be carried out with the stakeholders affected by the DL and those who reside near the wayleave.

#### Compensation Details

Compensation for the land taken will be in kind by doing a community project in health, education or water sector; the value of the project will be equivalent to the value of the land taken and informed by the National Lands Commission (NLC) Valuation criteria. In Athibohol, the community suggested these projects: Renovation of community Borehole and construction of maternity ward at the Athibohol Health Facilty.

Further, A-RAPs has been prepared for the sub project. The A-RAP stipulates procedures and actions for acquiring land and compensating affected communities. An A-RAP applies where affected persons are not physically displaced and less than 10% of their productive assets are lost, or fewer than 200 people are displaced. In the case of this sub project, there is no physical displacement of affected persons, and the foreseen impacts on livelihoods such as grazing occasioned by min-grid construction, way leaves acquisition and implementation of community projects are considered minor. An A-RAP outlining the principles and procedures for land acquisition and compensation is annexed in this report. (See annex 4)

## Resource Requirement

### Workforce Requirement

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

### Water Requirement and Source

#### Construction Phase

Water will be required on a daily basis for civil works and for workers at the project site. However, the quantity of water required will vary depending on the duration of construction and the mobilisation of construction workers at site.

#### Operation Phase

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

As noted previously, approximately, employees (direct and contractual) will be working during operation phase. For this workforce, approximately 10,000 Litres storage water tank will be required for domestic consumption.

### Raw Material Requirement

#### Construction Phase

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

#### Operation Phase

There will be no major requirement of raw materials during operation phase. Only maintenance spares will be required at this phase.

### Power Requirement

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

### Fire Safety

#### Construction Phase

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

#### Operation Phase

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

The systems and equipment’s will align to the Kenyan Fire Reduction Rules of 2007. The Fire protection and fighting systems will be maintained and serviced after every 6 months. The team managing the site will be trained on Fire safety as per the requirement on Fire Risk reduction rules. Further the proponent will be required to undertake Annual OSH Audits, Fire audits and Risk assessment as per the requirement of OSHA 2007 and the relevant subsidiary legislation.

### Electrical safety

The Contractor shall ensure that all safety equipment such as safety helmet, shoes, gumboots, dust respirator, hand gloves etc are available at the site and shall take adequate steps to ensure the proper use of the equipment at all times.

### Access to the Site

It is proposed that the Athibohol Solar Mini-grid will have one access road, which will be designed according to KP’s standards, taking into account the Ministry of Road’s requirements. The Solar Mini-grid will be accessed via the existing murram road. However, a proper access to the site and drainage will be constructed to safely access the Mini -grid site and to avoid flooding.

### Security

Providing and maintaining appropriate levels of site security benefits both the contractor, community, workers at the site and the minigrid. Security at the site is influenced by local, legal, social and geographical exposures of the location.

Security risks vary according to the construction type and site location and can originate not only from the external population but also from the project’s own workforce. The following are security related to threats at the Mini grid;

* + Theft of equipment’s and/or tools
  + Theft of fuel
  + Theft of materials from the site or off-site project storage areas
  + Vandalism
  + Arson
  + Breaches of security into partially completed project areas.
  + Robbery of or attacks on construction workers
  + Trespassers: both accidental and intentional
  + Protesters (either related to the site activity or simply for publicity)

The consultants carried out security assessment and the following are major factors to be considered to mitigate on security at the site:

#### Installation of CCTV

Closed-circuit television (CCTV) Security cameras are one of the most important components of the Mini grid safety plan, security cameras will be installed at strategic positions at the site to enhance their effectiveness in monitoring of the entire site. Presence of these cameras will deter intruders and prevent burglaries at the site as it will actively deter theft and record what is happening

Security cameras will cover the entire site perimeter and interior locations of the PV array area, inverter stations, main control room, switchyard and building housing the generators. The surveillance system should be monitored by a listed or approved central station alarm monitoring service.

#### Perimeter Fencing

Chain link fence will be installed to secure the Mini grid site. This kind of fencing is preferred for its durability and affordability.

#### Security guards

Four security personnel from the community will be employed to man the site throughout the phases of the project. Two will guard the site during the day and two at night. The guards will be responsible to maintain workers and visitor register and ensure the safe departure. They will be trained on how to respond in the event of an incipient stage fire, including emergency notification of local authorities. They will be equipped with suitable communication devices (radio, wireless telephone, etc.) incise of an emergency.

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

### Vegetation Undergrowth

Concrete will be used on surfaces where it is required leaving the rest of the areas covered with vegetation. Vegetation undergrowth will be managed by regular slashing and cleaning up of the site compound.

## ANALYSIS OF ALTERNATIVES AND PROJECT JUSTIFICATION

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

### Present Power Supply Position

According to the Wajir County Integrated Development Plan (2018-2022), electricity connectivity stands at 10.1% of households which is slightly common in male headed households at 12% as compared to the female headed households at 8%. More than half (71.7%) of households rely on firewood for cooking while 12.2% use charcoal, 7.7% use kerosene and 6.6% use liquefied petroleum gas (LPG). The county has potential for solar and wind energy which has not been exploited.

In Athibohol, majority of the households have no access to electricity. Only Athibohol dispensary and a few businesses have solar power Used for lighting purposes. During the Focus Group Discussions with the community, it was reported that the main challenge regarding access to power is that the area is not connected to the National Grid.

### 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.

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 Minigrid construction.

### 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, such as Sun
  + Availability of land to locate the site and associated infrastructure;
  + The availability and accessibility of infrastructure for the provision of services, manpower and social structure for the construction and operation of the power plant;
  + General environmental acceptability in terms of social impacts, water utilization, general ecology, etc.

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

Primary Resource: Athibohol village receives sunlight up to 8 hours a day, the availability of sun makes it suitable for a solar mini grid. The community is further marginalised with no electricity grid connectivity compared to other regions in the country.

Grid Connection: A grid connection with enough capacity and material was recommended due to the anticipated increasing demand in solar energy. This eliminates the need to overhaul the grid connection when the population increases in Athibohol location.

### Alternate Method of Power Generation

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

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

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

The use of firewood and solid waste for electricity generation by the use of thermal technology is another option. But the issue of air pollution and forest degradation already are environmental problems of serious concern which will further aggravate the natural environment. For these reasons, the thermal power options evaluated above seem inappropriate for Athibohol on environmental as well as economic grounds.

Solar energy was a desirable option because:

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

### Alternative Sources of Energy

#### Thermal Power Generation

Thermal power through installation of Diesel GenSets is an option which can be considered to provide power to Athibohol. This would need more than 250-300litres of Industrial Diesel Oil (IDO) is burnt daily to generate targeted 50kWp of electricity at Athibohol. Thermal generation can also be fueled using alternative fuels such as natural gas, bio diesel, industrial kerosene, heavy vehicle fuel, coal and unleaded petrol. Thermal power generation has serious negative environmental impacts including generation hence the need for the KPLC to install the proposed solar power plant.

#### Hydro Electric Power – HEP

This would mean exploring the possibility of extending the existing national grid to Athibohol since there are no hydro facilities within the region to facilitate HEP generation. The proposed project is quite far from the national grid hence this is a costly venture and may take time before the residents need power for their livelihood.

#### Other Sources of Energy:

Wood fuel is the greatest source of Energy contributing to 80% of energy requirements in Africa. Over reliance on wood has led to deforestation, desertification, global warming and climatic change among other socio – economic demerits. The Government of Kenya should look into the possibility of using nuclear energy to generate electricity. This is a long-term consideration and also has several deleterious effects to the environment and human health. Nuclear Waste disposal will also create a huge environmental challenge.

Based on this discussion the proposed solar Mini-grid presents the most appropriate option of electrifying/ bringing power to Athibohol in terms of technology, cost and environmental considerations.

### 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 to Athibohol 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.

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

### Analysis of Alternative Construction Materials and Technology

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

### Solid Waste Management Alternatives

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

### Conclusion

Based on the above-mentioned suitability criteria and technical requirements, the proponent decides to put up the Solar Mini-grid within Athibohol. Relocation option to a different site is an option available to the proponent. The project proponent can look for alternative land to accommodate the scale and size of the project. However, this will be a costly venture, may take a long time although there is no guarantee that the land would be available in the targeted area. It is recommendable that the proponent be allowed to install the project in the proposed site.

# POLICY, LEGAL AND REGULATORY FRAMEWORK

## 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.

## Kenya Electricity Supply Industry (ESI)

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

* **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 and Petroleum Regulatory Authority (EPRA).

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

* **The Energy and Petroleum Regulatory Authority (EPRA):** established by the Energy Act of 2019. The EPRA’s mandate extends beyond electricity and includes natural gas (including petroleum), renewables and all other forms of energy. The generation, transmission, distribution, supply, import and export of electricity can only be carried out by parties in possession of a license or a permit issued by the EPRA. In the event that the capacity involved is for own use and less than 1 MW, authorization is not required. Although the generated electricity is expected to be less than 1 MW (0.3 – 1 MW), the fact that the generated electricity is intended for use in the community 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.

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

* **Ministry of Energy and Petroleum:** aims to facilitate provision of clean, sustainable, affordable, reliable, and secure energy services for national development while protecting the environment.

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

* **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.

## National Policy and Legislative Framework rEVIEW

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

*Table 3‑1: Administrative stakeholders and their roles*

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

The applicable policy and legislative framework is illustrated in ***Table 3‑2*** below.

*Table 3‑2: Policy and Legislative Framework*

| S.No. | **Legislation/**  **Guidelines** | **Description of the Legislation/Guidelines** | **Relevance of the legislation/Guidelines** |
| --- | --- | --- | --- |
|  | **POLICY** | | |
|  | 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. |
|  | 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. |
|  | National Environmental Action Plan (NEAP) of 1994 | The NEAP for Kenya was prepared in mid 1990s. It was a deliberate policy whose main effort is to integrate environmental considerations into the country ‘s economic and social development. The integration process was to be achieved through multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and the conservation of natural resources forms an integral part of societal decision-making. | The NEMA does not approve a development project unless the impacts of the proposed project are evaluated and mitigation measures proposed for incorporation in the project ‘s development plan, which is in line with the requirements of the NEAP. The project will be reviewed by NEMA for approval before implementation. |
|  | Environmental and Development Policy (Session Paper No.6 1999) | As a follow-up to the foregoing, the goal of this policy is to harmonize environmental and developmental goals to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development. | The proponent:   * Is undertaking an Environmental Impact Assessment, Social Impact Assessment and Public participation as part of the planning and approval of infrastructural projects. * Will ensure that periodic Environmental Audits are carried out for the project |
|  | The Gender and Development Policy (Sessional paper no.2 2019) | The overall goal of this policy is to achieve gender equality by creating a just society where women, men, boys, and girls have equal access to opportunities in the political, economic, cultural, and social spheres of life. | In the absence of appropriate measures, the project can exacerbate gender inequalities and sexual and gender-based violence. In adherence to this policy, measures will be put in place to:   * + ensure gender inclusivity in decision making, employment opportunity and access to the energy generated from the Mini-Grid   + mitigate social risks including sexual and gender-based violence, and any form of discriminations |
|  | The HIV/ AIDS Policy 2009 | In summary, the policy aims at:   1. Establishing and promoting programmes to ensure non-discrimination and non- stigmatization of the infected. 2. Contributing to national efforts to minimize the spread and mitigate against the impact of HIV and AIDS. 3. Ensuring adequate allocation of resources to HIV and AIDS interventions; | The proposed project is to be implemented in the rural setting at Athibohol. The area is not economically empowered hence few HIV/AIDS prevention resources are available. This policy shall provide a framework to both the project proponent and contractor to address issues related to HIV/AIDS during the entire project phase. |
| **National Laws** | | | |
|  | The Constitution of Kenya, 2010 | The Constitution of Kenya promulgated in 2010 is the supreme law of the republic and binds all persons and all State organs at all levels of government. The Constitution provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectoral legislative documents are drawn. | The proposed project complies with the Constitution by proposing a structure in its ESIA on how to deal with Social, Health, safety and environmental issues for sustainable development. |
|  | Environmental Management and Coordination Act, 1999 (And the Amendments Of 2015) | The EMCA is a framework environmental law in Kenya. This Act (assented to on January 14, 2000) provides a structured approach to environmental management in Kenya. With the EMCA coming into effect, the environmental provisions within the sectoral laws were not superseded; instead, the environmental provisions within those laws were reinforced to better manage Kenya’s ailing environment. | The proposed project will be undertaken in accordance with relevant sections of the EMCA, specifically Clauses 58 – 63. These sections of the Act are operationalized by subsidiary legislation promulgated under the Act and specifically Legal Notice (L.N.) 101: Environment (Impact Assessment and Audit) Regulations, 2003. |
|  | L.N. 101: EIA/EA Regulations, 2003 And 2016 Amendments | These regulations provide the framework for undertaking EIAs and EAs in Kenya by NEMA licensed Lead Experts and Firms of Experts. An EIA or EA Study in Kenya is to be undertaken by a firm duly licensed by the NEMA. The EIA/EA Regulations also provide information to project proponents on the requirements of either an EIA or EA as required by the EMCA. | The proposed project is subject to relevant provisions of these regulations and subsequently, the ESIA has been undertaken in accordance with the requirements. |
|  | L.N. 120: Water Quality Regulations, 2006 | This regulation provides for the sustainable management of water used for various purposes in Kenya. The regulation contains discharge limits for various environmental parameters into public sewers and the environment. | The contractor will be required to properly manage the effluent from construction activities in accordance with the above regulations prior to discharge into the environment. |
|  | L.N. 121: Waste Management Regulations, 2006 | Generally, it is a requirement under the regulations that a waste generator segregates waste (hazardous and non-hazardous) by type and then disposes them in an environmentally acceptable manner. | Waste to be disposed in accordance with these regulations. |
|  | L.N. 61: Noise and Excessive Vibration Control Regulations, 2009 | The general prohibition of these regulations states that no person shall make or cause to be made any loud, unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health, or safety of others and the environment. | Rules 13 and 14 of the regulations define the permissible noise levels for construction sites. These noise limits will be applicable to the proposed project. |
|  | Environmental Management and Coordination, (Conservation of Biological Diversity) (BD) Regulations 2006 | These regulations are described in Legal Notice No. 160 of the Kenya Gazette Supplement No. 84, December 2006. These regulations apply to conservation of biodiversity which includes conservation of threatened species, inventory and monitoring of BD and protection of environmentally significant areas, access to genetic resources, benefit sharing and offences and penalties.  Additionally, this regulation provides for the local enforcement of the International Convention on Biological Diversity (CBD). | The proposed project will impact biodiversity through clearance of vegetation on the proposed site. This will be done in strict adherence to ESMMP and revegetation of degraded site will be done as spelt out in the ESMMP |
|  | Environmental Management and Coordination, (Fossil Fuel Emission Control) Regulations 2006 | These regulations are described in Legal Notice No. 131 of the Kenya Gazette Supplement No. 74, October 2006. These regulations include internal combustion engine emission standards, emission inspections, the power of emission inspectors, fuel catalysts, licensing to treat fuel, cost of clearing pollution and partnership to control fossil fuel emissions. The proposed project will generate fuel emissions linked to the back-up generator. This will only happen when the sun rays are poor. | This legislation gives caution to proponent on proper handling and management of fuels. The KPLC will adhere to the ESMMP while handling and managing the fuels |
|  | Licenses and Permits Required Under The EMCA | The subsidiary legislations under the EMCA are partially monitored using permits and licenses. Subsequently all licenses and permits required during the construction phase shall be the responsibility of the individual contractors and their agents. During the operational phase, all permits, and licenses required to operate the project will be the responsibility of the proponent. | The following permits to be available for inspection during the construction and operational phases of the project:   * EIA License under Environmental Management and Coordination Act, 1999; * Workplace Registration under Occupational Safety and Health Act, 2007; * Construction Permit by the County Government; and * Noise Permit under Legal Notice 61: The Environment Management and Coordination (Noise and Excessive Vibration Control) Regulations, 2009. |
|  | Occupational Health and Safety Act, 2007 | The Occupational Safety and Health Act (OSHA) was enacted to provide for the health, safety and welfare of persons employed in workplaces, and for matters incidental thereto and connected therewith. | The contractors will be required to fully comply with  Legal Notice 40 titled: Building Operations and Works of Engineering Construction Rules, 1984 (BOWEC). Each contractor will develop and implement a formal construction health and safety plan. |
|  | L.N. 31: The Safety and Health Committee Rules, 2004 | These rules came into effect on April 28, 2004, and require that an Occupier formalize a S&H Committee if there is a minimum of 20 persons employed in the workplace. The size of the S&H Committee will depend on the number of workers employed at the place of work | The contractor will be required to constitute Health and Safety Committee to oversee safety and health at the construction site |
|  | L.N. 24: Medical Examination Rules, 2005 | These rules provide for Occupiers to mandatorily undertake pre-employment, periodic, and termination medical evaluations of workers whose occupations are stipulated in the Eighth Schedule to the OSHA and the First Schedule to this Rules. Workers that fall under the above two schedules are required to undergo medical evaluations by a registered medical health practitioner duly registered by the DOSHS. | The contractor should that the workers exposed to hazards and or accidents undergo requisite medical examinations as required by these rules |
|  | L.N. 25: Noise Prevention and Control Rules, 2005 | The rules set the permissible level for occupational noise in any workplace (which includes construction sites)  The Proponent is to ensure that   * any equipment brought to the site for use shall be designed or have built-in noise reduction devices that do not exceed 90 dB(A). * those employees that may be exposed to continuous noise levels of 85 dB(A) are medically examined as indicated in Regulation 16. If found unfit, the occupational hearing loss to the worker will be compensated as an occupational disease. | The contractor to ensure that equipment is serviced properly and/or use equipment that complies with the threshold noise values provided in the act. Alternatively, each contractor will be required to develop and implement a written hearing conservation programme during the construction phase. |
|  | L.N. 59: Fire Risk Reduction Rules, 2007 | Several sections of the rules apply to the proposed project as enumerated below.   * Regulation 16 requires Proponents to ensure that electrical equipment is installed in accordance with the respective hazardous area classification system. It is also a requirement that all electrical equipment is inspected every six months by a competent person and the Proponent is required to keep records of such inspections. * Regulation 22 provides a description of the functions of a fire-fighting team. * Regulation 23 requires Proponents to mandatorily undertake fire drills at least once a year. * Regulation 34 requires Proponents to develop and implement a comprehensive written Fire Safety Policy * Regulation 35 requires a Proponent to notify the nearest Occupational S&H area office of a fire incident within 24 hours of its occurrence and a written report sent to the Director of DOSHS within 7 days. | The proponent is expected to comply with the requirements of L.N. 59: Fire Risk Reduction Rules, 2007 by   1. Carrying out, and record, a fire risk assessment identifying any possible dangers and risks. 2. Reducing, or where possible remove, the risk of fire and take precautions to deal with the remaining risks. 3. Developing an emergency plan should a fire occur which includes evacuation procedures etc. |
|  | The Energy Act, 2019 | The Energy Act of 2019 deals with all matters relating to all forms of energy including the generation, transmission, distribution, supply and use of electrical energy as well as the legal basis for establishing the systems associated with these purposes. The Act also established the Energy and Petroleum Regulatory Authority (EPRA). | The proponent is in line with the Energy act regulations in the following ways.   * The proponent has identified an available site * Alignment of the Mini-Grid Project to County development plans. * The Mini-Grid proponent has the technical and financial capability to conduct the project * The proponent has conducted the necessary engagement with the community. |
|  | Water Act, 2016 | Part 2 section one of the Act notes that every water resource is vested in and held by the national government in trust for the people of Kenya.  Section 143 (1) notes that; A person shall not, without authority conferred under this Act-  (a) Willfully obstruct, interfere with, divert or obstruct water from any watercourse or any water resource, or negligently allow any such obstruction, interference, diversion or abstraction; or  (b) Throw, convey, cause or permit to be thrown or conveyed, any rubbish, dirt, refuse, effluent, trade waste or other offensive matter or thing into or near to any water resource in such manner as to cause, or be likely to cause, pollution of the water resource. | All construction, operation and decommissioning phases will take caution to refrain from polluting any water resource and will endeavour to prevent pollution in line with the ESMMP. |
|  | The Energy (Solar Photovoltaic Systems) Regulations, 2012 | These regulations shall apply to a solar PV system manufacturer, importer, vendor, technician, contractor, system owner, a solar PV system installation and consumer devices. The Regulations prohibits any person from designing or installing any solar PV system unless he/she is licensed by EPRA. | The Regulations regulates the design and installation of PV systems. The persons engaged in the designing and installation of the Mini-Grid shall be licensed by EPRA |
|  | The Public Health Act (Cap. 242) | The Act prohibits the proponents from engaging in activities that cause environmental nuisance or those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety. | The proponent will be in line with the regulations of this act and will ensure suppression of infectious diseases and maintain proper sanitation during all the phases of the project. |
|  | The Standards Act Cap 496 | The Act is meant to promote the standardization of the specification of commodities, and code of practice; to establish a Kenya Bureau of Standards, to define its functions and provide for its management and control. The KPLC will ensure that commodities and codes of practice utilized in the proposed project adhere to the provisions of this Act. | All materials and spares used to construct the project will comply with the standardized specifications and certification. |
|  | Penal Code Act (Cap.63) | Section 191 of the penal code states that if any person or institution that voluntarily corrupts or foils water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighbourhood or those passing along public way, commits an offence. | The KPLC shall observe the guidelines as set out in the environmental management and monitoring plan laid out in this report as well as the recommendation provided for mitigation/minimization/avoidance of adverse impacts arising from the project activities. |
|  | The Land Act, 2012 | An Act of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land- based resources, and for connected purposes  Forms of Tenure. 5. (1) There shall be the following forms of land tenure- (a) freehold; (b) leasehold; (c) such forms of partial interest as may be defined under this Act and other law, including but not limited to easements; and (d) customary land rights, where consistent with the Constitution.  Methods of acquisition of title to land. 7. Title to land may be acquired through— (a) allocation; (b) land adjudication process; (c) compulsory acquisition; (d) prescription; (e) settlement programs; (f) transmissions; (g) transfers; (h) long term leases exceeding twenty-one years created out of private land; or (i) any other manner prescribed in an Act of Parliament.  Conversion of land. 9. (1) Any land may be converted from one category to another in accordance with the provisions of this Act or any other written law.  (d) Community land may be converted to either private or public land in accordance with the law relating to community land enacted pursuant to Article 63(5) of the Constitution. | Land in Athibohol is community land whose tenure falls under customary land rights. KPLC will observe all the relevant provisions of the Act including conversion from community land to public land as will be deemed appropriate |
|  | Community Land Act, 2016 | This Act is critical for the proposed project is within community land. Section 6(1) of the Act provides that ‘county governments shall hold in trust all unregistered community land on behalf of the communities for which it is held’. Furthermore, Section 6(2) maintains that ‘the respective county government shall hold in trust for a community any monies payable as compensation for compulsory acquisition of any unregistered community land’.  Section 30(1) states that ‘Every member of the community has a right to equal benefit from community land’. Section 26(1) provides that ‘a community may set aside part of the registered community land for public purposes and Sub-section (2) holds that ‘where land is set aside for public purposes under Sub-section (1), the (Land) Commission shall gazette such parcel of land as public land’. These provisions offer a window for the proposed project to acquire land for project works legally for communities as necessary and to convert the same into public land. This is useful for the project as once done powerful groups will not have opportunity to exclude them on account of their socio - economic statuses. In any event, Section 35 holds that, ‘subject to any other law, natural resources found in community land shall be used and managed-  (a) Sustainably and productively.  (b) For the benefit of the whole community including future generations.  (c) With transparency and accountability; and  (d) On the basis of equitable sharing of accruing benefits.  The concept of community land has been defined broadly enough to include VMGs. Women, children, old people, and future generations have been thought of as PAPs and thus their rights secured in this Act | The proposed project site falls on unregistered community land. The community has since allocated the land in kind for project use. The establishment of the mini-grid will convert communal land to generation and distribution of electric energy for long term. Further, based on community need assessment the proponent will undertake in kind development project to support the community health needs. The community chose renovation of community Borehole and construction of maternity ward at the Athibohol Health Facility |
|  | Land Registration Act, 2012 | Section 27 (2) provides that a transfer without valuable consideration shall have the same effect as a transfer for valuable consideration when registered. | Once the KOSAP PIU finalizes stakeholder engagements in all the identified counties, the transfer process shall be commenced to ensure that the land rights are secured. This gives the project the required land security to allow project implementation, which is in compliance with this legal requirement. |
|  | Land value amendment Act 2019 | It aims at standardizing the value of land in Kenya for the primary purpose of enhancing efficiency and expediting the compulsory land acquisition process for public projects.  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 Athibohol is community land. The 0.940Ha identified by the community for the proposed mini-grid. The land will be compulsorily acquired for the project. The MOE will pay compensation in kind through implementation of projects in water, education or health sectors. The community chose renovation of community Borehole and construction of maternity ward at the Athibohol Health facility |
|  | The Environment and Land Court Act 2011 | This is an Act of Parliament intended to give effect of article 162(2) b of the constitution; to establish a superior Court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land and to make provision for its Jurisdiction functions and powers, and for connected purposes. The principal objective of this Act is to enable the Court to facilitate the just and expeditious, proportionate and accessible resolution of disputes governed by this Act. | The project will have a grievance redress mechanism with a committee. The work of the committee will be to receive and respond to all the grievances raised. As explained in chapter five of this report, an aggrieved party will turn to the legal system after exhausting the GRM levels of resolution set. In the event any disputes on land and environment are not resolved through the project GRM, this court will provide a forum for timely resolution of such grievances. |
|  | The Physical and Land Use Planning Act, 2019 | This Act of Parliament makes provision for the planning, use, regulation, and development of land and for connected purposes. | The proposed site is not in contravention of any Zoning regulations. The project site is within unregistered community land; necessary county approvals will be sought by the proponent e.g., Project design approval and change of use. The approvals shall be issued by the Physical planner in the department of Lands, Housing and Urban Development – Wajir County. |
|  | The Employment Act No 11 of 2007 | This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the energy sector. | With the Contractor and the Project Proponent being primary employers during the construction and operational phases of the Project, respectively, they are bound by this law to abide to its stipulations on employee management and relations |
|  | The Work Injury Benefit Act, 2007 | This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment | The Proponent and Contractor will maintain an insurance policy cover for its employees, record of accident, carryout proper accident investigations; organize for pre-employment and regular medical examinations for staff. |
|  | Air Quality Regulations (2014) | Regulation 3 stipulates that the objective of these Regulations is to provide for the prevention, control, and abatement of air pollution to ensure clean and healthy ambient air. | The Proponent and contractor will implement mitigation during construction to ensure neighbouring properties are not impacted by nuisance dust |
|  | The Traffic Act Chapter 295 Laws of Kenya | This Act consolidates the law relating to traffic on all public roads. Key sections include registration and licensing of vehicles; driving licenses; driving and other offences relating to the use of vehicles on roads; regulation of traffic; accidents; offences by drivers other than motor vehicles and other road users.  Many types of equipment and materials shall be transported through the roads to the proposed site. Their registration and licensing will be required to follow the stipulated road regulations.  The Act also prohibits encroachment on and damage to roads including land reserved for roads. | The project will observe the provisions of the Act including management of traffic of construction vehicles as guided by the ESMMP |
|  | National Museums and Heritage Act, 2006 | The Act seeks to consolidate the law relating to national museums and heritage; to provide for the establishment, control, management and development of national museums and the identification, protection, conservation and transmission of the cultural and natural heritage of Kenya; to repeal the Antiquities and Monuments Act and the National Museums Act. | During implementation of the project, the Act will be followed in the event of case of chance find of cultural heritage on the proposed site |
|  | The Prevention, Protection and Assistance to Internally Displaced Persons and Affected Communities Act, 2012 | This an Act of Parliament that provides for the prevention, protection and provision of assistance to internally displaced persons and affected communities and give effect to the Great Lakes Protocol on the Protection and Assistance to Internally Displaced Persons, and the United Nations Guiding Principles on Internal Displacement and for connected purposes. | According to this Act, displacement in projects should be avoided to the extent possible and implementation of KOSAP sub-projects will adhere to this requirement. |
|  | County Government Act, 2012 | This Act makes provisions for county governments’ powers, functions and responsibilities to deliver services and for connected purposes. Part VIII of the act on Citizen Participation (87) (b) emphasizes on the right of citizens to participate to any development projects prior to their implementation.  This Act gives guideline on planning in the County and especially the partnership in development between the National Government and other investors | In complying with this requirement, the ESIA team held consultations on the project with the County Government of Wajir namely the Governor, County Executive Committee members for Environment, Energy and Public service and Administration. Additionally, the County government through the CEC Public service administration and the Chiefs office mobilized the communities for the consultation forums |
|  | The Sexual Offenses Act 2006 | This is a comprehensive law that criminalizes a wide range of behaviours including rape, sexual assault, defilement, compelled or induced indecent acts with child imbeciles or adults, gang rape, child pornography, child trafficking, child sex tourism, child prostitution, exploitation of prostitution, incest by male and female persons, sexual harassment, deliberate transmission of HIV or other life threatening sexually transmitted disease, stupefying with sexual intent, forced sexual acts for cultural or religious reasons among others. The Act also has orders for medical treatment for victims including free HIV prophylaxis, emergency pregnancy pill and counselling. The Act provides stiff penalties in which most of the crimes attract minimum of ten years imprisonment which can be enhanced to life imprisonment. | Implementation of a project creates changes in a community in which it is implemented and is has potential to can cause shifts in power dynamics between community members and within households. For instance, male jealousy is a key driver of Gender Based Violence (GBV) which can be triggered by labour influx on a project when workers are believed to be interacting with community women. Hence, abusive behaviour can occur not only between project-related staff and those living in and around the project site, but also within the homes of those affected by the project. |
|  | The Children Act, 2012 | Part 2 of the Act denotes the rights of the children and their welfare shall be protected from child labour and armed conflict i.e. Every child shall be protected from economic exploitation and any work that is likely to be hazardous or to interfere with the child’s education, or to be harmful to the child’s health or physical, mental, spiritual, moral or social development.  The Act also notes that a shall be protected from sexual exploitation and use in prostitution, inducement or coercion to engage in any sexual activity, and exposure to obscene materials. | Sensitization to the community on the need to ensure the protection of children has been done and will continue throughout the project cycle. In addition, the contractor will sensitize workers against abuse and exploitation of children. |
|  | 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. |

## Licenses and Permits Required

The subsidiary legislation under the EMCA is 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.

Before the contractor mobilizes to the site, there are certain permits that he will need to put in place. Some permits may be obtained during construction since they will be determined as need arises. Table 3-2 overleaf lists the environment-related permits required for this project

**Table 3‑3:** **Project Permit and License Requirements**

| No. | Relevant activity | Statute | Permit and License Requirement | Competent Authority | Responsible Agency for Obtaining Clearance | Date of Acquisition | Duration |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Pre-Construction Stage | | | | | | | |
| 1 | Construction and operation of the solar mini grid | Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018 | Need to submit ESIA report to obtain EIA license | NEMA | Proponent | Upon approval of ESIA report | Max 90 Days from date of submission of ESIA Report |
| 2 | Construction activities | Occupational Safety and Health Act (OSHA), 2007 | Need to apply registration of premises | DOSHS | Contractor | Before commencement of construction | 1 – 4 weeks |
| 3 | Setting up of construction camp sites | Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018 | Need to submit Project report for the Camp Sites to obtain EIA License | NEMA | Contractor | Before commencement of construction | 1– 1.5 months |
| 6 | Storage, transport and disposal of ordinary domestic and office waste | Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018 | Need to obtain waste license through submission of Waste Management Plan | NEMA | Contractor | Before commencement of construction | 1 – 1.5 months |
| 7 | Storage, transport and disposal of hazardous waste | Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018 | Need to obtain hazardous waste license through submission of Waste Management Plan | NEMA | Contractor | Before commencement of construction | 1 – 1.5 months |
| Construction stage | | | | | | | |
| 4 | Food handling in the campsite | Public Health Act | Obtain Food Handler Certificate | County Government | Contractor | Before handling of food in the campsite | 6 months |
| 5 | Workplace registration | Occupational Safety and Health Act, 2007 | Apply for Registration of a Workplace | DOSHS | Contractor | Before utilizing the campsite | Annual |

## World Bank OP applicability

Table 3‑3 below shows the applicability of World Bank Operational OPs to the proposed project in Athibohol site;

Table 3‑4: World Bank Operational Ops

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No.** | **Safeguard Policy** | **Objective** | **Applicability** |
|  | Environment Assessment (Operational Policy, OP/BP 4.01) | The objective of this policy is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is considered to be the umbrella policy for the Bank’s environmental ‘safeguard policies. | The policy is applicable to this project because there are environmental and social concerns associated with the construction and operation of the proposed project. In response, the KPLC has commissioned and Environmental impact assessment in order to identify and address the potential impacts to a level that is acceptable. |
|  | 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 ESMMP. |
|  | 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 culturally appropriate, gender and inter-generationally inclusive social and economic benefits. | The policy is applicable because the inhabitants of Athibohol who are Somalis are classified as a marginalized group in Kenya. They are the main inhabitants and the sole PAPs of the proposed solar mini-grid. 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. |
|  | 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. |

## Environmental and Social Management Framework (ESMF) for KOSAP

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

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

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

## Resettlement Policy Framework (RPF) for KOSAP

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

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

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

## 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 KP and REREC and other stakeholders. The framework was prepared then because was known that IPs are present in all the 14 target project counties. 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 VMGF is applicable because the main inhabitants of Athibohol are the Somali community who are classified as VMGs in Kenya. The Kamba communities are also present in Athibohol and they will all be PAPs of the proposed solar mini-grid. The ESIA did not identify any adverse impact on the communities therefore, a Vulnerable and Marginalized Group Plan (VMGP) will not be required however, elements of the VMGP such inclusion of Somali in the stakeholder engagement process as well as representation on the locational grievance redress committee will be incorporated in the ESMMP, to ensure that all the communities access culturally appropriate project benefits and opportunities, in a gender sensitive and intergenerationally inclusive manner.*

## Social Assessment (SA)

The KOSAP project has triggered the World Bank Operational Policy (OP 4.10) for Indigenous Peoples, and the relevant laws and regulations of the Government of Kenya concerning Vulnerable and Marginalized Groups (VMGs).

The OP 4.10 contributes to the Bank’s mission of poverty reduction and sustainable development by guaranteeing that the development process fully takes due regard to the dignity, human rights and cultures of indigenous people. The Bank requires that the Borrower engages the IPs/VMGs in a process of Free, Prior and Informed Consultations and this is the basis of the public participation in the Counties with the objective obtaining broad community support for the project by the affected IPs/VMGs. In case of any adverse impacts, these should be avoided or reduced where possible and where not feasible, they should be mitigated or compensated.

The Government of Kenya through KPLC has undertaken a Social Assessment (SA) in order to ensure that the VMGs are not disadvantaged by the project, excluded from benefiting and participating from the project, and to develop alternative plans to enhance project benefits.

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

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

**Table 3‑5: Comparison between the WB safeguard policies and the Kenya Legislation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **World Bank safeguard Policies** | | **Kenyan laws** | **Comparison** | **Recommendation** | |
| O.P 4.01 requires screening to determine level of environmental and social assessment to be done.  An ESIA is prepared before project implementation. | | EMCA requires screening of project to determine level of environmental and social assessment to be done.  An ESIA is required once determination is done. | Similar both require screening | Screening has been done and the project is established as medium risk which requires and ESIA. | |
| ESIA is needed once determination had been established and should be prepared identifying all environmental and social impacts and mitigation measures proposed to address the impacts. | | ESIA is needed once determination had been established and should be prepared identifying all environmental and social impacts and mitigation measures proposed to address the impacts. | Similar- both require ESIA depending on the project impacts. | ESIA is prepared in line with EMCA /EIA regulations and makes reference to WB safeguard policies. | |
| O.P 4.04 Natural Habitats- 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. | | Environmental Management and Coordination, (Conservation of Biological Diversity) (BD) Regulations 2006 – requires conservation of biodiversity which includes conservation of threatened species, inventory and monitoring of BD and protection of environmentally significant areas, access to genetic resources, benefit sharing and offences and penalties. | | Similar- both require conservation of natural habitats | This policy and law will not be applicable to the project because the proposed site has minimal vegetation that will be disturbed during project implementation. |
| O.P 4.12 Land Acquisition and Involuntary resettlement should be avoided wherever possible or minimized and exploring all alternatives. | | The Government and any other organization, shall prevent internal displacement linked to development projects to the extent possible by exploring other alternatives. | Similar- displacement in projects should be avoided to the extent possible by exploring alternatives. | WB policy is more elaborate than the Kenyan Law. | |
| O.P 4.10 on indigenous people seeks to promote the inclusion of these group in development project and especially through consultation to ensure they also share in the project benefits and ensure negative impacts do not disproportionately fall on them.  The policy requires these groups to be consulted separately to enhance their participation. | | The COK 20.10 article 56 provides for the right of marginalized communities and the importance of their input in decision making that regards them.  National Gender and Equality Act and the Children’s Act and Persons with disability Act seeks to promote the inclusion of these persons in all issues as they are often overlooked and left out.  Emphasis is also on consulting with them. | Similar- both seek to promote inclusion of these group so that they do can share the projects benefits and ensure that negative impacts of the project do not fall on them disproportionately  WB needs a social assessment to be conducted. | WB policy is more elaborate and the two are being used to compliment. | |
| Project affected persons should be meaningfully consulted and be given opportunities to participate in planning and implementing of projects and especially where there is resettlement. | | EMCA requires that the project owner seeks the views of the people who are affected and explain the project information to them and especially the impacts from the project and also obtain their opinions or comments. | Both are similar | Consultation has been done and will be progressed in line with the two WB policy and Kenya legislation. | |

# BASELINE SETTINGS - PHYSICAL AND SOCIO-ECONOMIC ENVIRONMENT

## Area of Influence

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

* The areas where project activities and facilities operated and managed by the Ministry of Energy, Kenya Power (KP), will be established,
* Project site where project components such as solar modules, control room and transmission line to power grid sub-stations; and any other selected compensation in kind project, such as the construction water abstraction and distribution points will be established
* Areas where impacts from unplanned but predictable developments caused by the project that shall occur later or at a related location such as increase in traffic on the approach road;
* Areas where there is biodiversity or on ecosystem services upon which affected communities’ livelihood are dependent; and
* Areas where associated facilities will be established e.g., approach road construction and widening of existing road.

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

**Air Quality**

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

**Noise**

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

**Water**

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

**Flora and Fauna**

* The direct footprint of the project comprising the project site
* The areas immediately adjacent to the project footprint within which a zone of ecological disturbance is created through increased dust, human presence and project related activities (e.g., trampling, water intake/outfall, transportation). This kind of disturbance has been estimated to occur within the project footprint and surrounding areas of about 500 m to 1 km from the activity areas. Based on the above the AoI for environmental studies was limited to 5 km from the project site.

**Socio-economic/Social**

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

### Project Footprint Area

The project falls in Athibohol village-Hadado ward, Wajir West sub county-Wajir County in North Eastern part of Kenya. The area has indigenous forest mainly composed of shrubs. The site is relatively flat; however, the surrounding areas within the Sub location has undulating slopes. The site is located at a close proximity to Athibohol primary school which are within a 200m radius from the site.

### Study Area

Locations of ecological and social surveys were also selected based on receptor locations; in addition, special emphasis is given to areas within 1.5 km radius of the project site and distribution lines. Based on the secondary information of the region, the following baseline information on environment, ecology and social has been discussed under the sections below:

## Physical Environment

### Geology and soils

The county has sandy soils that support scattered shrubs and grasslands which are ideal for livestock production. The county’s land is highly erodible. The exploitation of the soil resource thus must take into account conservation measures due to their fragile nature. The mineral potential of the soils is not exactly known as no geological mapping has been done.

### Topography

Most of the land in the Wajir County is flat low lying plain. The plains rise gradually from an altitude of 289m above sea level. The topography of the project site is a relatively flat. The site is featureless, there are no water bodies that pass though directly the proposed project site.

### Hydrogeology and Drainage

The Tana River runs along the western border with Tana River County. However, it covers very little portion of Wajir County as it forms part of the county boundary with Tana River County. Wajir is low-lying and flat, with very little surface water other than the Tana River and a few seasonal rivers that only flow during the rainy seasons. Most residents of Wajir County access groundwater through the use of boreholes, between 150 – 300 m deep. Athibohol is served by a borehole and a water pan.

### Flora and Fauna

Wajir County is a semi-arid area falling in the ecological zone V-VI. The county receives an average of 240 mm of rainfall per year which is erratic and short making it unfavourable for vegetation growth and rain fed agriculture. There are two rainy seasons’ i.e., short and long rains. The short rains are expected between October to December and the long rains from March to May each year. The project site has low vegetation The erratic rains make it unfavourable for vegetation growth. There is no gazzeted forest in the county, Fauna found: include the antelopes, dik-dik, Avian Spps (Kite, Heron, Sacred Bird and Marabou Stork). The area’s ecological conditions are influenced by the soil type, altitude, vegetation, rainfall pattern and human activities.

### Water Resources

Water is sourced from a borehole and a water pan. The water from the borehole is considered clean by the locals and utilizes it for drinking and domestic uses but is slightly saline.

### Ambient Air Quality

The proposed project area which can be described as generally rural with interfaces of natural vegetation. Most of the areas are vegetated and there are no major industrial developments. The air quality at the proposed project sites is therefore considered to be generally good.

### Ambient Noise Quality

In general, the project area is a rural setting where the main source of noise is from motorists and from machines such as the generators used to supply power. The noise quality of Athibohol is considered to be within the Kenyan limits for a mixed residential and commercial zone.

### Soil Type

The major soil type in Wajir West sub-county is sand. The soil drains excess water and cannot hold significant amounts of water or nutrients for plants.

### Climate and Meteorology

The County experience frequent drought episodes especially from June to September, which impact negatively on livestock, education, nutrition, access to water and pasture. On the other hand, the county also experiences flash floods which damages infrastructure and kills the shoats (goats and sheep). The frequency and intensity of the extreme climatic events has been increasing in the recent past disrupting the livelihood of the communities.

The topography of the landscape influences the amount of rainfall received. The county records more than nine hours of sunshine per day and has a huge potential for harvesting and utilization of solar energy. Heat stress, dry spells, and drought are hazards that strongly contribute to agricultural risks in the County. And August with the rest of the months getting calm winds.

## Socio-economic Environment

### Demographic Profile

The demographic profile in terms of total population, number of households, household size and sex -ratio of the selected villages surveyed in study area has been discussed in section below: According to the 2019 Kenya Population and Housing Census (KNBS), Athibohol Sub-location has an area of approximately 251.5 Km2 with a population estimate of about 2300 people with a population density of about 18 people per square kilometre. The average gender ratio for the population within the project area is estimated to be 60% female and 40% male.

***Table 4‑3*** below presents a summary of demographic profile of Athibohol.

*Table 4‑1: Summary of demographic profile*

|  |  |
| --- | --- |
| **Attribute** | **Magnitude/Number** |
| Approx. population | 2300 |
| Households | 350 |
| Gender. | Male – 45%  Female – 550% |
| Ave. No. per household | 8 |
| Vulnerable Individuals and Households | * Female headed households * Child headed households * The elderly (80 years and above) |
| Dominant ethnic group | Somali |
| Other groups | Kamba |
| Primary religion | Islam |

### Educational Infrastructure

As per the observation and information sought from Athibohol Location, the area has one school;Athibohol primary school. The school has 500 pupils and 3 teachers (1 is employed by TSC, 1 by the board of. There are 560 pupils (46% and 53% girls and boys) enrolled in the primary school but these figures keep changing cause of drop outs due to effects of culture, poverty and security related issues. There are a total of 11 primary school teachers and this implies that the teacher/pupil ratio is 1:37. According to key information interview with the school headteacher,80 percent of pupil’s transit to secondary schools, major causes of school dropout are said to be pastoralism, early marriages and insecurity. There is therefore urgent need to come up with strategies that will keep children in school. There is no Tertiary institution in the Area. management and 1 is employed by the county). Most of the young people below 18 years of age can generally read and write while most of those above that age cannot. This school is currently connected to solar power which is unreliable and it is anticipated that it will benefit from the project by getting connected to the reliable electricity once the project has been implemented.

### Access to health

The village is served by a dispensary that was reported to be ill equipped during the FGDs. Despite its condition, the residents prefer the dispensary as compared to the traditional methods of treatment. The dispensary is currently served by 1 male Nurse and 2 community health workers (a male and a female). The main health issues

* pre-dominant among the children in Athibohol are upper respiratory tract infections (URTI), diarrhea and measles.
* pre-dominant among the women in Athibohol are urinary tract infections (UTI), pneumonia and bilharzia.
* pre-dominant among the men in upper respiratory tract infections (URTI), Urinary tract Infections (UTI) and typhoid.

Malnutrition was the most prevalent among most groups due to food insecurity while Sexual health issues are the least common among the community of Athibohol. Implementation of the project will lead to access to a reliable source of power and this will result in improved healthcare.

### Employment

Wage earners

The 2009 KHPC put the number of people in Wajir county above fifteen years of age that are in employment at 196,322 in rural and 14,031 in urban areas which accounts for 32 per cent of the total population. 2% of people are employed**.**

**Self-employed**

The predominant self-employment activity is pastoralism which accounts for over 70 per cent of the population. The Livestock value chain that includes livestock and livestock products marketing is a major earner. Also, estimates indicate that approximately 10,000 people are employed in livestock value addition related activities; between 2,000 and 3,000 people are employed in quarry activities; 6,000 people in carpentry; 890 people in tailoring and about 5,000 people make mats, thatches and beads as part time activities. Labour force by sector Given that the self-employed as indicated above are less than 30,000. There is great potential in employment creation in the craft industry. There is a low skill mix in the county with high illiteracy. There is a need to support skills development, entrepreneurship and access to capital. The rate of unemployment in the county is 63 per cent. The main causes of unemployment include cyclic droughts, insecurity, high illiteracy and inefficient marketing systems for county products. The proposed project will create employment to the athibohol community members; skilled, unskilled and indirect employment hence boosting the economy.

### Land Use

Land in the community is mainly communal and is used mainly for livestock grazing. They mainly keep goats, sheep, cows and camels. Land in Athibohol is under unregistered community land and is considered as communal land where every member of the community has the right to use it. Most of the land in Wajir County are non-functional and lack policies to guide on land use, this has resulted to unplanned human settlement in Athibohol area. The project land has minimal vegetation cover. Land in the proposed project area is used for small scale subsistence farming and Livestock grazing. Domestic animals kept in the area are Sheep, goats, cows, donkeys and camels. Men practice pastoralism by moving with their livestock in search of pasture and water during dry season.

### Energy Access

As per observations and information sought in the project Athibohol is not covered by the national grid and hence the proposed solar project. The main source of energy for the residents is wood fuel. 85% of the households rely on fire wood as their main source of power, mainly for cooking. This has partly contributed to a decline in tree cover. 10% of households in the study area have access to electricity (portable solar systems). Energy tapped from the Solar system connected to the Athibohol Dispensary was purposely used for lighting. In Athibohol they collect firewood that they use for cooking and heating water.

### Social and Physical Infrastructure

**Transportation and Road network:**

The county has 28 kilometers of tarmac, one airport and seven airstrips. It lacks key infrastructure like rail network, major bus and lorry parks. The poor road network is inhibiting connectivity with settlements and other counties for inter and cross county collaboration. There is need to climate proof road infrastructure to ensure durability and efficient delivery of essential services. The total number of Kilometres of roads in the county both classified and unclassified roads is approximately 8,000 Kilometres. Athibohol area can be accessed by earth roads. The main forms of transport are private vehicles and motorbikes.

**Sanitation**: Open defecation (OP) is widely practiced in the village. There are however few pit latrines.

**Mobile Network Coverage:** *Safaricom* is the only Network coverage within the village but the signal is very weak.

### Vulnerable Individuals and Households

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

The categories of vulnerable groups identified at the project area include:

* Female headed households
* Child headed households
* The elderly (80 years and above)

The vulnerable households can hardly access the basic needs and most of them rely on well-wisher within the community. The project should consider such households for electricity connection. Most of them cannot afford the one thousand shillings’ connection fees.

### Gender based vulnerability

The society in the project area is characterized by a patriarchal family structure. Women continue to be rooted in traditional norms of social behavior which include early marriages and minimal participation in household or economic decision making, lesser economic freedom and limited opportunity to socialize with other females in the village. During the Focus Group Discussion with women, it was reported that men have more control over household resources such as land, assets and equipment. In a typical household, the head of the household is the eldest male members, while the decision-making authority is the man. In addition to this, men are responsible for ensuring the financial security of the family. The women on the other hand are responsible for household activities such as fetching water, cooking, cleaning, taking care of the children and also grazing of animals.

### Gender Based Violence

Based on the Focus Group Discussion with women at Athibohol, female genital mutilation (FGM) is practiced and there are no support centres for GBV cases. The women reported that the FGM cases have reduced over the years. Other forms of GBV including the intimate partner violence and sexual exploitation and abuse are not common. The forms of GBV that may arise during project implementation include Sexual Harassment (SH) and Sexual Exploitation and Abuse (SEA). A SEA/SH Prevention and Response Action Plan needs to be prepared and implemented in all the phases of the project.

### Culture and heritage

Athibohol is predominantly made up of the Somali community that values pastoralism to earning a living and as a measure of wealth. Traditionally men look after the cattle and they are also responsible for the safety of the tribe. women are in charge of gathering roots and vegetables, tending to children, and collecting water. They are also responsible for maintaining their homes. Degodia girls generally help their mothers with their domestic chores. Before marriage, young women are also subjected to female circumcision. The community practices polygamy and encourages early marriages for young girls. There was no cultural site of significance observed within the project area. The community burry their loved ones at their cemetery 2 kms away from the project site. There is no cultural site of significance that was reported/observed near the project area.

### Religion in the project area

The community members at Athibohol represent mainly the Muslims who go to the mosque within the village. The days of worship are usually Fridays therefore, the contractor is expected to put in to consideration the time of worship and the place to have the prayers.

### HIV/AIDs prevalence

The county’s HIV/AIDS prevalence rate stands at 0.9 per cent. The women 15-49 years who know that HIV can be prevented by use of condoms and limiting sex to one uninfected partner stands at 15%. Testing services in the county are limited to major health facilities and hence low number of infected people have been put on ARVs. There need to sensitive the communities on voluntary testing as well as living positively National AIDs Control 2018, There were no documented cases of Number of patients infected with HIV/AID at Athibohol Dispensary as at the time of study.

### Community Organizations/Non-State Actors

The county has 70 Self Help groups, 50 Community Based Organizations (CBOs), 700 women groups, 900 youth groups. In Athibohol there are four youth empowerment centres that are not operational hence the need to operationalize. Main NGOs operating in the county are; World Vision International, Save the Children-UK, Kenya Red Cross Society, Islamic Relief-UK, Mercy Corps, Oxfam GB, Veterinary Sans Frontiers (VSF),Arid Land Development Focus(ALDEF), RACIDA, Mentor, Catholic Relief Services and District Pastoral Association. These NGOs mainly operate in the livestock, health and education sectors offering subsidized treatment and supporting the government in vaccination. ALDEF, World Vision and WASDA offer relief food services. Save the children and Islamic relief are involved in nutrition and livelihood programmes and contribute considerably towards community empowerment, protection of human rights awareness creation and civic education. Most women groups operate in uninformed revolving funds (merry go round, table banking). The level of activity of women and youth groups in the county depends on funding from various donors and government funded initiatives.

# STAKEHOLDER ENGAGEMENT

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

1. stakeholder identification and analysis
2. planning for the stakeholder engagement;
3. disclosure of information;
4. consultation with stakeholders
5. addressing and responding to grievances; and
6. reporting to stakeholders

## Legal Requirement for Stakeholder Engagement

Timely stakeholder analysis and engagement is key as it provides opportunities for stakeholders to make significant contribution to the project design and implementation which results in enhanced project acceptance among other benefits.

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

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

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

## Objectives of Public Participation

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

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

Part of the key project information that was shared with the stakeholders to enable them to understand the project included; positive and negative impacts of the project including potential opportunities. The information specifically focused on; the objective, nature and scale of the project, potential risks and impacts of the project on local communities, mitigation measures to the negative impacts, need for future consultations and means of raising and addressing impacts.

## Stakeholder Consultation and Disclosure Requirement for the Project

The World Bank OP 4.01 Environmental Assessment - Stakeholder Engagement and Information Disclosure emphasises on engagement in meaningful consultations with all stakeholders. The stakeholders should be provided with timely, relevant, understandable, and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination, and intimidation.

The summaries of ESIA findings will be disseminated to the affected persons in a languaguage that they can understand using baraza and focus group discussions.Disclosure process will also consider any mobility, disability and literacy challenges affected persons may have.ESIA report will also be made available in public places that are accessible to project-affected groups and local NGOs (NEMA website and Respective NEMA County offices).

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 collected, has been presented below. The consultations were conducted in form of:

* Meeting with the client
* Consultation with the county commissioner and the county officials
* Key stakeholder interviews with the county officials
* Public meeting in Athibohol
* Focus Group Discussions

## Stakeholder Characterisation 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.

### 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;

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

Table 5‑1: Identified Stakeholders

|  |  |  |  |
| --- | --- | --- | --- |
| **Stakeholder Category** | **Stakeholder Group** | **Connection to the KOSAP** | **Consultation tool** |
| Project Affected Persons | Local Community | * Local communities to be affected either directly or indirectly by the project * Vulnerable Individuals and Households * Health institutions * Education institutions | **Public Meeting**   * 2 public meeting was held in Athibohol Village shopping centre on 31st may 2021 and 20/10/2021.   **Focus Group Discussions (FGD)**   * The FGDs were conducted with the men, women, youth.   **Key Informant Interviews (KII)**   * The KIIs for Athibohol Primary school and Athibohol Dispensary were conducted through one-on-one interviews.   The Assistant chief was also interviewed on the Community Profile of Athibohol. |
| Interested Parties | National Government and county government | National Government are of primary importance in terms of establishing policy   * County government are also of primary importance in county energy requirements and proposed interventions * They will play an important role in implementation and sustainability of the project | **Meeting**  During the first consultation, A meeting was held with the Wajir County Governor and county officials |

The significance of a stakeholder group is categorized considering the magnitude of impact (type, extent, duration, scale and frequency) or degree of influence (power and proximity) of a stakeholder group and urgency/likelihood of the impact/influence associated with the particular stakeholder group in the project context. The magnitude of stakeholder impact/influence is assessed taking the power/responsibility and proximity of the stakeholder group and the group is consequently categorized as negligible, small, medium or large. The urgency or likelihood of the impact on/influence by the stakeholder is assessed in a scale of low, medium and high. The overall significance of the stakeholder group is assessed as per the matrix provided in Table 5-2 below.

Table 5‑2: Stakeholder Significance and Engagement Requirement

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

## STAKEHOLDER ANALYSIS

The Stakeholder influence and priority have both been primarily rated as:

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

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

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

Table 5‑3:Summary of Stakeholder Influence

**Table 5‑4:Summary of Stakeholder Influence**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Stakeholder Category** | **Category** | **Sub Category** | **Magnitude of Influence** | **Urgency/Likelihood of Influence** | **Overall rating of stakeholder rating** |
| Interested parties | Government | National Government  County Government | Large | High | Major |
| National regulatory bodies | NEMA | Large | Medium | Major |
| Project affected persons | Individuals and households | VMGs and socially disadvantaged groups | Medium | High | Major |
| Institutions | Education and Health institutions | Medium | Low | Minor |

## Approach and methodology used in carrying out the public participation

ESIA consultants employed various methods in engaging different categories of the stakeholders, these methods included; face to face discussions for the government officers, focused group discussions with men, women, youth and people living with disability (PLWDS) and a public baraza/meeting for the community members.

### Stakeholder engagement schedule

The ESIA team identified four categories of stakeholders namely; government officials, opinion leaders at local level and elders and the general community. Stakeholder engagement began early in the planning phases of the project. A letter was written from the Ministry of Energy to Wajir County commissioner informing them about the need to undertake public participation for the proposed project. Stakeholder consultations for land identification was undertaken on 31st May 2021 and Stakeholder consultation for ESIA was undertaken on 21st October 2021. During this time project information in terms of (preliminary design, land identification, positive impacts, negative impacts, mitigation measures among others were discussed with various stakeholders. Different categories of stakeholders gave their views on the project.

## Summary of Stakeholder Engagement During the Land Identification Process

A Consultative meeting was held with the Athibohol community on 31st May, 2021, to discuss the details of the proposed mini-grid project, the project’s land requirements, the impacts of the project and grievance redress. Focus Group Discussions were also carried out separately with men, women and the youth. The FGDs were to allow the groups to freely express themselves and to ensure that they understood the project.

Some of the concerns of the community meeting are summarized in the table below;

Table 5‑3 Issues raised during Land identification stakeholder engagement.

|  |  |  |
| --- | --- | --- |
| **Issue** | **Comment discussed** | **Response by study team** |
| Community health and safety | when the government is recruiting, they check different parameters. We know that stealing and theft has no boundaries, but you can test for diseases and sickness, my request is that you ensure workers are healthy e.g free from Corona. | The contractor will ensure that covid 19 rules and protocols are followed. The contractor shall control access of people to site, do temperature checks at the gate and those with fever will be advised to go for medical checkup and treatment. Other health factors will be checked but I also wish to inform this audience that medical records are private and confidential.  Concerning theft; offenders will be subjected to strict disciplinary measures. |
| Appreciation for the project | Thanks for this project. You have brought a project we need; we will identify the land for you and cooperate as required. | Thanks. It is true Land is a key factor and as a community if you cooperate and identify the land for the project; we will implement it for the benefit of the community. |
| Employment | we request that you give priority to locals for jobs. If locals do not benefit from recruitments, yet they qualify for jobs and have skills, then it will not be fair.  How many people will you recruit? | The contractor will recruit 50-100 people during construction phase and about 10-15 people during operation. The contractor will sign in his tender bid that priority will be given to the local community for jobs they qualify for and can do. Payments for works will be as per market rates. |

In conclusion, the community resolved to provide land for the project, the GRC nominees were validated, and officials were elected to lead in the identification of project land and sign the land forms on behalf of the community.

Minutes Of the Meeting Are Appended at The End of This Report(Appendix 3).

## Summary Of Stakeholder Engagement during ESIA

### INFORMATION SHARED TO THE COMMUNITY MEMBERS

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

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

### KEY FEEDBACK RECEIVED DURING STAKEHOLDER CONSULTATION PROCESS

The general stakeholder consultation was done in a public meeting (Baraza) organized at Athibohol Village Shopping Centre under a big acacia tree. The meeting was chaired by the area Assistant chief, Mr. Abukar Bishar Nunow. The baraza was attended by 70 members and the feedback received during the stakeholder consultation process have been summarized below:

### Benefits of the Project

The community was in support of the project and they pointed out that the project will be beneficial them community as it will:

* result to business growth in Athibohol, improving the living standards
* improve security by lighting the location
* better the healthcare once the clinic is connected to power
* bring employment opportunities to the locals

|  |  |
| --- | --- |
| *Public participation “Baraza” Session* | |
|  |  |
| *Focused Group Discussion with the Men* | |
|  |  |
| *Focused Group Discussion with the Women* | |
|  |  |
| *Focused Group Discussion with the Youth* |  |
|  |  |

*Plate 5‑1: Stakeholder’s engagement process*

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

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Issue** | **Comments discussed** | **Response by study team** |
|  | Project site security | Type of fence would be constructed around the site to prevent animals and children from straying into the project site | The A chain-link fence or a concrete wall will be constructed to secure the project |
|  | Employment | contractor to source labour from within the community. | Employment will be given first priority to the locals for both skilled and unskilled jobs |
|  | Construction materials | Requested for the contractor to source available materials from the community. | the contractor will source materials from within the community. |
|  | Compensation in kind project | Will the project also assist in desilting a water pan approximately 4 km from the village? | The additional project will be the compensation in kind project that the community will choose |

The minutes of the meeting have been appended in Appendix 2 of this report.

## Disclosure of ESIA to the Stakeholders

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

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

## Stakeholder Engagement and Grievance Management Post ESIA

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

### Objectives and Principles of Stakeholder Engagement post ESIA

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

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

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

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

# IMPACT ASSESSMENT AND MITIGATION MEASURES

## Introduction

This section provides an assessment of potential environmental and social impacts from the proposed Project as well as the proposed mitigation measures to avoid, reduce, remediate or compensate for potential negative impacts and to enhance positive impacts. A description of the assessment methodology used to assess the significance of potential impacts, taking into account impact magnitude and sensitivity of receptors and resources affected, is provided below. To facilitate the reading of the ESIA, the same heading structure in terms of environmental indicators, receptors or resources affected by the project activities were considered as the ones used in the baseline. All the mitigation measures identified in this chapter have been collated into the Environmental and Social Management and Monitoring Plan (‘ESMMP’) matrix, including Occupational Health and Safety.

## Impact Assessment Methodology

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

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

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

## 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.

## 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 6‑1* below based on five levels;

*Table 6‑1: Categories of Significance*

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

For environmental impacts the significance criteria used in this ESIA is shown in Table 6‑2: .

Table 6‑2: Overall Significance Criteria for Environmental Impacts

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

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

## Magnitude of Impact

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

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

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

## Sensitivity of Resources and Receptors

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

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

## Likelihood

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

**Table 6‑3: Explanation of Terms Used for Likelihood of Occurrence**

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

## Definition of mitigation measures

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

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

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

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

## Assessing residual impacts

Impact prediction takes into account any mitigation, control and operational management measures that are part of the project design and project plan. A residual impact is the impact that is predicted to remain once mitigation measures have been designed into the intended activity. The residual impacts are described in terms of their significance in accordance with the categories identified in *Table 6‑1* and Table 6‑2 above.

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

## PRE-Construction Phase - Key Social Impacts

### Impacts related to Land Acquisition

The proposed project will entail the acquisition of a 0.94 hectares land parcel for setting up the mini-grid. The land acquired may also be used to develop contractor facilities, worker’s camps and other ancillary facilities e.g., storage and sanitary facilities. Loss of land used by the communities for livestock grazing and farming may trigger land disputes. New settlements may arise due to migration of people to the centres near the mini-grid disrupting the existing community settlement patterns. The project proponents will use existing access roads to set up the low-voltage power distribution lines and will seek access from PAPs and clients in whose property they will undertake electricity connection to the power grid.

During the consultation, it was also reported that the community is not entirely dependent on the land for income. The land has minimal vegetation cover. After implementing the embedded controls, the impact magnitude is assessed to be minor.

#### Source of Impact and Overview of Baseline Conditions

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

#### Embedded/In-built Controls

Enabling the community to benefit from the project by supporting local projects e.g., healthcare access, schools and local water need.

##### Significance of Impact

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

#### Additional Mitigation Measures

The following additional measures may be recommended to minimise this impact:

* Providing skills-based training interventions, especially for self-employment to the young and unemployed. This will enhance their employability and create potential for income generation through self-employment;
* Procuring resources from the local sources so as to induce more employment in the supply chain.
* Community compensation in kind. The community identifying projects admissible in Water, Health and Education sector within a radius of 10 km. During the public meetings the community identified these projects: Renovation of community borehole and equipping of maternity ward at Athibohol Dispensary.

### Impact related to Way leaves acquisition

The design of the distribution line will utilize the existing road reserves, however, any damage to structures, crops, community facilities and other assets will be compensated in line with the RPF provisions. If the affected persons voluntarily forego such compensation, the proponent will document such consents as voluntarily donated. Supply of electricity will involve passing of low voltage (LV) lines to connect the customers to power. It is estimated that a total of 9.2 km of LV circuit will be constructed.

#### Embedded/In-built Controls

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

##### Significance of Impact

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

#### Mitigation measures

* Consultations with the community during construction of the low voltage lines

### Impact Related to Stakeholder identification and consultations

These impacts are associated with these risks:

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

**Mitigation measures**

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

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

**Mitigation Measures**

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

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

**Mitigation measures**

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

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

**Mitigation measures**

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

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

**Mitigation measures**

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

#### Embedded/In-built Controls

Stakeholder engagements regarding the project to get their views and consent done prior to construction works. The consultations include public barazas, focus group discussions and key informant interviews.

##### Significance of Impact

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

## construction Phase- Positive Impacts

**6.11.1 Employment Opportunities**

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

Thus, anticipated benefits of the Project include Direct employment opportunities mainly during construction of the mini-grids The local community is likely to benefit from the opportunities to be created from the following:

Civil works during construction phase including, construction of solar PV module mounting area, transformer yard, inverter room, internal roads, laydown areas, labour camp, distribution line; and

Skill transfer from the contractors to the locals that will be given opportunities during the implementation of the project.

The area is characterised by major unemployment. This has affected the community members including the youths, men and woman as reported during Focused group discussion sessions. Thus, the contractor should develop and implement an employment management plan to promote local content. This will ultimately resolve conflict which can be arise if the community feels left out in employment opportunities

**6.11.1.1 Impact Significance**

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

**6.11.1.2 Enhancement Measures**

A significant segment of labour requirement during the construction phase will be sourced locally. While, the significance of the impact on employment opportunities during the construction phase is understood to be positive, the following measures should be put in place to ensure that the local community receives maximum benefit from the presence of the project;

Preference should be provided to local labour; and

Preference should be provided to the vulnerable population in the Study Area.

### Impact on Local Trade

Where possible, construction materials will be sourced locally in order to promote local businesses.

Thus, anticipated benefits of the Project include indirect employment generated by the procurement of goods and services for the Project; induced employment related to jobs ensuing from the expenditure of incomes. The local community is likely to benefit from the economic opportunities to be created from the following:

* Self- employment options for individuals possessing vocational or technical training skills like electricians, welders, fitters etc;
* Contracting opportunities for local’s residents including men, women and youths. During the public meeting the community insisted that all the unskilled labour force must be given to the locals.
* Creation of indirect employment for local community through establishing small shops like tea stalls, supply of intermediate raw materials, repair outlets, hardware stores etc. However, these are likely to be temporary.

**6.11.2.1 Impact Significance**

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

**6.11.2.2 Enhancement Measures**

* Preference should be provided to local sub-contractors or suppliers to pass on maximum economic benefit locally;
* The project proponent will establish a mechanism to audit sub-contractors and suppliers with respect to compliance of utilizing local labour and resources.

## Construction phase - Key Environmental Impacts

### Change in Land Use

The study area consists of communal land with patches of open scrubland. The internal distributions lines will be laid by Kenya Power. The land procured for the project site was uncultivated, and undeveloped. During consultation, it was established that the land belongs to the community. The community has allocated the land in kind for project use. The establishment of the mini-grid will convert communal land to generation and distribution of electric energy for long term.

For the purpose of assessment of impacts on land use of the area, the following project activities leading to an alteration in land use of the area during construction phase have been considered:

* Installation of PV modules;
* Establishment and operation of temporary structures such as temporary site office and store yard.

The land use receptor sensitivity criteria will be low. This is due to the fact that there will be visual change upon installation of the mini-grid. There is no major dependency for grazing or agriculture on the land offered for the project. The magnitude criteria of this impact will be medium because there will be noticeable of change over the restricted site area. The change may be medium to long term and is reversible.

#### Embedded/In-built Control

* The construction activities will be restricted to within the allocated land and the immediate surroundings only.
* After construction work, any land taken for a temporary basis for storage of material will be restored to their original form.
* The existing earth roads at Athibohol will be used for access to the project site.

#### Significance of Impact

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

#### Additional Mitigation Measures

* On completion of construction activities, land used for temporary facilities such as store yard should be restored to the extent possible;
* The land use in and around permanent project facilities should not be disturbed.
* Construction activities should be restricted to the designated area.

### Impact on Topography

The topography of the project site is an open area with gentle slope of about 1.7% and mild undulations. There are no water bodies that pass though directly the proposed project site. Typically, solar power projects do not undertake levelling of topography and since the proposed project, along with the access road, is mostly on a flat terrain the receptor sensitivity has been assessed to be low.

Due to undulating topography, study area may exhibit presence of micro drainage channels. Therefore, the impact magnitude has therefore been assessed as minor.

#### Embedded/In built Control

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

#### Significance of Impact

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

#### Additional Mitigation Measures

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

### Impact on Soil

#### Project Phases and Associated Activities

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

**Construction Phase**

* Vegetation clearance and top soil removal;
* Storage of oil and lubricants onsite;
* Storage of construction materials; and
* Disposal of different type of waste generated from the temporary project site.

**Operation and Maintenance Phase**

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

**Decommissioning Phase**

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

#### Significance of Impacts

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

#### Additional Mitigations

* Vehicles will utilize the existing roads to access the site;
* No unauthorized dumping of used oil and other hazardous waste should be undertaken at site;
* All waste should be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels;
* Solid waste should be Segregated in color coded waste receptacles.
* In case of accidental/unintended spillage on small area, the contaminated soil should be immediately collected and stored as hazardous waste;
* Compacting of loose soil in excavated areas.
* Enclose the construction site and protect the soil to prevent the waste soils and other debris from being washed away by surface runoff and wind.
* All dug up soil that is not needed on-site to be removed promptly and disposed of to appropriate areas.
* Re-use the dug-up soil in backfilling and landscaping.
* Any soil potentially contaminated by chemicals, oils, fuels to be collected and disposed of by a NEMA authorized waste

### Impact on Air Quality

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

* Fugitive emissions from site clearing, excavation work, material handling etc.;
* Fugitive emission from traffic movement;
* Exhaust emission from operation of machineries like pile drivers, vehicles; and
* Point source emission from diesel generator.

#### Embedded/in-built control

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

#### Significance of Impact

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

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

#### Additional Mitigation Measures

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

### Impact on Ambient Noise

As most of the noise generating activities will be performed within the site area, construction activities will likely have a small to insignificant incremental impact on the existing noise levels. The sources of noise in the construction phase include construction activities, operation of generator sets and movement of vehicles. There will also be increased noise levels because of increased anthropogenic movement in the area.

There are some residents within the 500m from the site and will most likely be affected by increasing noise levels. The receptor sensitivity is therefore considered as medium. Impact magnitude is considered to be minor to medium considering the construction period of the project that will last for not more than 12 months.

#### Assessment Criteria for Impact on Ambient Noise

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

* Construction activities including site preparation, piling work, construction of ancillary facilities;
* Transportation of construction materials, machinery and personnel;
* Operation of generator sets; and
* Demolition activities during decommissioning phase.

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

#### Embedded/in-built control

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

#### Significance of Impact

The impact significance has therefore been assessed moderate. This due to the fact that the impact magnitude is low and the receptor sensitivity is medium. The site is on very close proximity to Athibohol primary school and few residential houses nearby.

#### Additional Mitigation Measures

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

### Visual Intrusions and Changes in Landscape Impact

The project site is located on plain terrain with slight undulation. There will be no significant change to visual quality of the area resulting from development or change in land use that will alter the landscape. Changes in the visual landscape will range from construction phase to commissioning of the mini-grid and associated structures and further during operations. This Project is the first major solar power Project in the vicinity of project area and the new development will have impact on the surrounding area.

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

The construction of the mini-grid sites may involve the site clearance of vegetation (minimal vegetation at the site) and other natural attributes. The erection of the solar PV panels and the resulting glare from the sun will make it a standout feature from the natural surroundings and this would the lower the visual appeal of the area.

Even though the Mini grid facilities will be small, solar panels may have minimal visual impact. However, being visible is not necessarily the same as being intrusive. Aesthetic issues are by their nature highly subjective.

#### Embedded/In-built Control

Proper siting decisions can help to avoid aesthetic impacts to the landscape. The project site is located in open area with minimal settlement around besides the dispensary and residential homes.

#### Significance of Impact

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

#### Additional Mitigation Measures

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

* The extent of the labour camp and storage area should be limited in area to only that which is essential;
* Minimize presence of ancillary structures on the site and minimize roads disturbance;
* Upon completion of construction work, areas utilized for labour camp, storage area to be restored to original form.

### Impacts on Waste Generation and Soil Contamination

General construction waste generated onsite will comprise of concrete, steel cuttings/filings, packaging paper or plastic etc. solid wastes consisting of food waste, plastic, glass and waste paper will also be generated by the construction workforce. A small proportion of the waste generated during construction phase will be hazardous and will include waste fuel, grease and waste oil containing rags. Used transformer oil which is also categorized as hazardous waste will be generated from the plant. If improperly managed, solid waste could create impacts on soil quality. Therefore, the receptor sensitivity has been assessed as medium.

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

##### Embedded/in-built control

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

##### Significance of Impact

The impact significance for waste generation and soil contamination has been assessed as minor. Given the low sensitivity of the surrounding areas and the medium magnitude of the potential consequences of soil contamination, the potential impact significance is rated as minor.

##### Additional Mitigation Measures

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

### 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.

##### Significance of Impact

Generally, due to the localized area of impact, the overall significance of the related impacts on water quality is considered to be minor, provided the necessary mitigation/ management measures are implemented.

##### Mitigation Measures

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

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

### 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.

##### Significance of Impact

The amount of hazardous waste generated will be minimal. The significance of the impact will be minor due to a low magnitude and medium sensitivity.

##### Mitigation Measures

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

### 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.

##### Significance of Impact

This impact is evaluated to be of moderate significance. All the construction activities will be confined at the project site hence high sensitivity and low magnitude.

##### Mitigation Measures

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

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

### 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.

##### Significance of Impact

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

##### Mitigation Measures

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

### 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.

##### Significance of Impact

This impact will be negligible owing to the size of the project that will require very few trucks during the construction phase.

##### Mitigation Measures

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

## Construction Phase - Key Social Impacts

### Impact on Occupational Health and Safety

The construction activities include site preparation, infrastructure utilities installation, building structures. As a result, will be potential impacts on workers’ health and safety due to exposure to risks through construction activities that lead to accidents causing injuries and death. The most probable risks cause of accidental death and injury are:

* + Safety risks such as: tripping; falling due to working at heights; potential fire due to hot work, smoking, failure in electrical installations; electric shocks.
  + Health risks: Injuries such as: lifting, lowering, pushing, pulling and carrying; temporary or hearing loss which usually comes from noise generated from machinery used for excavation or piling work and from compressors and concrete mixers etc.; heat stress and working during high temperatures
  + Occupational hazards due to dust and noise pollution from operating of heavy machinery and vehicular movement in the project sites.
  + Safety risk due to working at heights during installation of power lines
  + Risks of road accidents during the transportation of material and equipment to the project sites owing to the poor road network leading to Athibohol Village.

#### Embedded/in-built control

* All construction activities will be carried out during daytime hours and vigilance should be maintained for any potential accidents;
* Personal Protective Equipment (PPEs) including safety shoes, helmet, goggles, ear muffs and face masks;
* Cranes and other lifting equipment are operated by trained and authorised persons;
* Training of the workers on climbing techniques, and rescue of fall-arrested workers; and
* Excavated areas should be temporarily fenced to avoid access to outsiders and animals.

#### Significance of Impacts

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

#### Additional mitigation measures

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

### Community Health and Safety

The receptors for impacts on community health and safety include project site workers, settlements in the close proximity of the project which will be exposed to health impacts from the project activities. The construction phase activities such as installation of solar panels, construction of distribution lines and substations and movement of material and personnel may result in impacts on the health and safety of the community.

Construction activities will involve the use of machinery and installation of distribution power

lines. Furthermore, the movement of material and personnel via the access roads may result in damage to human life or livestock due to accidents. The major community health and safety risks include structural failure of project infrastructure e.g., power line, fire safety and management of emergency situations.

#### Embedded/in-built control

Consultations with the proponent team and policy review indicated that the following embedded/in built control measures will be put in place during the construction phase;

* The excavated areas will be properly fenced for safety and sign boards in local languages will be put up;
* No hazardous waste or any waste be stored within the site for long periods of time and be in contact with the soil in order to prevent against ground water contamination
* The truck drivers carrying construction machinery and materials will be instructed to drive within speed limits with careful consideration for village traffic;
* Movement of heavy equipment and construction materials will be regulated during peak hours (0900hrs to 0500hrs).

#### Significance of Impact

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

#### Additional Mitigation Measures

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

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

### Impacts related to Labour Influx

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

#### Significance of Impact

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

#### Additional Mitigation measures

* In contract documents for the Contractor, MOE/KPLC should make explicit reference to the need to abide by Kenyan law, international best practice and the ratified ILO conventions and MOE’s policies in relation to health and safety, labour and welfare standards.
* In selection of a Contractor, MOE/KPLC should refer to past performance in similar assignments as an indicator of future performance with respect to worker management, worker rights, health and safety as outlined in Kenyan law and international standards.

• Regular checks by MOE/KPLC should be undertaken to ensure the relevant labour laws and occupational health and safety plans are adhered to at all times.

• All project workers should, as part of their induction, receive training on health and safety.

• The contractor should put in place mechanism to ensure no employee or job applicant is not discriminated against on the basis of his or her gender, marital status, nationality, ethnicity, age, religion or sexual orientation.

• All workers will have contracts which clearly state the terms and conditions of their employment and their legal rights. Contracts will be verbally explained to all workers where this is necessary to ensure that workers understand the provisions. Contracts must be in place prior to workers reporting to duty for the first time. The contract document will be enhanced by the Code of Conduct that will be provided by the Proponent.

• The Contractor will put in place a worker grievance redress mechanism accessible to all workers, whether permanent or casual, directly or indirectly employed. The Proponent worker grievance mechanism shall be open to the Contractor workforce in the event that their grievance is not adequately resolved by their direct employer. The Proponent will then have the authority to act to resolve this grievance.

• All project workers should have access to training on communicable diseases and STDs and community interactions in general. This training will be developed in collaboration with local health institutions.

• Carry out surveillance to ensure that no children are employed in the project, and to the extent possible by third parties related to the project and primary suppliers where such risk may exist

### Child labour impact

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

#### Significance of Impact

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

#### Mitigation measures

* The contractor should develop a code of conduct to ensure children are protected from any negative impact from the construction works.
* The contractor should strictly hire people who are above 18yrs and ensure they provide their Identity Cards.
* The contractor shall ensure every worker under their jurisdiction signs a document committing themselves to the protection of the area children.

### Impacts on Cultural Heritage

Cultural and paleontological artifacts and cultural landscapes may be disturbed by the construction of the mini grid facilities. These could include community burial sites, sacred shrines. It is expected that a number of workers will be on-site during project construction of the project including skilled, semi-skilled, and unskilled personnel. During the consultation and field survey, no cultural artefact was established at the proposed project site.

#### Significance of Impact

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

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

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

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

### Gender Based Violence, SEA & SH

Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) may be committed against the communities by the construction workers and by staff during the operation and maintenance of the mini-grids. Incidences of Sexual Harassment (SH) may occur among the staff during construction phases of the project. This may be experienced while the women are searching for jobs and those giving the jobs may ask for sexual favours.

#### Significance of Impact

GBV cannot be ruled out during project implementation. Thus, the significance of this impact is considered to be Minor considering low sensitivity of the receptor and low magnitude of the impact.

#### Mitigation measures

* Prepare an Awareness Raising Strategy, which describes how workers and local communities will be sensitized to GBV risks, and the worker’s responsibilities;
* Identify GBV Services Providers to which GBV survivors will be referred, and the services which will be available;
* Elaborate GBV Allegation Procedures i.e. How the project will provide information to employees and the community on how to report cases of GBV breaches to the GRM.
* An Accountability and Response Framework, to be finalized with input from the contractor, should include at minimum:
  + - GBV Allegation Procedures to report GBV issues to service providers, and internally for case accountability procedures which should clearly lay out confidentiality requirements for dealing with cases; and,
    - A Response Framework which has:
      * Mechanisms to hold accountable alleged perpetrators associated to the project;
      * The GRM process for capturing disclosure of GBV;
      * A referral pathway to refer survivors to appropriate support services.

### Exclusion of VMGs, Vulnerable Individuals and Households

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

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

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

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

#### Significance of Impact

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

#### Mitigation measures

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

### Risk of Communicable Diseases

The mini-grids will lead to increased migration of labour into the mini-grid sites. Local communities can be exposed to increased risk of communicable diseases such as HIV/AIDS, STIs and COVID-19 through risky behaviours involving job seekers and people employed on the project.

#### Significance of Impact

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

#### Mitigation measures

* The Contractor should develop and implement pre-employment screening measures for workers, which should include communicable diseases. Individuals found to be suffering from these diseases will need to be sensitized on prevention of transmission to others and management of the disease prior to mobilisation to site.
* The Contractor should develop and implement a Communicable Diseases Policy and an information document for all workers directly related to the Project. The document should address factual health issues as well as behaviour change issues around the transmission and infection of diseases.
* The Contractor will make condoms available to employees and communities neighbouring the site office during construction.
* All project personnel should be inducted on a Code of Conduct that gives guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.
* If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary action including dismissal from duty.
* Sensitize all community segments and project workers on Covid 19 and precautionary measures that need to be observed;
* Restrict site access to only Authorised persons; and
* Continuously adhere to the MoH, WHO and World Bank guidelines on Covid-19 management.

### 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.

#### Significance of Impact

Although the sensitivity of the receptor (surface water) in the project area is high owing to unavailability of feasible alternative source of water for the local community, the overall significance of impacts is assessed to be negligible due to negligible magnitude of the impact.

#### Mitigation Measures

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

### 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.

#### Significance of Impact

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

## OPERATION PHASE- POSITIVE IMPACTS

### Impact on Economy and Employment

Community consultations and observations made during the site visit suggest that the existing scenario of the agriculture in the study area is not capable enough to meet requirements of the people who are solely dependent upon it; especially due to limited water availability and growing population.

During the operations phase, the requirement for unskilled and semi-skilled labour is expected to reduce respectively. The locally procured services will include maintenance work of the facility, 24-hour security, bush and undergrowth cleaning and housekeeping activities. In addition to this, the community will improve their livelihood and businesses by using the electricity from the project.

#### Significance of Impact

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

#### Additional Enhancement Measures

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

* Priority should be provided to local labour or suppliers to pass on maximum economic benefit locally;
* Opportunities should be provided to the vulnerable population in the Study Area

### Quality, Reliable Power Supply

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

#### Significance of Impact

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

#### Enhancement Measures

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

### 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.

#### Significance of Impact

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

#### Enhancement Measures

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

### 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.

#### Significance of Impact

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

#### Enhancement Measures

* 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

### Improved 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.’

#### Significance of Impact

The impact significance is high as it will provide power to schools over a long period for additional study time in the night and morning

#### Enhancement Measures

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

### Health Benefits of the Project

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

#### Enhancement Measures

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

### 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.

#### Enhancement Measures

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

### Improved 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.

#### Enhancement Measures

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

### Improved 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.

#### Enhancement Measures

Ensure that the power supply is reliable.

## Operation phase- Key NEGATIVE Environmental impacts

### Impact on Soil

#### Soil compaction and Erosion

In the operation phase, soil compaction and erosion may occur due to vehicle movement, which only happens during the occasional maintenance activities. Soil compaction for the operation phase has therefore been considered to be infrequent and low. Since the chances of soil compaction and erosion during the O&M phase are less, the impact magnitude is assessed to be small.

##### Embedded/in-built control

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

##### Significance of Impact

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

##### Additional Mitigation Measures

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

### Waste Generation and management

During operation phase, the waste generated from project includes domestic solid waste building and substation and hazardous waste like waste oil and lubricants and oil containing jutes and rags will be generated during maintenance activities.

The quantity of hazardous and non-hazardous waste generated will be much lesser quantity than during the construction phase. Thus, the receptor sensitivity Impact magnitude has been assessed too small.

#### Embedded/in-built control

The waste generated will be disposed of through approved NEMA waste handlers.

The hazardous wastes will be stored onsite at separate designated covered area provided with impervious flooring and disposed through NEMA approved hazardous waste handler.

During operation phase, the quantity of municipal waste and hazardous waste generated is less and probability of the hazardous waste generation is only during plant maintenance and therefore occasional. The waste generated would be routed through proper collection and containment.

##### Additional Mitigation measures

* The Contractor shall develop a Solid Waste Management Plan in accordance with the guidelines.
* All Project staff will be trained on this plan and attendance will be recorded.
* Preparation and implementation of a Waste Management Plan (WMP) will be done.
* Fuel shall be stored on site in temporary above ground storage tanks.
* Adhere to Kenyan laws and regulations applicable to waste management and the MSDS.
* Proper waste segregation and colour coding of the waste receptacles.
* Provision of temporary ablution facilities and ensure treatment and/or removal of sewage wastes off site.
* Hazardous wastes such as damaged solar panels and batteries that contain heavy metals shall be collected and stored prior to disposal offshore at a licensed facility as per the requirements of the solid waste management plan. This will be done by a Licenced NEMA Waste Handler.
* Any Solar Panel or batteries removed from the array for disposal will first be collected and stored in the covered 10ft container before being disposed off.
* Hazardous waste shall be shipped offshore to a facility licensed by NEMA to handle hazardous waste.
* Maintain all waste tracking documents (Transportation, treatment and disposal)
* Solid Waste Management Code of Practice will be integrated into SOP

#### Significance of Impact

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

#### Additional Mitigation Measures

* Municipal domestic waste generated at site to be segregated onsite;
* Ensure hazardous waste containers are properly labelled and stored onsite provided with impervious surface, shed and secondary containment system;
* Ensure routinely disposal of hazardous waste through NEMA approved waste Handlers and records are properly documented; and
* Maintain all the waste tracking documents (Transport, treatment and disposal)
* The overall impact significance on land due to waste disposal during O&M phase has been assessed as minor.
* Disposal of hazardous wastes shall be done strictly as per the conditions of authorisation granted by NEMA.
* Ensure hazardous waste is properly labelled, stored onsite at a location provided with impervious surface, shed and secondary containment system.

### Fire Outbreaks

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

#### Significance of Impact

With the mitigation measures in place the impact is evaluated to be of moderate significance due to high sensitivity and low magnitude.

#### Mitigation Measures

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

### Impact on Water quality and demand

Water is required during operation phase to meet domestic requirements of O&M staff and for cleaning solar panels. For that purpose, the water requirement will most likely be sourced from existing local water vendors in the nearby area. During operation phase, there will be no wastewater generation from the power generation process.

The demand for water during operation phase 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.

Discussions with the residents in Athibohol confirmed that water is a major concern in the area. As noted earlier, the local community rely on ground water sources; borehole, with no feasible alternative. Therefore, the receptor (water resource) sensitive is assessed as high.

Since the project is likely to generate very little or negligible amount of wastewater during the O&M phase, the impact on water resources will be negligible as there will be no perceptible or readily measurable change from baseline conditions.

#### Embedded/in-built control

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

#### Significance of Impact

Although the sensitivity of the receptor (surface water) in the project area is high owing to unavailability of feasible alternative source of water for the local community, the overall significance of impacts is assessed to be negligible due to negligible magnitude of the impact.

#### Additional Mitigation Measures

* Ensure proper cover and stacking of loose construction material to prevent surface runoff and contamination of receiving water point;
* The workforce will be given training towards proactive use of designated areas/bins for waste disposal and encouraged to use toilets. Open defecation and random disposal of sewage shall be strictly restricted;
* Construction workers to be sensitised about water conservation and encouraged use of water optimally;
* Regular inspection for identification of water leakages and preventing wastage of water from water supply tankers.
* Recycling/reusing water to the extent possible.
* The contractor should provide portable/mobile toilets for use on site

### Landscape and Visual Impacts

The solar panels will be spread over a horizontal form with a maximum height of 2m above the ground level. The current use of land surrounding site is grazing, mixed commercial and residential. The permanent change of current landscape to area spread with solar panels will have potential visual impact for nearest habitations and passers.

#### Significance of Impacts

It is important to note that whether the visual impact is seen as positive or negative is highly subjective, and people’s attitude towards and perception of the visual impacts associated with the any project including solar power project. The project and its surrounding area are new for such developmental project and will have visual impacts during initial period of Project and the same will disappear over a period of time. Based on the above, significance of visual impact on landscape during operation phase of the project has been assessed as minor due to low receptor sensitivity and impact magnitude being medium.

#### Suggested mitigation measures

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

* Signage related to the mini-grid must be discrete and confined to entrance gates.
* The footprint of the operations and maintenance facilities, as well as parking and vehicular circulation, should be clearly defined, and not be allowed to spill over into other areas of the site;
* Construction of fencing or compound wall around the project boundary;
* Landscaping area around the site with the participation of the local community.

### 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.

#### Significance of Impact

The impact will be of minor significance.

#### Mitigation Measures

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

### 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.

#### Significance of Impact

The impact will be of minor significance.

#### Mitigation Measures

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

### 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.

#### Significance of Impact

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

#### Mitigation Measures

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

### 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.

#### Significance of Impact

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

#### Mitigation measures

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

### Noise and Vibration

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

#### Mitigation Measures

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

### 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.

### Dust emissions

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

#### Mitigation Measures

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

### Vehicle exhaust emissions

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

#### Significance of Impact

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

#### Mitigation Measures

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

## Operation Phase – Key NEGATIVE Ecological Impact

### Collision and Electrical hazards from Distribution Infrastructure

A number of birds’ species were identified during the impact assessment. These include Speckled Pigeon, Purple-crested Turaco, Common Swift, Black-headed Heron, Speckled Mousebird, European Roller, Cardinal Woodpecker, Black-crowned Tchagra, Red-backed Shrike, Hunter's Sunbird among others.

The distribution lines and poles can potentially constitute an electrocution and collision hazard to birds. Some birds also utilize the distribution towers for nesting.

#### Embedded/ in-built Control

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

#### Significance of Impacts

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

#### Additional Mitigation Measures

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

* Design of distribution towers and transformers should be such so as to minimize the risks of electrocution of birds;
* The distribution poles should be raised with suspended insulators in order to reduce the electrocution of bird species; and
* Marking overhead cables using bird-flight deterrents and avoiding use in areas of high bird concentrations of species vulnerable to collision.

## Operations Phase - Key NEGATIVE Social Impacts

### Impact on Occupational Safety and Health

During the operation phase, maintenance and repair will be done on the site. Therefore, there will be potential impacts on workers’ health and safety due to exposure to risks through such activities that lead to accidents causing injuries and death. The most probable risks cause of accidental death and injury are:

* Safety risks such as: tripping; falling due to working at heights; potential fire due to hot work, smoking, failure in electrical installations; electric shocks.
* Health risks: Injuries such as: lifting, lowering, pushing, pulling and carrying; heat stress and working during high temperatures
* Safety risk due to working at heights during installation of power lines
* Exposure of workers to electro-magnetic field (EMF) during operation and maintenance of the mini-grids

#### Embedded/in-built control

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

#### Significance of Impacts

Because the maintenance activities will be conducted less frequently, the impact magnitude on occupational Safety and Health will be low. Considering that the accidents may result in injuries and death, the sensitivity is considered to be High. Therefore, the significance is Moderate.

#### Additional mitigation measures

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

### Impact on Community Safety and Health

The receptors for impacts on community health and safety include settlements in the close proximity of the project which will be exposed to health impacts from the project activities. The operation phase activities that involve maintenance of the mini-grid components may result in impacts on the health and safety of the community.

The major community health and safety risks include electrocution, structural failure of project infrastructure e.g., power line, fire safety and management of emergency situations.

#### Embedded/in-built control

Consultations with the proponent team and policy review indicated that the following embedded/in built control measures will be put in place during the construction phase;

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

#### Significance of Impact

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

#### Additional Mitigation Measures

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

* Implementing the existing grievance redress mechanism
* The local community recommended that a technical operator should be stationed within or near the site in order to handle emergencies in the event that they occur

### Gender Based Violence, SEA & SH

Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) may be committed against the communities by the staff during the operation and maintenance of the mini-grids. Incidences of Sexual Harassment (SH) may occur among the staff during operation and phase of the project. This may be experienced while the women are searching for jobs and those giving the jobs may ask for sexual favours.

#### Significance of Impact

The significance of this impact is considered to be Minor considering low sensitivity of the receptor and low magnitude of the impact.

#### Mitigation measures

* Prepare an Awareness Raising Strategy, which describes how the staff and local communities will be sensitized to GBV risks, and the staff’s responsibilities;
* Identify GBV Services Providers to which GBV survivors will be referred, and the services which will be available;
* Elaborate GBV Allegation Procedures i.e. How the project will provide information to employees and the community on how to report cases of GBV breaches to the GRM.
* An Accountability and Response Framework, to be finalized with input from the contractor, should include at minimum:
  + - GBV Allegation Procedures to report GBV issues to service providers, and internally for case accountability procedures which should clearly lay out confidentiality requirements for dealing with cases; and,
    - A Response Framework which has:
      * Mechanisms to hold accountable alleged perpetrators associated to the project;
      * The GRM process for capturing disclosure of GBV;
      * A referral pathway to refer survivors to appropriate support services.

### Exclusion of VMGs, Vulnerable Individuals and Households

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

There is a high likelihood that the targeted PAPs of the new electricity connections to the mini-grids network will be dominated by the local elites. This may lead to the exclusion of those without the financial resources to connect to the mini-grid electricity distribution network. This could result in a situation where a majority persons or households with adequate financial resources in the project area will be able to take advantage of the provision to connect to the electricity grid. This will negate a key objective of the project of overcoming energy poverty.

#### Significance of Impact

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

#### Mitigation measures

* Participation will be through meetings with the different groups of the vulnerable people identified primarily to ensure that;
  + - The VMGs are aware of the project and its impacts
    - The VMGs are Aware of any restrictions and negative impacts
    - Provide support to VMG participation arrangements in the project
* Commit to open and transparent communication and engagement from the beginning and have a considered approach in place
* Ensure that all representatives of the contractor and Proponent staff carrying out the specific sub project investment including third party subcontractors and agents are well briefed on local customs, history and legal status, and understand the need for cultural sensitivity
* Regularly monitor performance in engagement
* Enlist the services of reputable advisers with good local knowledge
* Implement the existing grievance redress mechanism

### Risk of Communicable Diseases

The operation and maintenance phase of the mini-grids will lead to increased migration of labour into the mini-grid sites. Local communities can be exposed to increased risk of communicable diseases such as HIV/AIDS, STIs and COVID-19 through risky behaviours involving job seekers and people employed on the project.

#### Significance of Impact

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

#### Mitigation measures

* The Contractor should develop and implement pre-employment screening measures for workers, which should include communicable diseases. Individuals found to be suffering from these diseases will need to be sensitized on prevention of transmission to others and management of the disease prior to mobilisation to site.
* The Contractor should develop and implement a Communicable Diseases Policy and an information document for all workers directly related to the Project. The document should address factual health issues as well as behaviour change issues around the transmission and infection of diseases.
* The Contractor will make condoms available to employees
* All project personnel should be inducted on a Code of Conduct that gives guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.
* If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary action including dismissal from duty.
* Sensitize all community segments and project workers on Covid 19 and precautionary measures that need to be observed;
* Restrict site access to only Authorised persons; and
* Continuously adhere to the MoH, WHO and World Bank guidelines on Covid-19 management.

### Shocks and electrocutions to the PAPs

Majority of the PAPs who will be customers and users of the power have not used electricity before. Failure to take appropriate precaution while interacting with electricity can result in electric shocks, fires and even electrocution/death.

#### Significance of Impact

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

#### Mitigation Measures

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

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

### 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.

#### Significance of Impact

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

#### Mitigation Measures

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

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

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

### 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.

#### Significance of Impact

Impact magnitude is considered to be small considering the decommissioning period to last for a short duration. The overall impact significance is envisaged to be Minor due to low sensitivity and medium magnitude.

#### Enhancement Measures

* Notify the GRC, Local leadership, the County Government reps of the specific jobs and the skills required for the work
* Prioritize the employment of unskilled labour from the local communities.
* Prioritize the procurement of goods and services from within Wajir County.
* Develop and implement a fair and transparent employment and procurement policy.
* Advertise all jobs and tenders. (The jobs can be advised through local administrative offices, GRC meetings)
* Ensure gender mainstreaming during employment
* The contractor shall inform the workers and local community about the duration of work; and
* Reduction of worker will be done phase wise and corresponding to completion of each activity.

### 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.

## Decommissioning Phase – Key NEGATIVE environmental impacts

### Impact on Soil

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

#### Significance of Impacts

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

#### Additional Mitigations

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

### Impact on Air Quality

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

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

#### Embedded/in-built control

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

#### Significance of Impact

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

#### Additional Mitigation Measures

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

### Impact on Ambient Noise

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

#### Assessment Criteria for Impact on Ambient Noise

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

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

#### Embedded/in-built control

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

#### Significance of Impact

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

#### Additional Mitigation Measures

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

### Impacts on Waste Generation and Soil Contamination

General demolition waste generated onsite will comprise of concrete, steel cuttings/filings, packaging paper or plastic etc. solid wastes consisting of food waste, plastic, glass and waste paper will also be generated by the workforce. A small proportion of the waste generated during construction phase will be hazardous and will include waste fuel, grease and waste oil containing rags. Therefore, the receptor sensitivity has been assessed as medium.

##### Embedded/in-built control

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

##### Significance of Impact

The impact significance for waste generation and soil contamination has been assessed as minor. Given the low sensitivity of the surrounding areas and the medium magnitude of the potential consequences of soil contamination, the potential impact significance is rated as minor.

##### Additional Mitigation Measures

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

## Decommissioning Phase - Key NEGATIVE Social Impacts

### Impact on Economy and Employment

The major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, including their families. However, the impacts are likely to be limited due to relatively small number of permanent employees (mainly security guards) who will be affected.

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

#### Significance of Impact

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

#### Additional Mitigation Measures

The decommissioning phase will require removal of machinery, workers and other temporary structures. The mitigation measures for decommissioning shall include the following:

* Notify the GRC, Local leadership, the County Government reps of the specific jobs and the skills required for the Project
* Prioritize the employment of unskilled labour from the local communities.
* Prioritize the procurement of goods and services from within Wajir County.
* Develop and implement a fair and transparent employment and procurement policy.
* Advertise all jobs and tenders. (The jobs can be advised through local administrative offices, GRC meetings)
* Ensure gender mainstreaming during employment
* The contractor shall inform the workers and local community about the duration of work; and
* Reduction of worker will be done phase wise and corresponding to completion of each activity.

### Impact on Occupational Health and Safety

There will be potential impacts on workers’ health and safety due to exposure to risks through demolition activities that lead to accidents causing injuries and death. The most probable risks cause of accidental death and injury are:

* + Safety risks such as: tripping; falling due to working at heights; potential fire due to hot work, smoking, failure in electrical installations; electric shocks.
  + Health risks: Injuries such as: lifting, lowering, pushing, pulling and carrying; temporary or hearing loss which usually comes from noise generated from machinery used for demolition; heat stress and working during high temperatures
  + Occupational hazards due to dust and noise pollution from operating of heavy machinery and vehicular movement in the project sites.
  + Risks of road accidents during the transportation of material and equipment to and from the project sites.

#### Embedded/in-built control

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

#### Significance of Impacts

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

#### Additional mitigation measures

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

### Gender Based Violence, SEA & SH

Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) may be committed against the communities by the workers. Incidences of Sexual Harassment (SH) may occur among the staff during decommissioning phases of the project. This may be experienced while the women are searching for jobs and those giving the jobs may ask for sexual favours.

#### Significance of Impact

The significance of this impact is considered to be Minor considering low sensitivity of the receptor and low magnitude of the impact.

#### Mitigation measures

* Prepare an Awareness Raising Strategy, which describes how workers and local communities will be sensitized to GBV risks, and the worker’s responsibilities;
* Identify GBV Services Providers to which GBV survivors will be referred, and the services which will be available;
* Elaborate GBV Allegation Procedures i.e. How the project will provide information to employees and the community on how to report cases of GBV breaches to the GRM.
* An Accountability and Response Framework, to be finalized with input from the contractor, should include at minimum:
  + - GBV Allegation Procedures to report GBV issues to service providers, and internally for case accountability procedures which should clearly lay out confidentiality requirements for dealing with cases; and,
    - A Response Framework which has:
      * Mechanisms to hold accountable alleged perpetrators associated to the project;
      * The GRM process for capturing disclosure of GBV;
      * A referral pathway to refer survivors to appropriate support services.

### Exclusion of VMGs, Vulnerable Individuals and Households

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

#### Significance of Impact

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

#### Mitigation measures

* Participation will be through meetings with the different groups of the vulnerable people identified primarily to ensure that;
  + - The VMGs are Aware of any restrictions and negative impacts
    - Provide support to VMG participation arrangements in the project
* Commit to open and transparent communication and engagement from the beginning and have a considered approach in place
* Ensure that all representatives of the contractor and Proponent staff carrying out the specific sub project investment including third party subcontractors and agents are well briefed on local customs, history and legal status, and understand the need for cultural sensitivity
* Monitor performance in engagement
* Enlist the services of reputable advisers with good local knowledge
* Implement the existing grievance redress mechanism

### Risk of Communicable Diseases

The decommissioning of the mini-grid may lead to increased migration of labour into the mini-grid site. Local communities can be exposed to increased risk of communicable diseases such as HIV/AIDS, STIs and COVID-19 through risky behaviours involving job seekers and people employed on the decommissioning of the project.

#### Significance of Impact

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

#### Mitigation measures

* The Contractor should develop and implement pre-employment screening measures for workers, which should include communicable diseases. Individuals found to be suffering from these diseases will need to be sensitized on prevention of transmission to others and management of the disease prior to mobilisation to site.
* The Contractor should develop and implement a Communicable Diseases Policy and an information document for all workers directly related to the Project. The document should address factual health issues as well as behaviour change issues around the transmission and infection of diseases.
* The Contractor will make condoms available to employees and communities neighbouring the site during decommissioning.
* All project personnel should be inducted on a Code of Conduct that gives guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.
* If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary action including dismissal from duty.
* Sensitize all community segments and project workers on Covid 19 and precautionary measures that need to be observed;
* Restrict site access to only Authorised persons; and
* Continuously adhere to the MoH, WHO and World Bank guidelines on Covid-19 management.
  + 1. **Child labour and forced labour**

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

* + - 1. **Significance of Impact**

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

* + - 1. **Mitigation measures**
* Contractor must adhere to the employment Act which outlaws any form of forced labor
* Community to report any form of forced labor at the site
* Contractor to ensure that all workers have a national ID card or documentation to show they are adults (above 18 years).
  + 1. **Impacts related to labour influx**

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

* + - 1. **Significance of Impact**

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

* + - 1. **Additional Mitigation measures**
* In contract documents for the Contractor, MOE/KPLC should make explicit reference to the need to abide by Kenyan law, international best practice and the ratified ILO conventions and MOE’s policies in relation to health and safety, labour and welfare standards;
* All project personnel should be inducted on a Code of Conduct that gives guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities;
* If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary action including dismissal from duty;
* In selection of a Contractor, MOE/KPLC should refer to past performance in similar assignments as an indicator of future performance with respect to worker management, worker rights, health and safety as outlined in Kenyan law and international standards;
* Regular checks by MOE/KPLC should be undertaken to ensure the relevant labour laws and occupational health and safety plans are adhered to at all times;

## Cumulative Impacts

### Cumulative Impact Assessment

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

# ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

## Environmental And Social Management and Monitoring Plan

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

The key objectives of the ESMMP are:

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

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

## Monitoring

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

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

During construction phase, the Implementing agency shall monitor the contractor’s activities in order to verify that the management measures/procedures/specifications are implemented as contained in the ESMMP. Compliance will mean that the contractor is fulfilling their contractual obligation.

During operation phase, KPLC will monitor facility’s operations to ensure compliance with management measures in the ESMMP and operation procedures. As part of this monitoring, the KPLC will undertake or statutory initial environmental audit as required by the ESIA/EA Regulations, 2003 and subsequent annual environmental audits.

## Plan Monitoring

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

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

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

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

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

## Environmental and Social Monitoring by Contractors

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

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

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

Table 7‑1 ESMMP-ENVIRONMENTAL AND SOCIAL IMPACTS

**Environmental and Social Management and Monitoring Plan**

| **Potential Impacts** | **Recommended Mitigation Measures** | **Project phase** | **Responsibility** | **Monitoring Indicator** | **Frequency** | **Estimated Cost (Ksh)** |
| --- | --- | --- | --- | --- | --- | --- |
| **Social Impacts** | | | | | | |
| **Local employment** | -Prioritize hire of locals for all unskilled labour.  -Implement a local recruitment plan that is fair and transparent (including recruitment processes that ensure inclusivity of both men and women, vulnerable individuals, minority clans, ethnic groups and VMGs.  -Adhere to labour laws, and labour management practices (timely renumeration, equitable compensation for both genders for equal work etc.)  -Create awareness to workers and the community on worker and project grievance redress mechanisms. | Construction  Operations  Decommissioning | Contractor  O&M Contractor and KPLC | -Fair and transparent local recruitment plan in place.  -Recruitment processes (job adverts, interviews, selection etc.).  -Number of locals employed based on gender, vulnerability, ethnic group, clan etc.  -Type of employment (skilled, semi-skilled and unskilled).  -Grievances raised, those aggrieved, status of resolution. | Quarterly | Contractor’s cost |
| **Local Sourcing** | -Source materials from local businesses/communities, and where necessary give opportunities to businesses owned or operated by vulnerable individuals. | Construction  Decommissioning |  | -Number and types of businesses sourced from, businesses owned and operated by vulnerable individuals, types and quantities of materials etc. | Quarterly | No additional cost |
| **Land acquisition and compensation for land and assets on land** | In line with the RPF provisions;  -Prepare and implement an **Abbreviated Resettlement Action Plan (A-RAP)** to guide land acquisition for the mini-grid, and wayleaves for power distribution. Further, the proponent will fast-track A-RAP preparation to ensure that land acquisition and contractor mobilization to the site is undertaken after the A-RAP is finalized, cleared, and disclosed.  -The contractor will implement and adhere to agreements for temporal use of land and restoration of land after use.  -Compensate affected communities in-kind (priority project) for the loss of land.  -The construction activities will be restricted to within the allocated land and the immediate surroundings only.  -After construction work, any land taken for a temporary basis for storage of material will be restored to their original form.  -Consultations with the community on the low voltage lines.  -The design of the distribution line will utilize the existing road reserves. However, any damage to structures, crops, trees, community facilities and other assets will be compensated in line with the RPF provisions. | Pre- Construction | Contractor- *(contractors’ facilities, workers camps)*  Proponent- *(project land for generation assets)* | -Land Acquisition and consultation report (consultation (minutes and lists of participants).  -Type and amount of compensation paid to affected persons.  - Priority community project implemented and handed over to affected communities.  -Signed agreements with communities on the use and restoration of their land. | Quarterly | 1,000,000 |
| **Labor Influx and related impacts (SEA/SH, HIV/AIDs and other STIs)** | -Tap into the local workforce to the extent possible to reduce labor influx.  -Recruit local workforce to the extent possible especially for unskilled and semi-skilled jobs.  -Consult with and involve local community in project planning and other phases of the project.  -Raise awareness among local community and workers on the need to have a good /cordial working relation  -Sensitize workers regarding engagement with local community.  -Make provision to provide resources needed by the workers if the need for such resources may result to competition e.g., water.  -Establish and operationalize an effective Grievance Redress Mechanism accessible to community members.  -The contractor and the project/community grievance redress committee to work closely address complains raised on time.  -Include gender considerations in employment opportunities.  -Provide appropriate compensation for work done.  -Respect for community values/culture.  -Prompt payment of workers as per the contractual agreements/terms. | Construction  Decomissioning | Contractor;  O&M Contractor and KPLC | -Records of employees/updated employee register.  -Number of local community employees and external employees/ updated employee register. | Quarterly | 50,000.00 |
| **Child labor** | -Employ workers who are 18 years and above, and with a valid national ID at the time of hire.  -Implement and monitor the employment register regularly. Compliance with the national labor laws and labour management practices.  -Put visible signage on site “**No Jobs for children**”  -Do not allow children at the project site. | Construction  Decomissioning | Contractor, O&M Contractor and KPLC | -Updated employment register indicating locals employed, their ages, national identification numbers etc.  -Grievances raised, aggrieved persons and status on resolution etc. | Quarterly | 20,000.00 |
| **GBV- SEA and SH** | -Prepare an SEA/SH Prevention and Response Action Plan, to manage the SEA/SH risks.  -The Action Plan to be proportionate to potential SEA/SH risks, and to include measures such as awareness creation for communities and workers; identification of referral services for survivors and a GRM that ensures confidential reporting of GBV cases.  -Implement a code of conduct signed by all those with physical presence on site. | Construction  Operations  Decomissioning | Contractor;  O&M Contractor and KPLC | -Minutes of awareness creation sessions for the community and workers on GBV-SEA/SH.  -Code of conduct signed by all those with physical presence on site.  -GRM that ensures confidentiality of GBV cases in place.  Documented referral services for survivors.  -Grievances raised, aggrieved persons and status on resolution etc | Quarterly | 50,000.00 |
| **Forced Labor** | -Adhere to the Employment Act which outlaws any form of forced labor.  -Report any form of forced labor at the site.  -Ensure that all workers have a national ID card or documentation to show they are adults (above 18 years). | Construction  Decomissioning | Contractor  O&M Contractor and KPLC | -Number of reported cases of forced labor. | Quarterly | 20,000.00 |
| **Risks related to Inadequate stakeholder engagement** | -Prepare a stakeholder engagement/consultation plan (SEP) that is proportionate to the subproject and the identified stakeholders.  -Timely and prior disclosure of project all project information, including project instruments, the full rights and entitlements of project affected persons, sub-project positive and negative 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. | Construction  Operations  Decomissioning | Contractor;  O&M Contractor and KPLC | -Availabiliy of and implementation of the Stakeholder Engagement Plan.  -# of stakeholder consultations held  -Record of stakeholder consultations held (minutes of meetings and list of participants).  -Information disclosed, to whom it was disclosed  (men women, PWD, youth, vulnerable individuals and households etc., methods and languages used in the disclosure (culturally appropriate and accessible), grievances raised and status on resolution etc.  -Concerns raised andactons raised. | Quarterly | 30,000.00 |
| **Exclusion of VMGs and vulnerable individuals and households** | In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following.   * Early identification and inclusion of VMGs and disadvantaged groups. * Meaningful consultation to effectively participate in the project. * Timely and prior disclosure of relevant project information to VMGs and disadvantaged groups. * Adequate and ongoing consultations with VMGs and disadvantaged groups in line with the SEP. * All concerns or grievances raised are fully resolved in a timely manner. * Access to culturally appropriate project benefits and opportunities. | Pre-construction  Construction  Operations  Decomissioning | Contractor  O&M Contractor and KPLC | Minutes of consultative meetings with all community segments including VMGs and vulnerable individuals and households, grievances raised and status on resolution etc. | Quarterly | No additional cost |
| **Inaccessibility of project benefits to VMGs and other vulnerable individuals due to affordability challenges** | -Consult VMGs and Vulnerable individuals and households on charges for sub project services, and put in place specific interventions to ensure the vulnerable equally access project benefits. | Operations | O&M Contractor and KPLC | -Interventions to enable those vulnerable access project benefits.  -Number of complaints raised by VMGs/vulnerable individuals regarding access to project services.  -GRM that is culturally appropriate and accessible.  Grievances raised and status on resolution etc | Quarterly | No additional cost |
| **Inadequate grievances management** | -Constitute a Local Grievances Committee is in consultation with all community segments, and incorporates the existing local dispute resolution mechanism.  -Implement a workers grievances mechanism.  -Awareness on the culturally appropriate and accessible GRM to all community segments  including VMGs, vulnerable individuals and households and CSOs  -All reported grievances are logged, dated, processed, resolved and closed out in a timely manner.  -Proportionate representation of VMGs and vulnerable individuals in the local grievances committee.  -GRM provides for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity. | Construction  Operations  Decomissioning | Contractor  O&M Contractor and KPLC | -Local Grievances Committee in place, composition of committee, awareness of community and workers on project and worker GRMs, updated GRM logs, types of grievances  -Availability of grievance redress process  -Number of grievances reported  -Number of grievances resolved in a timely manner  -Number of grievances escalated to national courts and the World Bank Grievances Redress Service and Inspection Panel. | Quarterly | No additional cost |
| **Environmental Impacts** | | | | | | |
| **Vegetation clearance** | 1. Clear only the necessary areas 2. Ensure proper demarcation and delineation of the project area to be affected by construction works. 3. Specify locations for vehicles and equipment, and areas of the site which should be kept free of traffic, equipment, and storage. 4. Designate access routes and parking areas 5. Re-vegetation including planting of trees around the plant/facility | Construction | O&M Contractor and KPLC | -Number of trees cleared  -Planted trees | Once off | 50,000.00 |
| **Soil erosion** | 1. Avoid groundbreaking during the seasons of high rainfall to avoid erosion. 2. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled. 3. Construction related impacts like erosion and cut slope destabilizing should be addressed through landscaping and grassing, carting away and proper disposal of construction materials 4. Use silt traps where necessary 5. Cover soil stock piles 6. Landscaping with grass on areas without electrical installation (lower areas) 7. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled. | Construction | O&M Contractor and KPLC | Assess size of rills or Gulleys forming from accelerated run off from compacted areas | Quarterly | Part of contractor’s fee |
| **Contamination of soil from fossil fuels** | 1. Ensure waste water generated is discharged or drained into approved drainage facilities 2. Construction vehicles must be maintained in good state and proper servicing to ensure no oils are likely to leak 3. Care must be exercised not to spill any fossil fuels 4. Any contaminated soil shall be scooped and disposed-off appropriately. 5. No servicing vehicles on site | Construction | O&M Contractor and KPLC | Records of any leakages from construction equipment/ vehicles. | Quarterly | 50,000.00 |
| **Dust emissions** | 1. The construction area should be fenced off to reduce dust to the public 2. Suppress dust during dry periods by use of water sprays; 3. Stockpiles of excavated soil should be enclosed/covered/watered during dry or windy conditions to reduce dust emissions. 4. Burning of woody debris & construction waste to be prohibited 5. Use of personnel protective equipment (PPE) -masks should be provided to all personnel in areas prone to dust emissions 6. Restrict speed on loose surface roads during dry or dusty conditions 7. Keep stockpiles and exposed soils compacted and re-vegetate as soon as possible. 8. Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas 9. Plant short trees to break speed of wind | Construction | O&M Contractor and KPLC | -Visual Observation of dust  -Provision of PPEs especially masks | Daily | 100,000.00 |
| **Vehicle exhaust and emissions from Generator** | 1. Drivers of construction vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered. 2. Maintain all machinery and equipment in good working order to ensure minimum emissions of carbon monoxide, NOX, SOX and suspended particulate matter 3. Maintain equipment in good running condition – no vehicles to be used that generate excessive black smoke 4. Use of diesel which is Sulphur- free to run the power producing generators to be encouraged 5. The stack chimney of the generators will be increased from its normal height of 3 meters to 6 meters | Construction | O&M Contractor and KPLC | -Engine maintenance records  - inspection of stacks | Quarterly | 100,000.00 |
| **Solid waste generation** | 1. Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is top soil last; 2. Segregate waste 3. Provide litter collection facilities such as bins 4. Contractor to put in place and comply with a site waste management plan 5. The contractor should comply with the requirement of OSHA ACT 2007 and Building rules on storage of construction materials 6. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time 7. Recovery of materials remains and return to stores 8. Re-use of materials where possible 9. Proper budgeting to avoid waste generation 10. Proper disposal of waste in line with solid waste regulation 11. Construction wastes to be managed in accordance with construction standards in Kenya | Construction | O&M Contractor and KPLC | Presence of well-maintained receptacles and centralized collection points | Quarterly | 100,000.00 |
| **Impacts on Water Resources and Water Quality** | 1. Clear the necessary areas only. 2. Appropriate remedial measures shall be implemented by the contractor in the event of erosion. 3. Infrastructure shall be designed to ensure that contaminated run-off does not reach water source i.e., earth dam. 4. Contractor to develop an oil-spill containment plan as part of the emergency response plan. In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect. 5. No vehicle maintenance and service shall be done at project site 6. Ensure that potential sources of petro-chemical pollution are handled in such a way to reduce chances of spills and leaks. | Construction | O&M Contractor and KPLC | -Oil spill containment plan.  -Provision of fuel/oil drip and spill trays | Quarterly | 150,000 |
| **Noise & vibration** | 1. Construction activities to avoid any unchanneled flow of water at the site 2. Storage areas that contain hazardous substances should be bunded with an approved impermeable liner and provision for a pit to be made in case of oil spill. 3. The excavation and use of rubbish pits during construction should be strictly prohibited. 4. A waste disposal area should be designated within the active construction area and this should be equipped with suitable containers i.e., skips or bins of sufficient capacity and designed to contain and prevent refuse from being blown by wind, 5. Areas contaminated by spilled concrete and/or fuels and oils leaking from vehicles and machinery should be cleaned immediately | Construction | O&M Contractor and KPLC | Noise levels-Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid | Quarterly | 150,000.00 |
| **Impacts from Hazardous materials -** | 1. Maintenance of construction vehicles will not be done on site 2. All hazardous products and waste should be labeled and handled properly to avoid contact with the ground 3. Dispose hazardous waste through a NEMA approved waste handler | Construction | O&M Contractor and KPLC | Presence of well-maintained receptacles and centralized collection points | Quarterly | 100,000.00 |
| **Accidental Oil Spills or Leaks** | 1. In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately. 2. Refueling and maintenance of vehicles will not take place at the construction site. 3. Create awareness for the employees on site on procedures of dealing with spills and leaks 4. Vehicles and equipment must be serviced regularly and kept in good state to avoid leaks. 5. In case of spillage the contractor should isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent materials and/or other materials approved by materials. 6. All chemicals should be stored within the bunded areas and clearly labeled detailing the nature and quantity of chemicals within individual containers. | Construction | O&M Contractor and KPLC | Records of all accidental spills and number of liters | Quarterly | 150,000.00 |
| **Fire Hazards** | 1. Create awareness to the construction workers on potential fire hazards 2. Provision of firefighting equipment on site during construction. 3. No smoking shall be done on construction site 4. ‘No smoking’ signs shall be posted at the construction site 5. A fire risk assessment and evacuation plan should be prepared and must be posted in various points of the construction site including procedures to take when a fire is reported. 6. Designate an assembly point | Construction | O&M Contractor and KPLC | -Records of any Fire incidences  -Fire equipment and evacuation plan | Quarterly | 100,000.00 |
| **Impacts of construction material sourcing (e.g., quarrying)** | 1. Source all building materials such as stone, sand, ballast and hard core from NEMA approved sites. 2. Ensure accurate budgeting and estimation of actual construction materials to avoid wastage. 3. Reuse of construction materials where possible. | Construction | O&M Contractor and KPLC | Sources of raw materials (from local community) | Quarterly | Part of contractor’s cost |
| **Increased water demand** | 1. Prudent use of available water 2. Consultations with the project local committee on use of water in the community to avoid conflicts with the community 3. Source and utilize a sustainable and reliable water supply for both construction and operation phase. | Construction | O&M Contractor and KPLC | Water usage records | Quarterly | Part of contractor’s cost |
| **Energy Consumption** | 1. Ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used. 2. Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. 3. Complementary to these measures, they monitor energy use during construction and set targets for reduction of energy use. | Construction | O&M Contractor and KPLC | Energy consumption records | Quarterly | No additional cost |
| **Occupational Health and safety Impacts** | 1. Use skilled personnel for activities which demand skills/technical tasks 2. Awareness creation/Tool box talks on safety to workers while at construction site 3. Workers coming to the site should be knowledgeable on safety precautions to take 4. Appropriate PPE (helmet, safety harness, boots, masks, climbing irons) 5. Proper general house keeping 6. Close supervision of workers 7. Risk assessment by contractor of the construction activities and implement mitigation measures appropriately 8. Adherence to occupational Safety and Health Act 2007 9. Availability of equipped first aid box on site 10. Provide safe drinking water for workers 11. Engagement of trained first aider on site 12. Ensure the WIBA cover is taken for the staff 13. Establish safety committees | Construction | O&M Contractor and KPLC | Records of any near misses, incident, and accidents.  Records of corrective actions implemented if there was an accident. | Quarterly | 1,000,000.00 |
| **Community safety –access** | 1. Proper barricading 2. Hazard communication. 3. Controlled access to the site by designated personnel 4. Maintain records of any person who comes to site | Construction | O&M Contractor and KPLC | Presence of a controlled access and records of every person accessing the site | Daily | 20,000.00 |
| **Public Health Impacts** | 1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training, awareness campaigns and community *Barazas.* 2. Awareness creation and consultations with local communities prior and during construction on the dangers of these diseases 3. Informing workers on local cultural values and health matters. 4. Provision of condoms to workers 5. Allowing migrant workers time to be with their families 6. The contractor is impressed upon not to set a construction camp on site. 7. The contractor will provide public education/information about HIV/AIDS transmission and prevention measures. 8. Ensure equal treatment of workers 9. Provide all appropriate COVID-19 preventive measures including campaign to maintain individual measures at the workplace. | Construction | O&M Contractor and KPLC | Number of awareness creation sessions conducted.  -Availability of and distribution of condoms | Quarterly | 20,000.00 |
| **Sanitary waste** | 1. Construct/ install pit latrines for both genders clearly labelled | Construction | O&M Contractor and KPLC | Presence of separate and clean washrooms for both the gents and ladies | Quarterly | 300,000.00 |
| **Solid Waste Generation** | 1. Provide waste handling facilities such as labeled waste bins 2. Emphasis on prudent waste generation and give priority to reduction at source 3. Solid waste management awareness to operators 4. Operator to contract a NEMA licensed waste handler to collect and dispose solid waste | Operation | O&M Contractor and KPLC | Presence of well-maintained receptacles and centralized collection points | Quarterly | 50,000.00 |
| **Liquid Waste/Oils Generation** | 1. Proper storage of the oil is required to ensure no leakages 2. Frequent inspection and maintenance of the generator to minimize leakages. 3. No vehicles should be serviced or maintained at the Mini-grid area. 4. The waste oil or used oil must be disposed-off appropriately. 5. Proper training for the handling and use of fuels for the operators of the Mini-grid. 6. In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately. | Operation | O&M Contractor and KPLC | -Engine maintenance records  -Oil spill containment plan | Quarterly | 200,000.00 |
| **Increased oil Consumption** | 1. Efficient energy consumption 2. Install an energy-efficient lighting system | Operation | O&M Contractor and KPLC | Energy consumption records | Quarterly | No additional cost |
| **Increased storm water flow** | 1. Construct the drainage system in a way to follow natural drain of the water 2. Concrete only the required area and leave the rest of the land with vegetation like grass 3. Construct rain water harvesting system on the control buildings/office and harness into storage tanks for use | Operation | O&M Contractor and KPLC | Provision of a drainage system and a rain water harvesting system | Quarterly inspections | 200,000.00 |
| **Fire Outbreaks** | 1. The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points 2. Detection/alarm systems that can detect fire should be and installed 3. A fire evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported. 4. Workers especially operators of the plant must be trained on fire management 5. ‘No smoking’ signs shall be posted within the Mini-grid area 6. A fire Assembly point should be identified and marked | Operation | Contractor | -Provision of serviced fire equipment, evacuation plan and safety signages  -Records of fire safety training | Quarterly | 50,000.00 |
| **Visual Impacts** | 1. Fence round the solar Mini-grid to keep off/screen the solar panels. | Operation | O&M Contractor and KPLC | Presence of a perimeter fence | Quarterly inspections | No additional cost |
| **Water demand** | 1. Ensure prudent use of water. 2. Install water-conserving automatic taps. 3. Any water leaks through damaged pipes and faulty taps should be fixed promptly. | Operation | O&M Contractor and KPLC | Water usage records | Quarterly | 20,000.00 |
| **Sanitary waste** | 1. Provide sanitary waste facilities for both genders clearly marked 2. Disposal of waste through septic tanks | Operation | O&M Contractor and KPLC | Presence of separate and clean washrooms for both the gents and ladies | Quarterly | No additional cost |
| **Flooding** | 1. Ensure drainage channels are free of any obstruction at all times i.e., not blocked 2. Construct more channels and or expand existing ones 3. Raise foundations of the solar panels and ensure a proper and from concrete base 4. Create flooding diversions and or spill ways to divert water from getting into the solar power facility | Operation | O&M Contractor and KPLC | -Provision of drainage system  -Raised foundations for the structures | Quarterly | 100,000.00 |
| **Occupation health and Safety** | 1. Ensure only qualified staff are employed to work in the facility 2. All workers operating the Mini-grid must be equipped with appropriate and adequate person protective equipment (PPE) such as; safety footwear, helmet among others. 3. Operators must be skilled on firefighting management 4. Annual environmental audits should be done 5. WIBA cover for staff is mandatory | Operation | O&M Contractor and KPLC | -Provision of PPEs and WIBA cover  -Environmental audit reports | Quarterly | 100,000.00 |
| **Hazardous waste-damaged panels** | 1. Segregation from other waste streams 2. Proper disposal through a NEMA approved/licensed handler | Operation | O&M Contractor and KPLC | Presence of well-maintained receptacles and centralized collection | Quarterly | 200,000.00 |
| **Noise and Vibration** | 1. Generator room should be sound proof to ensure no noise of a nuisance level will be produced. 2. Monitor noise levels | Operation | O&M Contractor and KPLC | Noise levels-Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid | Quarterly | Part of contractor’s cost |
| **Shocks and electrocutions** | 1. Inspect the wiring of the houses before connecting power 2. Safety awareness campaigns to the community before connection of power on safety precautions such as:    * Require community to engage a certified technician to do wiring in the premises    * Use of quality materials while wiring    * Refraining from individual illegal extensions of power lines to other houses    * Observing safety measures while using electricity such as not touching sockets and switches with wet hands or wiping with wet cloths    * Keeping off all electricity infrastructure e.g., not tying livestock on electric poles, no cutting earth wires that run along some electric poles, not interfering with sockets or switches    * Reporting any electric wire/conductors if found fallen on the ground    * Report any incident regarding electricity at the local office –staff in charge of operating the Mini-grid | Operation | O&M Contractor and KPLC | -Records of awareness sessions conducted  -Incidences report | Quarterly | No additional cost |
| **Community Safety- Access to site by general public** | 1. Fencing off the facility to keep of community members, children and livestock from entering into the facility 2. Controlled access to the site only with prior approval 3. Maintain records of any person who comes to site | Operation | O&M Contractor and KPLC | Presence of a controlled access and records of every person accessing the site | Daily | Part of contractor’s cost |
| **Risks related to poor or inadequate stakeholder engagement (Conflict)** | 1. Employ from the community to the extent possible 2. Engage the community members and other stakeholders in a timely manner 3. Work closely with the GRM committee members in solving the conflicts 4. Solve all conflicts/grievances at the earliest time possible 5. Ensure all grievances are logged and closed 6. Monitoring the pattern of grievances to come up will long term measures | Operation | O&M Contractor and KPLC | Grievance records | Quarterly | 20,000.00 |
| **Gender Based Violence –SEA and SH** | To manage GBV risks, the contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The plan will include the necessary measures for prevention and response and must ensure survivor-based approach | Operation | O&M Contractor and KPLC | -SEA/SH Prevention and Response Action Plan  -Grievance records | Quarterly | 20,000.00 |
| **Public Health Impacts –HIV/AIDs** | 1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff awareness and awareness campaigns for the community 2. Provision of condoms to workers 3. Allowing migrant workers time to be with their families | Operation | O&M Contractor and KPLC | Number of awareness creation sessions conducted.  -Availability of and distribution of condoms |  | 20,000.00 |
| **Public health Impacts -Covid 19 disease** | 1. Social distance must be observed 2. Provision of hand wash facilities before access 3. Temperature check and monitoring of the temperature of workers and any other person coming to site 4. Enforce wearing of masks 5. Make provision for testing and treating especially of workers 6. Provision of contact numbers for the nearest health facility for testing and treatment 7. Adhering to any other measures from the ministry of health which may be issued from time to time | Operation | O&M Contractor and KPLC | Availability of hand washing facilities  Utilization of hand washing facilities  Number of Covid-19 cases reported | Quarterly | 30,000.00 |
| **Dust Emission** | 1. Trees can be planted around the plant/facility provided they do not cast shadows to the solar panels to act as wind breakers and hence decrease dust pollution 2. Ensure planting of grass around and within the facility compound | Operation | O&M Contractor and KPLC | Visual inspection | Quarterly | 50,000.00 |
| **Vehicle Exhaust Emissions** | 1. Drivers of the vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered. 2. Company vehicles should be well maintained | Operation | O&M Contractor and KPLC | Engine maintenance records | Quarterly | No additional cost |
| **Noise and Vibration** | 1. Install portable barriers to shield compressors and other small stationary equipment where necessary. 2. Use quiet equipment (i.e., equipment designed with noise control elements). 3. Co-ordinate with relevant agencies in case the noise produced will require a license. 4. Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible. 5. Demolish mainly during the day when most of the neighbors are out working. | Decommissioning | Contractor | Noise levels-Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid | Once off | 20,000.00 |
| **Solid Waste Generation** | 1. Demolition contractor to adhere to the various manufacturer’s guidelines and requirements regarding demolition and disposal 2. Segregation of waste in order to separate hazardous waste from nonhazardous waste and other streams of waste 3. Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements 4. Adequate collection and storage of waste on site 5. Safe transportation to the disposal sites / designated area 6. Hazardous waste must be disposed by NEMA approved waste handler | Decommissioning | Contractor | Presence of well-maintained receptacles and centralized collection points | Daily | 700,000.00 |
| **Dust Emissions** | 1. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard | Decommissioning | Contractor | Visual inspection | Daily | 20,000.00 |
| **Public Health- HIV/AIDS** | The project will sensitize workers and the surrounding communities on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training and awareness campaigns/ to the community. | Decommissioning | Contractor | Records of awareness creation sessions conducted.  -Availability of and distribution of condoms | Once off | 20,000.00 |
|  | Total |  |  |  |  | 5,380,000.00 |

**Table 7‑5: Institutional Framework and Compliance/Implementation of the ESIA/ESMMP**

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| --- | --- | --- |
| **No** | **Institution** | **Role/Function** |
| 1 | The National Environment Management Authority (NEMA) | NEMA:   * Approves the ESIA Report; * Issues EIA License for project implementation; and * Carries out independent Audit to determine compliance with ESMMP. |
| 2 | Directorate of Occupational Safety and Health Services (DOSHS) | DOSHS:   * Provides OSH permits for workplaces of the project including campsites and quarries; and * Conducts inspections to ensure conformance to OSHA. |
| 3 | Water Resources Authority (WRA) | WRA:   * Provides necessary water abstraction permits for boreholes and surface water sources (rivers, streams etc.); and * Monitors water use in the region and provide guidance water use. |
| 4 | National Land Commission (NLC) | NLC:   * Verifies the identified land for the purposes of ascertaining land ownership; and * Transfer of land ownership details to the proponent. |
| 5 | National Gender and Equality Commission | The Commission:   * Ensures that there is gender equality and equity throughout the implementation of the project; and * 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 |
| 7 | County Government of Wajir | County Governments will:   * Provide approval for the project & project site; * Approval of community land consent & verification; and * Provide support. |
| 8 | Supervision Consultant | Supervising Consultant:   * Will engage the following dedicated full-time safeguards staff to support risk management: * Supervising Engineer (RE) * Social Safeguards Specialist * Environmental Safeguards Specialist * Review and approval of the ESMMPs and other plans; * Day to day supervision of Contractor implementation of the ESMMPs and other plans; * Regular reporting on the ESMMP implementation; and * Has full time Environmental, Health and Safety and Social Specialists |
| 9 | Contractor | Contractor:   * Will engage the following dedicated full-time safeguards staff; * Environmental Safeguards Specialist * Social Safeguards Specialist * Registered Occupational Health and Safety (OHS) Expert * Community Liaison officer to act as link between the community and contractor and to support the social specialist. * Will Prepare the C-ESMPs informed by the proponent’s ESMMP and other plans before commencing construction; * Will Operationalize and implement the C-ESMPs; * Carries out day to day management of ES, H& S risks; and * Reports on incidents and accidents to the Resident Engineer and regulators. |

## Management Plan during Construction Phase

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

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

### Construction Management Plan

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

1. **Management of Fuels and other Hazardous Materials**

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

1. **Management of the Construction Site**

* The contractor shall prevent littering and the random discard of any solid waste on or around the construction site
* The contractor shall manage other solid and liquid waste

1. **Fire Prevention and Management**

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

1. **Management of Air Quality**

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

1. **Neighboring Land Owner and Occupier Relations**

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

1. **Complaints Register**

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

1. **Construction Control**

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

**Control of Access**

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

**Control of material supply and burrow areas**

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

### Rehabilitation and Site Closure Plan

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

### Local Recruitment Plan

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

In designing the local recruitment plan contractor shall:

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

The mitigation measure is:

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

### Workplace Health and Safety Plan

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

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

### Community Health and Safety Plan

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

* Adherence to OSHA 2007 Act and its subsidiary legislations to ensure that health and safety of immediate neighbors and the public is not threatened.
* The contractor to ensure that construction work is undertaken in manner not likely pose risks to community health and safety.
* The contractor shall undertake an independent risk assessment prior to construction. The findings of this assessment will inform the development of a community safety plan and create awareness to the community on the same.

### Emergency Preparedness Plan

The Contractor shall develop an emergency plan that will enable rapid and effective response to all types of environmental emergencies in accordance with recognized national and international standards.

The emergency plan shall include establishment of a network of communication between the Contractor and emergency services including police, ambulance services, and fire brigades among others.

### SEA/SH Prevention and Response Action Plan

The contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures confidentiality. The plan should have an Accountability and Response Framework. The plan will include the necessary measures for prevention and response of GBV impacts.

The mitigation measures shall include:

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

### Stakeholder Engagement Plan

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

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

The plan shall put this measure in to consideration:

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

### Labor Influx Management Plan

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

The objectives of this plan are as follows:

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

The plan shall consider these measures:

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

### Grievance Redress Mechanism

One of the key roles of the Grievance Redress Committees, will be 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.

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 Land Acquisition Tribunal established under the Land Act 2012 (Part VIIIA 133A) has the jurisdiction to hear and determine appeals from the decision of the NLC on the process of compulsory land acquisition of land. However, if a party is dissatisfied by the decision of the tribunal, they may appeal to the Environment and Land Court. 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. ADR 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. The affected persons and other stakeholders also have a right to access the World Bank Redress Service (GRS) and the World Bank Inspection Panel at no cost.

#### 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**

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

#### 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:**

1. Ensuring effective flow of information between PAPs and the implementing agency
2. Coordinate Locational Grievance Redress Committees (LGRC)
3. Coordinate activities between the various organizations involved; facilitate grievance and conflict resolution; and provide support and assistance to vulnerable groups.
4. Conducting extensive public awareness and consultations with the affected people so that they can air their concerns, interests, and grievances.
5. 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.

#### Locational Grievance Redress Committee (LGRC)

Since counties are large, further decentralized Grievance Redress Committee will be formed at the location of the sub-project. Subsequently, Locational Grievance Redress Committees(LGRC’s), based at each location of a sub-projects, will be established. The LGRC’s will be constituted by implementing agencies and representatives of CGRCs through consultation with the PAPs and will act as the voice of the PAPs.

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

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

Membership of LGRCs will be elected by each category of PAPs except the locational Chief and assistant chiefs who will be automatic members of the team by virtue of their positions. Each of LGRCs will elect their own chairperson and a secretary among themselves.

**The roles of LRCCs** will include among others the following:

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

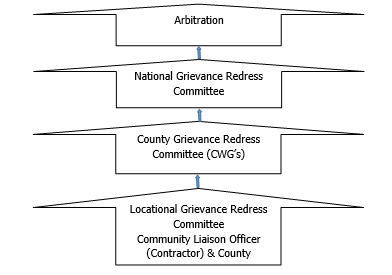


Figure 7‑1: KOSAP Grievance Redress Mechanism

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

It is expected that most disputes will be resolved at the lowest level-Locational Grievance Redress Committee and since most disputes arise during the Construction and operation period the contractor’s Environmental and Social Safeguard team specifically the Community Liaison Officer will work closely with the community to be able to resolve disputes.

Responsibilities of the Community Liaison Officer include:

* Monitor day to day Implementation of the Project
* Address grievances as they arise on the project
* A member of the Locational and County Grievances Redress Management Committee to respond on issues that may have been brought to the attention of the committee before escalating to the National Grievance Redress Committee
  + - * Escalate grievances internally to get a lasting solution

**Existence of a Local Grievance Redress Mechanism in Athibohol**

A Local grievance redress committee was constituted in 2020. The LGRM was not active during the site visit. It is anticipated that the committee shall become active during the construction and operation phase of the project. The LGRM is composed of the following members of the project committee:

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

The names off the nominated members of the LGRC have been appended in **Appendix 5** of this report.

Contractor will prepare an effective Grievance Redress Mechanisms (GRM) to address and respond to grievances from both the community, the workers and any other stakeholder.

A Grievance Redress Mechanism (GRM) provides access to remedy and identifies procedures to effectively address grievances arising from project implementation. GRM provides an avenue where people can formally lodge their complaints and grievances and have them properly considered and addressed.

The mitigation measures shall include:

* Prepare a project level timebound GRM in consultation with relevant stakeholders
* Ensure the project GRM incorporates existing local dispute resolution mechanisms at the lowest tier and allows access to administrative and judicial processes as well as to other redress mechanisms such as meditation/arbitration and the World Banks grievance redress service (GRS) and the Inspection Panel
* Have a subproject level GRM Focal Point to be responsible for receiving, logging/registering, submitting to the responsible tier for resolution and responding to and updating complainants on resolution status
* Sensitize all stakeholder categories on the GRM and encourage them to make use of it
* Ensure the GRM is functional, culturally appropriate, and accessible to all stakeholders without any cost to them and without fear of retribution or reprisal
* Ensure adequate and proportionate representation of VMGs and vulnerable individuals in the local grievances handling committee.
* Prepare a timebound Contractor’s GRM and sensitize community members and project workers its processes
* Ensure all reported grievances are logged, dated, processed, resolved and closed out in a timely manner, or escalated to other levels.
* Ensure the GRM provides for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity for those who wish to report anonymously.

**7.6.9.10 World Bank Grievances Redress Mechanism**

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

**7.6.9.11 World Bank Grievances Redress Service**

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

Those aggrieved or their representatives can report their complaints through the following mediums;

Online by accessing the online form;

Sending an Email to grievance@worldbank.org; or

Submitting a letter to the World Bank Headquarters in Washington D.C., United States or World Bank Kenya County Office.

**7.6.9.12 World Bank Inspection Panel**

The Inspection Panel is an independent complaints mechanism for people and communities who believe that they have been, or are likely to be, adversely affected by a World Bank-funded project. The Panel is an impartial fact-finding body, independent from the World Bank management and staff, reporting directly to the Board. The Inspection Panel process aims to promote accountability at the World Bank, give affected people a greater voice in activities supported by the World Bank that affect their rights and interests, and foster redress when warranted. In September 2020, the Board updated the resolution that created the Panel and added to the Panel functions. At the same time, the Board approved a resolution establishing the World Bank Accountability Mechanism (AM). The new AM began operations in early 2021 and houses the Panel to carry out compliance reviews and a new Dispute Resolution Service (DRS), which will give complainants another way to have their concerns addressed. Contacts for registration of complaints to the IPare ; (i) Tel:+12024585200: and (ii) Email: [ipanel@worldbank.org](mailto:ipanel@worldbank.org).

**7.6.9.13 Government Management of Land Acquisition Disputes**

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

**7.5.11 Labor Influx Management Plan**

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

The objectives of this plan are as follows:

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

The plan shall consider these measures:

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

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

## Rehabilitation and Decommissioning Management Plan

The rehabilitation and decommissioning management plan include the following:

### Planning for Closure

a) The implementing agency shall investigate practical options for closure of the facility at least one year before decommissioning and submit a report to relevant authorities NEMA included.

b) The KPLC shall develop rehabilitation and decommissioning plan in conjunction with relevant stakeholders at least one year before the end of facility’s operations.

c) The KPLC shall explore options of re-use and recycling of the facility’s components/structures.

### Decommissioning

a) The KPLC shall take into consideration the health and safety of personnel, contractors, neighbors and the public during the planning and implementation of the demolition process.

b) The KPLC shall undertake a further survey to identify any contaminated areas and remediate them accordingly.

### Post Closure

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

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

a) Monitoring of the rehabilitated site to confirm whether progress is satisfactory.

b) Outline of how land improvement and future land use will be affected by the past operations and decommissioning of the associated infrastructure.

## Institutional Implementation Arrangements for the Proposed Project

This section presents roles and responsibilities of proponent, implementing agency, supervision consultant and contractor. The project is jointly implemented by the Ministry of Energy and Kenya Power. Specific roles are presented below;

### Proponent -Ministry of Energy (MoE)

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

### KOSAP Project Implementation Unit

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

### The Implementing Agency (KP)

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

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

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

### County Government of Wajir

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

### National Environmental Management Authority

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

### Roles and Responsibilities of the Supervising Consultant

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

### Roles and Responsibilities of the Contractor

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

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

## Management of Impacts during Operation Phase

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

* Inspections
* Corrective action
* Reporting

# IMPACT SUMMARY AND CONCLUSION

## Introduction

This chapter gives a summary of impacts conclusion and recommendations.

## Summary of impacts identified and assessed

### Pre-construction Phase Impacts

A number of impacts have been identified as a result of the pre-construction of the proposed Athibohol project. The impacts in this phase will be associated to land acquisition and stakeholder engagements.

The significance of the land acquisition is minor prior to the application of appropriate mitigation measures, while that of stakeholder engagement is of major significance. With the application of appropriate mitigation measures, the significance of all the identified negative impacts associated with this phase will be reduced to minor or negligible.

### Construction Phase Impacts

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

The significance of the identified negative impacts associated with the construction phase is moderate prior to the application of appropriate mitigation measures. The significance of two of the identified negative impacts associated with the construction phase, specifically: impacts related to labour and working conditions and visual impacts are minor prior to the application of appropriate mitigation measures. With the application of appropriate mitigation measures, the significance of all the identified negative impacts associated with the construction phase will be reduced to minor or negligible.

### Operational Phase Impacts

A number of impacts have also been identified to be associated with the operational phase of the proposed Athibohol solar project. Of these, impacts on Economy and Employment will be positive impacts.Prior to the application of appropriate mitigation measures, none of the identified negative impacts will be of major significance during the operational phase. The presence of electrical infrastructure will pose this health threat to avifauna prior to the application of appropriate mitigation measures. Four of the negative impacts are of minor significance before the application of appropriate mitigation measures. These include: impacts on water quality; health, safety and security and visual impacts.

With the application of appropriate mitigation measures, the significance of all the identified negative impacts associated with the operational phase will be reduced to MINOR or NEGLIGIBLE.

### Decommissioning Phase Impacts

A number of impacts have been identified as a result of the decommissioning of the proposed Athibohol project.

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

## Conclusion and Recommendations

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

The Project Proponent and Contractor should accommodate the mitigation measures recommended during the ESIA process to the extent that is practically possible, without compromising the economic viability of the Project or having a lasting impact on the environment.

In summary, based on the 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.

# REFERENCES

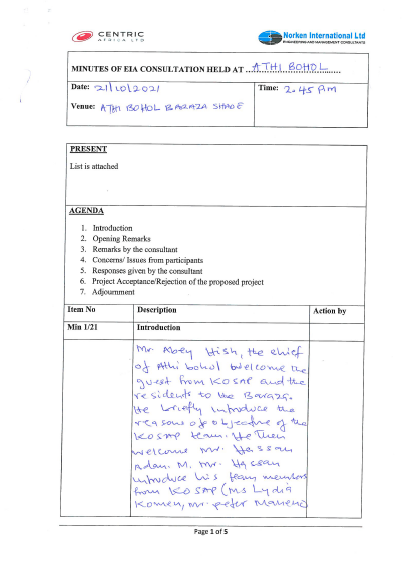
The following list of references was referred to in preparing this Project Report:

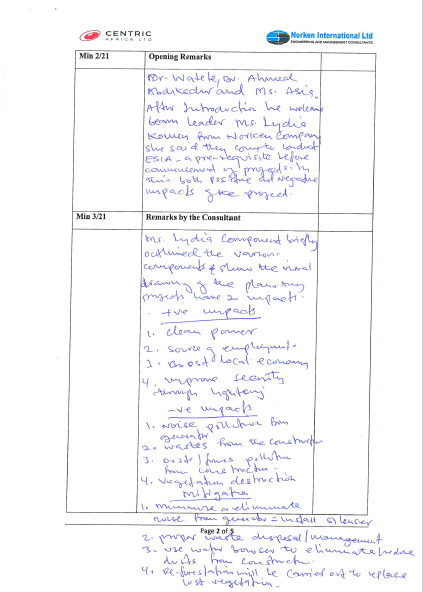
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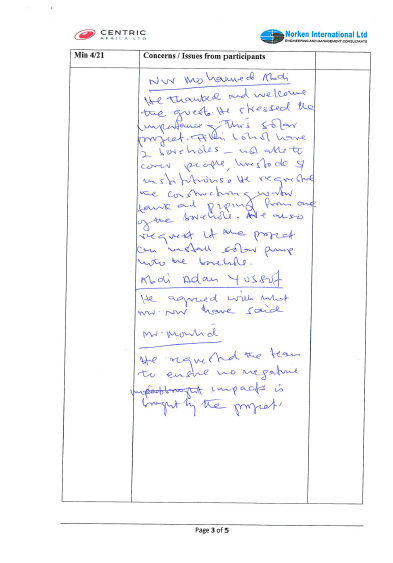
# APPENDICES

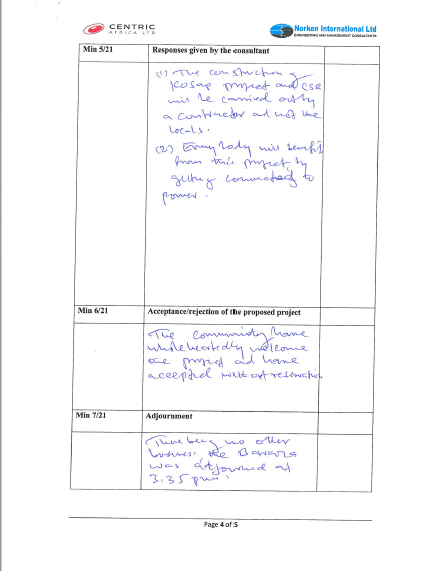
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| **No** | **Appendix** | **Item** |
| 1 | Appendix 1 | Minutes of EIA consultation meeting |
| 2 | Appendix 2 | List of attendance |
| 3 | Appendix 3 | Minutes of Land acquisition meeting |
| 4 | Appendix 4 | Land identification form |
| 5 | Appendix 5 | A-RAP Document |
| 6 | Appendix 6 | Firm and Lead expert EIA practising licences |

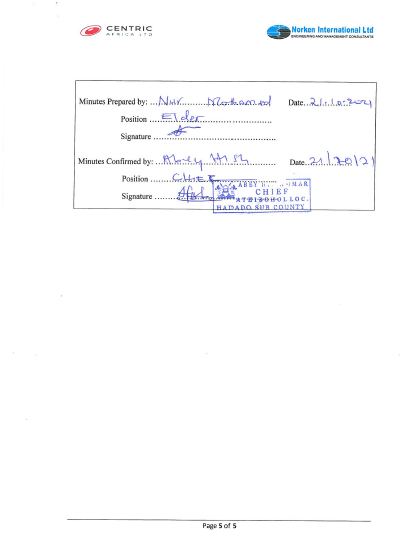
## APPENDIX 1 – MINUTES OF THE MEETING HELD



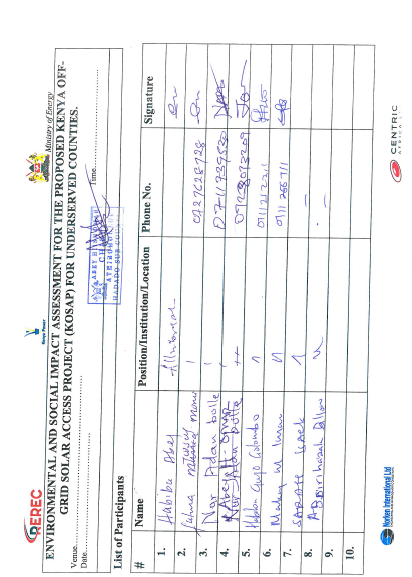


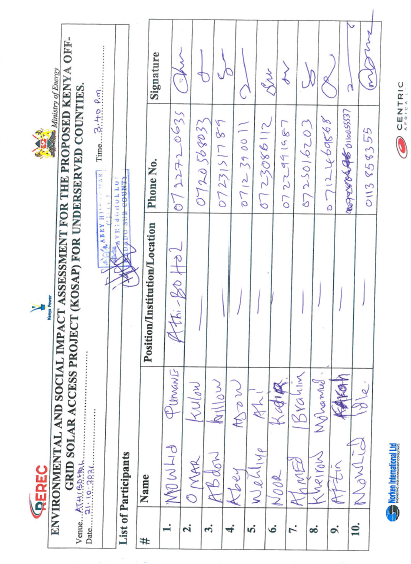






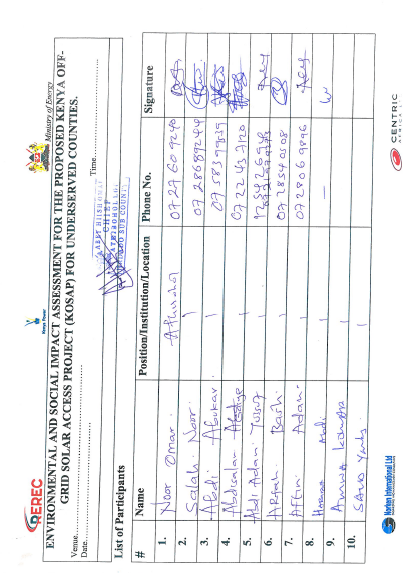
## APPENDIX 2 – PUBLIC MEETING PARTICIPANTS’ LIST



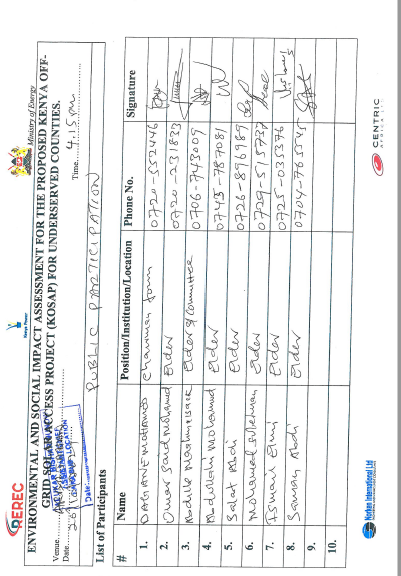


FOCUS GROUP DISCUSSION PARTICIPANTS LISTS

**FOCUS GROUP DISCUSSION MEN**



**YOUTHS**



## APPENDIX 3 – MINUTES OF LAND ACQUISITION MEETING

**MINUTES OF COOMMUNITY CONSULTATION MEETING LEADING TO LAND**

**IDENTIFICATION AND GRIEVANCE REDRESS COMMITTEE CONSTITUTION FOR**

**PROPOSED ATHIBOHOL SOLAR MINI-GRID PROJECT**

**DATED:31ST MAY 2021 VENUE: ATHIBOHOL TOWNSHIP.**

**Min: 1 Agenda**

Preliminaries

Project design

Land acquisition consultations

Positive and Negative impacts of the proposed project /mitigation measures

Way forward

A.O.B

**MIN 2 Meeting Preliminaries**

The meeting was called to order by the area chief at 10:30 am. The meeting began with a word of prayer from one of the elders (Community Sheikh). The Chief welcomed the vising team from MoE, KPLC, and Wajir County Government in a special way, he further welcomed the community members present for attending the developmental meeting in the community. He further emphasized the importance of having electricity in their community since it will improve their living standards. The chief further informed the team from MoE, KPLC, and Wajir county government that their various government institution within the neighbourhood and requested these facilities to be given first priority to be considered for electricity connection. He also further noted that there are other community facilities that include; Schools, Dispensary, Borehole, Administrative offices Primary School, Secondary School, Market, Mosques, Ward Admin Office, Borehole, Police Post, Public Dam and Safaricom Mast in the area. He finished making introductory remarks by inviting the Director of Energy of Wajir County to introduce his team and welcome MoE and KPLC staff to address the meeting.

**Min 3. Introduction of the Project Implementation Unit Team (PIU)**

Samuel Abaya thanked all community members present and went on introducing team members from MoE, KPLC and Wajir County Government. He further explained to the meeting that the proposed will require a piece of land that the community had set aside for government projects for the purpose of constructing the mini grid that will benefit the community. Mr. Abaya further explained to the community members present that the proposed Mini grid project is being funded by the World Bank and implemented by the Ministry of Energy, KPLC and County Government of Wajir. He in turn invited Eng. Kyalo to take members through the project design.

**MIN. 4 Project Design**

Eng. Kyalo explained to the meeting that the government of Kenya through vision 2030 is planning that every household should be connected with power hence the government has come up with this project called Kenya Off Grid Solar Access Project (KOSAP) that is meant to connect Kenyans in the rural areas which are far from the national grid. This project is being implemented in the 14 counties where Wajir is one of them and the process of starting the project has commenced in Wajir. He further noted the proposed project will have solar panels, small diesel generator, control room, distribution lines to various homesteads. The project is being funded by the World Bank and the Government of Kenya.

Eng. Kyalo informed the meeting that the project would also involve the reticulation of power connection to each homestead in the area. He informed the meeting that each household will be required to pay Kshs 1,000 (Kenya Shillings One Thousand only) as connection fees. After the payment each household will pay for their bills based on their consumption. He further explained to the meeting that we needed land that the community had set aside for government projects for the purpose of constructing the mini grid. He then welcomed the Land Surveyor to speak to the gathering

**Min 5: Land Identification process**

The team Surveyor Urbanus Muthoka told the meeting that the team appreciated the time they took to come for the meeting to discuss the project. He informed the meeting that the projects would be implemented in 14 counties in the country. Mr. Muthoka explained to the meeting that the project could only commence once the project proponent acquires land where the project would be constructed.

Mr. Muthoka confirmed to the community present that land is both a social and economic factor of life. He explained to the gathering that he would map out the identified land for the proposed project. He further added that the project required a minimum of 2 (two) acres. He further reiterated that the main purpose of the team visit was for the community to pin point identified land for the project, then the multi-disciplinary team would assess the suitability of the land for the project. If satisfied the surveyor would proceed and get the beacon points and map the parcel of land awaiting land acquisition. The Surveyor asked the meeting if it was the first time they had heard about the project. The members of the community confirmed that a team had visited the town some time earlier regarding this said project.

Mr. Muthoka explained to the gathering that the team that had previously come to their area was a team of consultants. The members present confirmed the same and that they had shown them the site of the proposed mini grid. He told them that the team that had come previously were consultants who had come to view the land. He further said that he was the surveyor of the team and would take the coordinates of the land to commence the land acquisition process. He further explained that he would then prepare a sketch map of the land and forward the same to the County Government for approval. Once the county approved the scheme it would be forwarded to the National Land Commission for approval and the process of preparation of a letter of allotment. The meeting was told that the title would finally be in the name of either Kenya Power and Lightening Company (KPLC) or the Rural Electrification and Renewable Energy Corporation (REREC). Mr. Muthoka then welcomed the Environmentalist Mr. Mwangangi to address the meeting.

**MIN 6: Environmental impacts of the proposed project /mitigation measures**

The Environmental Expert Simon Mwangangi thanked the community once again for listening to other Team members and their participation. Simon told the gathering that it was important that there be consensus by the community members on the land that they will be allocated since it will serve good for the community.

Mr. Mwangangi explained to the meeting that another meeting will be held for Environmental and Social Impact Assessment for the proposed site which will be submitted to the National Environmental and Management Authority (NEMA) for review. NEMA officers will undertake site visits to inspect and confirm that an Environmental and Social Impact Assessment had been done on the project and assess the community engagement on the proposed project. Subsequent to this the Contractor would then commence the construction of the mini-grid.

He further told the meeting that the proposed project will come along with both positive and negative impacts of the project. He began with the benefits. He said, the community would enjoy light from electricity and each household connected will no longer need to use paraffin lamps to light their homes. Electricity will be generally cheaper that the use of paraffin for lighting. Electricity will benefit school going children. They will be able to study to late hours in the evenings. There will also be an opportunity for the Teachers to teach the students late into the evening and also use the same light to give them early morning classes.

The community will also enjoy power for security lights at night. This will enhance security within the community at night. He further told the community that there may be members in the community who would love to buy televisions. Televisions will be a good source of entertainment and information of current affairs both locally and internationally. With electricity some community members will start businesses, the youth will open Barber shops among others. He asked the community where they cut their hair and many responded that they travel to long distances to access that service. He further told them this will then not be necessary as with the electricity in their township will enable barber shops to be established within.

Simon went ahead and told the gathering that the project will come along with employment opportunities for the community. This will be in the category of skilled and semi-skilled and unskilled jobs. The project will give priority to the locals for employment opportunities, especially for unskilled positions. The skilled works will be for masons, electricians when the contractor begins the construction. The work will be available for Men, Women and the youth. The rates payable will be agreed with the contractor but in line with the Kenyan Labour Laws. The Women will have an opportunity to sell tea, chapatti and food to the workers who will be working on the site of the mini grid.

The Contractor will also buy building materials like sand, gravel, stones and cement from the local community. Materials that will be available within the community for sale will be purchased by the contractor. Some materials like solar panels will be imported for the project.

The local Health Centre will also be supplied with electricity at an affordable cost. This will be a benefit in that the dispensary will now be able to refrigerate medicines that require being stored in cool places for patients. Laboratory and Pharmacy services will be more efficient for the community. Pastoralists engaged in the sale of livestock meat and/or milk will have access to infrastructure for cold storage facilities of their produce

Simon told the meeting that every project has both positives and negatives effects. He went further to explain the negative aspects of the project. He said the project will involve nonlocal people coming to work on the site. This means that the non-locals may come with habits that are not culturally acceptable to the Dagathia community that live within Athibohol Township. The workers may walk around the sites without shirts and in shorts. This may be unacceptable behaviour to the community. If the community have rules, they wish to have adhered to, the contractor will hold inductions with the elders for all his workers to understand and adhere to cultural standards.

The community will also experience noise pollution during the construction period the noise will be from excavation, drilling and vehicles driving to and from the site. This will be for just a while. The contractor will be limited to working from 8am to 5pm to control the noise. Samuel acknowledged that water is scarce in this area. He said that the contractor will require water from the locals to carry out the construction of the project. This will be an inconvenience for a while.

Dust pollution will also emerge from the site. The contractor will mitigate this by the use of tackifiers and soil stabilizers to reduce the dust. The vehicles may at times be driven at a high speed when transporting materials. The introduction of bumps will be used to control the speed of the vehicles. During construction of the project, the community may have trees in the proposed project land. In case the land has trees, they will be cut and cleared for the project. However, the contractor will plant trees to replace the ones cut and plant additional trees for the community on the site.

Accidents may occur during this period too. For example, a worker could get injured by a stone falling on them or hammer injuring a worker. The contractor will ensure that all workers wear a helmet, gloves, overall and safety boots at all times when on site. If a worker is found without any of the safety gear, he will be dismissed from the site on the spot. In case of any injury to the workers the Contractor will bear the responsibility for the staff. The contractor will give all the workers the regulations they must abide to while at work. Mr.

Mwangangi then welcomed Mr. Abaya to address the meeting.

**MIN 7: Social Impacts**

Samuel thanked the community members for turn out in large numbers for this developmental project that will benefit them. He went ahead and talked about Gender Based Violence that will result from the proposed project as an issue that needed to be mentioned. He said if a man got a job on site and is paid his wages, his wife may demand money knowing that he has been paid. This also applies in vice versa. The woman may work, and the husband may demand money from the wages paid. If one spouse does not cooperate, the consequence could lead to violence in the home.

He further noted another social issue that may occur when the women are employed on the site or cook for the workers, they may be sexually harassed or sexually abused. Such cases must be reported. HIV AIDS is also a disadvantage. The risk to this exposure is real and members of the community and workers should be aware since everyone is vulnerable.

Samul further noted Child labour is a negative activity that will not be condoned. A worker may wish to get additional money by bringing in a child to assist in his work. Such a situation will not be accepted. He further noted that other social impacts that might come along with the proposed impacts include;

Theft cases might be reported

Unwanted children cum pregnancies

Family disputes might arise especially on wayleave access

Land intake for government project

Mr. Abaya further noted that there are other social benefits the proposed project will come along with, they include;

Employments

Electricity connection

Improvement of the current health and education standards

Easy access of information

More businesses will come up/ economic empowerment i. e informal sector

Electricity as a source of energy can also be dangerous. Children may play around with nails in the sockets in the house. This can cause electrocution. When trying to save such a child, one may be bare footed and become a path for the electricity and get injured. The power poles can also be a curious object for the youth to climb risking their lives by falling from the poles. Precautions need to be taken where children and the community warned on the dangers of electricity. With all the disadvantages the meeting was told that there will be a solution for all the issues.

Samuel then told the meeting that to address grievances, the team will require that a

Grievance Redress Mechanism (GRM) to be put in place by the community. This GRM will have a committee that will help solve the grievances arising from the project. The community will need to identify persons who will sit on the committee and they should comprise a man, woman, youth and a person representing the special group e.g., a person living with a disability. The Committee will help address grievances to their conclusion. If in any case the committee is unable to solve an issue, they will be guided by the implementing agency on where to forward the matter. If it is still not solved at that level, then the Kenyan Courts will be used to resolve the issue. He said it is our hope that the grievances will be solved at the local level. The meeting was also told that the members of the Committee will be required to volunteer their services. This is because there will be no payment for their services. The committee was elected comprising a representative of men, women, youth and special needs in the society. Their names are;

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Names | Represents | Id. No | Phone No. |
| 1. | Halima Mudey Farah | Women | 21773144 | 0799 906 918 |
| 2. | Abass Muhumed | Men | 213257439 | 0725628543 |
| 3. | Noor Mohamed | Men | 1261661 | 0721 412889 |
| 4. | Hassan Qureish Ali | Youth | 22429514 | 0722893658 |
| 5. |  | Special Need |  |  |

MINUTE 8: Plenary session

Community Members present were given a chance to contribute and ask questions in regard to the proposed project as follows;

|  |  |
| --- | --- |
| QUESTION/COMMENTS | ANSWER/REMARKS |
| Jumail Osman  Thanks for bringing us development. My concern is this: when the government is recruiting, they check diffent parameters. We know that stealing and theft has no boundaries, but you can test for diseases and sickness, my request is that you ensure workers are healthy e.g free from Corona.  Thanks. | *Simon Mwangangi*  Thank you for your contribution.  My response to your concerns is as follows:  The contractor will ensure that covid 19 rules and protocols are followed. The contractor shall control access of people to site, do temperature checks at the gate and those with fever will be advised to go for medical checkup and treatment. Other health factors will be checked but I also wish to inform this audience that medical records are private and confidential.  Concerning theft; offenders will be subjected to strict disciplinary measures. |
| Abdi Yusuf  I support the first speaker. | *Simon Mwangangi*  Thanks, and concerns noted. |
| Noor Monhamed  Thanks for this project. You have brought a project we need; we will identify the land for you and cooperate as required. | *Engineer John Kyalo:*  Thanks. It is true Land is a key factor and as a community if you cooperate and identify the land for the project; we will implement it for the benefit of the community. |
| Ador Ali  We are grateful and need this project. Thanks to the government for considering us. | Samuel Abaya:  Point noted and its important to let you know that the government is planning to implement about 100 Solar mini-grids across the off-grid areas.  Thanks. |
| Mohamed Yusuf  On behalf of the community, we request that you give priority to locals for jobs. If locals do not benefit from recruitments, yet | Samuel Abaya:  The contractor will recruit 50-100 people during construction phase and about 10-15 people during operation. The contractor |
| they qualify for jobs and have skills, then it will not be fair.  How many people will you recruit? | will sign in his tender bid that priority will be given to the local community for jobs they qualify for and can do. Payments for works will be as per market rates. |



General meeting in progress

**MEN FGD**

Simon Mwangangi called the Focused group discussion for Men into order and thanked the Men present for turning up for the meeting in good numbers and for their contribution in the Public Baraza.

Simon went ahead and asked the Men to give their concerns and views on how they wished to be involved in the project. Their responses and concerns were as follows.

We want a beneficial project that can lift the livelihoods of the community members.

Men will play a crucial role in dispute resolution. We encourage resolution on the ground. Unresolved cases are elevated to the Elders committee first, if not resolved to Chief, if not resolved to MCA, Ward Administrator, Area MP upwards.

Men shall play a key role in land identification and also security both for the contractor, his materials; and we remind you we are a peaceful community.



**Men FGD in progress**

The members present confirmed most of the issues had been discussed. Simon thanked the members present for their attention and contributions and requested Men to select their representative to the Grievance Redress Committee.

The following were selected.

Abass Muhumed of ID. number 213257439 and phone number 0725628543

Noor Mohamed Abdi of ID number 1261661 and phone number 0721 412889

**WOMEN FOCUS GROUP DISCUSSION**

The group was led by Dorothy who was able to explain why a separate discussion was put up in order for them to have the opportunity to freely express themselves.

She explained the agenda of the visit by the officers from National government and county government was to undertake an environmental and social screening of the proposed site to check suitability in terms of environmental, technical, social and health requirements.

The second objective was to undertake community engagement to sensitize the community on the project and the third objective was about land acquisition for the project and the need for a project grievance redress mechanism.

She gave a summary of the project in terms of its positive and negative impacts and their mitigation measures, the safety precautions and the land acquisition process. She also explained the need for the women to select a representative to the project committee who would represent their views/issues to the committee for redress.

She ensured all the women had understood their rights, roles and benefits concerning the project. Further the women were educated on how they can take up economic opportunities that will raise during project implementation. They were also given opportunity to air their issues/ questions and or /give suggestions to make the project implementation process better.

The discussions went further to bring out issues on how the women can take advantage of the project benefits rather than taking a back seat. She explained to them that they would benefit more from the electricity because they will be able to use clean energy to cook and also benefit from access to information through use of radios and TV that are powered by electricity enabling them to make informed choices on different issues such as nutrition, health, farming among others. They were also set to benefit if they could set up small businesses like salons, cold drink kiosks, cooling milk because it spoils easily, children will have time to study and enhanced security due to the fact that the area will be well lit among other benefits. Gender based violence issues were also discussed including; forms of GBV, rationale for addressing GBV, ways in which a project can worsen existing GBV risks or create new risks, the need to report and document any complaints against workers, report incidences of GBV while ensuring survivor centered approach (respect for the choices, wishes, rights and dignity of the survivor). The women were told to be more vigilant to ensure young girls do not fall prey to GBV incidences. The women were requested to keep talking to the girls on GBV risks and the need to raise alarm in case of risks factors early enough.

All the women were in agreement for the project to be brought to the community.

**Question and answer session**:

Comment 1-Naima Muudey-Complained about the quality of Stand-Alone Solar Home systems supplied by Solar Panda company

Response-Details of the Systems and the fault was noted and escalated for further necessary action by the Kenya Facilities Manager-SNV/Sunfunder

The women selected their GRM representative for Athibohol Mini-grid as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Serial No. | Name | ID NO. | Cell No. |
| 1 | Halima Mudey Farah | 21773144 | 0799 906 918 |



**Women FGD in progress**

**FOCUS GROUP DISCUSSION FOR YOUTHS**

This FGDs were led Samuel Abaya

He welcomed the youths present for the focus group discussion. He further explained to them the proposed project the government wants to implement in their neighbourhood will be supplying electricity to the community. This electricity will be generated through solar panels and standby generator. This project is being funded by the World Bank and being implemented by Ministry of Energy through Kenya Power and Lighting Company and County Government of Wajir.

The youths noted were engaged on how the proposed project will be implement in the area and they identified the following positive impact the project will come along with as follows;

Creation of direct and indirect employment for the community people

Reduction of travel expenses since health services will be near them

Clean source of energy (electricity) in their neighbourhood

Improvement of education standards

Increase of the land value

Improvement of the economy of the area

Access to information and news since the community members will invest in the purchasing of the radios, Tvs, and internet services

Further the youths identified the negative impacts that the proposed minigrid will come up with in their neighbourhood;

Introduction of visual impacts due to the proposed mini grid and low voltage lines

Clearing of vegetation on the proposed project site to create room for the construction of the minigrid

Increase of population in the neighbourhood especially during the construction phase

Increase of crimes and other evil vices i.e., unwanted children, early pregnancies, spread of sexual transmitted diseases, petty theft.

Mixing of various cultures of different people who will be working during the construction and operational phases of the proposed minigrid project.

More intake of water during the construction and operational phases of the proposed minigrid

Instance of air pollution will be witnessed during the operation phase of the proposed mini-grid.

The youth further identified various areas of involvement during the implementation and operation of the proposed minigrid which include;

Taking up of employment opportunities both skilled and unskilled within the project site. These employment chances include; security, traffic marshals, drivers, marsonary and casual work among others.

They will assist in dispute resolutions on various conflicts that might arise during the construction and implementation of the proposed minigrid.

Ensure there are equal oppournities to all community members especially during employment and supplying of construction materials for the proposed minigrid.

Orientation of the construction team of the proposed minigrid into local community’s culture and religion so as to avoid confrontations with the construction team

To be given an oppournities to supply the construction materials that are local available especially the sand, murram, hardcore, building stones, wood among others

To be provided with an oppornities of transporting other materials and equipment that could be required for construction and operation of the minigrid.

Need to be involved in the ESIA consultation to ensure the project is environmentally friendly.

Land identification

Sub- contracting especially supply of building materials, transportation services, supply of fuel, supply of food items and water

Offering translation services between the contractors and the local community  To have a representation in the project implementation committee.

When youths were asked if they support the proposed project? All of the youths present were in full support of the proposed mini grid project and agreed that they will lobby other youths to support the project.

**Youth FGD in progress**



Samuel then concluded by thanking the community for their attention and said we would move to a question-and-answer session. He also told the meeting that Dorothy a member of the team would meanwhile hold a separate meeting with the girls and women to allow them to also speak their minds and ask questions freely away from the men

**Way Forward**

Members present welcomed the project and requested that it be implemented the soonest possible so that their problems of staying without electrical power gets sorted once and for all. They further agreed that the land they are giving for the proposed project is the land which the community has set aside for government projects and no any form of compensation will be demanded by the community.

**MINUTE 9: A.O.B**

Five community members were identified to sign Land Identification Form on behalf of the community.

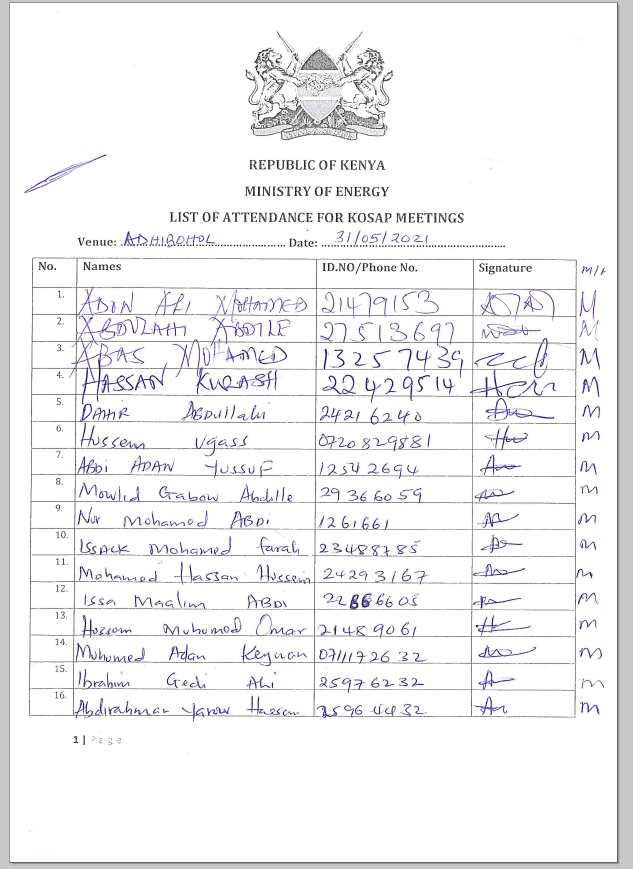
**MINUTE 10: Closure of Meeting**

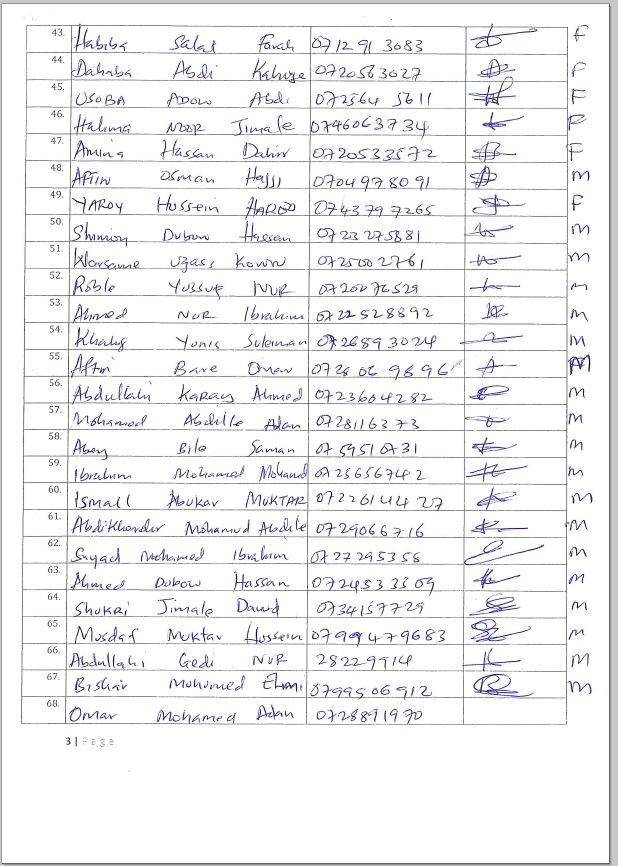
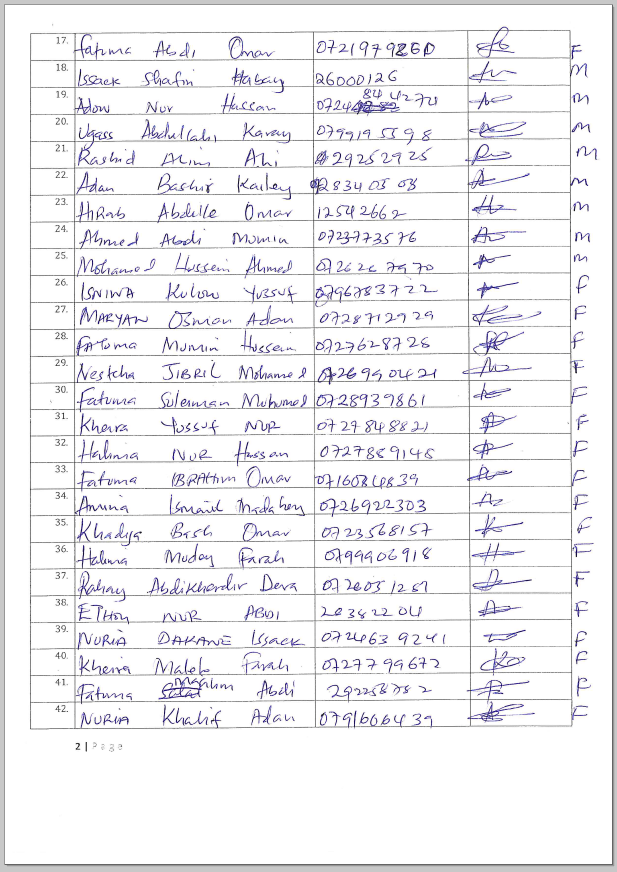
There being no other business, the Chairperson thanked all the attendants for turning up and their contributions. Members agreed to keep in touch and clarify on any necessary information as regards the intended projects. The meeting ended with a closing prayer at 11:20 PM.

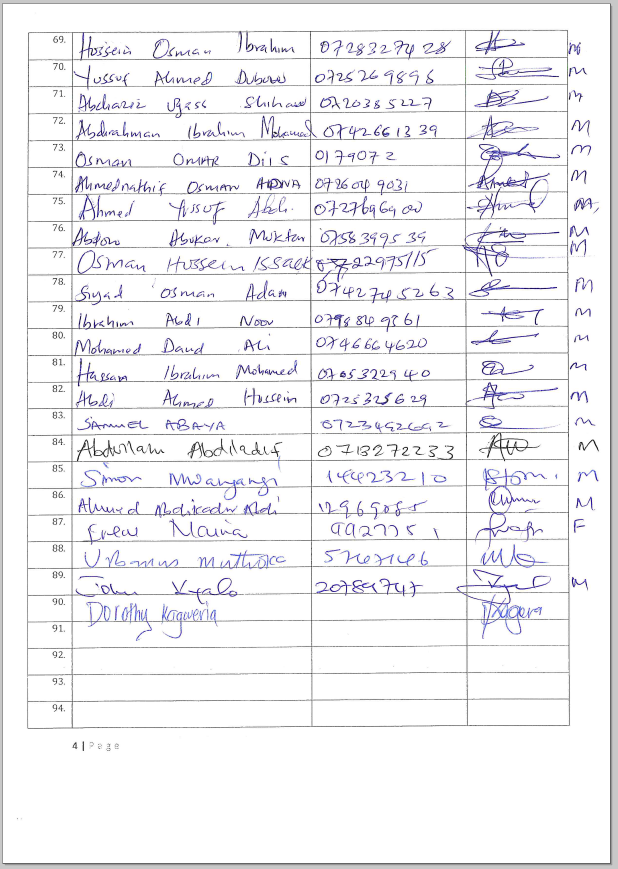
**END.**

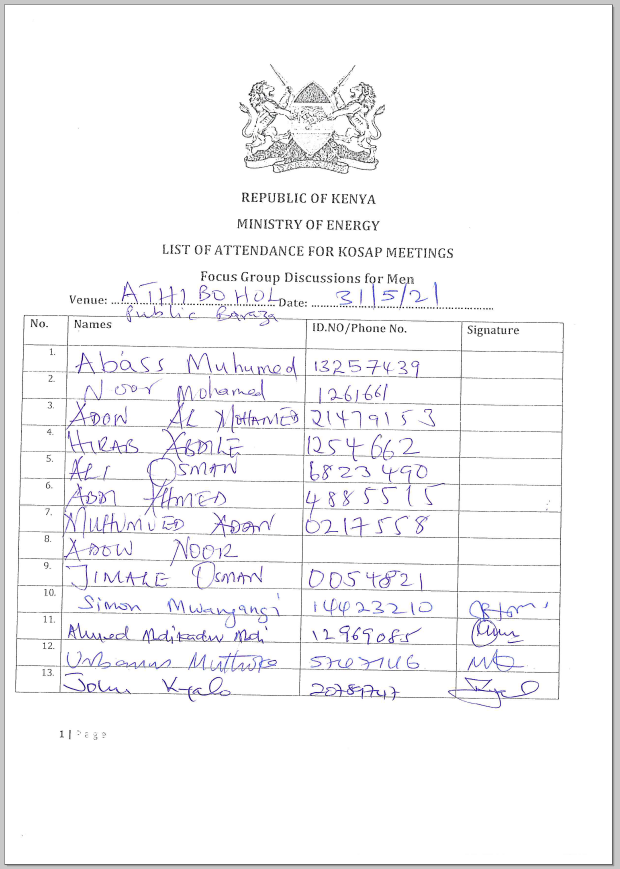
The community in Athibohol unanimously agreed to set aside land for Minigrid construction. A Land Identification form was signed by the representative of the community, the county government and the Implementing Agencies summarizing the process of land identification and the agreements reached with the community.

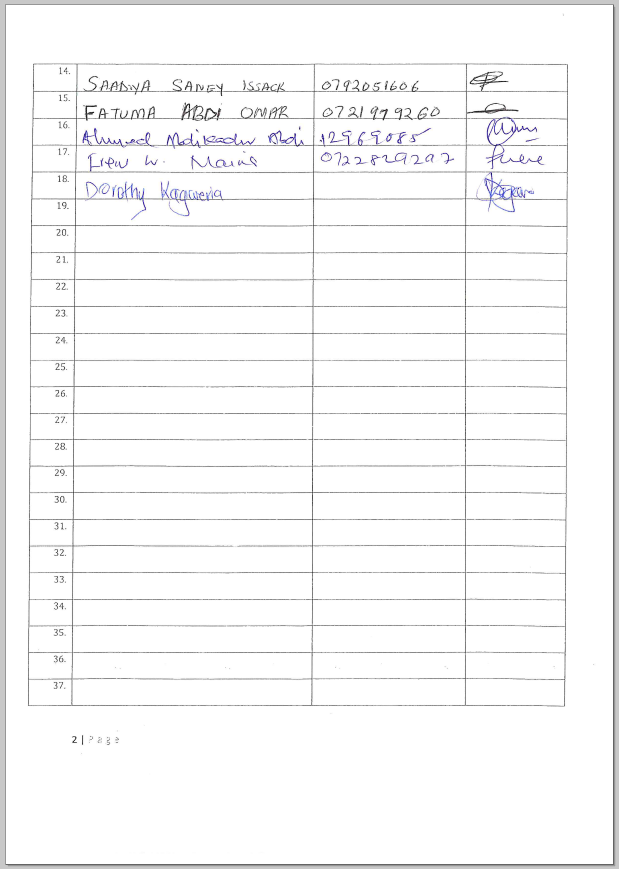
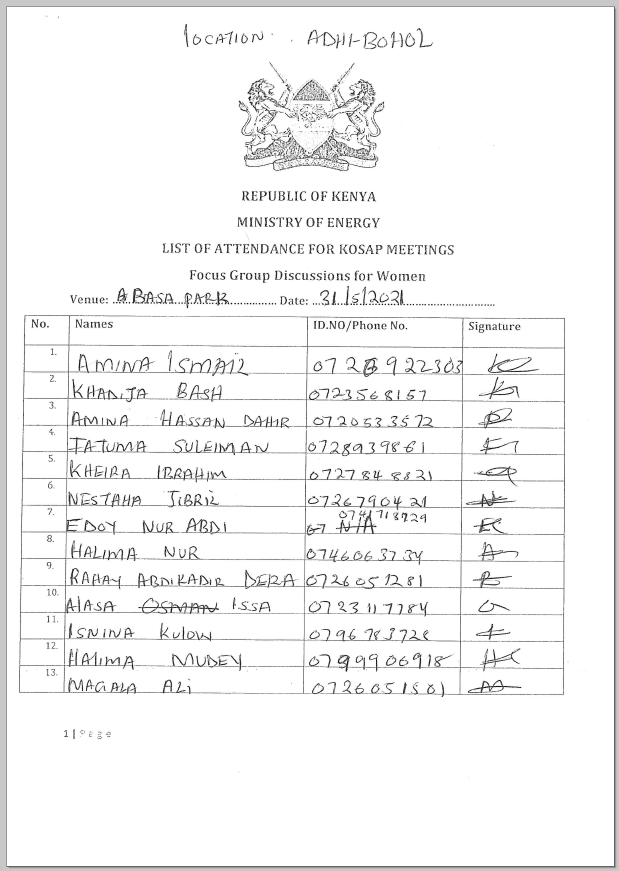
## APPENDIX 4 – LIST OF ATTENDANCE

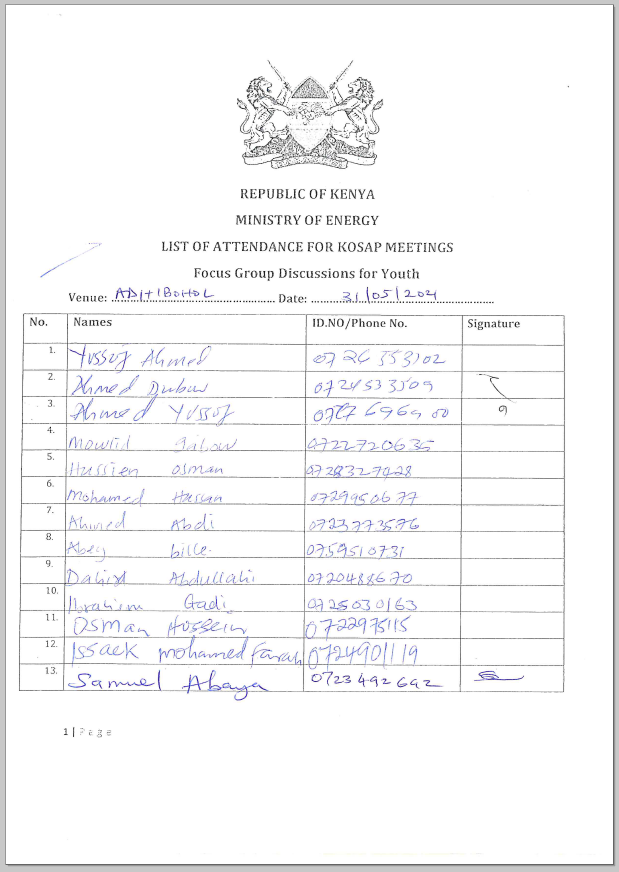












## APPENDIX 5 A-RAP

**ABBREVIATED RESETTLEMENT ACTION PLAN**

**(A-RAP)**

1. **Athibohol Sub-project Site**

The Athibohol sub-project site is on unregistered community land and held in trust by the County Government of Wajir 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 utilized by the community for small scale subsistence farming and grazing. Consultations leading to the identification and selection of the sub-project site are captured in the Environmental and Social Screening report for Athibohol. *Refer to Chapter 4 of the ESIA for the comprehensive socio-economic profile.*

1. **Actual Census Survey of PAPs and Valuation of Affected Assets**

The number of project-affected persons (PAPs) is 2,300 (approximately 350 households). The land acquisition-related impacts are loss of land and pasture. The land acquisition-related impacts are loss of land and pasture. Mitigation measures include in-kind compensation for loss of land and pasture, and designing power distribution lines to avoid impacting trees, crops, structures, and community facilities. No physical displacement is anticipated; however, there is minimal loss of pasture occasioned by the acquisition of land utilized by the community for grazing. The 0.940 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.*

1. 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 Athibohol community proposed solarization of the existing borehole, installation of an overhead steel tank and piping the water 1 km into the village .The value of the priority community project will be proportional to or higher than the value of land under acquisition. In addition, loss or damage to crops, trees, structures, and community facilities will be compensated in line with the provisions of the RPF, and as summarized in the entitlement matrix below.

**3.1 Entitlement Matrix**

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

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

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

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

Local administration and County Renewable Energy Officers (CREOs) supported the proponent and implementing agency (IA) to mobilize community members and other stakeholders for public consultations and engagement activities. National and county government entities, community segments (men, women, youth, elders, persons with disability, vulnerable and marginalized groups, etc.), NGOs, and local leaders were engaged through key informant interviews, community meetings, and focus-group discussions. The proponent and IA implemented appropriate measures to ensure PAPs effectively participated in the consultations. *Refer to Chapter 5 of the ESIA on public consultation and engagement.*

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

**4.2 Identification of Community Representatives**

The Athibohol 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 7 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.

* 1. **Summary of Consultations on Land Acquisition and Compensation Options**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date** | **Objective** | **Implementing**  **Entities** | **Land Acquisition and Compensation Aspects**  **Discussed** | **Key Issues Raised** | **Responses**  **Given** |
| May 31st 2021 | Environmental and Social Screening.  Voluntary land donation (VLD).  Constitution of the Locational Grievance Redress Committee (GRC). | Ministry of Energy (MoE)  Kenya Power (KPLC)  Rural Electrification and Renewable Energy Corporation (REREC) | Site identification and land allocation for the sub-project.  Criteria for VLD.  Community entitlements (forms of compensation and implications for each). | None | None |
| October 20th 2021 | 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. | The community proposed solarization of the existing borehole, installation of an overhead steel tank and piping the water 1 km into the village . | The proponent has set aside KES 1 million to implement the priority in-kind compensation project.  The value of the project will be proportional to or greater than the value of land.  NLC will determine the value of land. |
| May 2023 | Compulsory Land Acquisition. | NLC | Site inspection and inquiries.  Land valuation.  Award of compensation. |  |  |

5. Institutional Responsibility for Implementation of the ARAP

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

6. Procedures for Grievance Redress

The Project procedures for grievance redress were established through a public consultation process and informed by the existing conflict resolution structures in the community. The Grievance Redress Mechanism (GRM) comprises tiers at the project, county, and national levels. *Refer to Chapter 7 of the ESIA for a detailed GRM.*

7. Implementation Timetable and Budget for the ARAP Implementation

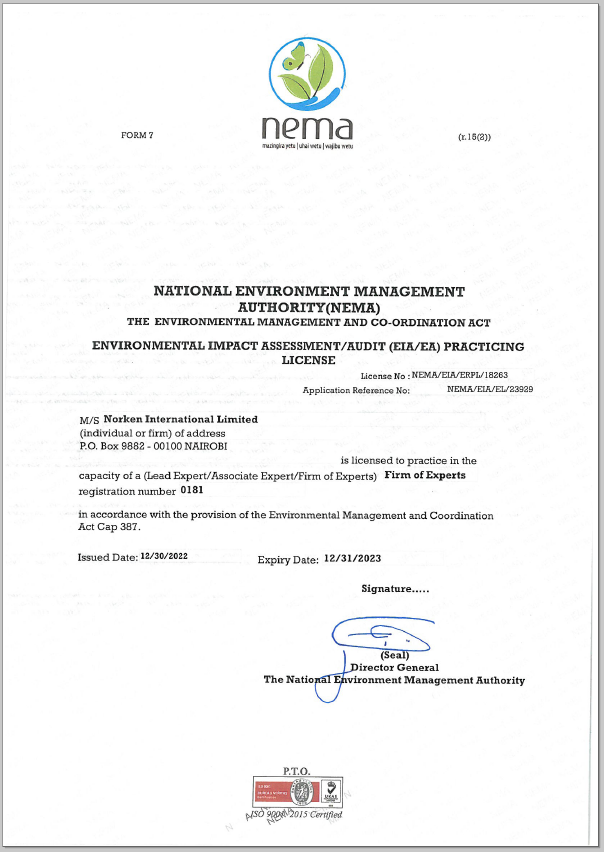
**7.1 Timelines**

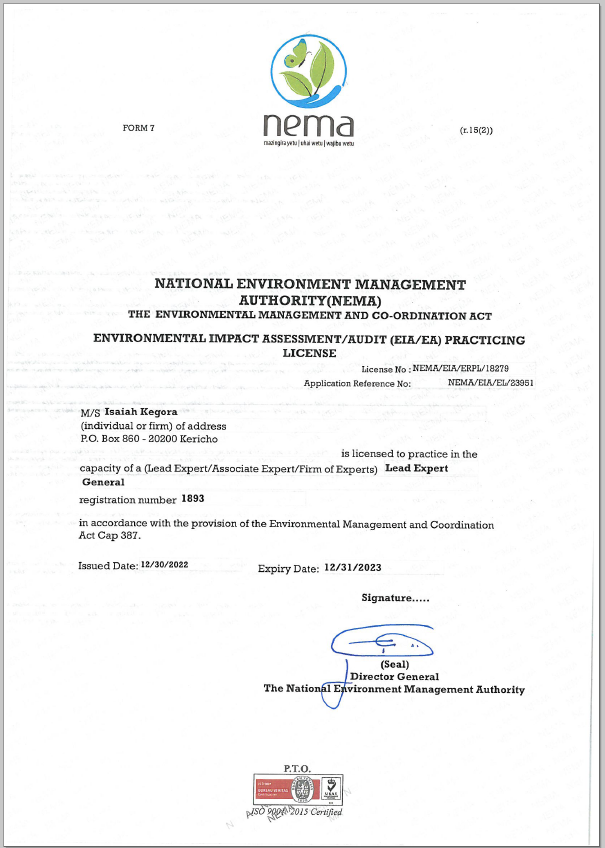
The proponent will commission the community project by May 25th, 2025, before operationalizing the mini-grid. The mini-grid contractor will implement the mini-grid and the community project simultaneously. The Supervision Consultant and IAs will implement a commitment register to ensure the mini-grid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

**7.2 Budget**

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

## APPENDIX 6 – NEMA LICENSES





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