MINISTRY OF ENERGY
Nairobi
Republic of Kenya

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

COMPREHENSIVE PROJECT REPORT (CPR) FOR THE PROPOSED DIRDIMA OFF-GRID SOLAR PROJECT AT COORDINATES 3°20'50.0"N 39°11'40.1"E

Rev	Description	Date
1	Final Draft	2023

CERTIFICATION

This ESIA project report for the proposed Dirdima Off-Grid Solar Project was prepared in accordance with the Environmental Management and Coordination Act (EMCA), 1999 and the Environmental (Impact Assessment and Audit) regulations, 2003 and their subsequent amendments 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.

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Disclaimer:
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.

ACKNOWLEDGMENT

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LIST OF ACRONYMS

ACRONYM	DEFINITION
ADR	Alternative Dispute Resolution
AoI	Area of Influence
CBOs	Community Based Organizations
CoK	Constitution of Kenya
CDI	County Development Index
CEMP	Construction Environmental Management Plan
CGRCs	County Grievance Redress Committees
CRA	Commission on Revenue Allocation
CSR	Customer Social Responsibility
CIDP	County Integrated Development Plan
CPS	Country Partnerships Strategy
DOSHS	Directorate of Occupational Safety and Health Services
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EPRA	Energy Petroleum Regulatory Authority
EPT	Energy and Petroleum Tribunal
EPRA	Energy and Petroleum Regulatory Authority
ESI	Electrical Supply Industry
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management Systems
EMCA	Environmental Management and Coordination Act
EMF	Electromagnetic Field
FGD	Focus Group Discussions
GDC	Geothermal Development Company
GoK	Government of Kenya
HDPE	High Density Poly Ethylene
IAs	Implementing Agencies
IPPs	Independent Power Procedures
IPs	Indigenous Peoples
JV	Joint Venture
KETRACO	Kenya Electricity Transmission Company
KII	Key Informant Interviews
KOSAP	Kenya Off-Grid Solar Access Project
KPLC	Kenya Power and Lighting Company
LEP	Labour and Employment Plan
LGRCs	Local Grievance Redress committee
MGs	Mini Grids
MOE	Ministry of Energy

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

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EXECUTIVE SUMMARY

E.1 Context Setting

The 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 Marsabit County, one of the target counties, the Proponent is proposing to develop 15 No. mini grid facilities including Dirdima 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 Dirdima 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 Dirdima 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 Dirdima village, Golbo ward, Moyale sub-county, is predominantly covered with shallow and stony soils, along with rock outcrops and clay loam. Flatter regions host scattered shrubs, while the presence of steeper slopes in the plains of Galgallo, Bure Dera, Milgis, and parts of the slope of Mt. Marsabit and Sololo Aljara hills. Classified as Ecological Zone IV (Woodland, Semi-Arid), the area experiences semi-arid conditions with medium potential and has become a hub for sedentarized agro-pastoral activities. Floods are a recurring concern in the area, leading to damage of water and sanitation facilities, disruptions in health facilities, and the delivery of quality healthcare services. Furthermore, siltation of dams and pans during flooding seasons presents a costly challenge. Disrupted road communication during flooding events also results in an increased cost of living for the local communities.

Groundwater resources were identified through site assessments, involving observations and data from a hydrological model. A borehole at the site indicated the presence of underground water; however, it was found to be slightly salty. The region is predominantly dominated by Acacia spp (including acacia xanthophloea, Acacia carneorum, caenothus leucodermis, and Commiphora spp) along with Balanites aegyptiaca and Salvadora persica. The area serves as an important foraging ground for various wild bird species such as ostriches, guinea fowls, hummingbirds, and more, owing to its high productivity and efficient nutrient cycles.

E-6 Project Description

The Dirdima Mini Grid project aims to provide electricity to approximately 85 residential and 3 non-residential consumers in Dirdima Village, Golbo ward, Marsabit County.

The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity. A 3.32km Low Voltage Power Distribution Network will be established to distribute the power to customers. The project utilizes solar panels with a total capacity of 30 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 75kWh 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 25 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, a 30 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 241,401 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 Dirdima Mini Grid approximately 1.41 hectares of land will be acquired from the community in line with the national laws and World Bank provisions. In accordance with the World Bank's Operation Policy (OP) 4.12 on Involuntary Resettlement, an abbreviated Resettlement Action Plan (A-RAP) was prepared, outlining the principles and procedures for land acquisition and compensation. This plan is annexed to this ESIA.

E-7 Project Alternatives

Solar energy is identified as a non-polluting and site-specific option, and the proposed site for Dirdima 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 neighbouring countries are considered as alternative methods of power generation but are found to have limitations or environmental concerns. Solar energy is favoured due to its low production costs, versatility, clean nature, and economic savings. The "No Project" alternative is deemed unfavourable as it would maintain the current lack of electricity access and hinder socio-economic development. The project will be constructed using modern materials and technology, with a focus on public health, safety, security, and environmental requirements. The technology will involve a Battery Energy Storage System.

E-8 Stakeholder Engagement

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

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

During the ESIA stakeholder engagement public meeting, which took place on January 19, 2022, a total of 25 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 projects identified and raised include installation of water storage tanks with trough and repair pipes at Dirdima borehole, fencing of the Dispensary to improve security and the construction of school fence and administration block with kitchen and staff quarters was also proposed. 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.

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

Table 0-1: Summary of Pre-construction, Construction, Operations and Decommissioning Impacts

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

Summary of Pre-construction Impacts		
Impact	**Significance Of Impact (Pre-Mitigation)**	**Residual Impacts (Post-Mitigation)**
Risk of communicable diseases	Minor	Minor
Increased water demand	Negligible	Negligible
Forced labor	Minor	Negligible
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 beneficiaries	Moderate	Minor
Risks related to poor and inadequate stakeholder engagement (conflict)	Minor	Negligible

E-10 Environmental and Social Management and Monitoring Plan

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

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

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

For the mitigation measures to be successful, it is imperative that the Rural Electrification and Renewable Energy Corporation (REREC) allocates sufficient resources for the implementation of the ESMMP. Adequate resources will enable the proper execution of the proposed measures and ensure their effectiveness in minimizing the identified negative impacts.

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

E- 11 Conclusion

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

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

1 INTRODUCTION

The national economic growth for Kenya is on upward trajectory as exemplified by the economic performance during the first quarter of 2009 that recorded an economic growth of 3.6%. It was anticipated that the economic growth pattern will surpass the economic growth pattern witnessed before December 2007 of 7.1% as the country gears towards the realization of vision 2030. Significant effects of this growth are notable in agriculture, tourism and construction among others. Considering that electricity demand is derived demand that is heavily influenced by the economic performance of the country, there is need to plan for sufficient electricity capacity additions to meet the growth aspirations of the Vision 2030.

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

The World Bank's (WB) Country Partnerships Strategy (CPS) for Kenya (2014-18) also recognizes the access to basic electricity, as a key developmental issue. The Strategy sets at improving core infrastructure as one of the Projects the WB will be engaged in. It also emphasizes the importance of mobilizing concessional funding to expand the sector including electricity generation, transmission, and distribution to meet the Government's economic growth targets.

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

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

1.2 Context

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

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

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

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

The project components are:

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

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

1.3 Project Overview

The project is located approximately 38km west of Moyale town in Dirdima village, Golbo Ward in Moyale sub county, Marsabit County at coordinates of Latitude of **3°20'50"N** and **Longitude 39°11'40 E**. The proposed solar mini grid will be located on 1.41-hectare piece of unregistered community land. The solar mini grid will contain Solar panels, batteries, invertors, perimeter fence and length of transmission line to cover a circuit distance of approximately 2.26 km.

Figure 1. Map showing the proposed site

1.4 Purpose and Scope of Work

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

1.5 ESIA Methodology

1Screening and Scoping

Screening Methodology

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

The below steps were followed.

Kick-off Meeting

Norken and Centric team had a brief kick-off meeting with the Proponent to discuss the scope of projects followed by subsequent online meetings and discussion on various aspects of the project. The meetings addressed various 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.

Desk based review and baseline assessment

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

1.5.11 Project Description

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

1.5.12 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 solar project.

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 in respect to the project

1.5.13 Impact Assessment Prediction

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

Socio-cultural risks linked to Component 1 of KOSAP were identified during the assessment. These include, Labour influx, Gender Based Violence, Sexual Exploitation and Abuse, workplace Sexual Harassment, Spread of HIV/AIDS, STDs & other communicable diseases, Gender biases and

inequality exclusion of vulnerable and marginalized groups (VMGs) and vulnerable individuals and households from accessing project decision making and governance structures, engagement processes, opportunities, and benefits. The vulnerable individuals and households will include the poor, elderly persons, PWDs, the sick, poor women, poor single mothers, child-headed households. The VMG's include ethnic minority communities that are present in Dirdima area.

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

1.5.14 Environmental and Social Management Plan (ESMP)

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

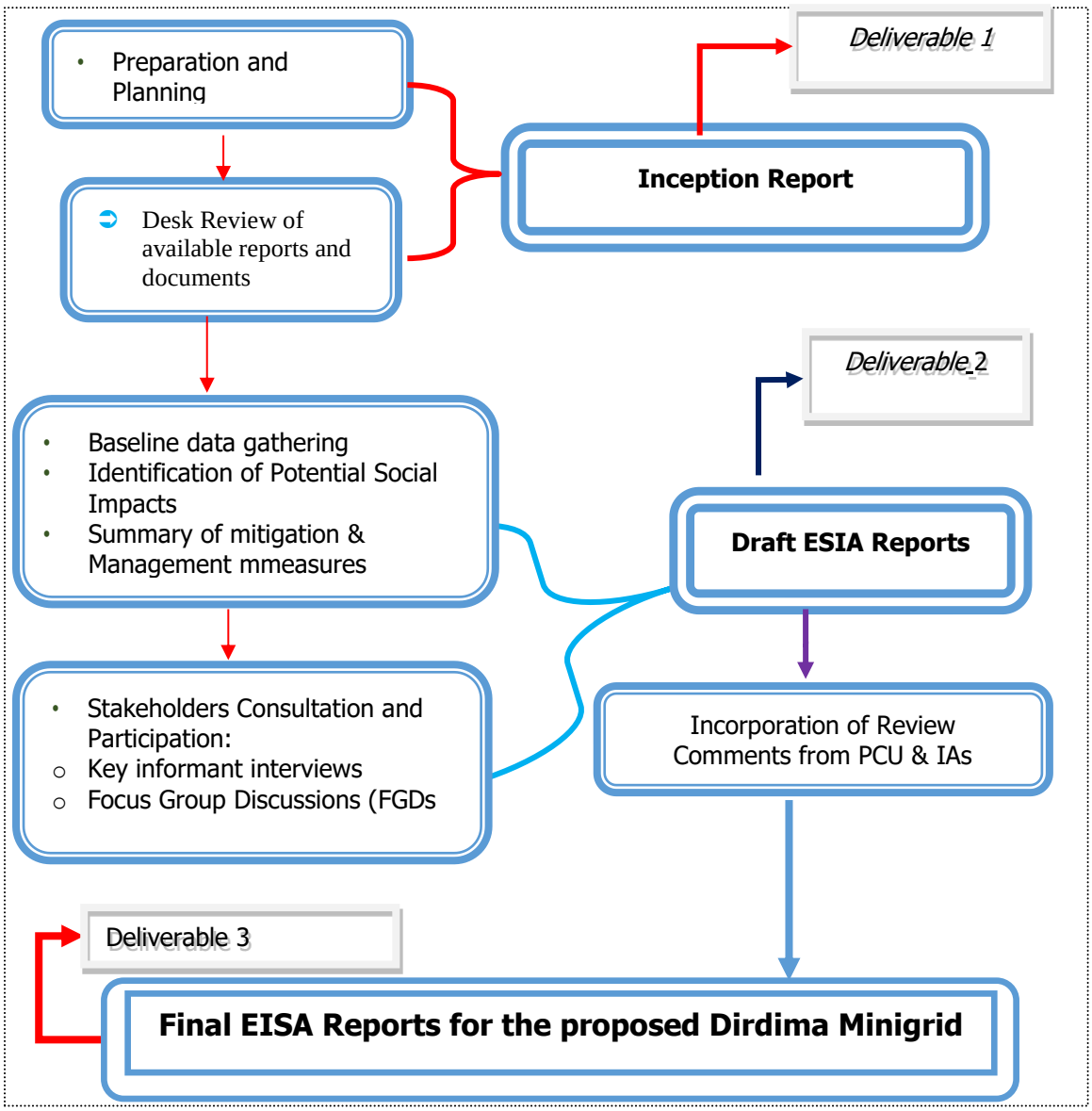
The ESMMP has a detailed arrangement of responsibilities for managing and monitoring the implementation of mitigation measures and the impacts of the project during construction, operation, and decommissioning. This include: a description of monitoring methodology, specific operations, and features to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

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

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

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

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



1.6 Study Team

This EIA study was conducted by a team of experts that comprised the following professionals**; -**

S/No	Names	Position
1	Irene Mate	Senior Environmentalist-REREC
2	Hottensia Kabuki	Associate Expert, Environmental and Social specialist- Centric Africa Ltd
3	Lucy Bii	Environmental Expert- Centric Africa Ltd
4	Dickson Alubala	Environment, Health and Safety Specialist- Centric Africa Ltd
1.	Said Luba	Environmental Expert- Centric Africa Ltd.

1.7 Limitations

The limitations of experienced during the study are illustrated below.

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

1.8 Layout of the Report

Table 2: Structure of the ESIA Report

SECTION	TITLE	DESCRIPTION
Section 1	Introduction	(*This section*) Introduction to the Project and ESIA scope and methodology adopted.
Section 2	Project Description	Technical description of the Project & related infrastructure and activities.
Section 3	Environmental, Ecology and Social Baseline	Outlines Environmental, Ecology and Social Baseline status in the study area of the Project
Section 4	Applicable Legal and Regulatory Framework	Discusses the applicable environmental and social regulatory framework and its relevance for the Project. (The world bank safeguards and EMCA and environmental regulations)
Section 5	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 Plan	Outline of the ESMP considering 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.

2.2 Introduction

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

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

Table 3. Component of the proposed Solar Mini-grid

S/NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project is located 38km North west of Moyale town in Dirdima village, Golbo Ward, Moyale subcounty in Marsabit County on 1.41 hectares of unregistered community land. Geographically, the site is located within Latitude 3°20'50.0"N and Longitude 39°11'40'.3"E,at altitude of 689 metres above the sea level. The area surrounded by women groups overhead raised water tanks, open fields ,the Mosque and household are to the south. The Borehole is to the western side just along the road.
2.	Land Size/Tenure	The proposed solar mini grid will be located on approximately 1.41 Hectares. This piece of land is undeveloped.
3.	Minigrid Power	- Minimum PV Inverter of 30kw; 75kWh Battery; 25kVA backup generator
4.	Distribution line	LV Circuit of 3.32km
5.	Target Consumers	(85 Residential and 3 Non-Residential)
6.	Climatic condition	The project area is generally hot with temperatures varying from 20^0C to 36^0C. The project area is fairly hot between September and March, while the months of June to July have the lowest temperatures averaging 24^0C. Moyale and Sololo towns are the wettest points in the district, these areas receive much rains due to proximity to the Ethiopian Highlands. The rainfall ranges between 500mm to 700mm
8.	Site Conditions	The side is generally in open area with minimal and scarce *fauna* and *flora*.
9.	Road Accessibility	Earth road from Dirdima junction is approximately 30km
10.	Nearest Airport	Moyale Airstrip 38km
11.	River/canal/nallah/ pond present in project footprint	No rivers or canals present in the village
12.	Protected areas (National Park/ Sanctuary)/ Forest land within 10 kms	None

2.3 Project Location

The project site is located in Dirdima village near Dirdima primary school in Golbo Ward, Moyale sub county in Marsabit County at coordinates of 3°20'50"N and Longitude 39°11'40 E". The proposed power plant will be constructed on approximately 1.41hectares piece of an unregistered community land.

The site soil is primarily black cotton soil within the area. The project site is approximately 30km North West of Moyale town.

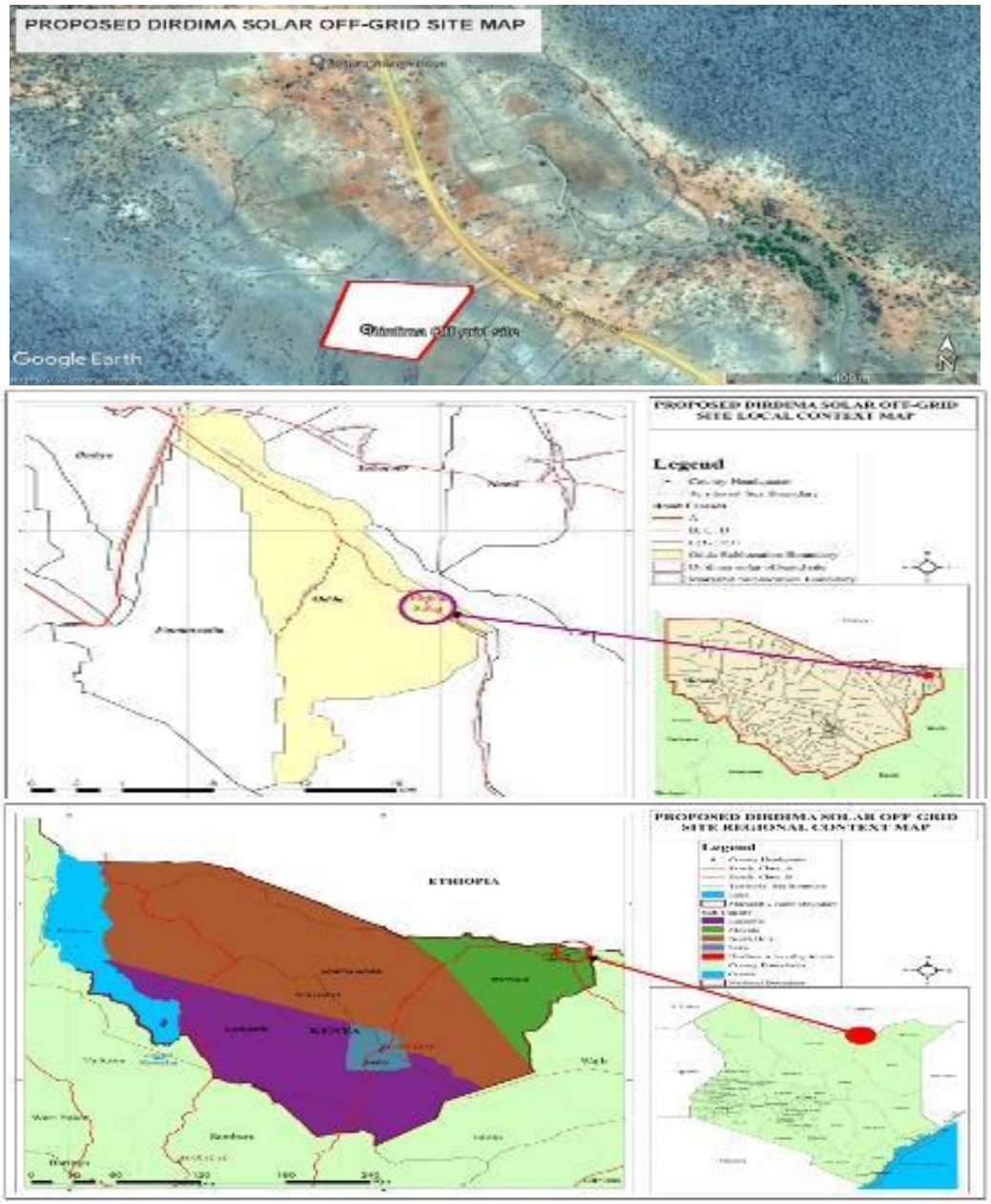


Figure 2: Project location in local and regional content

2.3.1 Project site setting

The proposed Dirdima mini grid is in Marsabit County. It falls under cluster 3 with a total of 15 minigrids and lot 2 which has a total of 48 mini-grids. Geographically, Dirdima site falls on coordinates latitude of 3°20'50"N and Longitude 39°11'40"E.

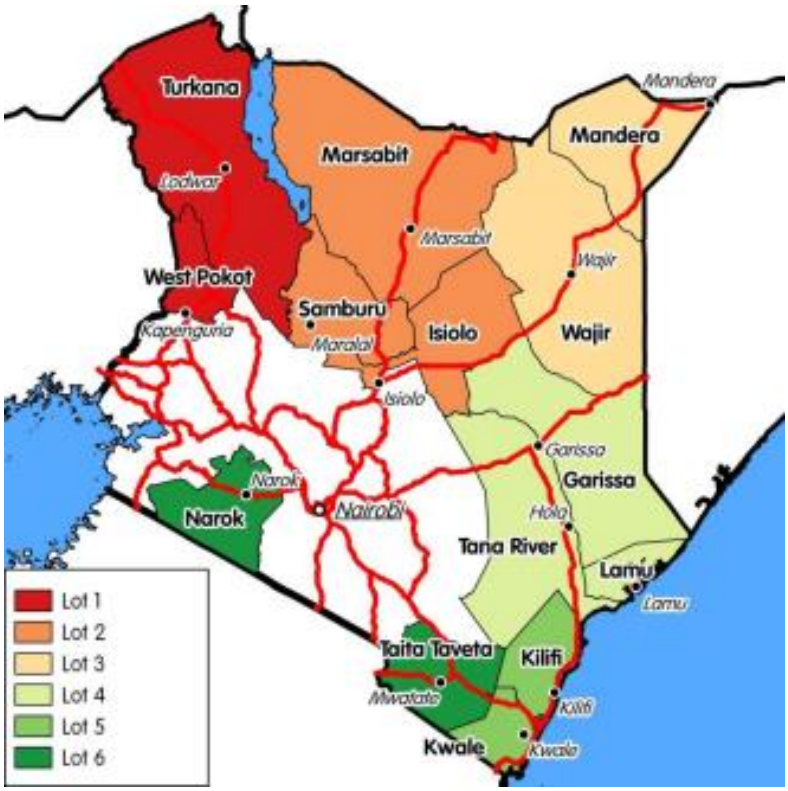


Figure 3: Map Showing the KOSAP Counties Lot 2

2.4 Land Requirement and Procurement Process

Land Requirement

Land is a primary factor of production in the economy and has aesthetic, cultural and traditional values. Land types in the Marsabit County are broadly classified as game reserve, townships, agriculture and grazing lands, with largest proportion under communal grazing areas. The land on which the proposed Dirdima mini-grid will be constructed covers approximately 1.41 Hectares.

Land Tenure

Due to the absence of the national land use policy and spatial plan has encouraged the proliferation of informal settlement, inadequate infrastructure services, congestion, environmental degradation, unplanned urban centres, pressure on agriculture and grazing land and inter- tribal conflicts among others.

The entire county is categorized as community land in Dirdima, the site falls on Unregistered Community land.

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

Compensation Details

Compensation for the land for the proposed project will be in kind for the land identified. The main key areas for development activities identified by the Dirdima community are:

1. Installation of water storage tanks with trough and repair pipes at Dirdima borehole.
2. Fencing of the Dispensary to improve security.
3. The construction of school fence and administration block with kitchen and staff quarters was also proposed.

2.5 Project description and alternatives

Name	Residential	Non-residential	LV Circuit (km)	Peak demand (kw)	Generation output (kw)	PV(DC-KWp)	Batteries	Generator (kva)	Generator Fuel Tank (L)	Cost (USD
Dirdima	85	3	3.32	18	30	30	75	25	2000	241,401

2.5.1 Project Components

- **Solar Photovoltaic Panels**: The project utilizes solar panels with a total capacity of 30 kWp to harness solar energy. Solar power is a clean and renewable energy source that will provide a significant portion of the electricity needed for the project.
- **Battery Energy Storage System**: A 75 kWh Battery Energy Storage System is incorporated to store excess solar energy during the day, ensuring a consistent power supply even during cloudy or nighttime conditions.
- **Diesel Generator:** A 25 kVA diesel generator is included to serve as a backup power source for periods of low solar generation or in case of battery depletion. It provides reliability and backup in the event of extended periods of cloudy weather or high demand.
- **Fuel Tank for Diesel Generator**: A 2,000-liter fuel tank is provided to store diesel fuel for the generator, ensuring continuous operation during extended periods of low solar or high demand.
- **Inverters and Chargers:**

  PV Inverter: A 30kW 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 25 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.
- **Low Voltage Power Distribution Network:**

  A 3.32-kilometer Low Voltage (LV) power distribution network is established to distribute the generated electricity to the residential and nonresidential consumers. The LV network is designed to efficiently transmit power while minimizing losses, ensuring a stable supply to the customers.

- **Project Metrics:**

  Monthly Energy Demand: The project is expected to meet a total monthly energy demand of 2,900 kWh.

  Daily Energy Demand: The average daily energy demand is approximately 97 kWh, ensuring a consistent supply for the consumers.

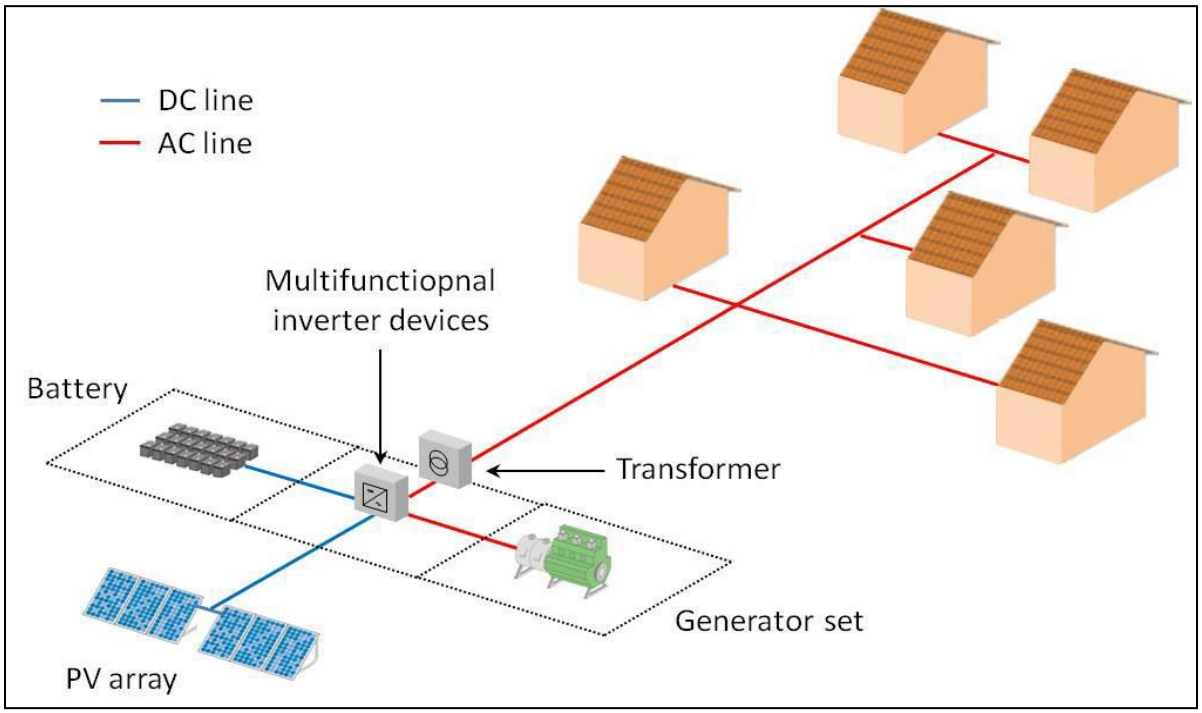
  Peak Demand: The peak demand of the system is 18 kW, which is the maximum power requirement during any given moment.

- **PV Capacity**: The solar photovoltaic panels have a total capacity of 30 kWp.

- **Estimated Project Cost:** The estimated cost of the Dirdima Mini Grid project is approximately USD 241,401. It's important to note that this cost may be subject to change as more detailed plans and implementation phases are developed. The investment is expected to provide long-term benefits to the local community, improving their quality of life, economic opportunities, and access to modern amenities.

Figure 4 below illustrates a sketch of the proposed design as it will be set up at the proposed project site. In addition to this Design architecture, the project site shall have an Office that shall also have a Control Room adjacent as well as a guard house. The guard shall be constructed using Concrete and Masonry works whereas the Control room and Office can also be a containerized facility.

Figure 4: Illustration sketch of the proposed design of the proposed project



2.5.1.1 Solar PV modules

The project will use PV Array (DC-kW) 70 polycrystalline silicon module with three strings connected in series. Each string will have five sets of panels connected in series, with output converged at the six-way combiners. The life expectancy of the PV modules is estimated at 25-30 years.

2.5.1.2 Battery Energy Storage System

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

2.5 1.3 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.

2.5.1.4 PV and Battery Inverter Charger

PV Inverter: A 30 kWp solar PV inverter will be 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 25 kW battery inverter charger will be employed to manage the energy flow to and from the battery storage system. The inverter charger ensures efficient charging and discharging of the battery, maximizing the system's overall performance.

2.5.1.5 Distribution lines

The site will have a distribution line circuit of 3.32km 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 earthling will be as per KPLC requirements/specifications.

2.5.2 Project Phases and Activities

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

2.5.2.1 Construction Procedures

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

The project inputs will include the following.

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

Construction activities will include the following:

- Contractor mobilization.

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

2.6 Construction, Operations and Maintenance

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

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

2.7 Land Tenure

Land ownership in Marsabit County is mainly community land, trust land and private land. The land for the proposed site is on communal land. The community has since identified the land to the project proponent establishment of the proposed project which will be acquired compulsorily by NLC.

2.6.1 Compensation Details

Compensation for the land for the proposed project will be in kind; the Proponent will undertake the community proposed projects as requested.

2.8 Analysis Of Alternatives

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

The alternative consists of the proponent's/applicant's final proposal with the inclusion of the legal guidelines, regulations and procedures as stipulated in the EMCA, 1999 which aims at reducing environmental impacts to the maximum extent practicable. This section analyses the project alternatives in terms of site and technology options.

2.8.11Site Selection

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

The proponent identified one location for the proposed solar project, which located 500km from Dirdima Primary school. The proposed site is undeveloped with scares acacia trees. The site was identified based on the location of settlement areas, commercial/ public facilities in Dirdima village. The site is within 800m to the shopping center and at a central location to the settlement areas within Dirdima.

This site selection process considered the following criteria.

- The availability and accessibility of primary resources required for the operation of the power plant, such as sun (i.e. the required Direct Normal Insolation) and water;
- No settlement present in the project site;
- General environmental acceptability in terms of social impacts, water utilization, general Ecology, etc.
- The project site land is predominantly unregistered community land;
- The land is unoccupied and does not have any ecological sensitive receptor such as national parks, Wildlife Sanctuary
- No cultural property of archeological importance.

2.9 Resource Requirement

2.9.11 Workforce Requirement

Approximately 30 skilled, semi-skilled and unskilled Labour's will be required at the construction stage. During the operation phase, the following personnel will be required; one operations and maintenance head, 2 engineers and 5 technicians.

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

2.9.12 Water Requirement and Source

Construction Phase

It has been estimated that approximately 50,000 liters of water will be required per day for civil works during construction stage. Further, water will be required for workers at project site. However, this quantity of water requirement will vary depending upon the mobilization of construction workers at site. The water for the construction phase will be sourced from the Borehole within the village.

Operation Phase

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

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

2.9.13 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 appropriate sources within or outside the country.

Operation Phase

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

2.9.14 Power Requirement

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

2.9.15 Fire Safety and Security

Construction Phase

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

Operation Phase

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

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

2.10 Analysis of Alternative

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

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

2.10.1 Alternate Sources of Energy

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

The possible alternatives to solar energy include;

- Wind power: shortfalls associated with wind power includes; lack of time series data of wind, trained human resources to intricate design of wind power etc, providing wind power for Dirdima residents is technically and financially challenging, expensive to install, dependent on wind pattern (not strong in Dirdima). However, generation is cheap, low emissions & insignificant pollution levels.
- Thermal power: High fossil consumption, high emissions levels, high water consumption

levels (water highly scarce in Dirdima). Besides coal and petroleum products used in thermal power processing are not readily available within Dirdima area and may have to be sourced from far locations. Therefore, thermal power option based on coal and petroleum products is not a viable option for Dirdima. It however has high distribution and large-scale production potential

- Nuclear power: disadvantages include; use of other fuel sources, has hazards associated with radioactive materials, expensive disposal of waste, high cost of project and long gestation period. The mode however does not emit smoke particles, low fuel cost, low emission levels and continuous electricity production.
- Wood fuel/ Firewood: The use of firewood and solid waste for electricity generation using thermal technology is another option. But the issue of air pollution and destruction of vegetative cover through firewood harvesting and charcoal burning already are environmental problems of serious concern which will further aggravate the natural environment. For these reasons, the wood fuel options evaluated above seem inappropriate for Dirdima on environmental as well as economic grounds

Solar energy was a desirable option because:

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

2.10.2Zero or No Project Alternative

The No Project option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. This option will, however, involve several losses both to Dirdima area 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:

- Increased poverty in the area.
- No employment opportunities will be created for thousands of Kenyans who will work in the project
- There will be no added values to the proposed project site.
- Lack of attempts to achieve Vision 2030, working toward clean energy production.
- There will be no added value to other developments in the neighborhood.
- The proponent will not benefit from the revenue expected from the solar power facility.
- The government kitty will not benefit from the revenue to be earned due to the establishment of the proposed solar project.
- The economic status of the Kenyans and the local people would remain unchanged.
- The local skills would remain under-utilized.

- Reduced interaction both at local, national and international levels.
- No Development of infrastructural facilities (roads, electrical etc.).

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

2.10.3 Analysis of Alternative Construction Materials and Technology

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

2.10.4 Conclusion

The proposed project should be upheld to support the local community based on the positive socio-economic and environmental benefits that will accrue because of the proposed development.

3.2 Study Area

The site is in question is located In Dirdima village, Golbo ward in, Moyale Sub-County. Based on the secondary information of the region, the following baseline information on environment, ecology and social has been discussed under the sections below.

3.3 Environment Baseline

3.3.1 Geology and Soil

The area is generally covered with soils that are shallow and stony with rock outcrops as well as clay loam. The flatter areas are covered by scattered shrubs. The zone consists of the plains of Galgallo, Bure Dera, Milgis and parts of the slope of Mt Marsabit and Sololo Aljara hills. These areas are characterized by steeper slopes, which may favour greater surface runoff and hence may experience greater sheet wash erosion.

Plate 1. Showing a team excavating soil from the proposed site

3.3.2 Topography

The zone includes parts of Mt. Marsabit above 1500m and Mt.Kulal above 1700m which supports dense evergreen forests. It's an important water catchment area covering an area of just about one percent of the county. The Ecological Zone IV (Woodland, Semi-Arid) is semi-arid with medium potential. The zone has become an area of sedentarized agro-pastoral activities. It constitutes the lower slopes of Mt Marsabit, the middle slopes of Mt Kulal and the top of Huri hills. Also included are areas of Sololo and Moyale. The Ecological Zone V (Bushland – Arid) includes the lower slopes of volcanic and basement piles lying between 700 and 1000m.

3.3.3 Hydrogeology and Drainage

The area is prone of flooding this causes damage to water and sanitation facilities, damage to health facilities leading to disruption of the delivery of quality health care services. Siltation of dams and pans along the project area during the flooding season shows that siltation is an expensive problem than can be shown. Disruption of road communication during flooding events result in increased cost of living.

3.3.4 Ground Water Development

The ground water resources were majorly identified during the site assessment by means of observation and selected data hydrological model of the area. The site has a borehole indicating

presence of underground water however, the water is slightly salty.

3.4 Ecological Conditions

The proposed project area and Moyale Sub County at large is endowed with a variety of flora and fauna species. The area is dominated by Acacia spps (including *acacia xanthophloea, Acacia carneorum, caenothus leucodermis* and *Commiphora Spps*, *Balanites aegyptiaca, Salvadora persica*). Wild birds such as ostriches, guinea fowls, humming birds and several others use the flood plain as their foraging grounds as it is an area of high productivity and more efficient nutrient cycles.

Plate 2. View of site locality with some of the flora and fauna present

3.5 Climatic Conditions

The project area is generally hot with temperatures varying from 20^0C to 36^0C. The project area is fairly hot between September and March, while the months of June to July have the lowest temperatures averaging 24^0C. Moyale and Sololo towns are the wettest points in the district, these areas receive much rains due to proximity to the Ethiopian Highlands.

This low rainfall in most of the parts of the sub-county coupled with high vapor-transpiration rates reduces crop productivity thus making the sub-county vulnerable to drought leading to reliance on relief food throughout the year. However, high potential areas like Moyale-Sololo escarpment receive about 700mm of rainfall. This is sufficient to support appropriate agricultural activities in the respective areas. On average rainfall is less than 50mm and is unreliable making Moyale sub-county one of the dry regions in Kenya.

3.6 Socio-economic Environment

3.6.1 Demographic Profile

Dirdima village is in Golbo ward, Moyale Subcounty in Marsabit County. It is located 38 km from Moyale town. The top community development priorities as presented in the community profile are installation of water storage tanks, provision of water throughs for livestock and repairs of community water pipes respectively. The village houses in the community mainly iron sheet roofed but a few of them are thatched and/or polythene covered manyattas. The community support mechanism includes Hunger safety net, emergency relief food/feed (for livestock and human). The area is dominated with Sakuye clan and. Islam is the dominant religion. Below is a summary of demographic profile of Dirdima.

Plate 3. Some of the household at Dirdima Village.

Attribute	Magnitude/Number
Approx. population	1500
Households	120
Gender.	Male – 60% Female – 40%
Ave. No. per household	7per household
Indigenous	Indigenous- 00% Settlers – 20%
Vulnerable classes	Elderly, PLWDs
Dominant ethnic group	Sakuye
Primary religion	Islam
Other groups	-
Employment (formal/Informal)	Formal – Less than 1% Informal – 99%

Table 4. Demographic profile of Dirdima

3.6.2 Socio-economic status of Study Area

3.6.2.1 Demographic Profile

The information shared on community profile by the area chief (Dirdima location) showed that Dirdima has a population of approximately 1500 and with an estimated number of households to be 120 with an average of 7 people. Dirdima has a gender ration that is currently estimated to be about 60% male and 40% female.

3.6.2.2 Educational Infrastructure

The village has only one primary school Dirdima Primary School located at the westside of the site along Moyale –Wajir road. The school has 221 pupils (49% Boys and 51% Girls) with 7 teachers; registered by Teachers Service Commission The school completion rate among the boys is approximately (89) while that of the girls is at (70%). Most pupils drop out at class 8 or Form 4 mainly due to lack of school fees, child labor (Taking care of livestock) early pregnancy and marriages for girls. Most pupils who attend the school travel as far as 3km (Misa area) and within the Dirdima area.

3.6.2.3 Occupation and Livelihood Profile

Dirdima community is mainly pastoralists moving with livestock in search of pasture and water. Major livestock kept are camel, cattle, sheep, goats, and local chicken. The community relies on livestock products for food at the household level and for income generation. Formal employment is <2%. Other sources of income in the society include sale of wood fuel/charcoal and firewood, building materials, retail shops and eateries. The community do not practice crop production due to the aridity of the area.

Plate 4. A sack of charcoal for sale along the road.

3.6.2.4 Land Use

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

Plate 5. Borehole within the settlement

3.6.2.5 Health facilities

Dirdima has only one public health dispensary with one male nurse. Main service provided is Outpatient services. The facility lacks tap water, electricity, beds, adequate maternity facility and other basic equipment.

3.6.3 Social and Physical Infrastructure

Water: Dirdima Village has one borehole for water to supply the community through a common water point as shown below. This borehole is located within the settlement

Sanitation: Private toilet facilities are provided in the school, dispensary, Mosque and few households within the area. Each household has a toilet on lock and key has a way of waste management, though others still practice open defecation (OP) leading into poor waste management.

Road Network: Roads connectivity within the area is also poor and not regularly maintained. The main forms of transport within the area are Motor bikes, Matatus to Moyale, While donkeys and Camels are used to transport goods from one place to another.

Mobile Network Coverage: Safaricom Network coverage within the village and few people can access internet services.

Power/electricity: - The area is not connected to the main Kenya Power and lighting line.

The population use mainly portable solar at the household for charging mobiles and lighting.

4. POLICY, LEGAL AND REGULATORY FRAMEWORK

4.3 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.

4.4 Kenya Policy Provisions

4.4.1 Kenya Energy Policy, 2014

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

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

The Policy strategizes the need to:

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

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

Table 5. Kenya power stakeholders and their roles

Stakeholders	Role
Kenya Power Company	Responsible for distribution and retail supply of electrical energy to end users. Kenya Power purchases power in bulk from the Kenya Electricity Generating Company Limited (KenGen) and the Independent Power Producers (IPPs) through bilateral contracts or Power Purchase Agreements (PPAs) approved by the Energy Regulatory Commission (ERC) (1).
The Energy and Petroleum Regulatory Authority (EPRA)	Established by the Energy Act of 2019. The EPRA's mandate extends beyond electricity and includes natural gas (including petroleum), renewables and all other forms of energy. The generation, transmission, distribution, supply, import and export of electricity can only be carried out by parties in possession of a license, or a permit issued by the EPRA. If the capacity involved is for own use and less than 1 MW, authorization is not required. Although the generated electricity is expected to be less than 1 MW (0.3 – 1 MW), the fact that the generated electricity is intended for use in a factory and there is a possibility for connection to the national grid and sale of excess power to the government, The project requires a license from the EPRC to generate electricity as stipulated in the Energy Act, 2019.
Ministry of Energy and Petroleum	Aims to facilitate provision of clean, sustainable, affordable, reliable, and secure energy services for national development while protecting the environment.
The Rural Electrification and Renewable Energy Corporation (REREC):	Is established under Section 43 of the Energy Act, 2019 as a corporate body. The Corporation is the successor to the Rural Electrification Authority established under section 66 of the Energy Act No. 12 of 2006 (now repealed) and subject to this Act, all rights, duties, obligations, assets and liabilities of the Rural Electrification Authority existing at the commencement of this Act is to be automatically and fully transferred to the Corporation and any reference to the Rural Electrification Authority in any contract or document shall, for all purposes, be deemed to be a reference to the Corporation.
The Geothermal Development Company (GDC):	Is a 100% state-owned company, formed by the Government of Kenya as a Special Purpose Vehicle to fast track the development of geothermal resources in the country. The creation of GDC was based on the government's policy on energy - Sessional paper No. 4 of 2004, and the energy Act No. 12 of 2006.

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

The Kenya Electricity Transmission Company (KETRACO):	Was incorporated on 2nd December 2008 and registered under the Companies Act, Cap 486 pursuant to Sessional paper No. 4 of 2004 on Energy. KETRACO's mandate is to design, construct, operate and maintain new high voltage electricity transmission infrastructure that will form the backbone of the National Transmission Grid, in line with Kenya Vision 2030.
Energy and Petroleum Tribunal (EPT):	The tribunal is established under section 25 of The Energy Act, 2019. The tribunal is established for the purpose of hearing and determining disputes and appeals in accordance with The Energy Act, 2019 or any other written law. In relation to the proposed Project, any disputes or appeals if they arise will need to be addressed by the EPT.

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

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

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

4.4.3 National Policy on Water Resources Management and Development, 1999

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

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

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

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

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

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

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

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

4.5 National Legal Framework

4.5.1 Administrative Framework

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

Table 6. Administrative stakeholders and their roles

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

4.6 Relevant statutes

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

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

Table 7: Policy and Legislative Framework

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
	NATIONAL POLICY FRAMEWORK		
1.	Vision 2030	Kenya Vision 2030 is the current national blueprint for development from its inception in 2008 until the milestone year of 2030. This plan is the national long-term development policy that aims to transform Kenya into a newly industrialised, middle-income country by 2030. The Vision is comprised of three key pillars (economic, social, and political), two of which are projected to be positively affected by project implementation.	Under Vision 2030, Energy is identified as one of the key sectors that form the foundation for socio-political and economic growth. Promoting equal opportunities across the entire Kenyan territory and enhancing access to competitively priced, reliable, quality, safe and sustainable energy is essential to the achievement of this vision.
2.	The Energy Policy, 2014	The Energy Policy sets out the national policies and strategies for the energy sector that align to the Constitution of Kenya and Kenya's Vision 2030. The Energy Policy envisages promoting an energy mix that includes solar energy at both the household/institutional levels as well as large-scale solar energy generation. The Government of Kenya has initiated and has been promoting programs for the provision of electricity to institutions far from the grid through solar PV systems. The Government has also embarked on a programme to provide solar/diesel and solar/wind hybrid generation capacity to off-grid stations. The Policy strategizes the need to: ✓ promote the widespread use of solar energy while enforcing existing regulations and standards. ✓ provide incentives to promote the local production and use of efficient solar systems. ✓ provide a framework for connecting electricity generated from solar energy to the national and isolated grids, through direct sale or net metering. ✓ promote the use of hybrid power generation systems involving solar and other energy sources; and ✓ facilitate the generation of electricity from solar energy by, among other things, funding, provision of land, fast-tracking issuance of permits and licenses, as well as acquisition of data and information to realize at least 100 MW from solar by 2017, 200 MW by 2022 and 500 MW by 2030.	

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		The Kenya Electricity Supply Industry (ESI) is one of the sub-sectors in the energy sector which the Ministry of Energy and Petroleum oversees on behalf of the Government of Kenya (GoK). Under the Energy Act of 2006, the Ministry is responsible for formulation and articulation of policies to provide an enabling environment for operators and other stakeholders in the energy sector. Relevant stakeholders in the ESI are briefly described below.	
3.	Policy paper on Environment and Development (Sessional Paper No. 6 of 1999)	The overall goal of this Sessional Paper is to ensure that environmental concerns are integrated into the national planning and management processes and provide guidelines for environmentally sustainable development. The objectives of the Paper are to conserve and manage the natural resources of Kenya including air, land, flora, and fauna and promote environmental conservation about soil fertility and conservation, biodiversity, to foster afforestation activities, and to protect water catchment areas. More importantly, the Policy emphasizes the enhancement of public awareness and appreciation of the essential linkages between development and environment, involving NGOs, private sector, and local communities in the management of natural resources and their living environment and ensures that an environmental impact assessment report is undertaken for all public and private projects and programmes.	The proposed solar plant facility must ensure that it promotes this integrated approach to environmental management and development, without compromising the livelihoods of the local community.
4.	National Policy on Water Resources Management and Development, 1999	While the National Policy on Water Resources Management and Development enhances a systematic development of water facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as wastewater. The Policy therefore calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution. This implies that industrial and business development activities should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating therefrom.	During construction, water will be required for concrete works and during the operational period water supply may be necessary for cleaning the PV modules. Appropriate water treatment and waste handling must be incorporated into the Project design to be in alignment with this policy
5.	Sessional Paper No. 10 of 2014 on the National Environmental Policy, 2014	The overall goal of this Session Paper is to ensure better quality of life for present and future generations through sustainable management and use of the environment and natural resources. This Session Paper calls for the use of environmentally sound technologies based on the best available techniques and policies as a way of minimizing negative impacts to the environment. Section 5.6 of this Session Paper focusses on infrastructure development and environment and makes explicit policy statements to ensure sustainable management and use of the environment and natural resources during the	In line with the above policy statements, this ESIA has been conducted for the proposed solar project (including the associated infrastructure) to ensure that environmental and social issues are appropriately addressed. Once approved by NEMA, the Project Proponent will also need to conduct periodic Environmental Audits to ensure continuous conformity with the overall goal of this Session Paper. In addition, this ESIA has considered analysis of alternatives

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		construction and operation of infrastructure developments. These policy statements require the commitment of the government to: ✓ Ensure Strategic Environmental Assessment (SEA), Environmental Impact Assessment, Social Impact Assessment and Public participation in the planning and approval of infrastructural projects. ✓ Develop and implement environmentally friendly national infrastructural development strategy and action plan. ✓ Ensure that periodic Environmental Audits are carried out for all infrastructural projects	including alternatives to technology to ensure that the best available and appropriate technology is used.
6.	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.
7.	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.
8.	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
9.	The National Energy and Petroleum Policy 2015	The overall objective of the energy and petroleum policy is to ensure affordable, competitive, sustainable, and reliable supply of energy to meet national and county development needs at least cost, while protecting and conserving the environment. This policy stipulates the transformation of the Rural Electrification Authority (REA) to Rural Electrification and Renewable Energy Corporation (REREC) to be the lead agency for development of renewable energy resources.	The policy is relevant to the project in the sense that the project will provide sustainable and reliable energy supply and measures will be put in place to protect and conserve the environment during its development. REREC will oversee the development of the mini grid and maintenance.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
10.	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
11.	The HIV/AIDS Policy 2009	In summary, the policy aims at: i. Establishing and promoting programmes to ensure non-discrimination and non- stigmatization of the infected. ii. Contributing to national efforts to minimize the spread and mitigate against the impact of HIV and AIDS. iii. Ensuring adequate allocation of resources to HIV and AIDS interventions;	The proposed project is to be implemented in the rural setting a tDirdima area. The area is not economically empowered hence few HIV/AIDS prevention resources are available. This policy shall provide a framework to both the project proponent and contractor to address issues related to HIV/AIDS during the entire project phase.
12.	Workplace Policy on HIV/AIDS	The main objective of this Policy is to provide a framework to address HIV and AIDS in the workplace. The principles that guide the Policy are in accordance with international conventions, national laws, policies, guidelines and regulations. They include recognition of HIV/AIDS as a workplace issue; Non-discrimination; Gender equality, Safety and Health work Environment, Workplace ethics and Confidentiality.	The requirements of this policy are expected to be fulfilled by all contractors and their subcontractors, especially in regard to having an internal company HIV Policy and worker sensitization initiatives. This policy is of paramount relevance to the project as the implementation of the proposed mini-grid construction and operation is expected to spur substantial in-migration into the project area by people seeking employment opportunities. This, coupled with the expected economic growth, increased financial spending power and disruption of social / cultural norms may result in predisposing factors associated with the spread of HIV/AIDS such as prostitution and adultery.
NATIONAL LAWS			
1.	The Constitution of Kenya, 2010	The Constitution of Kenya promulgated in 2010 is the supreme law of the republic and binds all persons and all State organs at all levels of government. The Constitution provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectoral legislative documents are drawn.	The proposed project complies with the Constitution by proposing a structure in its ESIA on how to deal with Social, Health, safety and environmental issues for sustainable development.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
2.	Environmental Management and Coordination Act, 1999 (And the Amendments Of 2015)	The EMCA is a framework environmental law in Kenya. This Act (assented to on January 14, 2000) provides a structured approach to environmental management in Kenya. With the EMCA coming into effect, the environmental provisions within the sectoral laws were not superseded; instead, the environmental provisions within those laws were reinforced to better manage Kenya's ailing environment.	The proposed project will be undertaken in accordance with relevant sections of the EMCA, specifically Clauses 58 – 63. These sections of the Act are operationalised by subsidiary legislation promulgated under the Act and specifically Legal Notice (L.N.) 101: Environment (Impact Assessment and Audit) Regulations, 2003.
3.	L.N. 101: EIA/EA Regulations, 2003 And 2016 Amendments	These regulations provide the framework for undertaking EIAs and EAs in Kenya by NEMA licensed Lead Experts and Firms of Experts. An EIA or EA Study in Kenya is to be undertaken by a firm duly licensed by the NEMA. The EIA/EA Regulations also provide information to project proponents on the requirements of either an EIA or EA as required by the EMCA.	The proposed project is subject to relevant provisions of these regulations and subsequently, the ESIA has been undertaken in accordance with the requirements.
4.	L.N. 120: Water Quality Regulations, 2006	This regulation provides for the sustainable management of water used for various purposes in Kenya. The regulation contains discharge limits for various environmental parameters into public sewers and the environment.	The contractor will be required to properly manage the effluent from construction activities in accordance with the above regulations prior to discharge into the environment.
5.	L.N. 121: Waste Management Regulations, 2006	Generally, it is a requirement under the regulations that a waste generator segregates waste (hazardous and non-hazardous) by type and then disposes them in an environmentally acceptable manner.	Waste to be disposed in accordance with these regulations.
6.	L.N. 61: Noise and Excessive Vibration Control Regulations, 2009	The general prohibition of these regulations states that no person shall make or cause to be made any loud, unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health, or safety of others and the environment.	Rules 13 and 14 of the regulations define the permissible noise levels for construction sites. These noise limits will be applicable to the proposed project.
7.	Licenses and Permits Required Under The EMCA	The subsidiary legislations under the EMCA are partially monitored using permits and licenses. Subsequently all licenses and permits required during the construction phase shall be the responsibility of the individual contractors and their agents. During the operational phase, all permits, and licenses required to operate the project will be the responsibility of the proponent.	The following permits to be available for inspection during the construction and operational phases of the project: ✓ Waste Transport License under Legal Notice 121: The Environment Management and Coordination (Waste Management) Regulations 2006 for disposal of all types of wastes; and Noise Permit under Legal Notice 61: The Environment Management and Coordination (Noise and Excessive Vibration Control) Regulations, 2009.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
8.	Occupational Health and Safety Act, 2007	The Occupational Safety and Health Act (OSHA) was enacted to provide for the health, safety and welfare of persons employed in workplaces, and for matters incidental thereto and connected therewith.	The contractors will be required to fully comply with Legal Notice 40 titled: Building Operations and Works of Engineering Construction Rules, 1984 (BOWEC). Each contractor will develop and implement a formal construction health and safety plan.
9.	L.N. 31: The Safety and Health Committee Rules, 2004	These rules came into effect on April 28, 2004, and require that an Occupier formalise a S&H Committee if there is a minimum of 20 persons employed in the workplace. The size of the S&H Committee will depend on the number of workers employed at the place of work	The contractor will be required to constitute Health and Safety Committee to oversee safety and health at the construction site
10.	L.N. 24: Medical Examination Rules, 2005	These rules provide for Occupiers to mandatorily undertake pre-employment, periodic, and termination medical evaluations of workers whose occupations are stipulated in the Eighth Schedule to the OSHA and the First Schedule to this Rules. Workers that fall under the above two schedules are required to undergo medical evaluations by a registered medical health practitioner duly registered by the DOSHS.	The contractor should that the workers exposed to hazards and or accidents undergo requisite medical examinations as required by these rules
11.	L.N. 25: Noise Prevention and Control Rules, 2005	The rules set the permissible level for occupational noise in any workplace (which includes construction sites) The Proponent is to ensure that • any equipment brought to the site for use shall be designed or have built-in noise reduction devices that do not exceed 90 dB(A). those employees that may be exposed to continuous noise levels of 85 dB(A) are medically examined as indicated in Regulation 16. If found unfit, the occupational hearing loss to the worker will be compensated as an occupational disease.	The contractor to ensure that equipment is serviced properly and/or use equipment that complies with the threshold noise values provided in the act. Alternatively, each contractor will be required to develop and implement a written hearing conservation programme during the construction phase.
12.	L.N. 59: Fire Risk Reduction Rules, 2007	Several sections of the rules apply to the proposed project as enumerated below. - Regulation 16 requires Proponents to ensure that electrical equipment is installed in accordance with the respective hazardous area classification system. It is also a requirement that all electrical equipment is inspected every six months by a competent person and the Proponent is required to keep records of such inspections. - Regulation 22 provides a description of the functions of a fire-fighting team. - Regulation 23 requires Proponents to mandatorily undertake fire drills at least once a year.	The proponent is expected to comply with the requirements of L.N. 59: Fire Risk Reduction Rules, 2007 by i. Carrying out, and record, a fire risk assessment identifying any possible dangers and risks. ii. Reducing, or where possible remove, the risk of fire and take precautions to deal with the remaining risks. Developing an emergency plan should a fire occur which includes evacuation procedures etc

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		- 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.	
13.	NEMA Guidelines for E-Waste Management, 2010	The E-waste Guidelines were developed to streamline the procedures of handling and disposal of e-waste generated by various sectors to enhance environmental conservation. The e-waste guidelines provide a framework for identification, collection, sorting, recycling and disposing of electrical and electronic waste (e-waste). The guidelines include approaches to enhance environmental protection, environmental awareness, categories of e-waste, e-waste treatment technologies and disposal procedures.	The Proponent and Contractor should put into use the e-waste guidelines in the handling and disposal of e-waste that will potentially be generated by the project i.e. solar array panels during all phases of the project.
14.	Draft E-Waste Regulations, 2013	These regulations were prepared in 2013 but are yet to be promulgated. Some sections of these regulations that apply to the proposed project include: • Regulation 13 stipulates proper transportation of e-waste • Regulation 16 requires all electrical and electronic equipment to bear labels indicating the year and country of manufacture • Regulation 17 states prohibitions on poor e-waste disposal • Regulation 18 requires Environmental Sound Management of e-waste Regulation 26 and 29 defines offences relating to false information, and general penalty, respectively.	The Proponent should ensure that procurement of equipment (electronic and electrical equipment) that will generate e-waste is done in accordance with the regulations. The Contractor should ensure that handling, storage and disposal of the e-waste in an environmentally sound manner
15.	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.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
16.	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
17.	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.
18.	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 proposed project site falls on community land and the land belongs to the community in Dirdima. The community has since offered to the land in kind for project use. The establishment of the mini grid will convert communal land to industrial use for long term. Further, based on community need assessment the proponent will undertake in kind development project to support the community water needs. The proponent should adhere to the provision of this legislation

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		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	
19.	The Land Act, 2012	The Land Act 2012 is the substantive law governing management of land in Kenya. It provides for the legal regime that will govern inter alia, the administration and management of public land and private land; contracts over land, leases, charges, compulsory acquisition, easements and related rights. The state organ responsible for land matters in Kenya is the National Land Commission (NLC).	Part VIII of the Land Act 2012 (Articles 107 – 133) describes the process that needs to be followed for compulsory acquisition of interests in public land. This part of the Land Act will be followed by the Proponent/Contractor for securing the and upon which the proposed solar power plant will be developed.
20.	Environment and Land Court Act, No. 19 of 2011	This Act gives effect to Article 162(2)(b) of the Constitution to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes	The project Grievance Redress Mechanism provides legal address as an option for alternative dispute resolution. The PAPs can seek redress on disputes relating to land and environment through the Environment and Land Court or if they are dissatisfied with NLC's decision in matters relating to compulsory land acquisition.
21.	The Physical and Land Use Planning Act, 2019	This Act of Parliament makes provision for the planning, use, regulation, and development of land and for connected purposes.	The proposed site is not in contravention of any Zoning regulations. The project site is within unregistered community land; necessary county approvals will be sought by the proponent e.g., Project design approval and change of use. The approvals shall be issued by the Physical planner in the department of Lands, Housing and Urban Development – Marsabit County.
22.	The Employment Act No 11 of 2007	This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the energy sector.	With the Contractor and the Project Proponent being primary employers during the construction and operational phases of the Project, respectively, they are bound by this law to abide to its stipulations on employee management and relations
23.	The Work Injury Benefit Act, 2007	This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment	The Proponent and Contractor will maintain an insurance policy cover for its employees, record of accident, carryout proper accident investigations; organize for pre-employment and regular medical examinations for staff.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
24.	Children Act, 2012	This is an Act of Parliament to make provision for care and protection of children; to give effect to the principles of the Convention on the Rights of the Child and the African Charter on the Rights and Welfare of the Child for connected purposes	The Proponent and contractor will not employ children in any manner that is economically exploitative, or 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.
25.	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 and also monitored to make sure they are not excluded from project benefits and that negative impact of the project do not adversely affect them.
26.	The Sexual Offences 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.	This Act mitigates the risk of GBV-SEA/SH foreseen in the mini grid project particularly during the construction and decommissioning phases due to labor influx.
27.	Air Quality Regulations (2014)	Regulation 3 stipulates that the objective of these Regulations is to provide for the prevention, control, and abatement of air pollution to ensure clean and healthy ambient air.	The Proponent and contractor will implement mitigation during construction to ensure neighbouring properties are not impacted by nuisance dust

4.7 National Administrative Requirements

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

Table 8: Relevant Enforcement agencies

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

4.8 International Safeguard Requirements

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

Table 9. World Bank Safeguards

OP	TITLE	APPLICABILITY	COMMENTS
4.01	Environmental Assessment	Applicable	The proposed project is likely to have potential environmental and social impacts. The objective of OP 4.01 is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate environmental and social screening, analysis of actions and mitigation of their likely environmental and social impacts and monitoring. The consultants have identified that the overwhelming majority of project beneficiaries in Dirdima area are considered vulnerable and marginalized. Therefore, OP 4.01 is applicable, and in line with this operational policy, the environmental and social screening process for the mini-grid project.
4.04	Natural Habitats	Applicable	The proposed project may be in or close to areas with natural unique flora and fauna though the component is unlikely to have significant negative impacts on natural habitat. Works will nevertheless be implemented in an area in Dirdima that may not negatively affect diverse flora, fauna, and avifauna. The area is dependent on pastoralism.
4.12	Involuntary Resettlement	Applicable	The proposed project will involve land take for construction purposes including, solar panels; generator rooms and distribution lines, as well as contractor yard and workers camp site
4.10	Indigenous Peoples	Applicable	The policy is applicable because the main inhabitants of Dirdima who are Sakuye are classified as a marginalized group in Kenya. Further the proponent will continue to engage the beneficiaries in a culturally appropriate way and allow for decision making in a free, prior and informed consent manner throughout the phases of the project.

5. STAKEHOLDER ENGAGEMENT

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

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

1.1 Stakeholder Consultation and Disclosure Requirement for the Project

The World Bank Environmental Social OPs 10 emphasizes on engagement in meaningful consultations with all stakeholders. The stakeholders with timely, relevant, understandable, and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination, and intimidation. The final ESIA report will be shared with the stakeholders by way of making it available to the target beneficiaries and other interested parties. The ESIA report will be shared through the county headquarters (a copy will be availed) or will be accessible through the CREO office and KPLC website. In addition, a copy of the ESIA should be availed by CREO to the chief's office for access by the local community and other stakeholders. The findings of the ESIA will be shared or disseminated to the target community in a culturally appropriate format such as using local language and through public meetings and focus group discussions. The disclosure will also consider any mobility, disability, and literacy challenges that the affected persons may have.

Plate 6. Stakeholders listening to the project details

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

The respective minutes and list of participants for the public consultation undertaken at Dirdima primary school is enclosed under appendices in page 3-173 of this report. Further, an initial communication was shared with the county commissioner Garissa and Dirdima Chief Location in October 2021, two months prior to the public participation meeting held on 19th January 2022 at Dirdima Baraza park.

1.2 Stakeholder Characterization and Identification

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

- **Project Affected Persons** - Stakeholders who have a direct impact on or are directly impacted by the project.
- **Interested Parties**- Stakeholders who have an indirect impact or are indirectly impacted by the project.

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

Table 10. Identified Stakeholders

Stakeholder Groups	Project Affected Persons	Interested Parties
Households and individuals	Local Labourer VMG's Pastoralists Local Community	
Institutions	Community & Faith Based Organizations Education & Healthcare institutions	
Government Bodies		County Government Government agencies National regulatory bodies

1.2.1 Stakeholder Mapping

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

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

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

Table 11: Stakeholder Significance and Engagement Requirement

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

1.3 Stakeholder Analysis

The table below is used to classify the identified stakeholders (directly or indirectly influencing the project) in accordance with their levels of influence on the project has rated as:

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

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

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

3.4 KEY SUMMARY OF COMMUNITY CONSULTATIVE MEETING LEADING TO LAND ACQUISITION

Land requirements for the project
The project site needed to be identified thus the surveyor informed the community members the land needed was to cover 2-5 acres. However land in Dirdima falls under the community land category and its use and management is governed by the Community Land Act 2016. The project site was to be identified by the exact GPS points, for purposes of registration on behalf of the implementing agency.

Plenary Session
As a process of gathering information from the public concerning the proposed project, the community members were allowed to raise any concerns. The questions raised are presented in the table below.

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

NO.	Name	Question / Comments	Answer / Remarks
1.	Ahmed Abdi	Among compensations, what about 1000 payment for wiring – is it possible to be put or divert to other things? Missa village is 4 kms from here, will it get power?	No. It should be a community project. Connection fee will be paid by premise/household owner No. The project radius is 1.5 kms. But the residents can benefit from home solar systems which is part of Kosap
2.	Ahmed Abdi Lafa	Asking whether power could go up to Missa which is 4km away. Even police post constructed between the two village Committees allowances – is there any payment	No. The project radius is 1.5 kms. But the residents can benefit from home solar systems which is part of Kosap No
3.	**Edin Halalce (dirdima elder)**	Clarification on compensation? Is the estimated land belong to REA?	-Payment of cash for the land that has been identified for the project. For this to take place the land is has to be valued first. All monies payable as compensation for acquisition unregistered community land are then held in trust by the county government. Any such monies shall be deposited in a special interest earning account by the County Government and shall be released to the community upon registration of the community land. -Compensation of land for land. The community would identify a similar piece of land in value to the project site and request that the same is purchased for the community. A further option is compensation in kind. This option is for the community to grant land for the project and request for compensation in kind. This could be in the form of a project for the benefit of the community like the construction of classrooms, dispensary or a borehole. This is the most preferred option. Yes, ownership will have to be transferred to REREC
4.	Yusuf Hussein Elema	When connected will poles would be put, places like mosques, schools and hospitals. how would it be?	Yes
5.	Boru Guyo	Company and community relationship, how payment is done on land?	Will depend on community's preferred mode of compensation
6.	Fatuma Abdi Guyo	Would it be possible for our compensation to be put in place in the village main problem like borehole drilling?	Compensation is pegged at 1million Kshs. A borehole is expensive and may exceed this figure
7.	Hassan Bonaya Guyo	Dirdima started very long time ago. Main problem which hindered the	

		development of this village is water	
8.	Rashid Adan Alake	Weakness in committee's should it be possible to re-elected.	Yes
9.	**Abdinur Adan Hassan (assistant chief dirdima)**	Is the any watchman for this project? Is there any payment for this watchman?	Yes Yes

Photographs of Community Baraza on land acquisition in Dirdima

1.4 KEY FEEDBACK RECEIVED DURING STAKEHOLDER CONSULTATION PROCESS.

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

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

The general stakeholder consultation was done in a public meeting (Baraza) organized at Dirdima community baraza point where 14 male and 11 women attended. The area chief and the "Nyumba Kumi" leaders chaired the meeting. The feedback received during the stakeholder consultation process has been summarized below.

1.4.1 Area Chief's Remarks

The Area Chief, Abdinur Adan Hassan after having mobilized the community members, gathered everyone at the community meeting point located at Dirdima AP office compound area. The Baraza was opened with a word of prayer from one of the elders. The chief, then briefly informed the gathering that the team was here to undertake ESIA assignment for KOSAP projects. He then welcomed the members and urged then to fully participate in the discussions.

1.4.2 Consultant's Remarks

The Consultant informed the members that it was important to involve the public in decision making regarding the implementation of any project before ESIA is carried out. He further expounded on the project importance and possible impacts that any project will have both positive and negative impacts and that the purpose of the Public Baraza was to identify these likely impacts.

The consultant elaborated further that the solar project shall have Different components like the solar panels, solar battery, and standby generator for power back-up.

The consultant with assistance from the Chief then guided Focused Group Discussions and requested the participants to give information for documentation.

1.4.3 Positive Comments about the Project from the Participants

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

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

1.4.4 The identified negative impacts of the project

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

- ✓ **Employment Disputes:** There was a concern over the possibility of disputes arising between the local communities with people of different cultures in the construction sites. The community suggested that proponent should consider employing local construction workers.
- ✓ The proponent will contact the contractor and ensure that for any skilled member of community who qualified for the opportunity provided should be given first priority.
- ✓ **Environmental Aesthetics** the aesthetic of the area was a concern that the project will affect negatively during construction. It was suggested that the proponent should ensure landscaping is conducted after construction.
- ✓ **Accidents**: some of the members raised concerns of possible accidents from open pits, which may affect their animals, will graze falling poles, electrocution especially the children as well as possible accidents from falling of the electric poles. The community suggested extra care when, protection of appliances and reinforcement of electric poles to mitigate these accidents.
- ✓ **Dust Generation:** The participants expressed concern over possibility of generation of large amounts of dust within the project site and surrounding areas because of excavation works and transportation of building materials.

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

- ✓ **Noise Pollution**: possible noise and exhaust fumes from the site will affect the neighboring school and neighbors.

Other concerns

- Some of the members asked whether they be required to pay the cost of connection or only the daily usage
- Questions were also raised on whether the labor and raw materials will be sourced from the community.
- A youth felt that the proposed site was an individual's plot and suggested that an alternative site be considered.

1.4.5 Additional Responses from the Consultant

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

- ✓ Safety of all the workers working during construction phase shall be provided with PPEs
- ✓ Every resident, business or public facility will be connected to the electricity at an affordable cost
- ✓ That the Contractor/KOSAP will rehabilitate and plant trees after the construction phase of the project
- ✓ All non-skilled labor will be sourced from the Dirdima Community and not from outside
- ✓ He assured the community that the project will commence soon after ESIA
- ✓ That noise from the Machinery and vehicles will be minimized

1.4.6 Consent

The Community members present agreed unanimously accepted the Project Proposal.

1.4.7 Community Presentation

Adult to youth Representation

During the stakeholder's consultation adults were more represented than the youth, this was because the youth have been assigned domestic duties and majority have left the village to the city and towns to search for employment and study.

1.4.8 Focused Group Discussions analysis

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

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

The consultative meeting had a wide representation as follows:

Table 12. The consultative meeting had a wide representation

Category	Male	Female	Total
Youth	5	0	5

Adult	9	11	20
TOTAL	**14**	**11**	**25**

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

Female Stakeholders' Consultation and Participation

The females' participants in the FGD were 11 and between 30-60 years of age. There was no female headed household in the meeting. The following were their responses.

Youth Stakeholders' Consultation and Participation

- ✓ The youth participants were 9 in number, and consisted of 9 males and 0 females. The following opinions were provided by the youth participants during the FGD.

Plate. 7 Male FGD

Plate 9. Female FGD

Plate 8. Public Participation

2 IMPACT ASSESSMENT AND MITIGATION MEASURES

2.1 Introduction

This section provides an assessment of potential environmental and social impacts from the proposed Projects 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.

2.2 Impact Assessment Methodology

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

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

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

2.3 Defining Impact

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

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

2.4 ASSESSMENT OF SIGNIFICANCE

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

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

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

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

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

Table 5-13: Categories of Significance

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

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

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

Table 5-14: Overall Significance Criteria for Environmental Impacts

Receptor sensitivity (or resource value)	**Impact Magnitude**		
	Low	**Medium**	**High**
Low	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.

2.5 Magnitude of Impact

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

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

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

2.6 Sensitivity of Resources and Receptors

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

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

2.7 Likelihood

Terms used to define likelihood of occurrence of an impact are explained in **Error! Reference source not found.** below.

Table 5-15: 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)

2.8 Definition of mitigation measures

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

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

- The provision of like-for-like replacement, restoration or compensation.

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

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

2.9 Assessing residual impacts

Impact prediction takes into account any mitigation, control and operational management measures that are part of the project design and project plan. A residual impact is the impact that is predicted to remain once mitigation measures have been designed into the intended activity. The residual impacts are described in terms of their significance in accordance with the categories identified in **Error! Reference source not found.** and **Error! Reference source not found.** 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.

2.10 Negative Impacts – Pre-Construction Phase

2.10.1 Land Acquisition

The proposed project will entail the acquisition of 1.41hectares 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 beneficiaries 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.

2.10.1.1 Source of Impact and Overview of Baseline Conditions

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

2.10.1.2 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.

2.10.1.2.1 Significance of Impact

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

2.10.1.3 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. The community Installation of water storage tanks with trough and repair pipes at Dirdima borehole.
- A-RAPs will be prepared and implemented in sub-project sites on the community land

2.10.2 Acquisition of Way leaves

The project proponent will use existing access roads to set up the power distribution lines and will seek access from beneficiaries and clients in whose property they will undertake electricity connection to the power grid. Supply of electricity will involve passing of low voltage (LV) lines to connect the customers to power.

2.10.2.1 Embedded/In-built Controls

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

2.10.2.1.1 Significance of Impact

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

2.10.2.2 Mitigation measures

- Consultations with the community during construction of the low voltage lines to agree on the mode of compensation of the affected areas
- A-RAPs will be prepared and implemented in sub-project sites on the community land

2.10.3 Impact Related to Stakeholder identification and consultations

This 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

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

Mitigation Measures

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

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

Mitigation measures

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

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

Mitigation measures

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

- Train members of the various governance structures on their roles and responsibilities

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

Mitigation measures

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

2.10.3.1 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.

2.10.3.1.1 Significance of Impact

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

2.11 Positive Impacts- construction Phase

2.11.1 Impact on Employment

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

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.

2.11.1.1 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.

2.11.1.2 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.

2.11.2 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; and
- 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.

2.11.2.1 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.

2.11.2.2 Enhancement Measures

- Preference should be provided to local sub-contractors or suppliers to pass on maximum economic benefit locally; and

- The project proponent will establish a mechanism to audit sub-contractors and suppliers with respect to compliance of utilizing local labour and resources.

2.12 negative Impacts – Construction phase

2.12.1 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 in Dirdima Location. The community has since identified 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 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.

2.12.1.1 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 Dirdima will be used for access to the project site.

2.12.1.2 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.

2.12.1.3 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.

2.12.2 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.

2.12.2.1 Embedded/In built Control

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

2.12.2.2 Significance of Impact

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

2.12.2.3 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.

2.12.3 Impact on Soil

2.12.3.1 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.

2.12.3.2 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.

2.12.3.3 Additional Mitigations

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

2.12.4 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.

2.12.4.1 Embedded/in-built control

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

2.12.4.2 Significance of Impact

There are few Receptors (settlements) within 500 m of the project site, that include the community borehole and some residential homes, 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.

2.12.4.3 Additional Mitigation Measures

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

2.12.5 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.

2.12.5.1 Assessment Criteria for Impact on Ambient Noise

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

- Construction activities including site preparation, piling work, construction of ancillary facilities;
- Transportation of construction materials, machinery and personnel; and
- Operation of generator sets.

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

2.12.5.2 Embedded/in-built control

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

2.12.5.3 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.

2.12.5.4 Additional Mitigation Measures

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

2.12.6 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, the 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.

2.12.6.1 Embedded/In-built Control

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

2.12.6.2 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.

2.12.6.3 Additional Mitigation Measures

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

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

2.12.7 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.

2.12.7.1.1 Embedded/in-built control

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

2.12.7.1.2 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.

2.12.7.1.3 Additional Mitigation Measures

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

2.12.8 Impacts on 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.

2.12.8.1.1 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.

2.12.8.1.2 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.

2.12.9 Impacts from Hazardous Materials

Some hazardous materials will be used during construction phase of the project. They include insulating oil, paints, solvents and oils. Spilled chemicals can contaminate soil as well as pollute water resources. Additionally, hazardous and flammable substances if improperly stored and handled on site become potential health hazard for construction workers and the public.

2.12.9.1.1 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.

2.12.9.1.2 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

2.12.10 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.

2.12.10.1.1 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.

2.12.10.1.2 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.

2.12.11 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.

2.12.11.1.1 Significance of Impact

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

2.12.11.1.2 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.

2.12.12 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.

2.12.12.1.1 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.

2.12.12.1.2 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.

2.12.13 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 Dirdima village.

2.12.13.1 Embedded/in-built control

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

2.12.13.2 Significance of Impacts

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

2.12.13.3 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;
- 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.

2.12.14 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.

2.12.14.1 Embedded/in-built control

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

- The excavated areas will be properly fenced for safety and sign boards in local languages will be put up;
- No hazardous waste or any waste 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).

2.12.14.2 Significance of Impact

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

2.12.14.3 Additional Mitigation Measures

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

- Developing an onsite ESMS and EHS Policy by the 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.

2.12.15 Child labour

Implementation of the Dirdima 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.

2.12.15.1 Significance of Impact

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

2.12.15.2 Mitigation measures

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

2.12.16 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.

2.12.16.1 Significance of Impact

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

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

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

- ✓ A chance find can be reported by any member of the Project. Accordingly, if a chance find is encountered, the first course of action is to stop work in the vicinity of the find. Then the following steps will be undertaken:
  - Inform site supervisor/foreman.
  - Install temporary site protection measures (warning tape and keep off signs).
  - Inform all personnel of the Chance Find if access to any part of the work area is restricted.
  - Establish a localized no-go area needed to protect the Chance Find.
  - The National Museum of Kenya will be contacted to perform a preliminary evaluation to determine whether the Chance Find is cultural heritage and if so, whether it is an isolate or part of a larger site or feature.
  - Artefacts will be left in place when possible; if materials are collected, they will be placed in bags and labelled by an archaeologist and handed over to the National Museum of Kenya; no Project personnel are permitted to take or keep artefacts as personal possessions.

- Document find through photography, notes, GPS coordinates, and maps (collect spatial data) as appropriate.
- If the Chance Find proves to be an isolated find or not cultural heritage, the specialists brought in from the National Museum of Kenya will authorize the removal of site protection measures and activity in the vicinity of the site can resume.
- If the archaeological specialists from National Museum of Kenya confirm the Chance Find is a cultural heritage site, they will inform the project team and initiate discussions with the latter about treatment.
- Prepare and retain archaeological monitoring records including all initial reports whether they are later confirmed or not.
- Develop and implement treatment plans for confirmed finds using the services of qualified cultural heritage experts.
- If a Chance Find is a verified cultural heritage site, prepare a final Chance Finds report once treatment has been completed.
- While investigation is on-going, co-ordinate with on-site personnel keeping them informed as to status and schedule of investigations, and informing them when the construction may resume.
- If mitigation is required, then expedient rescue excavations will be undertaken by the National Museum of Kenya specialist, except in the case that the chance find is of international importance (i.e., Critical Cultural Heritage). If an archaeological site of international importance is encountered special care will be taken and archaeologists with the appropriate expertise in addressing the find will be appointed.

2.12.17 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.

2.12.17.1 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.

2.12.17.2 Mitigation measures

- Prepare an Awareness Raising Strategy, which describes how workers and local communities will be sensitized to GBV risks, and the worker's responsibilities;
- 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 grievance committee.

- 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 GM process for capturing disclosure of GBV;
        - A referral pathway to refer survivors to appropriate support services.

2.12.18 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 beneficiaries 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)

2.12.18.1 Significance of Impact

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

2.12.18.2 Mitigation measures

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

2.12.19 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.

2.12.19.1 Significance of Impact

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

2.12.19.2 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.

2.12.20 Increased Water Demand

During the construction of the project there will be increased demand for water by the construction workers and the construction works. Water will be mostly used in the construction works and for wetting surfaces or cleaning completed structures. It will also be used by the construction workers to wash themselves and even drink.

2.12.20.1 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.

2.12.20.2 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.

2.12.21 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.

2.12.21.1 Significance of Impact

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

2.12.21.2 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).

2.13 POSITIVE IMPACTS- OPERATION PHASE

2.13.1 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 to 5 and 15 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.

2.13.1.1 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.

2.13.1.2 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

2.13.2 Quality, Reliable Power Supply

There is no electricity in Dirdima. 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.

2.13.2.1 Significance of Impact

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

2.13.2.2 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

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

Residents in the area use different sources of energy. Electricity supply will imply that as many as are willing can apply for connection and get connected. This will result in reduced individuals and organizations using diesel generators, less reliance on kerosene, wood fuel and charcoal.

This would mean less carbon dioxide is released to the environment and destruction of forests will be reduced hence decreasing greenhouse gases.

2.13.3.1 Significance of Impact

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

2.13.3.2 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

2.13.4 Improvement of Local and National Economy

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

2.13.4.1 Significance of Impact

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

2.13.4.2 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

2.13.5 Education

Access to electricity at the household level and schools will create opportunities for children be able to study even for longer hours. Additionally, children in households can also access education programs being aired through different radio and T.V. channels. Schools will be able to take advantage of information technology and communication that are becoming a way of life in education sector and learning in general.'

2.13.5.1 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

2.13.5.2 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

2.13.6 Health Benefits of the Project

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

2.13.6.1 Enhancement Measures

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

2.13.7 Improved Standard of Living

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

2.13.7.1 Enhancement Measures

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

2.13.8 Security

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

2.13.8.1 Enhancement Measures

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

2.13.9 Communications

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

2.13.9.1 Enhancement Measures

- Ensure that the power supply is reliable.

2.14 Negative impacts – Operation phase

2.14.1 Impact on Soil

2.14.1.1 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.

2.14.1.1.1 Embedded/in-built control

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

2.14.1.1.2 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.

2.14.1.1.3 Additional Mitigation Measures

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

2.14.2 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.

2.14.2.1 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.

2.14.2.1.1 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

2.14.2.2 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.

2.14.2.3 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.

2.14.3 Impact on Water Quality and Scarcity

Water is required during operation phase to meet domestic requirements of O&M staff and for cleaning solar panels. 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.

Discussions with the residents in Dirdima 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.

2.14.3.1 Embedded/in-built control

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

2.14.3.2 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.

2.14.3.3 Additional Mitigation Measures

- 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;
- Workers to be sensitised about water conservation and encouraged use of water optimally;
- Recycling/reusing water to the extent possible.
- There is need to source for a sustainable water source for use
- Install water-conserving automatic taps
- Encourage water harvesting from rooftops and storage for cleaning purposes (washing the panels off dust)
- Any water leaks through damaged pipes and faulty taps should be fixed promptly.

2.14.4 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.

2.14.4.1 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.

2.14.4.2 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.

2.14.5 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.

2.14.5.1 Significance of Impact

The impact will be of minor significance.

2.14.5.2 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.

2.14.6 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.

2.14.6.1 Significance of Impact

The impact will be of minor significance.

2.14.6.2 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

2.14.7 Fire Outbreaks

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

2.14.7.1 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.

2.14.7.2 Mitigation Measures

- ❖ The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points
- ❖ Detection/alarm systems that can detect fire should be considered and installed

- A fire risk assessment and evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported.
- Workers especially operators of the plant must be trained on fire fighting and management
- 'No smoking' signs shall be posted within the Mini-grid area
- A fire Assembly point should be identified and marked

2.14.8 Sanitation

Although there are few people who will be running the Mini-grid during operation phase provision for disposal of waste must be put in place through septic tanks.

2.14.8.1 Significance of Impact

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

2.14.8.2 Mitigation Measures

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

2.14.9 Flooding

Flooding may occur and cause damage to the plant and other associated infrastructure but the risk of occurrence is low since the area is not known for regular flooding.

2.14.9.1 Significance of Impact

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

2.14.9.2 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

2.14.10 Noise and Vibration

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

2.14.10.1 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.

2.14.11 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.

2.14.12 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.

2.14.12.1 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

2.14.13 Vehicle exhaust emissions

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

2.14.13.1 Significance of Impact

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

2.14.13.2 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

2.14.14 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.

2.14.14.1 Embedded/ in-built Control

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

2.14.14.2 Significance of Impacts

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

2.14.14.3 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.

2.14.15 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

2.14.15.1 Embedded/in-built control

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

2.14.15.2 Significance of Impacts

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

2.14.15.3 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.

2.14.16 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.

2.14.16.1 Embedded/in-built control

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

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

2.14.16.2 Significance of Impact

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

2.14.16.3 Additional Mitigation Measures

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

- Implementing the existing grievance redress mechanism
- 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

2.14.17 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.

2.14.17.1 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.

2.14.17.2 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 grievance committee.
- 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 GM process for capturing disclosure of GBV;
    - A referral pathway to refer survivors to appropriate support services.

2.14.18 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 beneficiaries 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.

2.14.18.1 Significance of Impact

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

2.14.18.2 Mitigation measures

- Participation will be through meetings with the different groups of the vulnerable people identified primarily to ensure that;
    - The VMGs are aware of the project and its impacts
    - The VMGs are Aware of any restrictions and negative impacts
    - Provide support to VMG participation arrangements in the project
- 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

2.14.19 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.

2.14.19.1 Significance of Impact

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

2.14.19.2 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.

2.14.20 Shocks and electrocutions to the beneficiaries

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

2.14.20.1 Significance of Impact

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

2.14.20.2 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

2.14.21 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.

2.14.21.1 Significance of Impact

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

2.14.21.2 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

2.15 Decommissioning Phase

2.15.1 Preparation for decommissioning

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

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

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

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

2.15.2 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.

2.15.2.1 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.

2.15.2.2 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 Marsabit 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.

2.15.3 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.

2.16 Negative impacts – Decommissioning Phase

2.16.1 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.

2.16.1.1 Significance of Impacts

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

2.16.1.2 Additional Mitigations

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

2.16.2 Impact on Air Quality

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

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

2.16.2.1 Embedded/in-built control

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

2.16.2.2 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.

2.16.2.3 Additional Mitigation Measures

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

2.16.3 Impact on Ambient Noise

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

2.16.3.1 Assessment Criteria for Impact on Ambient Noise

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

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

2.16.3.2 Embedded/in-built control

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

2.16.3.3 Significance of Impact

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

2.16.3.4 Additional Mitigation Measures

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

2.16.4 Impacts on Waste Generation and Soil Contamination

General demolition waste generated onsite will comprise of concrete, steel cuttings/filings, packaging paper or plastic etc. solid wastes consisting of food waste, plastic, glass and waste paper will also be generated by the workforce. A small proportion of the waste generated during 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.

2.16.4.1.1 Embedded/in-built control

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

2.16.4.1.2 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.

2.16.4.1.3 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.

2.16.5 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.

2.16.5.1 Significance of Impact

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

2.16.5.2 Additional Mitigation Measures

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

- 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 Marsabit 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.

2.16.6 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.

2.16.6.1 Embedded/in-built control

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

2.16.6.2 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.

2.16.6.3 Additional mitigation measures

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

2.16.7 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.

2.16.7.1 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.

2.16.7.2 Mitigation measures

- Prepare an Awareness Raising Strategy, which describes how workers and local communities will be sensitized to GBV risks, and the worker's responsibilities;
- 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 grievance committee.
- 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 GM process for capturing disclosure of GBV;
        - A referral pathway to refer survivors to appropriate support services.

2.16.8 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.

2.16.8.1 Significance of Impact

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

2.16.8.2 Mitigation measures

- Participation will be through meetings with the different groups of the vulnerable people identified primarily to ensure that;
  - The VMGs are Aware of 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

2.16.9 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.

2.16.9.1 Significance of Impact

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

2.16.9.2 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.

2.16.10 Child labour

Decomissioning of the Dirdima 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.

2.16.10.1 Significance of Impact

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

2.16.10.2 Mitigation measures

- The contractor should develop a code of conduct to ensure children are protected from any negative impact during the decommissioning activities.
- 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.

2.16.11 Forced Labor

During decomissioning 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.

2.16.11.1 Significance of Impact

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

2.16.11.2 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).

2.17 Cumulative Impacts

2.17.1 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.

3 ENVIRONMENTAL AND SOCIAL MITIGATION AND MANAGEMENT PLAN (ESMMP) FOR THE PROPOSED PROJECT

3.1 Introduction

ESMMP for developing projects is used to provide a logical framework within which identified negative environmental impacts can be avoided, mitigated and monitored. 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 ESMMP is a vital output of an Environmental and Social Impact Assessment as it provides a checklist for project monitoring and evaluation. The ESMMP outlined below will address the identified potential negative impacts and mitigation measures of the project.

By design, the project's potential positive impacts can be easily optimized, while the majority of the project's negative environmental and social impacts are mostly limited to the planning and construction phases, with the negative impacts experienced during the project's operation phase mitigated by continuous system maintenance. These are classified as negligible, minor to moderate, reversible and short-term, and manageable through well-defined mitigation and monitoring strategies.

3.2 Possible Enhancement Measures

The following are some examples of potentially positive impact enhancement measures:

- Construction should follow best design practices that make efficient and cost-effective use of locally available resources such as materials, expertise, and labor;
- The project should be run in accordance with the operations and maintenance specifications produced in conjunction with the design;
- Ascertain that the project under GRM will provide for the underprivileged and other vulnerable groups in the project area;
- Ensure that social services provide instruction on acceptable hygienic conditions, taking gender-specific duties and responsibilities into account.

3.3 Environmental and Social Management Plan

The potential negative impacts from the proposed project as well as their mitigation measures have been discussed in Chapter 8 of the ESIA Report. This chapter highlights the various mitigation measures, the party responsible for implementing it and the costs, this data makes up the Environmental and Social Management Plan (ESMP) which is presented in table below.

The costs of the proposed mitigation measures some of which will have already been included in the main engineering Bills of Quantities and therefore need not be included in the Environmental and social mitigation costs, should be included in the Bill of Quantities as the Environmental and Social Mitigation Costs.

3.3.1 Pre-Construction, Construction, Operational and Decommissioning Phases

The following are the necessary objectives, activities, mitigation measures, cost and responsibility allocations for the prevention, minimization, and monitoring of significant negative impacts and maximization of positive impacts related with the project's construction phase.

Table 16: Environmental and Social Management Plan

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Local employment	-Prioritize hire of locals for all unskilled labour. -Implement a local recruitment plan that is fair and transparent (including recruitment processes that ensure inclusivity of both men and women, vulnerable individuals, minority clans, ethnic groups and VMGs. -Adhere to labour laws, and labour management practices (timely renumeration, equitable compensation for both genders for equal work etc.) -Create awareness to workers and the community on worker and project grievance redress mechanisms.	Construction Operations Decommissioning	Contractor REREC O&M Contractor/KPLC	-Fair and transparent local recruitment plan in place. -Recruitment processes (job adverts, interviews, selection etc.). -Number of locals employed based on gender, vulnerability, ethnic group, clan etc. -Type of employment (skilled, semi-skilled and unskilled). -Grievances raised, those aggrieved, status of resolution.	Quarterly	Contractor's cost
Local Sourcing	-Source materials from local businesses/communities, and where necessary give opportunities to businesses owned or operated by vulnerable individuals.	Construction Decommissioning	Contractor REREC	-Number and types of businesses sourced from, businesses owned and operated by vulnerable individuals, types	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
				and quantities of materials etc.		
Land acquisition and compensation for land and assets on land	In line with the RPF provisions; -Prepare and implement an **Abbreviated Resettlement Action Plan (A-RAP)** to guide land acquisition for the mini-grid, 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.	Pre- Construction	Contractor- *(contractors' facilities, workers camps)* Proponent- *(project land for generation assets)*	-Land Acquisition and consultation report (consultation (minutes and lists of participants). -Type and amount of compensation paid to affected persons. - Priority community project implemented and handed over to affected communities. -Signed agreements with communities on the use and restoration of their land.	Quarterly	Value of compensation in kind project will be equivalent to the value of land acquired as per NLC

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-Consultations with the community on the low voltage lines. -The design of the distribution line will utilize the existing road reserves. However, any damage to structures, crops, trees, community facilities and other assets will be compensated in line with the RPF provisions.					
Labor Influx and related impacts (SEA/SH, HIV/AIDs and other STIs)	-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	Construction Decommissioning	Contractor REREC	-Records of employees/updated employee register. -Number of local community employees and external employees/ updated employee register.	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.					
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**"	Construction Decommissioning	Contractor REREC	-Updated employment register indicating locals employed, their ages, national identification numbers etc. -Grievances raised, aggrieved persons and status on resolution etc.	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-Do not allow children at the project site.					
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 Decommissioning	Contractor REREC	-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.	Construction Decommissioning	Contractor REREC	-Number of reported cases of forced labor.	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-Ensure that all workers have a national ID card or documentation to show they are adults (above 18 years).					
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	Construction Operations Decommissioning	Contractor REREC	-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	Quarterly	30,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	representatives from the community. -Sensitize stakeholders on SEP and GRM.			and status on resolution etc. -Concerns raised andactons raised.		
Exclusion of VMGs and vulnerable individuals and households	In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following. • Early identification and inclusion of VMGs and 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.	Pre-construction Construction Operations Decomissioning	Contractor REREC	Minutes of consultative meetings with all community segments including VMGs and vulnerable individuals and households, grievances raised and status on resolution etc.	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	• All concerns or grievances raised are fully resolved in a timely manner. • Access to culturally appropriate project benefits and opportunities.					
Inaccessibility of project benefits to VMGs and other vulnerable individuals due to affordability challenges	-Consult VMGs and Vulnerable individuals and households on charges for sub project services, and put in place specific interventions to ensure the vulnerable equally access project benefits.	Operations	O&M Contractor KPLC	-Interventions to enable those vulnerable access project benefits. -Number of complaints raised by VMGs/vulnerable individuals regarding access to project services. -GRM that is culturally appropriate and accessible. Grievances raised and status on resolution etc	Quarterly	No additional cost
Inadequate grievances management	Constitute a Local Grievances Committee is in consultation with all community segments, and incorporates the existing	Construction Operations Decomissioning	Contractor REREC	-Local Grievances Committee in place, composition of committee,	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.			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.		
Impacts on Security	-A Security Management Plan that involves a threat assessment and analysis should be developed by the Contractor and the Proponent. -The plan should address	Construction Operations Decommissioning	Contractor REREC	-A Security Management plan -Number of reported crimes -Number of	Monthly	300,000

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	security threats such as Terrorism, bomb threats, workplace violence and vandalism etc. of the solar plant. -Working hours should be kept within daylight hours during the construction phase -Security personnel should be trained on how to deal with the community to avoid confrontations -Access in and out of the site should be strictly controlled by a security company -The contractor should provide workers with identity tags and prohibit access of unauthorized people to the construction site. -A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process -The Project Contractor should			complaints		

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	also be guided by the Voluntary Principles on Security and Human Rights in managing security during the construction phase.					
Environmental Impacts						
Vegetation clearance	1. Clear only the necessary areas 2. Ensure proper demarcation and delineation of the project area to be affected by construction works. 3. Specify locations for vehicles and equipment, and areas of the site which should be kept free of traffic, equipment, and storage. 4. Designate access routes and parking areas 5. Re-vegetation including planting of trees around the plant/facility	Construction	Contractor REREC	-Number of trees cleared -Planted trees	Once off	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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	Construction	Contractor REREC	Assess size of rills or Gulleys forming from accelerated run off from compacted areas	Quarterly	Part of contractor's fee

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	that any incidents of erosion are quickly controlled.					
Contamination of soil from fossil fuels	1. Ensure wastewater generated is discharged or drained into approved drainage facilities 2. Construction vehicles must be maintained in good state and proper servicing to ensure no oils are likely to leak 3. Care must be exercised not to spill any fossil fuels 4. Any contaminated soil shall be scooped and disposed-off appropriately. 5. No servicing vehicles on site	Construction	Contractor REREC	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	Construction	Contractor REREC	-Visual Observation of dust	Daily	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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			-Provision of PPEs especially masks		

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas Plant short trees to break speed of wind					
Vehicle exhaust and emissions from Generator	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	Construction	Contractor REREC	-Engine maintenance records - inspection of stacks	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	4. Use of diesel which is Sulphur- free to run the power producing generators to be encouraged 5. The stack chimney of the generators will be increased from its normal height of 3 meters to 6 meters					
Solid waste generation	1. Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is top soil last; 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	Construction	Contractor REREC	Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	construction standards in Kenya					
Impacts on Water Resources and Water Quality	1. Clear the necessary areas only. 2. Appropriate remedial measures shall be implemented by the contractor in the event of erosion. 3. Infrastructure shall be designed to ensure that contaminated run-off does not reach water source i.e., earth dam. 4. Contractor to develop an oil-spill containment plan as part of the emergency response plan. In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect. 5. No vehicle maintenance and service shall be done at project site	Construction	Contractor REREC	-Oil spill containment plan. -Provision of fuel/oil drip and spill trays	Quarterly	150,000

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	6. Ensure that potential sources of petro-chemical pollution are handled in such a way to reduce chances of spills and leaks.					
Noise & vibration	1. Construction activities to avoid any unchanneled flow of water at the site 2. Storage areas that contain hazardous substances should be bunded with an approved impermeable liner and provision for a pit to be made in case of oil spill. 3. The excavation and use of rubbish pits during construction should be strictly prohibited. 4. A waste disposal area should be designated within the active construction area and this should be equipped with suitable containers i.e., skips or bins of	Construction	Contractor REREC	Noise levels- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Quarterly	150,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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					
Impacts from Hazardous materials -	1. Maintenance of construction vehicles will not be done on site 2. All hazardous products and waste should be labelled and handled properly to avoid contact with the ground 3. Dispose hazardous waste through a NEMA approved waste handler	Construction	Contractor REREC	Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00
Accidental Oil Spills or Leaks	1. In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately.	Construction	Contractor REREC	Records of all accidental spills and number of liters	Quarterly	150,000.00

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	individual containers.					
Fire Hazards	1. Create awareness to the construction workers on potential fire hazards 2. Provision of firefighting equipment on site during construction. 3. No smoking shall be done on construction site 4. 'No smoking' signs shall be posted at the construction site 5. A fire risk assessment and evacuation plan should be prepared and must be posted in various points of the construction site including procedures to take when a fire is reported. 6. Designate an assembly point	Construction	Contractor REREC	-Records of any Fire incidences -Fire equipment and evacuation plan	Quarterly	100,000.00

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Energy Consumption	1. Ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used. 2. Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. 3. Complementary to these measures, they monitor energy use during construction and set targets for reduction of energy use.	Construction	Contractor REREC	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	Construction	Contractor REREC	Records of any near misses, incident, and accidents.	Quarterly	1,000,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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			Records of corrective actions implemented if there was an accident.		

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	11. Engagement of trained first aider on site 12. Ensure the WIBA cover is taken for the staff 13. Establish safety committees					
Community safety –access	1. Proper barricading 2. Hazard communication. 3. Controlled access to the site by designated personnel 4. Maintain records of any person who comes to site	Construction	Contractor REREC	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	Construction	Contractor REREC	Number of awareness creation sessions conducted. -Availability of and distribution of condoms	Quarterly	20,000.00

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	measures including campaign to maintain individual measures at the workplace.					
Sanitary waste	Construct/ install pit latrines for both genders clearly labelled	Construction	Contractor REREC	Presence of separate and clean washrooms for both the gents and ladies	Quarterly	300,000.00
Solid Waste Generation	1. Provide waste handling facilities such as labelled 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 KPLC	Presence of well-maintained receptacles and centralized collection points	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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 KPLC	-Engine maintenance records -Oil spill containment plan	Quarterly	200,000.00
Increased oil Consumption	1. Efficient energy consumption	Operation	O&M Contractor	Energy consumption records	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	2. Install an energy-efficient lighting system		KPLC			
Increased storm water flow	1. Construct the drainage system in a way to follow natural drain of the water 2. Concrete only the required area and leave the rest of the land with vegetation like grass 3. Construct rain water harvesting system on the control buildings/office and harness into storage tanks for use	Operation	O&M Contractor KPLC	Provision of a drainage system and a rain water harvesting system	Quarterly inspections	200,000.00
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	Operation	O&M Contractor KPLC	-Provision of serviced fire equipment, evacuation plan and safety signages -Records of fire safety training	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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					
Water demand	1. Ensure prudent use of water. 2. Install water-conserving automatic taps. 3. Any water leaks through damaged pipes	Operation	O&M Contractor KPLC	Water usage records	Quarterly	20,000.00

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

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Noise and Vibration	1. Generator room should be soundproof to ensure no noise of a nuisance level will be produced. 2. Monitor noise levels	Operation	O&M Contractor KPLC	Noise levels- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Quarterly	Part of contractor's cost
Shocks and electrocutions	1. Inspect the wiring of the houses before connecting power 2. Safety awareness campaigns to the community before connection of power on safety precautions such as: o Require community to engage a certified technician to do wiring in the premises o Use of quality materials while wiring o Refraining from individual illegal extensions of power lines to other houses	Operation	O&M Contractor KPLC	-Records of awareness sessions conducted -Incidences report	Quarterly	No additional cost

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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 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	Operations	O&M Contractor KPLC	Grievance records	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	5. Ensure all grievances are logged and closed 6. Monitoring the pattern of grievances to come up will long term measures					
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	Operations	O&M Contractor 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	Operations	O&M Contractor KPLC	Number of awareness creation sessions conducted. -Availability of and distribution of condoms		20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	awareness campaigns for the community 2. Provision of condoms to workers 3. Allowing migrant workers time to be with their families					
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 4. Provision of contact numbers for the nearest health facility for testing and treatment	Operations	O&M Contractor KPLC	Availability of hand washing facilities Utilization of hand washing facilities Number of Covid-19 cases reported	Quarterly	30,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	5. Adhering to any other measures from the ministry of health which may be issued from time to time					
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	Operations	O&M Contractor 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	Operations	O&M Contractor KPLC	Engine maintenance records	Quarterly	No additional cost

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Solid Waste Generation	1. Demolition contractor to adhere to the various manufacturer's guidelines and requirements regarding demolition and disposal 2. Segregation of waste in order to separate hazardous waste from non-hazardous waste and other streams of waste 3. Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements 4. Adequate collection and storage of waste on site 5. Safe transportation to the disposal sites / designated area 6. Hazardous waste must be disposed by NEMA approved waste handler	Decommissioning	Contractor	Presence of well-maintained receptacles and centralized collection points	Daily	700,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Dust Emissions	Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard	Decommissioning	Contractor	Visual inspection	Daily	20,000.00
Public Health-HIV/AIDS	The project will sensitize workers and the surrounding communities on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training and awareness campaigns/ to the community.	Decommissioning	Contractor	Records of awareness creation sessions conducted. -Availability of and distribution of condoms	Once off	20,000.00
	Total					4,680,000.00

NB/ MoEP (Ministry of Energy and Petroleum; IA (Implementing Agency); E&S (Environmental and Social) specialists; PMC (Project Management Committee); CMs (Community Members

Table 5-17: Institutional Framework and Compliance/Implementation of the ESIA/ESMMP

No	Institution	Role/Function
1	The National Environment Management Authority (NEMA)	NEMA: • Approves the ESIA Report; • Issues EIA License for project implementation; and • Carries out independent Audit to determine compliance with ESMMP.
2	Directorate of Occupational Safety and Health Services (DOSHS)	DOSHS: • Provides OSH permits for workplaces of the project including campsites and quarries; and • Conducts inspections to ensure conformance to OSHA.
3	Water Resources Authority (WRA)	WRA: • Provides necessary water abstraction permits for boreholes and surface water sources (rivers, streams etc.); and • Monitors water use in the region and provide guidance water use.
4	National Land Commission (NLC)	NLC: • To exercise the powers of compulsory land acquisition on behalf of MoE
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
6	Marsabit County-Department of Gender women, social services and children	• Work with poor, marginalized, vulnerable and disadvantaged communities as its primary target group will ensure that this group is supported and is not left out of the project implementation.
7	County Government of Marsabit	County Governments will: • Provide approval for the project & project site; • Approval of community land consent & verification; 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.

3.4 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
- Sexual Exploitation and abuse and sexual harassment prevention and response action plan

3.4.1 Construction Management Plan

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

a) Management of Fuels and other Hazardous Materials

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

b) Management of the Construction Site

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

c) Fire Prevention and Management

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

d) Management of Air Quality

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

e) Neighboring Land Owner and Occupier Relations

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

f) Complaints Register

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

g) Construction Control

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

Control of Access

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

Control of material supply and burrow areas

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

3.4.2 Rehabilitation and Site Closure Plan

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

3.4.3 Local Recruitment Plan

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

In designing the local recruitment plan contractor shall:

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

The mitigation measure is:

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

3.4.4 Workplace Health and Safety Plan

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

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

3.4.5 Community Health and Safety Plan

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

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

3.4.6 Emergency Preparedness Plan

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

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

3.4.7 SEA/SH Prevention and Response Action Plan

The contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a Grievance Mechanism (GM) that ensures confidentiality. The plan should have an Accountability and Response Framework. The plan will include the necessary measures for prevention and response of GBV impacts.
The mitigation measures shall include:

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

3.4.8 Stakeholder Engagement Plan

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

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

The plan shall put this measure in to consideration:

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

3.4.9 Labor Influx Management Plan

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

The objectives of this plan are as follows:

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

The plan shall consider these measures:

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

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

7.5 Grievance Redress Mechanism

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

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

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

7.5.1 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.
Members to **NGRC** include representation from the following agencies and entities

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

Functions of the National Grievances Redress Committee

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

7.5.2 County Grievance Redress Committees (CGRC)

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

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

1. Representative of NLC, to grant legitimacy to the acquisition process and ensure that legal

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

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

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

7.5.3 Locational Grievance Redress Committee (LGRC)

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

At the time of assessment, it was noted that the committee was constituted in October 2021 during the land acquisition forum. The membership of LGRCs was elected from each category of PAPs except the locational Chief and assistant chiefs who will be automatic members of the team by virtue of their positions.

The implementing agency representatives present during this forum included MoE, KPLC and REREC (County Renewable Energy Officer). They held a consultative forum with the community and constituted an LGRC consisting of seven (7) members. The members consisted of two (2) ladies, four (2) men, one(1) youth and one (1)disable person all identified and elected from each category of PAP except for the location Chief and village administrator who are automatic members of the team.

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

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

1. The locational Chief, who is the Government administrative representative at the locational unit and who deals with community disputes will represent the Government in LGRC

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

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

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

The roles of LRCCs will include among others:

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

7.5.4 Available Grievance Redress Mechanism –

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

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

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

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

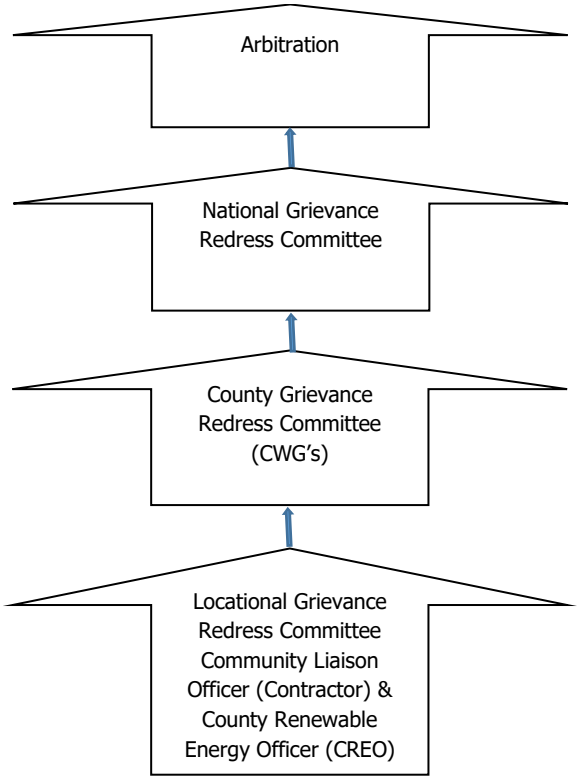


Figure 5: KOSAP Grievance Redress Mechanism

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

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

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

8 IMPACT SUMMARY AND CONCLUSION

8.1 Introduction

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

8.2 Impacts Requiring Detailed Assessment

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

8.3 SA AND VMGP CONCLUSION

The Dirdima project has triggered the World Bank Operational Policy (OP 4.10) for Indigenous Peoples due to the known presence of indigenous peoples (IPs)/vulnerable and marginalized groups (VMGs) at the project area. Dirdima area is overwhelmingly IP/VMG area and is inhabited predominantly by the Garre community. This is addition to The Kenya Constitution requirement to protect and promote the interests and rights of minorities and marginalized communities and the relevant laws and regulations of the Government of Kenya concerning VMG (Vulnerable and Marginalized Groups). The OP 4.10 Indigenous Peoples 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 engage the IPs/VMGs in a process of Free, Prior and Informed Consultations. This was the basis of the public participation done in Dirdima Centre on 19th jan 2022. During the ESIA study the community members further identified members of the community they consider vulnerable by the community member. The vulnerable were identified to include;

- Female headed households-approximately 910
- Orphans –approximately 23
- Persons Living with Disabilities- Approximately 11
- The elderly (80 years and above)- approximately 33

The elements of the VMGP are incorporated in the ESMP.

8.4 Conclusion

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

The proponent/contractor to consult all relevant service providers and authorities (i.e., County Administrators, NEMA, amongst others) to harmonize the projects infrastructural and socio-economic developments with existing facilities.

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

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

9 REFERENCES

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10 APPENDICES

Summary of Appendices	
Appendix 1:	Abbreviated Resettlement Action Plan (A-RAP)
Appendix 2:	Summary of Community Consultation Meeting Leading to Land Identification and GRC Constitution
Appendix 3:	Lists of Attendance
Appendix 4:	Summary of Community Consultation meeting during ESIA Public Participation
Appendix 5:	Environmental and social screening form for the proposed project
Appendix 6:	Lead Expert's Practicing Licence

Appendix 1: Abbreviated Resettlement Action Plan (A-RAP)

ABBREVIATED RESETTLEMENT ACTION PLAN (A-RAP)

1. Dirdima Sub-project Site

The Dirdima sub-project site is on unregistered community land. The proposed site is undeveloped and uncultivated with scares acacia trees and patches of open scrubland. In consultation with community members and local leadership, it was agreed for the project to utilize 1.41 Hectares for the mini-grid. The minutes of the discussions including key agreements are annexed to the Dirdima Environmental and Social Screening report. *Refer to Chapter 3 of the ESIA for the comprehensive socio-economic profile.*

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

The number of project-affected persons (PAPs) is 1500 (approximately 120 households). The land acquisition-related impacts are loss of- land and pasture. Mitigation measures include in-kind compensation for loss of land and pasture, and designing power distribution lines to avoid impacting trees, crops, structures, and community facilities. No physical displacement is anticipated; however, there is minimal loss of pasture occasioned by the acquisition of land utilized by the community for grazing. The 1.41 Hectares identified for the sub-project will be acquired compulsorily by the National Land Commission (NLC). The proposed site will be valued and compensated in line with the provisions of the Resettlement Policy Framework (RPF) prepared under KOSAP. *Refer to section 2.2 of the ESIA for the sketch map of the site.*

3. Compensation Measures Agreed with the PAPs and other Resettlement Assistance to be Provided

The proponent requested the community identify three priority projects, whereby one out of the three would be provided as in-kind compensation for loss of land and pasture. The Dirdima community proposed three projects; Installation of water storage tanks with trough and repair pipes at Dirdima borehole, fencing of the dispensary to improve security and construction of school fence and administration block with kitchen and staff quarters. The value of the priority community project will be proportional to or higher than the value of land under acquisition. In addition, loss or damage to crops, trees, structures, and community facilities will be compensated in line with the provisions of the RPF, and as summarized in the entitlement matrix below.

3.1 Entitlement Matrix

Types of Impact	Person(s) Affected/Eligible for Compensation	Compensation/Entitlement/Benefits	Responsible organization
1. Loss of Land			
Loss of unregistered community land.	Community.	Compensation in-kind as prioritized by the community.	REREC
Loss of land in unregistered group ranches.	Group ranch members.	Compensation in-kind as prioritized by the community.	
Loss of land in registered group ranches.	Group ranch members.	Compensation in-kind as prioritized by the community.	
Loss of land owned by the National Police, county governments and the Ministry of Interior	Government agencies.	No compensation for public land allocated to another government body.	

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

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*

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

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

4.3 Summary of Consultations on Land Acquisition and Compensation Options

Date	Objective	Implementing Entities	Land Acquisition & Compensation Aspects Discussed	Key Issues Raised	Responses Given
October 21st, 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).	Among compensations, what about 1000 payment for wiring – is it possible to be put or divert to other things? Missa village is 4 kms from here, will it get power? Clarification on compensation?	-No. It should be a community project. Connection fee will be paid by premise/household owner. -No. The project radius is 1.5 kms. But the residents can benefit from home solar systems which is part. -Compensation of land for land. The community would identify a similar piece of land in value to the project site and request that the same is purchased for the community. -Further option is compensation in kind. This option for community to grant land for the project and request for compensation in kind. Be in form of project in benefit of the community like the construction of classrooms, dispensary, or a borehole. This is the most preferred option.
January 19th 2022	Environmental and Social Impact Assessment.	Consultants MoE KPLC REREC	Land acquisition through compulsory acquisition (not voluntary land donation). three priority community projects, to be implemented as in-kind compensation for land.	Community requested for; Installation of water storage tanks with trough and repair pipes at Dirdima borehole, fencing of the dispensary to improve security and construction of school fence and administration block with kitchen and staff quarters.	The proponent has set aside KES 1 million to implement the priority in-kind compensation project. The value of the project will be proportional to or greater than the value of land. NLC will determine the value of land.

May 2023	Compulsory Land Acquisition.	NLC	Site inspection and inquiries. Land valuation. Award of compensation.		

5. Institutional Responsibility for Implementation of the ARAP

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

6. Procedures for Grievance Redress

The Project procedures for grievance redress were established through a public consultation process and informed by the existing conflict resolution structures in the community. The Grievance Redress Mechanism (GRM) comprises tiers at the project, county, and national levels. *Refer to 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 2: Summary of Community Consultation Meeting during ESIA Public Participation

MINUTES

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MINUTES OF EIA CONSULTATION HELD AT .....

Date: 19/01/2022	**Time:** 1400HRS
Venue: DIRDIMA	

ABDINUR ADAN HASSAN
ASST CHIEF DIRDIMA
P O BOX 1 MOYALE

PRESENT

List is attached

AGENDA

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

Item No	Description	Action by
Min 1/22	**Introduction**	
	KOSAP Project - Introduction of project to members by the Chief. Session x Prayer for by community member x Introduction of Environmental Exp. County Representatives, RTREC representative	
Min 2/22	**Opening Remarks**	
	1. Chief opened the session by a word of prayer, presided on by one of elders 2. Abdi - chief x Welcomed all members introduced the expert team, led by team lead Hatensia. 3. Briefing on objective of the Meeting and lead team 4 Objective of ESIA process, outcome and the approval process 5. Need to understand benefits / failures as presented by the project	

Min 3/22	Remarks by the Consultant	
	Consultants led by Hotensia briefed community members on: 1) The proposed project. 2) Project Nature and compatibility with neighborhood. 3) Understanding Environmental concerns as presented by proposed project 4 Need to undertake analysis of the current situation/ status of immediate environment of soil air quality and water as regards to quality to life and reduced risk as a result of project 5) The occupational ~~health~~ Health and Safety → Close household to project site → Workers/Visitors. Need to ensure protection of environmental pollution, distruction of ecosystems Cause of injuries during construction and operation time. → Contractor and all involved shall be expected to observe requirement of the OSH act 2007 and EMCA 1999 requirement out. i) Air quality 2) Waster management – Solid – Liquid – Human waste. 3) Safety of personnel engaged in project through: – provision of suitable PPE's – provision of relevant training needs (pre-task inductions, Risk Assessment and adoption of best practices as relate, to safe work procedures) 6) Contractor shall be expected to reduce pressure on existing resources main water existing Sanitary facilities and controlled weight management to reduce damage to the roads. 7) Security shall be maintained in consultation with local administration. 8. Public participation is an integral part of any sustainable project development → Hence the today's meeting. → All raised concerns shall be taken with the seriousness as required. REREC Rep – Reminded community members on the nature of project being Solar project with capacity to run/operate household equipments, welding works, barbash-ps etc. – ~~when~~ when ~~they~~ were ~~they~~ informed that installation fee shall be 1000/= per household and there shall be a monthly fixed payment based on ~~fact~~ The usage.	Hotensia Kabuu

Min 4/22	Concerns / Issues from participants	
	1. Power Connection and installation - All households shall be required to pay an installation fee of 1000/= x Community is also reminded that installations/wiring in their household shall be expected to be done by competent electricians. x There shall be a monthly remittance of tokens, based on consumption. 2) Employement - Contractor shall be expected to ensure locals are considered for all tasks that do not required skilled labour. 3) Proposed projects (As requested by Ministry/ to community) - There are projects already selected by community lead team, as a form of appreciation/compensation for the community allowing and allocating the community land. x It's agreed that the agreed upon project shall be implemented by Contractor. 4) Safety and Health Requirements - It shall be the duty of the contractor to take considerable measures that shall ensure the safety and health of all persons at the construction site. - Contractor shall ensure: 1) provision of suitable PPE's (Fluorescent Clothing and Head protection) and as it may be considered by RA 2) Provide medical covers to all workers (valid WIBA) 5) Waste Generation (solid & liquid) - Contractor shall be required to ensure waste generated is well segregated, and disposed off at designated area - as may be advised by the county government of Marsabet. - Sanitary Mr Hassan Mbonaya (participants) - Will the power be installed at the 1) Mosques 2) Churches 3) Schools 4) Hospitals 5) Dispensaries who shall bear the cost of installation and operation	

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Min 5/22	Responses given by the consultant	

D) Response on Mr Hassan

1) Everyone (individual household or facilities shall be expected to raise the installation fee individually as well be able to pay for consumption).
REREC Rep [Hellen]

2) Ali Ger Response [Hotensia]
- Will contractor employee 20 Watchman during construction.
* It shall be determined by contractor, before commencing the task

3) Mr. Hassan
- We agreed on three project as away to appreciate/compensate community for allowing the community land

Question
→ When shall the agreed on projects be started
REREC Rep (Irene.)

- Based on the plan the proposed compensation projects shall be started before the proposed KETRACO project.
- It shall as well be

4 Youth Group Rep Mr. Ali Abdi Lafa
· Question: How will be the electric poles be installed and by who.
REREC REP Response.
x The Community shall not be expected to pay for any post/pole
x Community/Households shall only be required to pay for connection fee and consumption fee.

5. Yusuf Hussein
Question: In an event that an accident takes place as a result of electricity:

REREC REP Hellen Response.

- It shall be the responsibility of KPLC, to conduct investigation. to get to the root cause.
- Based on investigation, if the fault is

Min 6/22	**Acceptance/Rejection of the project**	
	All members accepted the project	
Min 7/22	**Adjournment**	
	Meeting was adjourned at 16:45HRS	

Minutes Prepared by: DICKSON OKUBARA Date 19/01/2022

Position ~~DICKSON~~ Environmental Expert

Signature

Minutes Confirmed by: ABDINUR ADAN HASSAN Date 19/1/2022

Position ASSISTANT CHIEF DIRDIMA SUB-LOCATION

Signature

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Mr. Ibrahim (participants)

Question: 1) Type of pole (timber, concrete)

2) Sustainability of project since we have similar projects where we have solar installed, and after 2-3 yrs the facility of check.
- Advice whether it's amaintainance arrangement to ensure that the project is sustainable.

Response: REREC Rep ~~Hellen~~ Irene

1) All poles shall be concrete.

2) It's sustainable based on capacity with similar projects in Sololo marsabit and there is technical team from REREC, shall be available for maintenance and service.

3) Due to approval procedures the project shall have to seek approval from all relevant Urgencies including NEMA.

4) There is support of this project hearing

Fatima Madera

Question: The developer should consider implementation of agreed upon community projects before actualization of the KOSAP project

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Kenya Power

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: DIRDIMA Date: 19/01/2022

MAIN ATTENDANCE LIST Time: 1400HRS

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Abubakar Abdullahi Abdi	DIR-DIMA	0740736831	
2.	Dahabo Abdi Guyo	DIR-DIMA	0113938815	
3.	Marian Adan Shone	DIR-DIMA	0727795785	
4.	Nuria Ali duba	DIR-DIMA		
5.	Rufo Galgalo Gawana	DIR-Dima	0729741028	
6.	Suleqa Adan Ibrahim	DIR-Dima	0728324625	
7.	Fatuma Mohamed Rashid	DIR-Dima	0757240538	
8.	Abdia Doti Iya	DIR-Dima	0768135507	
9.	Tume Halkano Dika	DIR-Dima	-	
10.	Fatuma Halake Jillo	DIR-Dima	0790754620	

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: DIRDIMA

Date: 19/01/2022

Time: 1400HRS

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Ibrahim NUR BORU	DIR-Dima	0740096119	
2.	ISSACK Jaro Ali	DIR-Dima	0705654243	
3.	NUR HUKA Bidu	DIR-Dima	0727469798	
4.	Hussein Somo Ali	DIR-Dima	—	
5.	Salad Mohamed Manko	DIR-Dima	0704348561	
6.	Luca Bii	Centric Agnca	0725135119	
7.	IRENE MATE	S. ENVIRONMENTALIST REREC	0729081220	
8.	Said Luga	ABDINUR ADAN HASSAN ASS. ... DIPLOMA ... TECHNICIAN	0729377370	
9.	Dickson Ajubala	CENTRIC AFRICA LTD	0712647491	
10.	HOTTENSIA W. KABUKI	CENTRIC AFRICA LTD.	0720826705	Hkabuki

REREC Barza Kenya Power M

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: ..DIRDIMA..... Date: 19/01/2022.....

Time: 1400HRS.....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Robley Adan Abduba	DIR - Dima	-	
2.	Fatuma Abdi	DIR - Dima	0707558511	
3.	Hawo boru Guyo	DIR - Dima		
4.	Yussuf Hussein Elema	DIR - Dima	0716688565	
5.	Edin Halake dido	DIR - Dima		
6.	Hassan Bonaya	DIR - Dima	0729840061	
7.	Ali Abdi Iafah	DIR - Dima	0798832802	
8.	NUR BORU GUYO	DIR - Dima	0743838316	
9.	Aligen Edin Duba	DIRDIMA	0707470008	
10.	Liban Roba Harsama	DIR - Dima	0757082602	

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P O BOX 1 MOYALE

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: ....Dirdima..... Date: ..13/01/2022.....

Women Time: ...4pm.....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	DAHABO ABDI Gunjo	DIRI DIMA	0113938811	DAG
2.	HAADIMI ADAN	DIRI DIMA	0727795785	~~HAS~~
3.	ABDIA DOTI	DIRI DIMA	0768125507	
4.	HUDIA ~~ADAN~~ ALI DOBA	DIRI DIMA		HAA
5.	FATUMA ABDI Gunjo	DIRI DIMA	0707558811	~~FAS~~
6.	ROBLEY NECHO	DIRI DIMA		
7.	ROBLEY ADAN	DIR DIMA		
8.	HANI EDIN	DIRI DIMA	ABDIRAK I DAN HASSAN ASST CHIEF DIRDIMA P.O BOX 1 MOYALE	
9.	Shuma Sori	DIRI DIMA		~~SS~~
10.	TOME HALCANO DIKA	DIRI DIMA	0759177572	

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Venue: ...Dirdima..... Date: ...19/01/2024.....

Women' Time: ...4pm:.....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	FATUMA JILO HALAKE	DIRI DIMA	0790754620	
2.	Lucy Bii	Centric Africa Ltd	0725131019	
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

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ASST CHIEF DIRDIMA
PO BOX 1 MOYALE

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: DIRDIMA VILLAGE CGRC. Date: .....

Time: .....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	HASSAN BONAYA GUYO	DIRDIMA	0729 840061	HA
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

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MALE FGD LIST

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: Dirdima Sub location
Male FGD

Date: 19/01/2022

Time: 04:00PM

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	IBRAHIM ABDULLA	Village elder	07249[illegible]	[signature]
2.	HUSSEIN SOMO	Village elder		[signature]
3.	NUR BORU	Village elder	0743838316	[signature]
4.	AHMED Edin	Village elder	0707470008	[signature]
5.	ISSACK JARO ALI	Village elder	0705654243	[signature]
6.	IBRAHIM BORU	Village elder	0799590211	[signature]
7.	YUSSUF Hussein	Village elders	0716688565	[signature]
8.	Hassan Bonaya	Village elder	0729840061	[signature]
9.	Said [illegible]	E-Health [illegible]	[illegible]377370	[signature]
10.				

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED KENYA OFF-GRID SOLAR ACCESS PROJECT (KOSAP) FOR UNDERSERVED COUNTIES, MARSABIT COUNTY

Venue: DIR-DIMA Date: 19/01/2022

FGD - YOUTH Time: 1645HRS

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Ali Abdi Iafah	DIR-Dima	0798832802	
2.	Abubakar Abdullahi Abdi	DIR - Dima	0740736831	
3.	Ibrahim NUR boru.	DIR - Dima	0740096119	
4.	NUR Ituka Bidu	DIR - Dima	0727469798	
5.	Liban Roba Harsama.	DIR - Dima	0757082602	
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10.				

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Appendix 4: Summary of Community Consultation meeting Leading to Land Identification and GRC Constitution

MINUTES OF COMMUNITY CONSULTATION MEETING HELD ON 21/10/2021 IN DIRDIMA

AGENDA

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

In attendance (refer to annexed list of participants)

MIN 1.0 WELCOMING AND OPENING

The project team introduced themselves to the community as follows;

No	Name	Title/Institution
1.	Dorothy Kagweria	Ministry of Energy
2.	Ms. Irene Kawira	Snr. Environmentalist (REREC)
3.	Ms. Agnes Gachoki	Snr. Surveyor (REREC)
4.	Mr. Kioko Maithya	Social Safeguards Officer (REREC)
5.	Amina C. Abdi	CGM, Land & Energy
6.	Salim Lesuper	Surveyor, Marsabit County Government
7.	Abdillahi Jillo	National Lands Commission (NLC)
8.	James Chege	REREC supervisor, Marsabit
9.	Osman Galgallo	CGM-Land, Marsabit

2.0 KOSAP AND DIRDIMA MINI GRID

Ms. Dorothy Kagweria informed the participants that the proposed project is part the Kenya off Grid Solar Access Project (KOSAP) which is funded by the World Bank and is being implemented by the Ministry of Energy, the Kenya Power and Lighting Company (KPLC) and the Rural Electrification and Renewable Energy Corporation (REREC). MoE will provide overall coordination of the Project including responsibility for safeguards, due diligence and compliance monitoring. REREC will implement the mini grid and will be responsible for the implementation of Resettlement Framework Plan, Environmental Social Management Framework and Social Assessment. She said the Government is committed to providing electricity to communities that have not been served by the national grid such as Dirdima because it recognises energy as an enabler to development.

She said KOSAP entails the following components;

1. Provision of electricity through solar mini grids to households, enterprises and community facilities,
2. Provision of energy services through solar home systems for and clean cooking technologies for households

3. Provision of solar power to electrify boreholes as well as to power community facilities
4. Community engagement and education as well as capacity building and institutional support for the national and county Governments

She further said KOSAP is being implemented in 14 counties. In Marsabit County 16 minigrids including one to be sited at Dirdima will be implemented in addition to stand-alone solar projects (public facilities) and solarisation of boreholes. The agenda of the visit she said was to; undertake an environmental and social screening of the proposed project site, to sensitize the community on the project land requirements and community rights and entitlements, explain the Project Technical architecture and connection requirements, discuss potential environmental/social risks and impacts and mitigation and sensitize community on grievance redress mechanism. The proposed mini grid will comprise a solar system and a thermal unit (generator) and those residing within 1.5 km radius from the project site will be connected to power. Those living beyond this radius can benefit from solar home systems. She said for one to be connected he/she will be required to pay a one-off connection fee of Kshs 1000. Thereafter they shall be buying prepaid tokens in order to access electricity. Tokens can be purchased through a vendor or directly through the mobile money platforms (Mpesa).

3.0 PROJECT LAND REQUIREMENTS: RIGHTS AND ENTITLEMENTS OPTIONS AND IMPLICATIONS

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

She explained the various forms of acquiring land including; allocation, land adjudication process, compulsory acquisition, settlement programs, transfers, and long-term leases.

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

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

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

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

She said the surveyor will need to pick exact GPS points of the land proposed for the project and with community consent the land will be registered in the name of the implementing agency. The surveyor

encouraged the community to make an informed decision that collectively involved every member of the community i.e. elders, men, women, the marginalised and PLWDs. Land consent would have to be signed by at least five representatives nominated by the community. She disclosed to the meeting what the term advance possession on land issues meant and requested them to consider allowing the implementing agency to take possession of the parcel and commence construction of the project even as the land transfer process was on-going.

MIN 4.0 SOCIAL AND ENVIRONMENTAL ISSUES

The Environmental specialist Ms. Irene Kawira Mate said that there were both positive and potential negative impacts that were likely to emanate due to the construction of the project.

POTENCIAL POSITIVE IMPACTS

1. Employment and Wealth Creation - locals will be prioritized for unskilled and semi-skilled employment opportunities, therefore creating an income source for especially youth. Other services to be procured locally could include accommodation, catering and cleaning,

2. Access to electricity

The area will be supplied with power for domestic and commercial use for those residing within 1.5 kilometre radius from project site,

3. Improved Standard of living

Locals to use domestic electric appliances such as iron boxes etc., improved lighting, longer business operating hours, ability for children to study at home, locals can diversify their businesses and create alternative livelihood opportunities, as well as improved security. Access to electricity will also limit exposure to smoke associated with kerosene lamps, a major cause of lower respiratory infections.

4. Reduced disease burden and mortality rates

Residents currently use firewood and kerosene lamps for lighting, causing indoor pollution. Replacing kerosene lamps and firewood for lighting with electricity will reduce disease burden at the family level and on the government.

5. Benefits to Education

Access to reliable electricity at the household level and schools will create opportunities for children to study, access more information through informative TV channels and radios. This will increase the amount of time spent by children studying and accessing valuable information translating into better results and an informed society.

6. Improved Security

There will be enhanced security arising from well-lit social, commercial and individual premises. This is as a result of improved security lighting, which will help ward off opportunistic crimes and gender-based violence.

7. Improved communication and access to information

Access to electricity will lead to improved communication for the beneficiaries. For example, charging of mobile phones will be easier and cheaper. Project beneficiaries will have access to information on local, national and international social, economic, political affairs.

8. Gender Considerations

Both men and women will access electricity and benefit from opportunities electrification brings. Lighting, internet and television will improve access to information therefore, women will benefit from information

especially on health and nutrition, among others. Women will have an opportunity to engage in productive uses of power including baking bread, blending juices, running salons and so on and elevate themselves economically.

POTENNIAL NEGATIVE IMPACTS AND THEIR MITIGATION

NO	POTENTIAL NEGATIVE IMPACT	PROPOSED MITIGATION MEASURES
1.	Dust emission	The Contractor/EHS officer will ensure strict enforcement of on-site speed limit regulations, Cover stock piles of fine materials with tarpaulin during windy conditions and Provide and enforce use of PPEs by construction workers
2.	Exhaust emission	Regular maintenance of equipment to increase their efficiency and reduce generation of exhaust emission Avoiding equipment and vehicles running unnecessarily to reduce emission
3.	Noise Pollution	Construction activities to be restricted to daytime, drivers and machine operators instructed to switch off engines when not in use. Drivers will avoid hooting especially when passing through sensitive areas such as mosque.Noise abatement generators and heavy-duty equipment are insulated or placed in enclosures to minimize ambient noise levels. Use equipment with low noise ratings
4.	Oil spills	Contractor and EHS will ensure proper storage, handling and disposal of new oil and used oil wastes, maintain plant & equipment to avoid leaks which should be carried out in contractors' yard (off the site), provide oil interceptors along the drains leading from potentially oil spill/leak prone areas. Oil absorbent material, traps and storage drums will be used to contain and control any minor releases of engine and other equipment oil and there shall be regular inspection and maintenance of the transformers to minimize spillage
5.	Soil erosion	Levelling of the project site to reduce run-off velocity and increase infiltration of storm water into the soil and restriction of construction vehicles to use existing access roads. Any compacted areas are ripped to reduce run-off. Site excavation works be planned in such a manner that a section is completed and rehabilitated before another commences. The contractor will ensure proper compacting of soil when constructing the mini grid.
6.	Visual/aesthetic impacts	Contractor will design structures at the site in such a way as to improve the beauty of the surroundings. Restore site area through backfilling and landscaping and Plant locally occurring trees and shrubs on the open spaces to re-introduce visual barriers
7.	Solid waste	Construction materials left over at the end of construction will be used in other projects rather than being disposed of. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time. Segregate waste according to type & dispose waste by dumping at designated landfills only. Reuse packaging materials such as cartons, cement bags, metal containers and plastic containers to reduce wastes on site. Put up well protected mobile collection units/storage for obsolete batteries before collection by a licensed waste handler by NEMA, which should be properly equipped and shall be protected from solar radiation, humidity and temperature
8.	Increased demand for raw materials	Harness rainwater and storm-water whenever possible for use in dust prevention & construction work. Consultations with the project local committee on use of water in the community to avoid conflicts with the community. Construct borehole to meet water demand. Promote recycling and reuse of water.Ensure that damage or loss of materials at the construction site is kept to a minimum through proper storage and use Employing

		water conservation techniques and only using the required amounts of water to prevent wastage Providing adequate water storage reservoirs at the construction site to meet project needs during periods of high demands externally and refill tanks during the periods of low demands
9.	Loss of flora & natural habitat	Clearing of vegetation & trees will be strictly controlled & only done if it's absolutely necessary
10.	Occupational health & safety risks	Contractor and EHS officer will enforce adherence to safety procedures and prepare contingency plan for accident response in addition safety education and training shall be emphasized. Provide workmen's compensation cover (WIBA) for construction staff. Register the project site as a workplace with DOSH Develop, document and display prominently an appropriate SHE policy for operation works. Formation & training of a Health and Safety Committee. Provide suitable, efficient, clean and adequate sanitary conveniences for workers Ensure that machinery, equipment, PPEs, appliances and hand tools used in construction and power generation comply with the prescribed safety and health standards and be appropriately installed maintained and safeguarded Train and supervise workers regarding construction and power generation machinery and as well as safe work procedures Equipment such as fire extinguishers MUST be inspected by a government authorized person. The equipment may only be used if a certificate of examination has been issued Ensure that materials are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency; Provide a well-stocked first aid boxes which are easily available and accessible should be provided within the premises Provide sufficient number of trained first aiders with their contacts prominently displayed within the site. Carry out safety and health inductions and toolbox talks for all workers to enhance awareness on safety and health requirements Provide workers with PPEs and training them on equipment use and risks Contractor to register the mini grid construction site as a workplace with the Directorate of Occupational Safety and Health Services (DOSHS) Placing safety signs where there are safety hazards control the movement of vehicles, motorists and pedestrians around the site. Create awareness to the public on the potential impacts of powered lines to prevent electrical hazards
11.	Open excavations	Barricade the proposed project area using high visibility tape to avoid falls into open excavations Pole pits should be dug and poles erected immediately and where inevitable the pit shall be covered to avoid falls and injury to humans and animals or traffic accidents.

		Contractor to compensate any injuries to the public and animals arising from his negligence Provision of adequate warning signs to promote good safety culture at project site
12.	Increase in social vices	Encourage public participation with the locals Proper training of construction staff on local cultural behaviour and responsible community interaction Prioritize locals for certain jobs for locals. Sensitize workers and communities on HIV/AIDs prevention and mitigation through staff inductions and awareness campaigns
13.	Contractors Yard Site and Workers camp	Liaison with local administration for identification of possible sites for Contractor's Yard. Contractor to consult with community and if required pay compensation for temporal use of site. Contractor to ensure restoration of contractor's yard and workers. Contractor and community to have a written agreement on the above-mentioned mitigation measures
14.	Sanitary waste	Provide clearly marked sanitary waste facilities for both genders and ensure disposal of waste through septic tanks.
15.	Spread of communicable diseases and HIV/ AIDs	Awareness creation and consultations with local communities prior and during construction. Informing workers on local cultural values and health matters. Provision of condoms to workers. Allowing migrant workers time to be with their families. The contractor is impressed upon not to set a construction camp on site. The contractor will provide public education/information about HIV/AIDS transmission and prevention measures. Awareness sensitization and disciplinary action. Ensure equal treatment of workers Develop and implement a STD/HIV/AIDS awareness plan on prevention and mitigation
16.	Risk of Covid-19.	Avoid holding community meetings where many persons congregate until advised so by MoH Sensitize all community segments and project workers on COVID-19 and precautionary measures that need to be observed.
17.	Stakeholder engagement and information disclosure	Contractor to develop and implement the Stakeholder Engagement Plan to guide consultations and information disclosure to stakeholders Contractor to ensure that community engagement and disclosure is done prior to project mobilization Contractor to ensure full disclosure to communities on positive and negative impacts as well as opportunities
18.	Labour influx into project area	The contractor to develop & implement a Labour Influx Management Plan, Workers' Camp & Accommodation Management Plans and as part of C-ESMP and monitor all mitigation measures, including codes of conduct signed by all with physical presence on site, prioritization of local recruitment, induction of workers on GBV-SEA/SH, GRM for staff, avoid child and forced labour and enforce sub-contractor compliance of the same. Contractor to develop a recruitment plan Establishment and operationalization of an effective Grievance Redress Mechanism accessible to community members The contractor and the project grievance redress committee to work closely address complains raised on time.

		Contractor to hire Community Liaison Officers to work closely with the supervision consultant and the community Gender considerations in employment opportunities Appropriate compensation for work done Prompt payments as per the contractual agreements/terms
19.	GBV-SEA/SH	Contractor to develop and implement a GBV(SH &SEA (Sexual Exploitation and Abuse in workplace Sexual Harassment (SH) management plan, (including plans for prevention, response and GRM that is culturally appropriate and accessible and developed in consultation with the affected communities All workers with physical presence on site to sign employment contract including Code of Conduct The contractor to implement provisions that ensure that gender-based violence at the community level is not triggered by the Project e.g. review of specific compensation schemes Develop specific plan for mitigating these known risks, e.g. sensitization around gender equitable approaches to compensation and employment Confidential reporting & responding of incidences of GBV Use survivor centred approaches when responding & dealing with GBV issues Contractor to have referral services when responding to incidences of GBV survivors
20.	Liquid waste generation	Collect the used oils and re-use, re-sell, or dispose of appropriately using expertise from licensed waste handlers Proponent will make sure that storm water channels are maintained regularly to avoid release of the effluent into the land and water bodies Monitor effluent quality regularly to ensure that the stipulated discharge rules and standards are not violated
21.	Fire outbreaks	Ensure compliance with fire safety regulations and install all necessary fire safety equipment Conduct regular trainings on firefighting & emergency response Conduct regular inspection and maintenance to ensure that, there are; - no overloaded electrical systems; no incorrectly installed wiring; no live naked wires; and fuel store areas are continuously monitored Contractor to ensure all fittings are tight and implemented using quality materials to prevent arcing and any loose connections. Adapt effective emergency response plan
22.	Electric shock & electrocution	Premises to be wired by qualified technicians and test certificates maintained Deactivate and properly ground live wires before repair works are performed Ensure that live wire works is conducted by trained personnel Ensure that access to the power plant should only be by authorization and trained personnel Place warning signs on strategic places Conduct periodic awareness and sensitization campaigns for the neighbouring communities on electrical safety

23.	Insecurity	Liaising with area administration to enhance security Create public awareness on the need to protect public infrastructure for continued supply of electricity and to minimize exposure to electrical hazards Employing of security guards/competent security firm from the local population at the site Fencing of the installation area and whole site using a perimeter wall to ward off intruders
24.	Health & safety for workers and community members	Implement an appropriate re-vegetation programme to restore the site to its original status. Indigenous plant species should be prioritized

She said that the project beneficiaries were the Sakuye sub-clan of Borana, who are Indigenous people and are the only VMG residing near the sub-project area thus the sole project beneficiary.

5.0 GRIEVANCE RESOLUTION COMMITTEE (GRC)

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

Existing Grievance Redress Mechanism

In case of a dispute the aggrieved party firstly informs the offender of the offence. If they cannot come into agreement then he/her will take it up with the clan elders (YAROLE) who then summon the parties to state their cases. The elders' degree decree is deemed binding.

The summary of the comments/remarks from the community in the meeting held at Dirdima

QUESTION/COMMENTS	ANSWER/REMARKS
Ahmed Abdi Among compensations, what about 1000 payment for wiring – is it possible to be put or divert to other things? Missa village is 4 kms from here, will it get power?	No. It should be a community project. Connection fee will be paid by premise/household owner No. The project radius is 1.5 kms. But the residents can benefit from home solar systems which is part of Kosap
Ahmed Abdi Lafa Asking whether power could go up to Missa which is 4km away. Even police post constructed between the two village Committees allowances – is there any payment	No. The project radius is 1.5 kms. But the residents can benefit from home solar systems which is part of Kosap No
Edin Halalce (dirdima elder) Clarification on compensation? Is the estimated land belong to REA?	a) Payment of cash for the land that has been identified for the project. For this to take place the land is has to be valued first. All monies payable as compensation for acquisition unregistered community land are then held in trust by the county government. Any such monies shall be deposited in a special interest earning account by the County Government and shall be released to the community upon registration of the community land. b) Compensation of land for land. The community would identify a similar piece of land in value to the project site and request that the same is purchased for the community. c) A further option is compensation in kind. This option is for the community to grant land for the project and request for compensation in kind. This could be in the form of a project for the benefit of the community like the construction of classrooms, dispensary or a borehole. This is the most preferred option. Yes, ownership will have to be transferred to REREC
Yusuf Hussein Elema When connected will poles would be put, places like mosques, schools and hospitals. how would it be?	Yes
Boru Guyo	

Company and community relationship, how payment is done on land?	Will depend on community's preferred mode of compensation
Fatuma Abdi Guyo Would it be possible for our compensation to be put in place in the village main problem like borehole drilling?	Compensation is pegged at 1million Kshs. A borehole is expensive and may exceed this figure
Hassan Bonaya Guyo Dirdima started very long time ago. Main problem which hindered the development of this village is water.	
Rashid Adan Alake Weakness in committee's should it be possible to re-elected.	Yes
Abdinur Adan Hassan (assistant chief dirdima) Is the any watchman for this project? Is there any payment for this watchman?	Yes Yes

d) 6.0 FOCUS GROUP DISCUSSIONS

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

FGD-MEN

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

Kioko told them the FGD was a good avenue for them to express their opinions and freely ask any questions they might not have been unable to ask in front of the youth and women, He said that at the end of the FGD discussion the group should come into consensus on issues discussed in the earlier meeting and select representatives to the GRC. Matters agreed on and selected representatives would then be presented to the main meeting for adoption.

During the meeting the Men agreed to provide land, and elected the following representatives to the GRC;

Name	ID number	Telephone number
Hassan Bonaya Guyo	8492861	0729 840061
Adan Alake Dido	6826348	0700392804

The Men said they had fully understood the project and did not have any questions

FGD-WOMEN

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, and 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 centred approach (respect for the choices, wishes, rights and dignity of the survivor). The women were

told to be more vigilant to ensure young girls do not fall prey to GBV incidences. 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 their area. They did not ask any questions

After the discussions in the FGD for women, Dorothy requested that they elect 2 women to the GRC. The women elected were:

Name	ID number	Telephone number
Robley Adan Abduba	26237313	0743979885
Sureqa Adan Ibrahim	25024040	0728324625

FGD YOUTH

The main aim of the discussion was to know if the youth understood the project and its requirements and to give them a chance to give their opinions and ask questions they had about the project. James Chege (CREO) explained to the youth that it was important to hold a separate discussion with them so that they have opportunity to freely express themselves as this may have not been possible in the main Baraza. The FGD meeting was to clarify any issues about the project on environmental and social issues as well as request for land from the community. He explained further that there was need for land for construction of a solar mini-grid. The youth were allowed to ask questions, seek clarifications and give suggestions.
The youth did not ask any questions, and proceeded to select the following as members of the grievance redress committee;

Name	ID number	Telephone number
Liban Roba Arsama	20877195	0757082602
Abubakar Abdullah Abdi	385665575	0740736831

7.0 REVIEW OF FEEDBACK FROM FGD's BY ALL COMMUNITY MEMBERS

After the FGDs the participants convened back to the main meeting to review the respective resolutions from the FGDs.
They resolved to provide land for the project, validated the nominees to the GRC and elected officials to lead the identification of project land and sign the land forms on their behalf.

They also proposed the following as a their preferred projects for compensation

1.Water-Storage water tanks, Trough and repair of pipes at Dirdima borehole
2.Hospital(Dirdima Dispensary) Fencing
3. School(Dirdima Primary)
- Fencing of school compound
- Kitchen
- Administration Block
- Staff Quarters

The community nominated the following as members of the GRC:

No	Name	Category	1D No.	Mobile No.
1.	Hassan Bonaya Guyo	Men	8492861	0729 840061
2.	Adan Alake Dido	Men	6826348	0700392804
3.	Liban Roba Arsama	Youth	20877195	0757082602
4.	Abubakar Abdullah Abdi	Youth	385665575	0740736831
5.	Robley Adan Abduba	Women	26237313	0743979885

6.	Sureqa Adan Ibrahim	Women	25024040	0728324625

Photographs of Community Baraza on land acquisition in Dirdima

REPUBLIC OF KENYA

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

SITE ...DIRDIMA.....

MEETING VENUE.....DIRDIMA.....

DATE...21/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	KIOKO MAITHYA	10924666	0722176 597	M	RERec	
2.	SALIM DIKACHA TITA	12430403	0793709571	M	DIR.DIMA	
3.	Dorothy Kaqueria					
4.	IRENE MATE	26961056	0729 081220	F	RERec	
5.	RASHID ADAN	24816404	0701681220	M	DIR-DIMA	

LIST OF ATTENDANCE

	NAME	ID NO	MOBILE	GENDER	VILLAGE	SIGN
6.	MUR BARU GUYO	20158264	0743835316	M	DIR-DIMA	
7.	ADAN ALAKE DIDO	6826348	~~0700~~392804	M	DIR-DIMA	ADAN
8.	ABUBAKAR ABDULLAH ABDI	28566575	0740736831 ~~0740687337~~	M	DIR-DIMA	
9.	LIBAN ROBA	20877185	0757082602	M	DIR-DIMA	
10.	MAHEDO KATA	12430913	0729237~~885~~	M	DIR-DIMA	
11.	SIHEDO KURO HAPPI	0069968	—	M	DIR-DIMA	
12.	YUSSUF HUSSEIN ELEMA	21523527	0716688565	M	DIR DIMA	
13.	AHMAD ABDI ZAFA	0070065	0720701671	M	DIR-DIMA	
14.	ADAN GOLLO	22439896	08 0755~~8~~3293	M	DIR-DIMA	
15.	MAHAD ADAN			M	DIR-DIMA	
16.	HASSAN BONAYA	8692866	0729840061	M	DIR-DIMA	
17.	Adan Roban Adano	27489793	0724947118	M	DIR DIMA	
18.	MUNI HUKA	23358378	0727469798	M	DIR-DIMA	
19.	Nuria Ali	12430386	0757127435	F	DIR-DIMA	

20.	BISHAR ALI	0073933	0705698688	M	DIR-DIMA	
21.	ZEITUNA BISHAR	0394612	0790754620	F	DIR-DIMA	
22.	HADIJA ALI	0075414		F	DIR-DIMA	
23.	QALO BORU	-	-	F	DIR-DIMA	
24.	MARIAN ADAN	9561844	0727795789	F	DIR-DIMA	
25.	HALIMA HASSAN	11503845	0728950826	F	DIR-DIMA	
26.	HADIJA ABDI	20451048	0799978849	F	DIR-DIMA	
27.	INTALO GURA	0075981	—	M	DIR-DIMA	
28.	HASSAN YUSSUF	29433155	0706498818	M	DIR-DIMA	
29.	FADLE SOMO	—	—	F	DIR-DIMA	
30.	FATUMA ABDI	0087224	0755851	F	DIR-DIMA	
31.	HABIBA TORE	—	—	F	DIR-DIMA	
32.	ROGE IBREN	—	—	F	DIR-DIMA	
33.	MAKA MAALIM MOHAMED	3361483	—	F	DIR-DIMA	

48.	FATUMA GALGALO		—	F	DIR-DIMA	
49.	KALTUMA HUSSEIN	34585834	0742566744	F	DIR-DIMA	
50.	MAKAY MOHAMED	34186310	—	F	DIR-DIMA	
51.	ASHA HASSAN	24816385	0790788371	F	DIR-DIMA	
52.	AMINA HASSAN	25248518	—	F	DIR-DIMA	
53.	RUKIA ABDI DIKACHA	3943140	0743645 14	F	DIR-DIMA	
54.	Rodley Necho	0 215801	—	F	DIR-DIMA	
55.	Shaice HASSAN	35770143	0715739593	F	DIR-DIMA	
56.	BATULA DIBA	28233255	—	F	DIR-DIMA	
57.	HABIBA DUBE	256 7830	—	F	DIR-DIMA	
58.	Sulega ADAN	25024040	0728326625	F	DIR-DIMA	
59.	MAHAD ADEN	20197725	0700379925	M	DIR-DIMA	
60.	HUSSEIN ADAN	25539698	0725998984	M	DIR DIMA	
61.	ADAN GOLLO	22439894	0708583392	M	DIR DIMA	

	NAME	ID.NO	MOBILE	GENDER	VILLAGE	SIGN
62.	Mohamed Edin Noor					
63.	James Chege	24790566	0728905945	M	Rerec/ Diraima	
64.	Awad Gatholi	11899322	0722583569	F	Lorec	
65.	IRENE MATE	26961056	0729081220	F	RERCC	
66.	Osman M Gachango	25749064	0727431554	M	GGM-LANDS	
67.	Abdullah Hika Jillo	[illegible]	0722996612	M	N-L-C Hansabil	
68.	Abdinur Adan Hassan	28182047	0713768792	M	CHIEF DIRDIMA	
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SITE ..... DIRDIMA .....

MEETING VENUE..... DIRDIMA .....

DATE..21/12/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD MEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	KIOKO MAITHYA	1892866	0722176597	M	KEREC	
2.	S.Alcin Jokacha TITA	12430403	0793709571	M	Dir Dima	
3.	NUR BORU GUYO	20158264	0743838216	M	DIR-DIMA	
4.	Adan Alake Dido	6826348	0700392804	M	DIR-Dima	ADAN
5.	Mohamed Koto	12430413	0729237888	M	Dir-Dima	

	NAME	ID. No	MOBILE	GENDER	VILLAGE	SIGN
6.	Yussuf Hussein elema	21523527	0716688565	M	DIR-DIMA	
7.	Ahmed Abdi Lafa	0070065	0720701671	M	Misa	
8.	Bishar Ali	0073933	0705698603	M	DIR-DIMA	
9.	Intalo GUYRA	0075981	–	M	DIR-DIMA	
10.	Hassan Bonaya	8492861	0729840061	M	DIR-Dima	
11.	Adan Robow Adano	27489793	0724947118	M	Dir Dima	
12.	Adin Kuro Hapi	0069968	–	M	DIR-DIMA	
13.						
14.						
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SITE ..... DIRDIMA .....

MEETING VENUE..... DIRDIMA .....

DATE... 21/10/2021 .....

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD WOMEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	Dorothy Kaguwira					
2.	ROGE IBREN	–	0725067371	f	DIR-DIMA	
3.	Qalo BORU	–	–	f	DIR-DIMA	
4.	Maka Maalim Mohamed	33614339	–	F	DIR-DIMA	
5.	Marian Adan Shore	9561844	0727795785	f	DIR-DIMA	~~MAS~~

	NAME	ID.NO	MOBILE	GENDER	VILLAGE	SIGN
6.	Hadija Abdi Jibra	20481048	0799775745	f	DIR-Dima	
7.	Halima Hassan Hussein	11503848	0728930826	f	DIR-Dima	
8.	Habiba Tore	—	—	f	DIR-Dima	
9.	Rubley Neneha	0215801	—	f	DIR-Dima	
10.	Kaltuma Hussein	34585034	0742586674	f	DIR-Dima	
11.	RUKIA ABDI	—	0743653214	f	DIR-Dima	
12.	AENG GACHOKI	11099322	0722583869	F	Rural	
13.						
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REPUBLIC OF KENYA

MINISTRY OF ENERGY

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

SITE ..... DIR DIMA .....

MEETING VENUE.... DIR DIMA .....

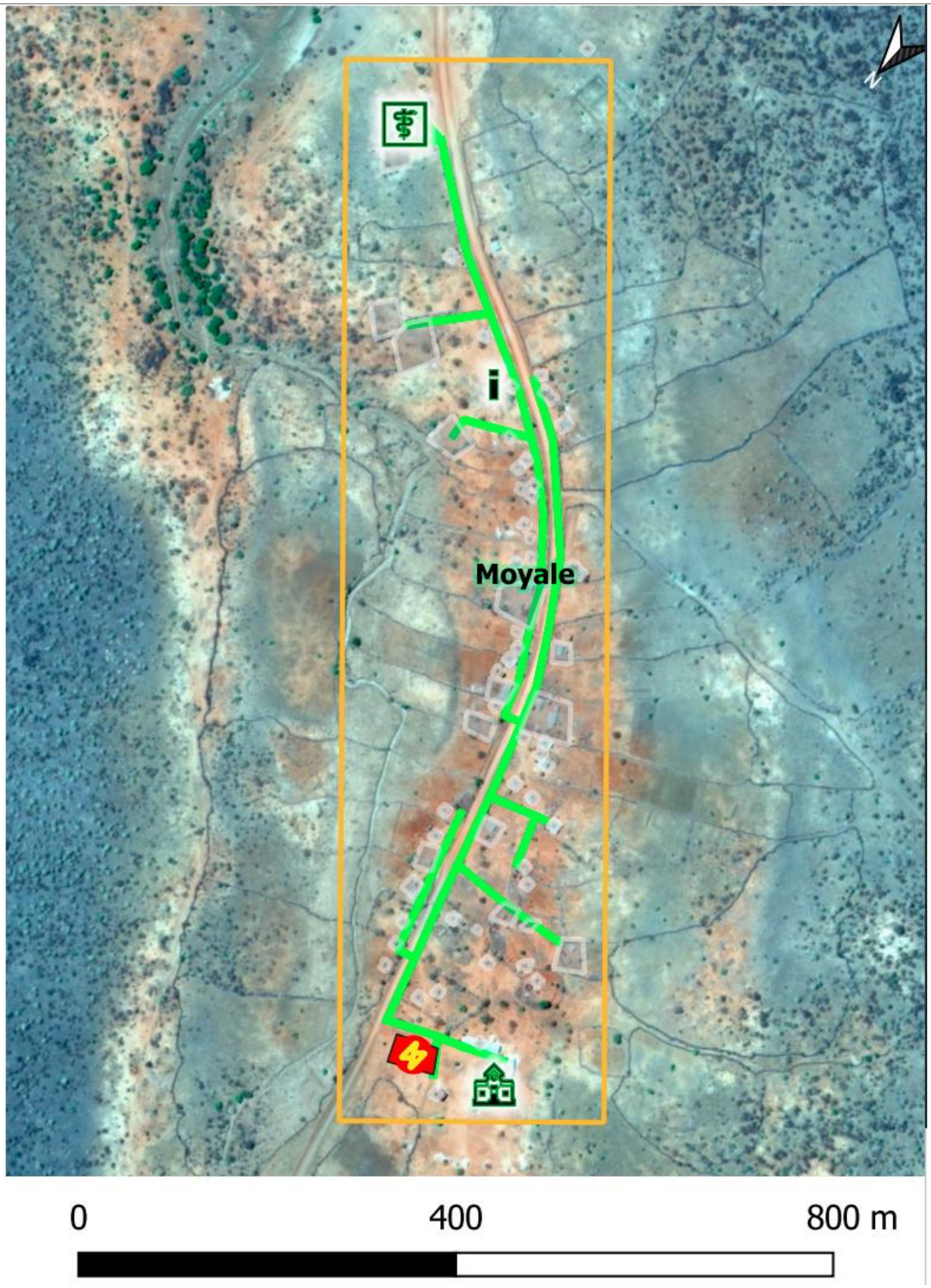
DATE.... 21/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD YOUTH

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	IRENE MATE	26961056	0729051220	F	REREC (DIR DIMA)	
2.	ABDULLAHI INICA Jillo	29815040	0722996912	M	NLC – County Coordinator Mandera	
3.	Abubakar Abdiwahi	38566575	0740736831	M	DIR-Dima	
4.	Abdikhair Mohamed	–	0769386000	M	DIR-Dima	
5.	Mohamed EDIN	35773178	0100528225	M	DIR-Dima	

	NAME	ID. NO	MOBILE	GENDER	VILLAGE	SIGN
6.	RASHID ~~ADAM~~	24814404	0701481226	M	Dir Dima	
7.	Rukia Abdi Dikacha	–	0743653214	F	Dir-Dima	
8.	Kaltuma Hussein	34585034	0742586674	F	DIR-Dima	
9.	~~Shamsa~~ Bafula Diba Mamo	28233255	–	F	DIR-Dima	
10.	Fatuma galgalo	38458542	0729741028	F	DIR-Dima	
11.	Makay Mohamed Kala	34186310	0723127413	F	Dir-Dima	
12.	Robley Adan ABDUBA	26237313	0743979885	F	DIR-Dima	
13.	James Chege	24790565	0728905965	M	Dr Dima	
14.	Shakey Hassan.	35770443	0715739883	F	Dir-Dima	
15.	Osmond. M. Macharia	25749064	0727431554	M	PHYSICAL PLANNER	
16.						
17.						
18.						
19.						

Appendix 5: Project Design



Appendix 6: Lead Expert's Practicing Licence

FORM 7 (r.18(3))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/EAPL/18163

Application Reference No: NEMA/EIA/EL/23329

M/S **Norken International Limited**
(individual or firm) of address
P.O. Box 9882 - 00100 NAIROBI

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

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

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

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified

FORM 7 (r.19(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/EBPL/18279

Application Reference No: NEMA/EIA/EL/23951

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

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

registration number **1893**

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

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

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.