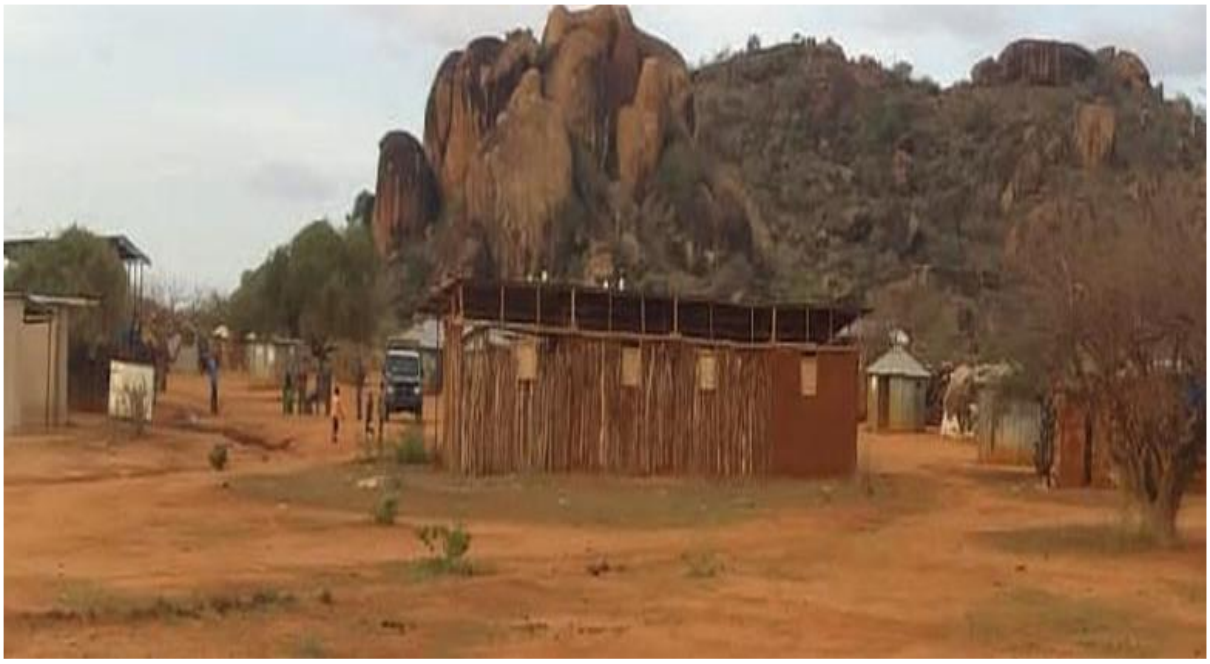
MINISTRY OF ENERGY

REPUBLIC OF KENYA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED ELLE BORR SOLAR MINI-GRID



PROJECT: KENYA OFF-GRID SOLAR ACCESS PROJECT

SUB-PROJECT: COMPONENT 1. MINI-GRIDS FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS

LOCATION : ELLE BORR VILLAGE, BANALE SUB-LOCATION, RAWANA LOCATION, SOLOLO SUB-COUNTY IN MARSABIT COUNTY

2023

CERTIFICATION

This ESIA project report for the proposed Elle Borr 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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Rodney I. Sultani
Project Co-ordinator – KOSAP

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.

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 Introduction and Project Brief

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

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

In Marsabit County, one of the target counties, the Proponent is proposing to develop 14 No. mini grid facilities including Elle Borr 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 Elle Borr 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 Elle Borr site as a solar power facility, it falls within the medium risk project category as per the Kenyan legislative framework. Norken International Limited in association with Centric Africa Limited has been contracted by the MOE to provide consultancy services for the Environmental and Social Impact Assessment (ESIA), Social Assessment (SA) and Vulnerable and Marginalized Groups Plan (VMGP) for KOSAP for the Underserved Counties following a competitive bidding process. The consortium of Norken International Limited and Centric Africa Limited will jointly undertake the ESIA, SA and prepare VMGPs in accordance with the terms and conditions of the contract entered with MOE.

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 Baseline

The proposed project site is in Elle Borr village, Rawana sub-location, Sololo subcounty in Marsabit County. The nearest major town is Turbi town approximately 40 Km from the village.

Elle Borr village has a population of approximately 2040 people with about 340 households. The gender ratio is currently estimated at about 40% male and 60% female. The inhabitants are mainly pastoralists keeping livestock such camel, cattle, goats, sheep, and donkeys.

The area encompasses scarce tree species and several shrubs. Elle Borr falls under Semi-Arid areas/Woodland Zone - Ecological zone IV. The semi-arid areas have a medium potential for supporting both pastoralism and agriculture. These comprise areas that constitutes the lower slopes of Mt. Marsabit, the middle slopes of Mt. Kulal and the top of Huri Hills which has increasingly become an area of sedentarized agro-pastoral production. Some pockets within Sololo and Moyale fall in this zone as well. The county lowland environment consists of about 20% arid and semi-arid land (ASAL), predominantly under bushland and shrublands. Bushland is dominated by high woody bushes mixed with trees, whereas the shrubland is shorter, continuous shrubs of about 6m in height. The bushlands cover slopes of Mt. Marsabit, Kulal, Kalacha, Maikona, Ngurnit and others while the shrublands occur around Sololo, Funanyatta, Illeret, Sibiloi, Hedad, Korole and others.

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The main forest products are charcoal, timber, stones, wood fuel and non-timber forest products such as water, medicinal herbs and grass. The main tree species include olea Africana, croton spp, leucaena spp, cassia spp, moringa spp, jacaranda, and acacia spp and cordia sp; the main shrub species include psychotria kirti, clausesena anisat and rytigynia neglecta while the most common grass species include oplismenus hirtelus and schoenoxiphium lehmanni.

E.6 Project Description

The Elle Borr Mini Grid project aims to provide electricity to approximately 340 residential consumers in Elle Borr Village at Banale Sub-location, Rawana Location, Sololo sub-county in Marsabit County.

The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity. A 13.86km Low Voltage Power Distribution Network will be established to distribute the power to customers. The project utilizes solar panels with a total capacity of 175kWp 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 438kWh 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 130kVA 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 175kW 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 443,503.35 although this amount may change as more detailed plans are developed.

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

To develop the Mini Grid, approximately 1.399 hectares of land will be compulsorily acquired by NLC. This land is unregistered community land. The Proponent engaged with the community during the land acquisition process, and there were no objections to transferring 1.399 hectares of land to REREC for the management of the solar mini grid. In accordance with the World Bank's Operation Procedure 4.12 on Involuntary Resettlement, an abbreviated Resettlement Action Plan (A-RAP) was prepared, outlining the principles and procedures for land acquisition and compensation. This plan is annexed to the project report.

E.7 Project Alternatives

It is important to highlight that two rounds of stakeholder engagement were carried out for the project. The first round 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 20th, 2022, a total of 75 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 views and provide feedback on the project.

E-8 Stakeholder Engagement

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The key concerns and expectations that were raised during the consultation process have been summarized below:

1. Key feedback received from local community of Elle Borr regarding the proposed mini grid: There was a positive outlook towards the solar projects in the area. They expect to receive benefits from the project in terms of access to electricity by homes, the school and medical centre, improved security due to lighting as well as creation of job and business opportunities.

2. Community Development activities:

   The local community believed apart from the economic opportunities; the local community should also benefit from the project in terms of community development activities. The main key area for development activities identified was enhancing security because there are many cases of Insecurity such as conflicts between ethnic groups, improvement of communication because Elle Borr has a poor network coverage, improvement of road transport because the roads are in poor condition and impassable during rainy season.

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, potential diffusion and transfer of communication and knowledge from specialist construction staff to the local participants, boosting local businesses through sourcing materials locally among others. 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 1: Summary of Pre-Construction Impacts

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

Table 2. Summary of Construction Phase Impacts

Impact	Significance (pre-mitigation)	Residual Impact (Post mitigation/enhancement)
Visual Intrusion and Changes in Landscape	MODERATE	MINOR
Change in Land Use	MODERATE	MODERATE
Impacts on Topography	MINOR	NEGLIGIBLE
Impacts on Soils	MINOR	NEGLIGIBLE
Impacts on Waste Generation	MINOR	NEGLIGIBLE
Impacts on the Air Quality	MODERATE	MODERATE
Impacts on Ambient Noise	MODERATE	MINOR
Reduction on Land-holding Income	MODERATE	MINOR
Impacts on Occupation, Health and Safety	MINOR	NEGLIGIBLE
Impacts on Community Health and Safety	MODERATE	MINOR
Labour influx	MINOR	NEGLIGIBLE
Child Labour	MINOR	NEGLIGIBLE
Impacts on Cultural Heritage	MINOR	NEGLIGIBLE
GBV & SEA	MINOR	NEGLIGIBLE
Exclusion Of VMGS, Vulnerable Individuals and Households	MAJOR	MODERATE
Risk of communicable diseases	MINOR	NEGLIGIBLE

Impact	Significance (pre-mitigation)	Residual Impact (Post mitigation/enhancement)
COVID-19	MINOR	NEGLIGIBLE

Table 3. Summary of Operations Phase Impacts

Impact	Significance (pre-mitigation)	Residual Impact
Impact on soil environment	MINOR	NEGLIGIBLE
Waste Generation and Soil Contamination	MINOR	NEGLIGIBLE
Impact on Water Environment	MINOR	NEGLIGIBLE
Collision and Electrical Hazards from Distribution Infrastructure	MODERATE	MINOR
Landscape and Visual impacts	MODERATE	MINOR

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 Kenya Power 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

1.1 Project Background

The Government of Kenya has pledged to stimulate economic growth and accelerate job creation to improve the economic wellbeing of Kenyans. Among the many interventions to achieve this is expansion of the new sources of energy to enable more Kenyans to connect to the grid at affordable cost and hence initiate economic activities at the micro-economic level. Driven by the imperative to provide equal opportunities across the entire Kenyan territory as key to achieving Kenya's Vision 2030, and the national target of achieving universal access to electricity by 2020, the GoK seeks to close the access gap by providing electricity services to remote, low density, and traditionally underserved areas of the country. Consequently, the Government of Kenya partnered with World Bank and conceptualized a project by the name Kenya Off-grid Solar Access Project (KOSAP). The project's objective is to achieve increased electricity access to Kenyans in off-grid areas (areas not covered by the national electricity grid network).

The project targets 14 out of the 47 counties in Kenya that have been defined as marginalized by the Commission on Revenue Allocation (CRA). The 14 underserved counties collectively represent 72% of the country's total land area and 20% of the total population. The population is highly dispersed at a density of 4 times lower than the national average. These counties are also characterized by infrastructural deficits, including lack of access to roads, electricity, water and social services. The 14 counties include Garissa, Isiolo, Kilifi, Lamu, Kwale, Marsabit, Narok, Samburu, Taita-Taveta, Tana River, Turkana, Wajir and West Pokot. The total number of un-electrified households is roughly 1.2 million in these counties.

1.2 KOSAP Objective

The objective of KOSAP is to increase access to modern energy services in underserved counties of Kenya, and is be achieved through the implementation of the components below;

- Component 1: Mini-grids for Community Facilities, Enterprises, and Households
- Component 2: Standalone Solar Systems and Cooking Solutions for Households
- Component 3: Standalone Solar Systems and Solar Water Pumps for Community Facilities
- Component 4: Implementation Support and Capacity Building

1.3 Mini-grids for Community facilities, Enterprises and Households

This component supports the electrification of areas where electricity supply through mini-grids represents the least cost option from a country perspective, as underpinned by the geospatial plan. Depending on the number of users to be supplied, and the service level defined for each type of user (households, businesses, community facilities, etc.), the generation system of each specific mini-grid will combine solar PV, battery storage and thermal units running on diesel Mini-grids. The component will be implemented in approximately 151 locations throughout the 14 target counties, typically in Mini-grids supplying 100-700 prospective users, with approximate total demand of 20-300kW. These potential sites, capturing approximately 27,000 consumers in total, have preliminarily been identified as part of the geospatial plan. In Marsabit County, 15 locations were proposed for the solar Mini-grids installation. Elle Borr village in Banale sub-location, Rawana location, Sololo Sub-County is one of the villages in Marsabit County that will benefit from this component.

1.4 Project Justification

The Kenya Off Grid Solar Access Project (KOSAP) intends to support the Government initiative of ensuring increased electricity access to Kenyans, particularly among the low- income groups in off- grid areas. This proposed project is in line with the commitment of the Government of Kenya

to reach 100% electricity access by 2023 through grid extension, stand-alone individual plant and autonomous solar mini- grids. REREC as the implementing agency aims to develop the solar/diesel mini- grids to electrify areas that are not economically feasible through national grid extension. The Elle Bor site was proposed as part of this project due to its isolated nature and the high cost of grid extension to the area.

1.5 Institutional and Implementation Arrangements

The Ministry of Energy and Petroleum (MoEP) will provide overall coordination of the project and oversight during planning and implementation of the project. This will include overall coordination and oversight for safeguards due diligence, and implementation.

REREC will be responsible for the implementation of the Solar Mini-grid during construction and implementation. 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.

1.6 Environmental and Social Impact Assessment (ESIA) Report

1.6.1 Justification for the ESIA

This Environmental and Social Impact Assessment on the proposed solar Mini-grid in Elle Borr was commissioned in order to examine its impacts on the environment and community prior to its construction. The study sought to identify positive and negative impacts of the Mini-grid and propose measures to mitigate the negative impacts while maximizing the positive impacts.

The ESIA was conducted in accordance with Section 58 of Environmental Legislation, EMCA 1999, and its 2015 Amendment and the Environmental Impact Assessment and Auditing Regulations (ESIA/EA) of 2003. Further, international environmental and social policies have been adhered to in this report especially the World Bank OP4.01 (Environmental assessment). In addition, appropriate sectoral legal provisions relevant to this project have also been referred to for the necessary considerations during the construction, commissioning, operation and decommissioning of the project.

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

1.6.2 Objectives of the study

The main objective of this ESIA study was to examine both positive and negative effects of the proposed solar mini grid on the people, their property and the environment and proposed measures to mitigate the negative impacts and enhance positive impacts during the construction, operation and decommissioning phases of the project.

Specific objectives of the study included;

- Present an outline of the project background,
- Establish the environmental baseline conditions of the project area and review all available information and data related to the project,

- Identify key areas for environmental, social, health and safety concerns as well as the anticipated impacts associated with the proposed project implementation and commissioning,
- Undertake public consultations with the potentially affected peoples and other interested parties
- Establish a comprehensive environmental management plan covering the construction, operation and decommissioning phases of the project,
- Preparation of a Comprehensive Project Report in accordance with the local environmental legislation and submission to NEMA for further instructions and/or approval.

1.6.3 Scope of the ESIA Study

The ESIA scope largely covered the following areas:

a) Baseline Conditions:
   - Environmental setting (climate, topography, geology, hydrology, ecology, water resources, sensitive areas, baseline information etc.)
   - Socio-economic activities in the surrounding areas (land use, human settlements, economic activities, institutional aspects, water demand and use, health and safety, public amenities, etc.),
   - Infrastructural issues (roads, water supplies, drainage systems, power supplies, etc.).

b) Legal and policy framework:

   Focusing on the relevant national environmental laws, regulations and by-laws and other laws and policies focusing on allied activities relative to the project in question.

c) Interactive approach was adopted for the immediate neighborhood in discussing relevant issues including among others: land use aspects, project acceptability, social, cultural and economic aspects,

d) Identification of Environmental impacts namely physical impacts, biological impacts and Legal Compliance.

1.6.4 Terms of Reference (ToR) for the ESIA Process

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

1. Establish the suitability of the proposed site/location to set up a solar Mini-grid.
2. A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.

3. A description of the technology, procedures and processes to be used, in the implementation of the project.
4. A description of materials to be used in the construction and implementation of the project, the products, by-products and waste to be generated by the project.
5. A description of the potentially affected environment/social economic and cultural setting of the project area.
6. Identification and consultation with stakeholders including the proposed project PAPs.
7. A description of positive and negative impacts of the project on the environmental, health, safety and social cultural aspects of the community
8. Analysis of alternatives including project site, design and technologies
9. Identification of the most appropriate mitigation measures/interventions against negative impacts during construction, operation and decommissioning.
10. Development of an Environmental, Health, Safety and Social Management Plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures.

1.7 ESIA Methodology

The approach chosen in undertaking this study was careful to consider EMCA, 1999, 2015 requirements as well as the Environmental Impact Assessment and Audit Regulations, 2003. It involved largely an understanding of the project background, the preliminary designs and the implementation plan. The approach and methodology applied during the study enabled collection of both primary and secondary data. Qualitative and quantitative methods of data collection were employed. Secondary data was obtained through literature reviews while primary data was obtained through physical observations, photography, check lists, interviews, focus group discussions and stakeholders' consultation

1.7.1 Key activities undertaken during the study included the following

- Physical inspections of the proposed project area
- Literature review of relevant documents
- Stakeholder consultations with different stakeholders and project affected persons and PAPs
- Gathering environmental and socio-economic data of the area by use of check list
- Continuous discussions with the stakeholders and accessing other sources of information on the proposed project details, the site planning and implementation plan,
- Photography, and interviews with people in the immediate neighborhood.
- Evaluation of the activities around the site and the environmental setting of the wider area.
- Report writing and submission.

The initial stage of this assessment was project screening. Screening of the project sought to ascertain whether or not this project falls within a category that requires ESIA prior to commencement. Other considerations made during this stage included a preliminary assessment of the environmental sensitivity of the proposed project area/site. This screening indicated that

the proposed solar Mini grid is among the listed projects under Schedule 2 of EMCA, 1999 thus requires an ESIA study.
Project scoping was the next stage which was done to delineate project issues that required detailed analysis. This step involved collection of primary and secondary data through field visits and literature review respectively.

1.7.2 Desk study/literature review

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

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

Documents relevant to the proposed development were reviewed. Some of the documents reviewed included Marsabit County Integrated Development Plan 2018-2022, various Kenyan legal legislations, World Bank safeguard policies, project frameworks (ESMF, VGMF, and RPF), topographical maps, google earth/maps, Kenyan government publications among others.

1.7.3 Environmental, socio-economic and cultural setting/status

To gain a better understanding of the environmental, socio-economic and cultural setting of the project site and it's surrounding the ESIA team needed to gather primary data. This entailed collection of the data using various tools and methods. Interviews, discussions, photography and observations and check lists are some of the methods employed in gathering the data needed from different stakeholders.

1.7.4 Public Consultations

Section 17 of the Environmental (Impact Assessment and Audit) Regulations of 2003, requires that all ESIA Studies undertake Public Consultation (PC) as part of the study. The aim of the PC is to ensure that all stakeholders interested in a proposed project such as project PAPs, government officers and the general public in the vicinity of the proposed project be identified and their opinion considered during project planning, design, construction, operation and decommissioning phases. Consequently, public consultations were carried out in the project area in a bid to inform the public and other interested parties on the proposed project and obtain their views on the same. The consultations also presented an opportunity for the community to raise issues and concerns pertaining to the project.
Public consultations were conducted thorough public barazas organized at appropriate location near the proposed site for the Mini grid. Key stakeholder's views on the project were solicited through interviews and discussions with County officials, technical teams at Ministry of Energy and REREC and also (KOSAP project implementation unit) officers.

1.7.4.1 Stakeholder Identification and Mapping

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

- PAPs of the proposed project who largely are the community members living within 3km radius of the proposed project:
- Interested parties include:
  - ✓ County government of Marsabit various departments including the office of the governor, land and environment, survey and public administration such as ward and village administrators. In addition is the county commissioner and officers under his administration such as chiefs.

1.7.4.2 Approach and Methodology used in carrying out the Public Participation

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

1.7.4.3 Mobilization for the Community Meeting

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

1.7.4.4 Public Forum/Meeting

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

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

1.7.4.5 Focus Group Discussions

After the meetings the community members were told of the need to have focus group discussions to discuss the project further and allow the different groups more opportunities to ask questions or give suggestions regarding the project. Therefore, three separate meetings for men, women

and youth were held. In these meetings the message on the project was echoed again especially on benefits and impacts (both positive and Negative) of the project to the community, rights of the community and the need to have a grievance redress mechanism and committee with representation from all groups in the community. The Focus Group Discussions were also used as a form of baseline data collection. The respondents were able to give feedback on socio-economic status of their community i.e. education, healthcare, economic activities, cultural practices etc.

1.7.4.6 Key Informant Interviews

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

1.7.4.7 Stakeholder Engagement Schedule

The ESIA team identified four categories of stakeholders namely; government officials, opinion leaders at local level, elders and the general community. Stakeholder engagement began early in the planning phases of the project. A letter was written from the Ministry of Energy to the Governor Marsabit County, the County commissioner informing them about the need to undertake public participation for the proposed project. Stakeholder consultation was undertaken on October 19th, 2021. During these meetings, project information in terms of preliminary design, positive impacts, negative impacts, mitigation measures among others were discussed with various stakeholders. The stakeholders gave their views on the project.

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

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

1.7.5 Outline of the basic ESIA steps followed during the assessment

Step 1: Project Concepts

The project details regarding; scope, design, implementation, tests, commissioning were first analysed.

Step 2: Terms of Reference (Tor)

The terms of Reference were developed guided by EMCA 1999 and The Environmental Impact Assessment/ Audit regulations 2003. Any new developments out of character with their surrounding must have an ESIA undertaken; for review, Approval and Licensing by NEMA.

Step 3: Project Screening

Details about baseline conditions and potential environmental and social impacts were collected through desktop study, stakeholder consultations, site visits, photography, and inductive methods.

Step 4: Identification of Potential Environmental and Social Impacts

The Potential Environmental impacts were identified, Classified and magnitude determined.

Step 5: Impact Assessment and Consultations

The Environmental and Social Impacts were analysed, assessed and discussed in details involving consultations with REREC and other stakeholders.

Step 6: Formulation of Mitigation measures

Mitigation measures to ameliorate or minimize the potential Environmental and Socio – economic impacts were formulated for the entire project life.

Step 7: Development of an Environmental & Social Management and Monitoring Plan:

An E&SMMP for the project life was developed indicating parameters to be monitored, persons responsible, timing and costs involved.

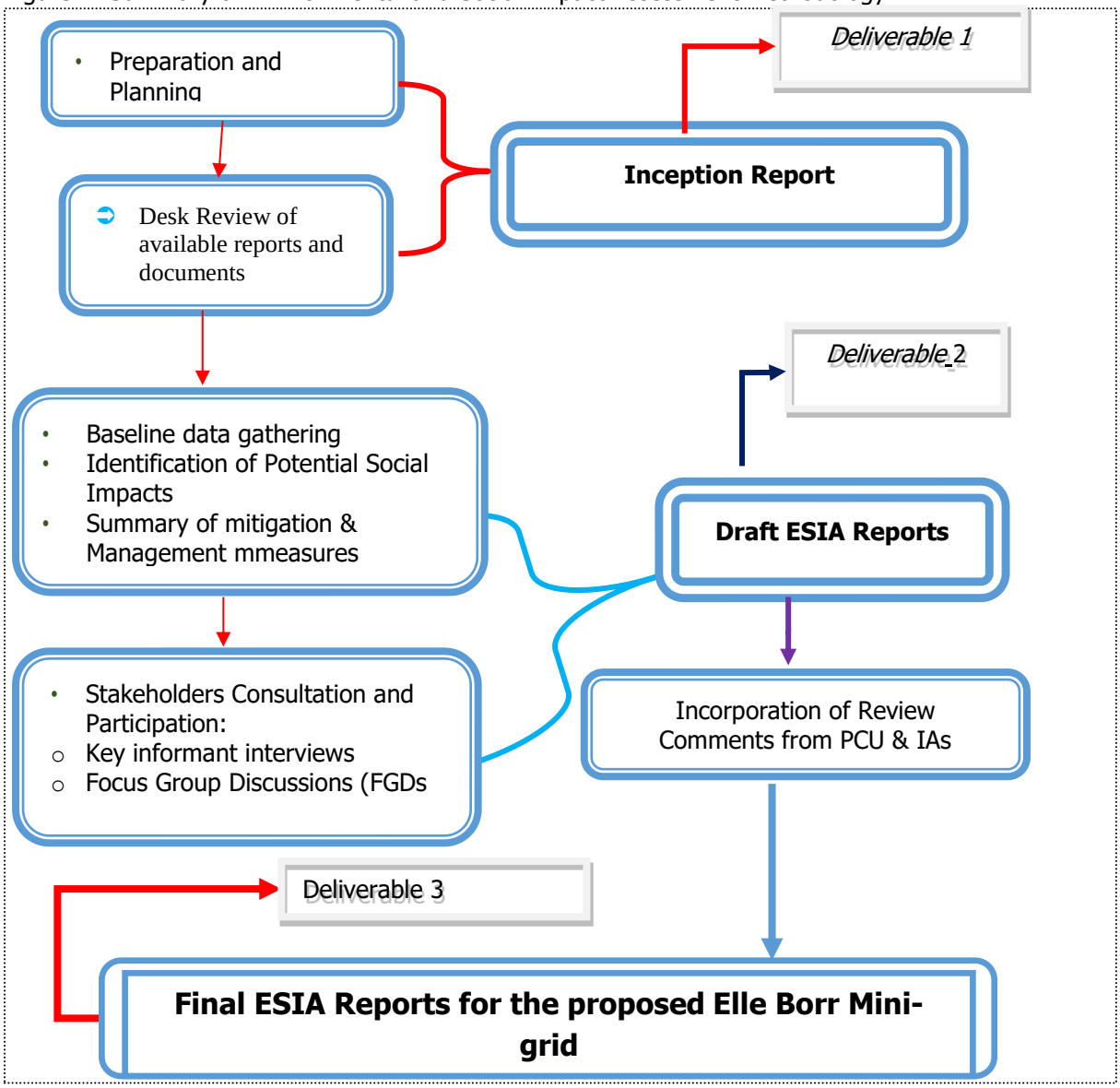
Specific issues covered in the project report include but are not limited to:

- Name of the proponent, address and contact person
- Title of the project
- Objectives and scope of the project
- Nature of the project;
- Location of the proposed project, including the physical area that may be affected by the project's activities;
- Types of activities that will be undertaken during the project construction, operation and decommissioning phases;
- Design of the project;
- Materials to be used, products and by-products, including waste to be generated by the project and the method(s) of their disposal;
- Potential environmental impacts of the project;
- Economic and social impacts to the local community and the nation in general;
- Views of the public/potentially affected people about the project; and
- An Environmental and Social Management Plan (E&SMP) for the entire project cycle to include mitigation measures to be taken during and after implementation of the project and an action plan for the prevention and management of foreseeable accidents during the project cycle.
- An Environmental and Social Management and Monitoring Plan *(ESMMP)*

1.8 ESIA Procedure

Figure 1 is a summary of the methodology the firm will adopt in undertaking environmental and social impacts assessment for the proposed KOSAP project.

Figure 1: Summary of Environmental and Social Impact Assessment Methodology



1.9 Target Group for the ESIA Report

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

In this regard, the report is useful to the following stakeholders:

- Engineers to be involved in preparation of designs and plans for the proposed solar Mini grid.
- Contractors to be engaged in the construction works for the project
- MOE and other relevant government ministries and implementing agencies such as; KPLC, REREC etc.
- County Government of Marsabit

- Funding agencies
- Project affected persons and other stakeholders.

1.10 Study Team

The ESIA team spearheading the process included the following;

NAME	ORGANISATION	Designation
Irene Kawira	REREC	Senior Environmentalist
Lucy Bii	Centric Africa Limited	Gender specialist
Hottensia Kabuki	Centric Africa Limited	Environmental and Social Specialist
Said luba	County Government of Marsabit	County Renewable Energy Officer
Hassan Boru	Marsabit County	Energy officer
Diskson Alubala	Centric Africa Limited	Environmentalist

1.11 Limitations

The limitation experienced during the study are illustrated below.

- ✓ Risk of being infected or transmitting COVID-19. The teams had to adopt preventive measures by wearing face mask and providing the community members with face mask and sanitizers during the public meetings and interactions.
- ✓ Some data which the consultants sought from the community could not be ascertained e.g., the exact number of the VMG's, orphans, rate of HIV infections, number of cases of GBV etc

1.12 Uncertainties in Compiling Information

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

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

2 PROJECT DESCRIPTION

2.1 Introduction

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

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

Table 4. Component of the proposed Solar Mini-grid

S/NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project is located 40km from Turbi town in Elle Borr village, Uran Ward in Sololo subcounty, Marsabit County Geographically, the site is located on Latitude 3°29'18.95N and Longitude 38°14'16.57"East altitude of 9 metres above the sea level.
2.	Climatic condition	In Marsabit County, evidence of narrative of many older people agree that there is tremendous change. This concurs with scientific evidence of global climate change. The rainfall ranges between 200mm and 1,000mm per annum and its duration, amount and reliability increases as altitude rises. North Horr (550m) has a mean annual rainfall of 150mm; Mt. Marsabit and Mt. Kulal 800mm while Moyale receives a mean annual rainfall of 700mm
3.	Site Conditions	The side is generally in open area with minimal and scarce *fauna* and *flora*.
4.	Road Accessibility	Earth road
5.	River/canal/nallah/ pond present in project footprint	No rivers or canals present in the village
6.	Protected areas (National Park/ Sanctuary)/ Forest land within 10 kms	None

2.2 Project Location

The project site is located in Elle Borr village in Uran Ward, Sololo subcounty in Marsabit County at coordinates of Lattitude 3°29'18.95N and Longitude 38°14'16.57"E.

The site soil is primarily sandy loam within the area. The project site is approximately 40km from Turbi town.

Plate 1: Proposed site for the Elle Borr Solar Mini-grid project with scarce vegetation

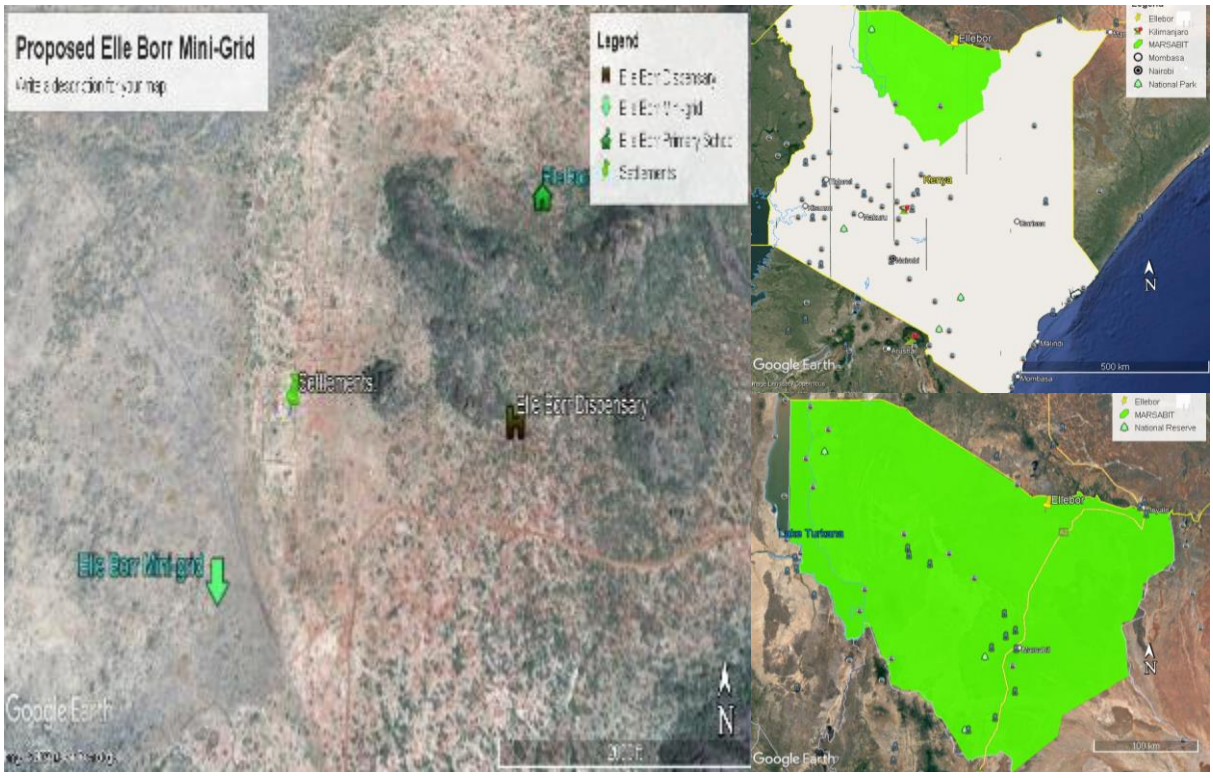


Figure 2: Project location

2.2.1 Project site setting

The proposed mini grid is in Marsabit County. It falls under cluster 3 with a total of 48 minigrids and lot 2. Geographically, Elle Borr site falls on coordinates of Lattitude 3°29'18.95N and Longitude 38°14'16.57"E.

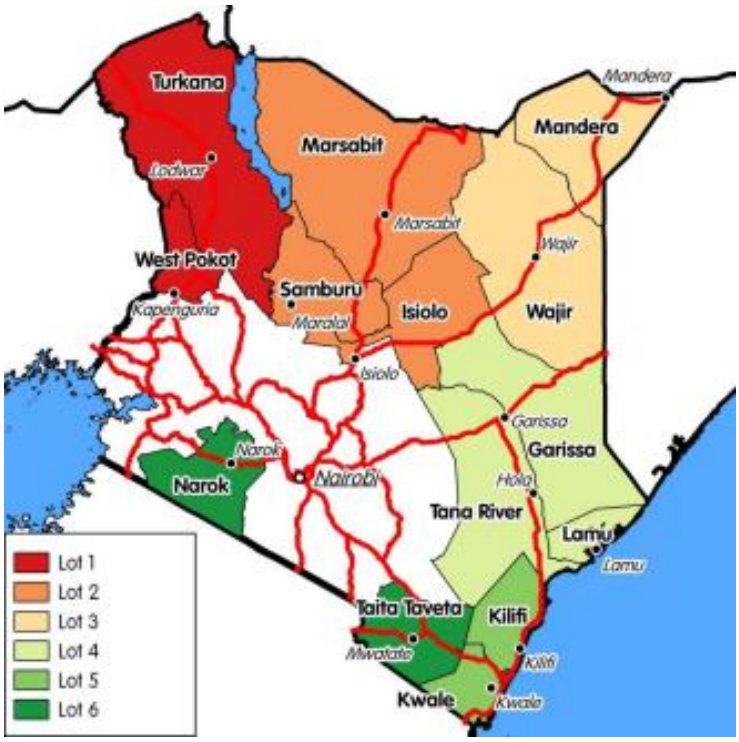


Figure 3: Map Showing the KOSAP Counties Lot 2

2.3 Description of Project Facilities, Components and Activities

Name	Residential	Non-residential	LV Circuit (km)	Peak demand (kw)	Generation output (kw)	PV(DC-KWp)	Generator (kva)	Generator Fuel Tank (L)	Cost (USD
Elle Borr	680	7	13.86	102	175	175	130	2000	443,503.35

2.3.1 Key Components of the Project

- **Solar Photovoltaic Panels**: The project utilizes solar panels with a total capacity of 175kWp 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 438kWh 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 130kVA 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 175kW 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 130kW 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 13.86-kilometer Low Voltage (LV) power distribution network is established to distribute the generated electricity to the residential and nonresidential consumers. The LV network is designed to efficiently transmit power while minimizing losses, ensuring a stable supply to the customers.

- **Project Metrics:**

  Monthly Energy Demand: The project is expected to meet a total monthly energy demand of 16,400 kWh.

  Daily Energy Demand: The average daily energy demand is approximately 547kWh, ensuring a consistent supply for the consumers.

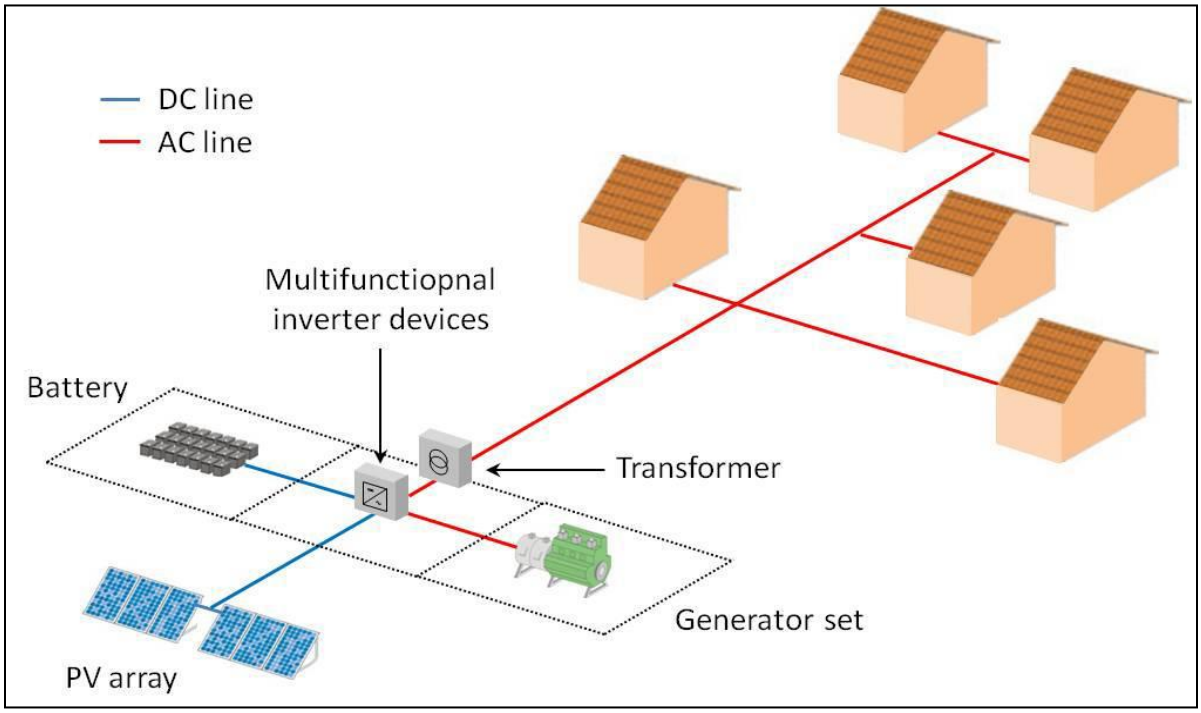
  Peak Demand: The peak demand of the system is 102kW, which is the maximum power requirement during any given moment.

- **PV Capacity**: The solar photovoltaic panels have a total capacity of 175kWp.

- **Estimated Project Cost:** The estimated cost of the Elle Borr Mini Grid project is approximately USD 443,503.35. 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



2.3.1.1 Solar PV modules

The project will use PV Array (DC-kW) 190 polycrystalline silicon module with three strings connected in series. Each string will have five sets of panels connected in series, with output converged at the six-way combiners. The life expectancy of the PV modules is estimated at 25-30 years.

2.3.1.2 Battery Energy Storage System

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

2.3.1.3 Diesel Genset

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

PV and Battery Inverter Charger

PV Inverter: A 175 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 130 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

2.3.1.4 Distribution lines

The Elle Borr site will have a distribution line circuit of 13.86km in total Supply of concrete poles for the distribution lines will be based on detailed survey and accessories like phase plates, circuit plates, number plates, danger plates, anti-climbing devices as per KPLC requirements/specifications. Erection of the Poles, fixing of insulator strings, stringing of conductor and earth wires along with all necessary line accessories and earthing will be as per KPLC requirements/specifications.

2.4 Project Activities

The final design and construction of the Solar Mini-grid will be undertaken by a contractor selected through a competitive bidding process. Construction will be supervised by REREC to ensure works are undertaken in accordance to specifications. This is to ensure quality work is achieved.

It is anticipated that the proposed site will undergo alteration during construction to install the Solar Mini-grid and associated structures. Some of the activities envisaged in this project include site clearance and leveling, civil works and construction of utilities and structures for the facilities, installation and connection of the power plant as described in the section below.

Safety protocol, requirements and precautions and established National and International Environmental protection regulations/ standards as well as all management plans proposed under this ESIA report for this project, shall guide the contractor and project operator during the project cycle. Modest construction procedures will be followed to reduce noise and vibration levels and the production of dust and any form of pollution that may affect the neighboring community within the project area.

2.5 Construction, Operations and Maintenance Arrangements

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

The Solar Mini-grid will be 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.

2.5.1.1 Construction Procedures

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

The project inputs will include the following.

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

- Construction machines will include machinery such as trucks, and other relevant construction equipment. These will be used for the transportation of materials, clearing of resulting construction debris.
- A construction labour force of both skilled and non-skilled workers will be required.

Construction activities will include the following:

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

2.6 Resource Requirement

2.6.1 Workforce Requirement

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

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

2.6.2 Water Requirement and Source

2.6.2.1 Construction Phase

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

2.6.2.2 Operation Phase

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

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

2.6.3 Raw Material Requirement

2.6.3.1 Construction Phase

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

2.6.3.2 Operation Phase

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

2.6.4 Power Requirement

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

2.6.5 Fire Safety and Security

2.6.5.1 Construction Phase

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

2.6.5.2 Operation Phase

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

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

2.7 Pollution Streams during Construction Phase

2.7.1 Solid Waste Generation

2.7.1.1 Construction Phase

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

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

2.7.1.2 Operation Phase

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

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

Any broken solar panels or PV Modules will be sent back to the vendor as part of buyback arrangement.

Alternatively, the e-waste will be disposed by licensed waste handlers in sites that are licensed by NEMA and local authorities to dump e-waste. All the other domestic solid waste will be disposed at the nearest municipality dumpsite.

2.7.2 Air Emissions

2.7.2.1 Construction Phase

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

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

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

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

2.7.2.2 Operation Phase

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

2.7.3 Waste Generation

2.7.3.1 Construction Phase

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

2.7.3.2 Operation Phase

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

2.7.4 Noise Emissions

2.7.4.1 Construction Phase

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

restricted to Day time only.

2.7.4.2 Operation Phase

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

3 LAND REQUIREMENT AND PROCUREMENT PROCESS

3.1 Land Requirement and Procurement Process

3.1.1 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 Elle Borr mini-grid will be constructed covers approximately 1.399 Hectares.

The Ministry of Energy has partnered with the community who are the owners of the land and the County government of Marsabit in identifying land for the proposed project. The sub-project site will be acquired compulsorily by NLC, and in-kind compensation in form of priority community projects provided to affected communities.
Therefore, the community in Elle Borr were given an opportunity to identify one project within the Water, Education or Health sector that will be undertaken and implemented by the mini-grid Contractor.

3.1.1.1 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 communal land. In Elle Borr, the site falls on Unregistered Communal land set aside for public use.

An abbreviated Resettlement Action Plan (A-RAP) outlining the principles and procedures for land acquisition and compensation is annexed to this ESIA. An A-RAP applies where affected persons are not physically displaced, and less than 10% of their productive assets are lost, or fewer than 200 people are displaced. In the case of KOSAP sub-projects, there is no physical displacement of affected persons, and the foreseen impacts on livelihoods such as grazing occasioned by mini-grid construction, wayleaves acquisition, and implementation of community projects are considered minor. A-RAPs will be implemented for sub-project sites on registered and unregistered community land/group ranches. The report has been attached in appendix 4 of this report.

3.1.1.2 Compensation Details

Compensation will be done in for kind for the land provided by the community. The main key area for development activities identified by the community in Elle Borr:

1. Construction of Staff Houses for Elle-Bor Primary School
2. Repairing of Classrooms for Elle-Bor Primary School
3. Construction of School fence for Elle-Bor Primary school

4 APPLICABLE AND REGULATORY FRAMEWORK

4.1 Introduction

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

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

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

4.2 Kenya Policy Provisions

4.2.1 Kenya Energy Policy, 2014

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

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

The Policy strategizes the need to:

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

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

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

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

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

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

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

4.2.3 National Policy on Water Resources Management and Development, 1999

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

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

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

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

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

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

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

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

4.3 National Legal Framework

4.3.1 Administrative Framework

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

Table 6. Administrative stakeholders and their roles

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

4.4 Relevant statutes

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

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

Table 7. National Legal 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. 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	

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		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 construction and operation of infrastructure developments. These policy statements require the commitment of the government to:	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.

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
		✓ 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	
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 at Bubisa 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 pastoralist in Bubisa. 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

4.5 National Administrative Requirements

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

Table 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.

4.6 International Safeguard Requirements

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

Table 9. World Bank Safeguards

OP	TITLE	APPLICABILITY	COMMENTS
4.01	Environmental Applicable	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 PAPs in Elle Borr 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	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 Elle Borr that may not negatively affect diverse flora, fauna, and avifauna. The area is dependent on pastoralism.
4.12	Involuntary Resettlement Applicable	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

4.7 Licenses and Permits Required

The subsidiary legislation under the EMCA is partially monitored through the use of permits and licenses. Subsequently all licenses and permits required during the construction phase shall be the responsibility of the individual contractors and their agents. During the operational phase, all permits and licenses required to operate the project will be the responsibility of the proponent.

Before the contractor mobilizes to the site, there are certain permits that he will need to put in place. Some permits may be obtained during construction since they will be determined as need arises. Table 10 overleaf lists the environment-related permits required for this project.

Table 10: Project Permit and License Requirements

No.	Relevant activity	Statute	Permit and License Requirement	Competent Authority	Responsible Agency for Obtaining Clearance	Date of Acquisition	Duration
Pre-Construction Stage							
1	Construction and operation of the solar mini grid	Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018	Need to submit ESIA report to obtain EIA license	NEMA	Proponent	Upon approval of ESIA report	Max 90 Days from date of submission of ESIA Report
2	Construction activities	Occupational Safety and Health Act (OSHA), 2007	Need to apply registration of premises	DOSHS	Contractor	Before commencement of construction	1 – 4 weeks
3	Setting up of construction camp sites	Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018	Need to submit Project report for the Camp Sites to obtain EIA License	NEMA	Contractor	Before commencement of construction	1– 1.5 months

No.	Relevant activity	Statute	Permit and License Requirement	Competent Authority	Responsible Agency for Obtaining Clearance	Date of Acquisition	Duration
4	Storage, transport and disposal of ordinary domestic and office waste	Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018	Need to obtain waste license through submission of Waste Management Plan	NEMA	Contractor	Before commencement of construction	1 – 1.5 months
5	Storage, transport and disposal of hazardous waste	Environmental Management and Coordination Act (EMCA) Cap 387, Rev 2018	Need to obtain hazardous waste license through submission of Waste Management Plan	NEMA	Contractor	Before commencement of construction	1 – 1.5 months
Construction stage							
1	Food handling in the campsite	Public Health Act	Obtain Food Handler Certificate	County Government	Contractor	Before handling of food in the campsite	6 months
2	Workplace registration	Occupational Safety and Health Act, 2007	Apply for Registration of a Workplace	DOSHS	Contractor	Before utilizing the campsite	Annual

5 ANALYSIS OF ALTERNATIVES AND PROJECT JUSTIFICATION

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

5.1 Site Selection

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

The proponent identified one location for the proposed solar project which located to the immediate south west of the settlements. The site was identified based on the location of settlement areas, commercial/ public facilities in Elle Borr.

Further details on the other locations identified were not available.

- No settlement present in the project site;
- The project site has few scattered trees and shrubs

The proposed project site has the following location advantages:

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

5.2 Power Scenario at Elle Borr

Elle Borr location has an estimate of 2040 number of people with approximately 340 households within the area. This will reach out to over 78% of the population within the area.

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

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

According to Marsabit Intergrated Development Plan ,Marsabit county is wood fuel which is used both for cooking and lighting, while kerosene is predominantly used for lighting. The main type of fuel used by households is both a factor of the socio-economic status of households and availability of alternative low cost energy. As a result, the proportion of households using firewood as main source of cooking fuel is 92.6%, charcoal is 5.6%, and paraffin is 1.4% while biomass residue is 0.2%. Electricity coverage is mostly restricted to urban centres of Marsabit, Moyale, Sololo and Laisamis. The county is not served by electricity from the national grid but by diesel generators and solar energy. Moyale and Sololo are connected with electricity from Ethiopia. Despite massive gains in electricity connectivity in rural Kenya, majority of the households in Marsabit still use firewood as their main source of lighting energy. The total number of households with electricity connection is estimated at 1,273 while the proportion of households using firewood as the main source of cooking fuel is 92.6 per cent, charcoal is approximately 5.6 per cent, paraffin is 1.4 per cent and biomass residue is 0.2 per cent. Households using firewood for lighting comprise 57.2 per cent, paraffin 27.5 per cent and those using electricity is 3.6 per cent.

5.3 Analysis of Alternative

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

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

5.3.1 Alternate Location for Project Site

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

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

Elle Borr was identified as the most suitable area for the establishment of the proposed minigrid based on the above.

5.3.2 Alternate Sources of Energy

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

The possible alternatives to solar energy include;

- Wind power: shortfalls associated with wind power includes; lack of time series data of wind, trained human resources to intricate design of wind power etc, providing wind power for Elle Borr residents is technically and financially challenging, expensive to install, dependent on wind pattern (not strong in Elle Borr). 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 Elle Borr). Besides coal and petroleum products used in thermal power processing are not readily available within Elle Borr 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 Elle Borr. 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 Elle Borr on environmental as well as economic grounds

Solar energy was a desirable option because:

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

5.3.3 Zero or No Project Alternative

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

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

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

5.3.4 Analysis of Alternative Construction Materials and Technology

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

5.3.5 Conclusion

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

6 BASELINE SETTINGS- ENVIRONMENT, ECOLOGY AND SOCIAL

6.1 Study Area

The project site is located in Elle Borr village, Uran ward in Sololo subcounty, Marsabit county. Based on the secondary information of the region, the following baseline information on environment, ecology and social has been discussed under the sections below.

6.2 Environment Baseline

6.2.1 Geology and Soil

Geologically, Marsabit area and its environs consists of a massive alkaline basaltic rock system that overlies Precambrian basement rock complex at depth. These volcanic rocks referred to as the Marsabit Shield cover the entire mountain forming basaltic rapilli breccia volcanic ash cones, and cinder cones interlayed with extensive olivine basalt flows. These miorene-oliocene basalts unconformably overlie undifferentiated basement rock system at depth.

The formation of the Marsabit Shield (evolution of Marsabit Mountain), took place in a series of volcanic eruptions. Volcanism in the Marsabit Shield commenced at the same time with the Rift system faulting in the Pliocene and continued into the Quaternary period according to the recorded basal basalt rock ages dated 2.5 and 0.5 million years respectively.

The volcanic centers comprising of cinder cones and block and ash cones (or maars) are concentrated trending northwest and northeast through the shield summit. The initial lava flows are uniformly thin and laterally extensive fissure controlled basal basalts erupted during the late Miocene to Pliocene periods.

Subsequent violent eruptions during the Quaternary period produced intervals of pyroclastic accumulations from cinder cones and maars with faulting accompanying volcanism. The major faults were concealed by later volcanic flows with eruptions of narrow lava tongues of olivine basalts emerging from the cones.

6.2.2 Hydrogeology and Drainage

The most predominant geological formation in the county is volcanic rock. Only in a few areas these volcanic rocks are interrupted by pockets of quaternary sediments. Nevertheless, many parts of Marsabit County are known to have productive deep aquifers. The borehole database (which is currently being updated with the data provided within the Rapid program by the counties) shows that Mt. Kulal has productive boreholes. On the high-altitude area surrounding Marsabit Town, borehole siting and drilling can be challenging due to unstable volcanic formations, and deep groundwater levels (>200 meters below ground level). On the lower slopes groundwater appears to have a higher potential, as many good yielding deep boreholes are present with water strikes generally between 50 to 150 mbgl, and with boreholes with a yield of up to 20 m^3/h present. Most productive boreholes appear to be related to water bearing fractured bedrock. Generally, the water quality is reported to be good, but some of these aquifers have water quality problems due to high salinity, while the omnipresent volcanic rocks are associated with presence of high fluoride levels in the groundwater.

The large depression between the hills of Mount Marsabit, Mount Kulal, Hurri Hills and the Ethiopian plateau, is the Chalbi Desert and forms the largest drainage system in Marsabit County, covering an area of 948 km^2. The depression receives run-off from the lava and basement surfaces of the surrounding mountains and hills. The lowest part of this depression is seasonal (Old) Lake Chalbi (the 'grey' area south and west from Kalach Dida in the figure above), which is covered by recent sediments. Although, groundwater potential in the depression of (Old) Lake Chalbi is currently still unknown in terms of volumes and annual recharge, high yielding boreholes can be found here, especially south of the Marsabit – North Horr ridge and around North Horr town.

The rest of the county is covered by rocky, stony and rugged lava plains with poor soil development. Some of these soils in the western part of the county have acidic moisture and are saline in the Chalbi Desert. The groundwater potential in the sedimentary areas of these plains is expected to be low. Generally, the bedrock in the lowland areas is varying from 20 and 80 mbgl. The larger area around the depression, which is still considered the Old Chalbi Lake aquifer (the brown filled area in the figure above), has limited rainfall in the Chalbi desert and presence of saline soils, especially the area between North Horr and Lake Turkana. The recharge and quality aspects of groundwater are therefore not expected to be advantageous for efficient groundwater abstraction. Moreover, the low success rate of boreholes in the sedimentary areas appears very often also related to inadequate hydrogeological assessments and poor application of geophysics.

6.2.3 Water Resources

With regard to water availability in the county, water is sourced from the main sources of water are shallow wells, boreholes, pans, rock-catchments, buried tanks and springs. The average distance to the nearest water points in Elle Borr is two (2) Kilometres.The community also sources water from a borehole, however, the quantity of water is mainly depending on the amount of rainfall received within the area.

6.3 Ecological Conditions

The project area located in Uran Ward, Sololo sub county in Marsabit County, the area encompasses scarce tree species and several shrubs. Elle Borr falls under Semi-Arid areas/Woodland Zone - Ecological zone IV. The semi-arid areas have a medium potential for supporting both pastoralism and agriculture. These comprise areas that constitutes the lower slopes of Mt. Marsabit, the middle slopes of Mt. Kulal and the top of Huri Hills which has increasingly become an area of sedentarized agro-pastoral production. Some pockets within Sololo and Moyale fall in this zone as well. The county lowland environment consists of about 20% arid and semi-arid land (ASAL), predominantly under bushland and shrublands. Bushland is dominated by high woody bushes mixed with trees, whereas the shrubland is shorter, continuous shrubs of about 6m in height. The bushlands cover slopes of Mt. Marsabit, Kulal, Kalacha, Maikona, Ngurnit and others while the shrublands occur around Sololo, Funanyatta, Illeret, Sibiloi, Hedad, Korole and others.

The main forest products are charcoal, timber, stones, wood fuel and non-timber forest products such as water, medicinal herbs and grass. The main tree species include olea Africana, croton spp, leucaena spp, cassia spp, moringa spp, jacaranda, and acacia spp and cordia sp; the main shrub species include psychotria kirti, clausesena anisat and rytigynia neglecta while the most common grass species include oplismenus hirtelus and schoenoxiphium lehmanni.

The county is very rich in wildlife diversity. In fact, before 1990s, only a few species were not found in the county. The wildlife species found in the county includes; rhinoceros, elephant, lion, leopard, cheetah, buffalos, Oryx, Thomson's gazelle, Ostrich, Spotted Hyena, Gerenuk, Kudu, Giraffe, Zebra and baboons.

The bird species found in the county include African olive pigeon, bearded vulture, hartlaub's turaco, Heuglin's bustard, little grebe, masked lark, peregrine falcon, purple heron, Somali courser among others.

The main livestock types are cattle, goats, sheep, camels, donkeys, poultry,

6.4 Climatic Conditions

In Marsabit County, evidence of narrative of many older people agree that there is tremendous change. This concurs with scientific evidence of global climate change. The rainfall ranges between 200mm and 1,000mm per annum and its duration, amount and reliability increases as altitude rises. North Horr (550m) has a mean annual rainfall of 150mm; Mt. Marsabit and Mt. Kulal 800mm while Moyale receives a mean annual rainfall of 700mm. The average temperature is 29°C. There are two rainy seasons' i.e., short, and

long rains. The short rains are expected between October to December and the long rains from March to May each year.

6.5 Area of Influence

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

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

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

Air Quality

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

Noise

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

Water

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

Flora and Fauna

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

Socio-economic/Social

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

6.6 Socio-economic Environment

6.6.1 Community Profile

Elle Borr village is in Uran ward, Sololo subcounty in Marsabit County. It is located 40 km from Turbi town. The top community development priorities are 1st security, 2nd communication 3rd water in that order. The village has been in existence for 13 years. Houses in the community mainly composed of thatched and/or polythene covered manyattas with a few that are roofed by iron sheet. The community support mechanism includes Hunger safety net, emergency relief food/feed (for livestock and human). The only clan in Elle Borr is Borana. The community practice Islam, Christianity and African Traditional Religion. Below is a summary of demographic profile of Elle Borr.

Table 10. Demographic profile of Elle Borr

Attribute	**Magnitude/Number**
Approx. population	2040
Households	340
Gender.	Male – 40% Female – 60%
Ave. No. per household	6 per household
Indigenous	Indigenous- 100% Settlers – None
Vulnerable classes	Elderly, PLWDs
Dominant ethnic group	Borana
Primary religions	Islam, Christianity, Traditionalists
Employment (formal/Informal)	Formal – 1% Informal – 99%

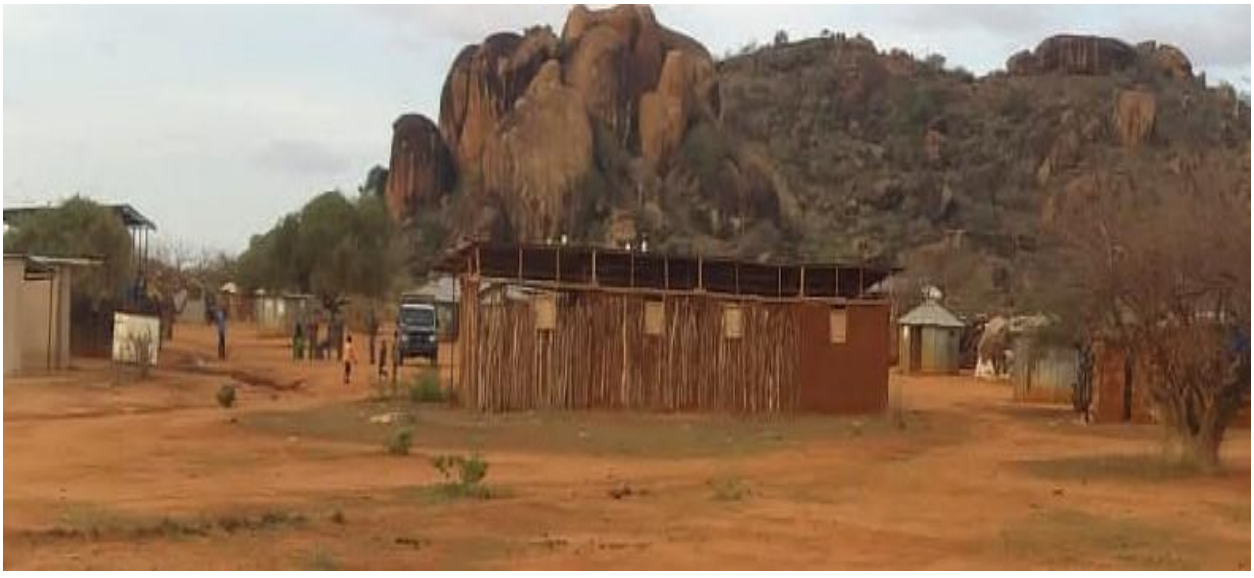


Plate 2. Households of different structures in Elle Borr

6.6.2 Socio-economic status of Study Area

6.6.2.1 Demographic Profile

The information shared on community profile by the area chief Elle Borr location) showed that Elle borr has a population of approximately 2040, and with an estimated number of households to be 340 with an average of 6 people. Elle Borr has a gender ration that is currently estimated to be about 40% male and 60% female.

6.6.2.2 Educational Infrastructure

The village has only one primary school – Elle Borr primary school located at the immediate south of the site. The school has a total of 214 pupils with 7 teachers; The school completion rate among the boys is approximately (95%) while that of the girls is at (80%). Most pupils drop out at class 8 or form 4 mainly due to lack of school fees, child labor (Taking care of livestock).

6.6.2.3 Occupation and Livelihood Profile

Elle borr community are mainly pastoralists moving with livestock in search of pasture and water. Major livestock kept are camel, cattle, sheep, goats, and local chicken. The community rely of livestock products for food at the household level and for income generation. Formal employment is 1%. Other sources of income in the society include sale of wood fuel/charcoal and firewood, building materials, retail shops. Due to the aridity of the county, food production (crop growing) is not practiced.

6.6.2.4 Land Use

Land in the community is mainly communal. The land is used for homesteads, livestock grazing, underground water is also harnessed from the land, however the water at the borehole is scarce and very salty.

6.6.2.5 Health facilities

Elle Borr has only one public health dispensary with two nurses. Main service provided is Out-patient services, Nutrition services, Immunization, Maternity, Anti and Post- natal care services. The facility lacks water, electricity, beds, adequate toilet facility and other basic equipment.

6.6.2.6 Social and Physical Infrastructure

Water: The main source of water in the village is a water pan which is located approximately 3-5km from Elle Borr village. Water is collected by the use of Jerricans and mainly transported by the use of donkeys.

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

Plate 3 : Private toilets at Elle Borr primary school

Mobile Network Coverage: At the time of assessment Safaricom signal booster was being sets for stable mobile network in Elle Borr

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

Road Network: Road's connectivity within the area is also poor and not regularly maintained. Elle Borr is accessed through an earth road. The main forms of transport within the area are Motor bikes, the donkeys also provide alternative modes of transport.

Plate 4: An Earth road connecting to Elle Borr

7 STAKEHOLDER ENGAGEMENT

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

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

7.1 Stakeholder Consultation and Disclosure Requirement for the Project

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

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

The respective minutes and list of participants for the public consultation undertaken at Elle Borr is enclosed under appendices of this report. Further, an initial communication was done and the information was shared with the county commissioner and Chief of Elle Borr location on 5th January 2022, two (2) weeks prior to the public participation meeting held on 20th January 2022 at Elle Borr village.

7.2 Stakeholder Characterization and Identification

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

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

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

Table 11. Identified Stakeholders

Stakeholder Groups	Primary Stakeholders	Secondary Stakeholders
Community	Local Laboure's Land sellers VMG's Local Community	Pastoralists
Institutions	Community & Faith Based Organizations Education & Healthcare institutions	
Government Bodies	NEMA County Government District and local administration	

7.2.1 Stakeholder Mapping

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

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

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

Table 12: 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

7.3 Stakeholder Analysis

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

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

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

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

7.4 Stakeholder Engagement during the Land Identification Process

A Consultative meeting was held with the Elle Borr community on October 23rd, 2021, to discuss the details of the proposed mini-grid project, the project's land requirements, the impacts of the project and grievance redress. Focus Group Discussions were also carried out separately with men, women and the youth. The FGDs were to allow the groups to freely express themselves and to ensure that they understood the project.

The outcome of the community meeting and the FGDs included the following:

- The community was informed of the proposed mini-grid project and its benefits
- The environmental and social impacts of the project were discussed and the proposed mitigation measures
- There were discussions on the project's land requirements and the community's rights and entitlements for their provision of land for the minigrid project. This included the various options on land compensation i.e. payment of cash for land, land for land compensation and compensation in kind
- A locational Grievance Resolution Committee (GRC) was constituted with representation of men, women and the youth. Additionally, the implementing agency representatives were informed of the community's existing grievance redress mechanism which will be integrated with the project's redress mechanism
- Feedback in form of questions, opinions and recommendations was obtained from the community and responses were provided by the project team

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

They also proposed the following as their preferred projects for compensation

1. The construction of a teacher's staff house – 3 or 4 rooms
2. Renovation of classrooms
3. Erecting a school fence

Minutes of the meeting are appended at the end of this report.

7.5 Key Feedback Received During Stakeholder Consultation Process

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

A detailed CPP and community engagement for Elle Borr Solar Mini Grid was held in Elle Borr village, at Baraza point on 20th January 2022 chaired by the area chief.

The general stakeholder consultation was done in a public meeting (Baraza) organized at community baraza point where 67 males and 8 women were in attendance. The meeting was chaired by the chief. The feedback received during the stakeholder consultation process have been summarized below.

7.5.1 Positive Comments about the Project from the Participants

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

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

7.5.2 The identified negative impacts of the project

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

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

  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

7.5.3 Additional Responses from the Consultant

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

- ✓ Every resident, business or public facility will be connected to the electricity at an affordable cost
- ✓ 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 Community and not from outside
- ✓ He assured the community that the project will commence soon after ESIA
- ✓ That noise form the Machinery will be minimized.

7.5.4 Consent

The Community members present agreed unanimously accepted the Project Proposal.

7.5.5 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 13. The consultative meeting had a wide representation

Category	Male	Female	Total
Youth	10	0	10
Adult	47	8	55
TOTAL	**57**	**8**	**65**

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

7.5.5.1 Female Stakeholders' Consultation and Participation

The females' participants in the FGD were N=7 and between 25-49 years of age. There was no female headed households in the meeting. The following were their responses.

The project perception

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

Women in Elle Borr community and their roles as reported by the FGD

- ✓ Building houses, fetching of firewood and water, cooking and other house chores.
- ✓ Women and men have equal opportunities in the community however, women control household equipment while male control livestock and other major assets.
- ✓ Women feel safe in the community and level of crime was low at the time of the assessment, however tribal clashes have been experienced within the area between the Borana and Gabra clan.
- ✓ The challenges encountered by women include inadequate water, lack of proper sanitation, high
- ✓ levels of illiteracy.
- ✓ Women receive information about local issues and development or news through radios and from the local chief.
- ✓ Women are currently involved in herding of livestock, roles that were exclusively for men. They are also involved in decision making of various issues in the community

Economy /income generation by women

- ✓ Women earn income from sale of khat (*Miraa*), small businesses such as retail shops.
- ✓ At the household level, women contribute less income than men
- ✓ To have greater economic opportunities, women suggested they should be capacity built and be involved in businesses
- ✓ The women have no access to any bank/credit/saving accounts; however, they save their own money and use it to buy food and clothing.

Land use by women

- ✓ The livestock (goats, sheep, camels and cattle) are reared for both subsistence and income generation.
- ✓ Community members are nomadic and move with their livestock in search of water and pasture during the dry seasons.
- ✓ Women collect natural resources like firewood for both domestic use and commercial purposes
- ✓ So far, no conflict has been experienced in the community.
- ✓ Some women in the FGD indicated that sometimes they experience gender-based violence (GBV) such as physical fights between them and their husbands at household level. To eliminate GBV the women suggested creation of awareness on reducing GBV among community members.

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

Education, literacy, and training of Women in Elle Borr

- ✓ The women denoted that they do not access quality education due to inadequate teaching facilities and teachers
- ✓ A few women can read and write in the community especially the young adults.

Health care for Women in Elle Borr

- ✓ The women access health care at Elle Borr health center, though the main health problems/challenges facing women include inadequate medicine, Malaria and backache.
- ✓ Environmental issues affecting health in the community is mainly poor sanitation because of inadequate water.
- ✓ The women have no access to family planning, this is due to cultural beliefs.
- ✓ The community members opt and prefer going to the hospital than the use of traditional medicine.

Access to Water by women

- ✓ The community has a water pan located approximately 5km from the village. The water from the pan was confirmed to be turbid with dust particles and suspension and not good for human consumption.
- ✓ Women use jerricans to collect water and transport water by use of donkeys.
- ✓ During dry season water is not sufficient

Transport and communication

- ✓ The community has no public transport, very few members use motorcycles to transport goods to Turbi/Sololo.
- ✓ The village is served by an earth road that is impassable during wet seasons
- ✓ The area has a poor network coverage, however at the time of the assessment Safaricom signal booster was being sets for stable mobile network in Elle Borr

Sanitation and hygiene for women

- ✓ The main type of toilets in the village are pit latrines. Open defecation was also reported by the FGD.

Hygiene and waste management by Women

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

Access to Power as per the FGD

- ✓ Sources of energy and their uses in village include
  - For lighting use of torch, D-light, kerosine lamp which is an expensive means of lighting since kerosine costs approximately 300 (three hundred) Kenya shillings per liter.
  - For warming -wood fuel
  - Cooking -wood fuel
  - Charging mobile- D-Light.

- ✓ The village has limited sources of power as the main challenge.

Cultural heritage

- ✓ The area has no cultural heritage

7.5.5.2 Male Stakeholders' Consultation and Participation

- ✓ The male participants were N=19 in number between 35-70 years of age. The male participants are household heads. The following were the response during the male FGD.

The project perception

- ✓ The men indicated that they had heard about the project in October 2021 and that they were aware that the County and National government were planning to install the solar to provide electricity to the community.
- ✓ They men also indicated that negative impacts would also arise such as accidents from electrocution especially to children and accidents related from falling of electric poles.

Role of Men as per the FGD

- ✓ The findings showed that the roles of men are mainly siring of children, herding, and watering of livestock, providing leadership and security at the household level.
- ✓ They indicated that men have more opportunities in the community and that women have more difficulties than men due to more responsibilities and challenges.
- ✓ Men have more control over livestock, water points, and environments than women.
- ✓ Men generally feel safe in the community
- ✓ The main challenges encountered by men in Elle Borr community mainly include drought which greatly affect the animals thus forcing them to trek for long distances in search of water and pasture.
- ✓ Men generally receive information about local issues and development or news through radios, word of mouth and over internet.
- ✓
- ✓ Men do not have any cultural groups and their top three community development priorities include water because of the water shortage experienced in the area, Health because the health facility in Elle Borr lacks maternity services and education projects.

Economy /income generation

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

Land use

- ✓ Men keep livestock both as subsistence and income-generating activities. Livestock reared include cattle, camels, sheep, goats, donkeys.
- ✓ Community members are nomadic- moving with livestock in search of water and pasture especially during the dry seasons. Some of them go as far as 600km in search of pasture.
- ✓ The men are also involved in collection of natural resources like firewood and herbs from the nearby vegetation covers for both subsistence and domestic use.

- ✓ According to the men FGD, conflicts such as physical fights between the neighbours are experienced within the communities.

Education, literacy, and training as per the FGD

- ✓ Young boys and men access education at Elle Borr Primary school located within the village
- ✓ Ability to read and write among the male population is generally average.

Health care analysis by the male FGD

- ✓ The men access health care from Elle Borr dispensary; the services provided are satisfactory to men needs. However, complicated cases are referred to Sololo Hospital.
- ✓ The dominant health issues among men at the time of the assessment include corona, Diarrhea, and Kala Azar due to the soil type in the area.
- ✓ The PLWDs are present among the male population are mostly not well cared for.

Access to Water analysis by the male FGD

- ✓ The men are responsible for searching water to be provided to the livestock while women collect water for both livestock use a domestic use.
- ✓ The men access water from a water pan located at about 2km from the village for drinking, cooking, washing dishes and bathing. Water for livestock is accessed from a borehole approximately 3km from Elle Borr village. The borehole was constructed in 2016 by the county government of Marsabit.

Sanitation and hygiene according to Male FGD

- ✓ The main type of toilets are pit latrines.
- ✓ Men indicated that open defecation is commonly practiced as an alternative where access to latrines is impossible.

Hygiene and waste management

- ✓ Handwashing and general cleaning are done by use of basins

Access to Power

- ✓ Sources of energy for Elle Borr village
  - For lighting use of torch.
  - For keeping warm they use firewood
  - Cooking -firewood
  - Charging mobile-solar
  - Cooling – solar fridges

- ✓ The village has limited sources of power since the solar power which they mostly rely own since access to maintenance is limited and the systems are of low standards.
- ✓ The men suggested that the solar energy system need improvement.

Religious heritage

- ✓ Mosques, churches and shrines are the main religious sites within Elle Borr community.
- ✓ The main festivals undertaken by men include religious festivities e.g., Idd, weddings and offering sacrifices.

7.5.5.3 Youth Stakeholders' Consultation and Participation

- ✓ The youth participants were 10 in number. The following opinions were provided by the youth participants during the FGD.

The project perception

- ✓ The youth disclosed that they were aware and understood the importance of the project to the community.

- ✓ They suggested that the project had positive impact since it will bring with it employment opportunities, and improve quality of education.
- ✓ They also indicated that they will be able to also charge their phones.
- ✓ They however noted that negative impact as likely injuries through electric shocks and suggested great care while handling electrical appliances.

Role of Youth

- ✓ The youth indicated that they are involved in the decision-making processes and therefore their voices are generally heard.

Institutions/community Development

- ✓ The youth have Banale and Ibse youth groups that majorly deals with livestock trading and small businesses.

Economy /Income Generation/Employment

- ✓ An estimate of fifty (50%) of the youth are self-employed while about one (1%) have full-time salary jobs.
- ✓ The income-generating activities pre-dominant among youth in Elle Borr include livestock keeping and motorbike business

Education, literacy, and training for youth FGD

- ✓ An estimate of 50% of the youth have completed secondary education while a further 25% have completed Vocational/College level education.

7.5.5.4 Education Stakeholders' Consultation and Participation

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

The project perception

- ✓ He heard about the project in 2021, from the community members within the village.
- ✓ The project will improve economic opportunities within Elle Borr area will improve, this includes; availability and utilisation of office equipment
- ✓ Provision of cheap phone charging services and businesses.
- ✓ The respondent indicated that the project would have a positive impact to the school through access of electricity that will provide light especially in the evening study by students
- ✓ Provided various possible ways of mitigating negative impact from the solar project through fencing the project area, informing and properly educating the locals on negative effects of the projects and employing security personnel.

Infrastructure/Resources

- ✓ Elle Borr Primary School currently has **7** teachers in total
- ✓ The challenges facing the school include increased insecurity issues experienced within the region, and lack of adequate TSC staff. The respondent suggested that the challenges can be solved by government employing more TSC teachers and enforcing peace within the community members.
- ✓ Further indicated that the school received support from a Non-Governmental Organization called FHI-360 Kenya. They had built the school kitchen and food store to promote food hygiene in our school. The school is also supported by the county government through the County Development Fund that, was renovating six classrooms at the time of the assessment.
- ✓ The average walking distance of students to school is up to 150m.
- ✓ The respondent indicated that the government provides for school feeding programme.

The School Curriculum

- ✓ The respondent indicated that the boys achieve higher grade than girls because they are not given domestic chores and responsibilities unlike girls.

The School Attendance

- ✓ 214 pupils in total and the total sex ratio of boys to girls is 5:4
- ✓ The completion rate for male students attending school is 95% compared to 80% of female.

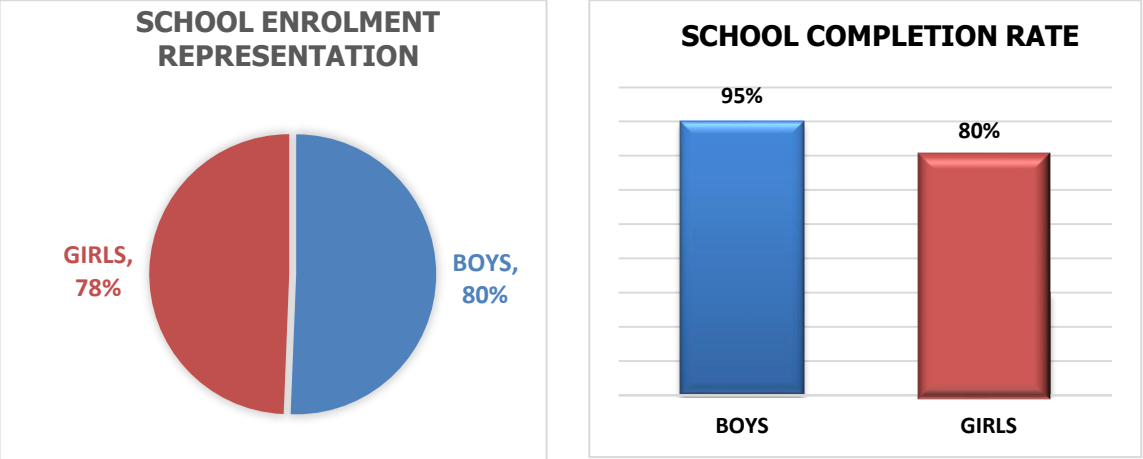


Figure 7. School Enrolment and School Completion rate

7.5.5.5 Health Stakeholders' Consultation and Participation

- ✓ The following were responses from the health worker; the nurse in charge at the health centre during the KII.

The project perception

- ✓ He was aware of the implementation of the project from another KOSAP team in 2021.
- ✓ He noted that the project will improve the Infrastructure of Elle Borr and the surrounding area.
- ✓ The respondents further noted that the project shall have positive impacts that include boosting security due to lighting and improvement of economic standards of the community. They also indicated that it will improve provision of services at the healthcare facility.

Facility Profile

- ✓ Elle Borr dispensary currently operates from 8:00am to 5:00pm and provides emergency services at night.
- ✓ It serves the local community and the surroundings informal villages.

Infrastructure/Resources

- ✓ The health center has the following staff; 2 nurses.
- ✓ The facility offers services such as out-patient, nutrition, Anti-Natal Care and Immunization
- ✓ The nurse indicated that the infrastructure at the institution is at moderate condition.
- ✓ Lack of electricity is the main challenge regarding the infrastructure and equipment at the dispensary.
- ✓ The facility does not have an emergency vehicle; however, it is easily accessible since its located within the trading center.
- ✓ The facility provides outreach and educational services in relation to health such as family planning and nutrition.

Prevalence Rates/Health Issues

- ✓ The main health issues pre-dominant among the children in Elle Borr are malnutrition due to improper diet, Diarrhea, and Pneumonia.
- ✓ The main health issues pre-dominant among the men and women in Elle Borr are Typhoid, Peptic Ulcer Disease and Nephrolithiasis
- ✓ Malnutrition was the most prevalent among most vulnerable groups due to food insecurity among the community
- ✓ The reported average life expectancy for men and women is between 60 to 65 years
- ✓ There are no cases of GBV or health issues arising from the quality of the environment which have been handled by the health center.
- ✓ The most vulnerable groups within the community are *children under 5 and elderly people*.

Plate 8. Male FGD

Plate 7. Youth FGD

7.6 Stakeholder Engagement Post ESIA

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

7.6.1 Objectives and Principles of Stakeholder Engagement

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

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

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

- Consultations with affected persons and interested parties should avoid manipulation, interference, coercion, or intimidation.
- Consultations should also pay attention to the needs of VMGs, vulnerable individuals and households.
- The contractor shall identify the stakeholders early and consider appropriate methods for engaging them. The stakeholder engagements will be reported to KPLC on monthly basis alongside the construction progress reports.

8 GRIEVANCE REDRESS MECHANISM

8.1 Grievance Mechanism

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

8.2 National Grievances Redress Committee (NGRC)

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

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

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

Functions of the National Grievances Redress Committee

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

8.3 Introduction

Grievance mechanisms should receive and facilitate resolution of the affected institutional or communities' concerns and grievances. Community concerns should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities, at no cost and without retribution. Mechanisms should be appropriate to the scale of impacts and risks presented by a project. Grievances can be an indication of growing stakeholder concerns (real and perceived) and can escalate if not identified and resolved. The management of grievances is therefore a vital component of stakeholder management and an important aspect of risk management for a project.

Projects may have a range of potential adverse impacts to people and the environment in general, identifying grievances and ensuring timely resolution is therefore very necessary. As such the project has developed a grievance management process to serve as a guide during project implementation.

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

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

8.4 County Grievance Redress Committees (CGRC)

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

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

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

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

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

8.5 Locational Grievance Redress Committee (LGRC)

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

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

The implementing agency representatives present during this forum included MoE, KPLC and REREC (County Renewable Energy Officer). They held a consultative forum with the community and constituted an LGRC consisting of nine (9) members. The members consisted of three (3) ladies, four (4) men and two (2) youth all identified and elected from each category of PAP except for the location Chief and village administrator who are automatic members of the team.

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

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

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

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

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

The roles of LRCCs will include among others:

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

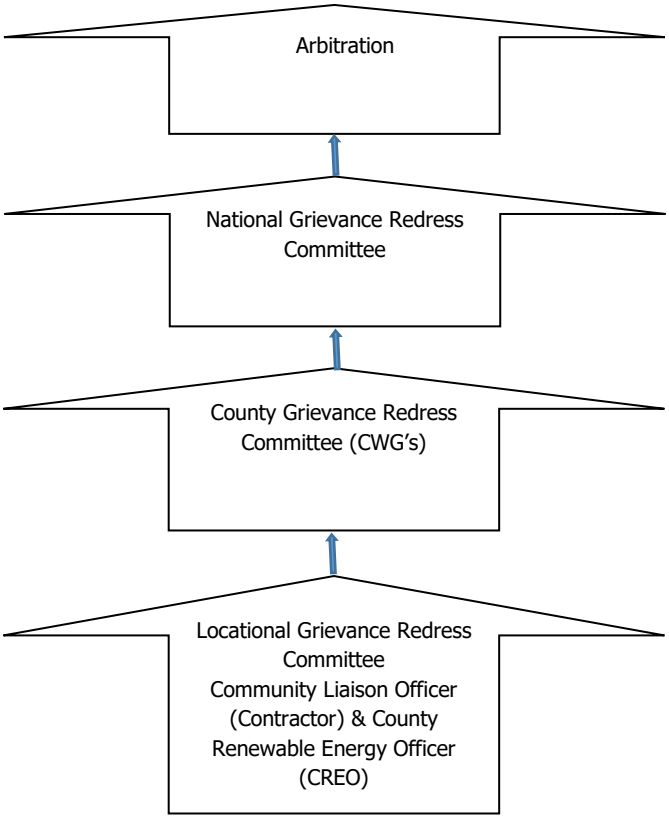


Figure 8. KOSAP Grievance Redress Mechanism

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

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

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

9 IDENTIFICATION AND ASSESSMENT OF POTENTIAL IMPACTS AND PROPOSED MITIGATION MEASURES

9.1 Introduction

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

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

9.2 Assessment Methodology

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

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

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

9.3 Defining of Impacts

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

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

9.4 Evaluation of Impacts

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 below based on five levels described in the table below;

Plate 9. **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 the table below.

Plate 10. Overall Significance Criteria for Environmental Impacts type definitions

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

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

9.5 Magnitude of Impact

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

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

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

9.6 Sensitivity of Resources and Receptors

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

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

9.7 Likelihood

Terms used to define likelihood of occurrence of an impact are explained in the table below.

Table 14: 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)

9.8 Definition of Mitigation Measures

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

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

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

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

9.9 Positive Impacts-Construction Phase

9.9.1 Creation of Employment Opportunities

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

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

Enhancement Measures

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

9.9.2 Improving local economy

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

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

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

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

Enhancement Measures

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

9.10 Positive Impacts during Operation Phase

9.10.1 Quality, Reliable Power Supply

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

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

Enhancement 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

9.10.2 Employment Creation

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

The impact significance is low.

Enhancement Measures

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

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

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

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

Enhancement Measures

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

9.10.4 Improvement of Local and National Economy

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

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

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

9.10.5 Education

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

Enhancement Measures

- KPLC should consider having the transmission lines are closer to schools for them to benefit from the power supply;
- KPLC should consider 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

9.10.6 Health Benefits of the Project

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

9.10.7 Improved Standard of Living

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

9.10.8 Security

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

9.10.9 Communications

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

9.11 Positive Impacts during Decommissioning Phase

9.11.1 Employment Opportunities

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

9.11.2 Site Rehabilitation

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

9.12 Negative Environmental and Social Impacts during Pre-Construction Phase

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

9.12.1Impacts related to Land Acquisition

The land in consideration is approximately 1.399 hectares for the proposed mini-grid. The land acquired may also be used to develop contractor facilities, worker's camps and other ancillary facilities e.g., storage and sanitary facilities. Loss of land used by the communities for livestock grazing and farming may trigger land disputes. New settlements may arise due to migration of people to the centres near the mini-grid disrupting the existing community settlement patterns.

The project proponents will use existing access roads to set up the low-voltage power distribution lines and will seek access from PAPs and clients in whose property they will undertake electricity connection to the power grid.

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

Mitigation measures

In line with the RPF provisions;

- The proponent has Prepared an Abbreviated Resettlement Action Plan (A-RAP) to guide land acquisition for the mini-grid, wayleaves for power distribution, potential economic displacement and community projects (if applicable).
- The contractor will implement and adhere to agreements for temporal use of land and restoration of land after use.
- Compensate affected communities in-kind (priority F) for the loss of land.
- The construction activities will be restricted to within the allocated land and the immediate surroundings only.
- After construction work, any land taken for a temporary basis for storage of material will be restored to their original form.
- Consultations with the community on the low voltage lines.

9.12.2Impact on Way leaves

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

Mitigation measures

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

- Consultations with the community during construction of the low voltage lines.

9.13 Negative Environmental and Social Impacts – Construction phase

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

9.13.1 Vegetation Clearance

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

Mitigation Measures

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

9.13.2 Soil Erosion Impact

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

Mitigation Measures

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

9.13.3 Contamination of Soil from Fossil Fuels

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

Mitigation Measures

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

9.13.4 Dust Emissions

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

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

Mitigation Measures

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

9.13.5 Vehicle Exhaust Emissions

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

Mitigation Measures

- Drivers of construction vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered.

- Maintain all machinery and equipment in good working order to ensure minimum emissions of carbon monoxide, NO_X, SO_X and suspended particulate matter;

9.13.6 Pollution from Solid Waste Generation

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

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

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

Mitigation Measures

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

9.13.7 Impacts on Water Resources and Water Quality

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

Mitigation Measures

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

- Clear the necessary areas only.
- Appropriate remedial measures shall be implemented by the contractor in the event of erosion.
- Infrastructure shall be designed to ensure that contaminated run-off does not reach watercourses.
- In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect.

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

9.13.8 Noise and vibration

During construction activities noise pollution will occur and is bound to be a nuisance and a disturbance to neighboring communities. This noise is from construction equipment, excavation works, concrete mixing and vehicles coming to site but will be temporary. From the prediction of the specialist study on ambient noise quality measurements, the traffic noise that will be emitted by traffic accessing the proposed project site during construction is expected to have an adverse impact on ambient noise. The level of traffic noise will increase depending on the traffic volume. General guideline indicates that an increase of 20% in traffic volume approximates to a noise level increase of around 1 dB, while a doubling of traffic volume results in a noise level increase of about 3 dB. It is however, worth noting that the level of noise is attenuated with increase in distance from the source and thus the sites/objects in close proximity to the source will receive more noise in comparison to those at remote location. The impact significance has therefore been assessed minor. This due to the fact that the impact magnitude is low and the receptor sensitivity is medium.

Mitigation Measures for Noise and Vibration

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

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

9.13.9 Impacts from Hazardous Materials

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

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

9.13.10 Accidental Oil Spills or Leaks

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

Mitigation Measures

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

9.13.11 Fire Hazards

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

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.

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

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

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.

9.13.13 Increased Water Demand

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

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.

9.13.14 Energy Consumption

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

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.

9.13.15 Occupational Health and Safety Impacts

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

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

Mitigation Measures

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

9.13.16 Community Safety -Access to Site by General Public

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

Mitigation Measures

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

9.13.17 Spread of HIV/AIDS and STIs

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

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

Mitigation measures include:

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

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

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

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

Mitigation Measures

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

- Appropriate compensation for work done
- Respect for community values/culture
- Prompt payments as per the contractual agreements/terms

9.13.19 Child Labor

Implementation of the project will lead to increased opportunities for the host community to sell goods and services to the incoming workers. This can lead to child labour to produce and deliver these goods and services, which in turn can lead to school truancy. The impact significance is rated minor, based on low sensitivity of the receptor and medium magnitude of the impact.

Mitigation Measures

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

9.13.20 Gender Based Violence- SEA and SH

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

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

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

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

There is no incident of gender-based violence in Ele Borr as identified during FGD with Men, women and youths. However, it cannot be ruled out during project implementation. Thus, the significance of this impact is considered to be Minor considering low sensitivity of the receptor and low magnitude of the impact.

Mitigation Measures

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

refer to World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2020) for further guidance.
It should be noted that the decision to report a GBV case lies with the survivor or the guardians if the survivor (in case of a minor) and such a decision must be respected. Therefore, the contractor or project will only refer the survivor of guardian to the established referral pathway, including the nearest police station with a gender desk for handling GBV cases. Also, should a survivor choose legal redress, the project will similarly facilitate him/her by referring him/her to the nearest established legal support facility that offers legal support to GBV survivors.

Key tasks will include:

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

9.13.21 Public Health Impacts

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

Mitigation Measures

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

- Ensure equal treatment of workers
- Provide all appropriate COVID-19 preventive measures including campaign to maintain individual measures at the work place.

9.13.22 Public Health Impacts Sanitary Waste

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

Mitigation Measures

- Construct/ install pit latrines for both genders clearly labelled

9.13.23 Forced Labor

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

Mitigation Measures

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

9.13.24 Risks related to Inadequate Stakeholder Engagement

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

Mitigation measures;

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

9.14 Negative Impacts during Operation Phase of the Project

NOTE: According to the MOE the proposed project will be constructed by a third party (contractor) who will also operate and maintain the solar mini-grid for a period of seven years and then hand over the plant to Kenya Power. *Therefore, for the seven years KPLC will be monitoring the operations of the contractor to ensure the mitigation measures are put in place* .

9.14.1 Solid Waste Generation

The proposed Mini-grid is expected to generate some amounts of solid waste during its operation phase. The type of the solid waste generated during the operation of the project will consist of paper, drums, plastic, cables, meters, panels. Such wastes can be injurious to the environment. Some of these waste

materials especially the plastic, cables, metals, polythene among others are not biodegradable hence may cause long-term injurious effects to the environment. The overall impact significance on land due to waste disposal during O&M phase has been assessed as minor due to medium sensitivity and low magnitude.

Mitigation measures

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

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

9.14.2 Liquid Waste/Oils Generation

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

Mitigation measures

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

9.14.3 Increased oil Consumption

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

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.

9.14.4 Increased Storm Water Flow

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

be of minor significance.

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

9.14.5 Fire Outbreaks

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

Mitigation Measures

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

9.14.6 Visual Impacts

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

Mitigation Measures

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

9.14.7 Water demand

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

Mitigation Measures

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

9.14.8 Sanitary waste

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

Mitigation Measures

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

9.14.9 Flooding

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

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

9.14.10 Workers Occupation Health and Safety

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

Mitigation Measures

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

9.14.11 Hazardous waste

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

Mitigation Measures

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

9.14.12 Noise and Vibration

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

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.

9.14.13 Electric and magnetic fields (EMFs)

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

9.14.14 Shocks and electrocutions to the PAPs

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

Mitigation Measures

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

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

9.14.15 Community safety -Access to the facility by general public

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

Mitigation Measures

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

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

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

Mitigation measures

- Employ from the community to the extent possible
- Engage the community members and other stakeholders in a timely manner
- Work closely with the GRM committee members in solving the conflicts
- Solve all conflicts/grievances at the earliest time possible
- Ensure all grievances are logged and closed
- Monitoring the pattern of grievances to come up will long term measures
- Gender Based Violence- SEA/ SH
- Gender based violence risk is also possible during operation phase although the labor force will be smaller. the impact is assessed as minor due to the low magnitude and medium receptor sensitivity. Therefore, measures must be put in place to address GBV risks.

Mitigation Measures

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

Key tasks will include

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

9.14.17 Public Health Impacts –HIV/AIDs

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

Mitigation Measures

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

- Allowing migrant workers time to be with their families

9.14.18 Public health Impacts -Covid 19 disease

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

Mitigation Measures

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

9.14.19 Dust emissions

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

Mitigation Measures

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

9.14.20 Vehicle exhaust emissions

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

Mitigation Measures

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

9.15 Negative Impacts during Decommissioning Phase

Preparation for decommissioning

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

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

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

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

9.15.1 Noise and Vibration

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

Mitigation Measures

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

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

9.15.2 Solid Waste Generation

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

Mitigation Measures

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

9.15.3 Dust Emissions

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

Mitigation Measures

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

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

9.15.4 HIV/AIDs awareness and prevention

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

9.16 Social Protection

There will adequate mechanisms in place to protect local vulnerable population especially women and minors from risks associated with influx of workers (harassment, underage sex). This system will ensure having security on site provided by the contractor as well as sensitization and enforcement by the contractor. There will also be a code of conduct established for contractor employees and contract workers acknowledging a zero-tolerance policy towards child labour and child sexual exploitation. Additionally, the contractor will employ their skilled staff and apply unskilled construction labour from the local population as far as possible to minimize on influx of foreigners into the community.

9.17 Social Inclusion

Gender Mainstreaming

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

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

10 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING (ESMMP)

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

10.1 Purpose and Objectives of ESMMP

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

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

10.2 Auditing of ESMMP

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

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

10.3 Incident Reporting

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

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

10.4 Management Responsibility of ESMMP

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

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

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

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

10.4.2 National Environment Management Authority (NEMA)

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

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

10.4.3 Contractor

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

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

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

Deficiency and performance management: actions taken in response to previous notices of deficiency or observations regarding E&S performance and/or plans for actions to be taken—these should continue to be reported until KPLC determines the issue is resolved satisfactorily.

10.4.4 Consultant

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

10.4.5 County Government of Marsabit

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

10.5 Environmental and Social Management Plan

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

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

10.5.1 Management Plan during Construction Phase

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

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

10.5.2 Management Plan during Operational Phase

The operation phase of the proposed project will be mainly power supply, line maintenance and clearing of wayleaves. A contractor (contracted to run the plant for a number of seven years before handing over to KPLC) will be responsible for all the mitigation measures for negative impacts during the operation phase for the first seven years after which responsibility will be KPLC. However, for the seven years KPLC will be monitoring the operations of the contractor to ensure the mitigation measures are put in place.

This will be done by implementation of the following steps:

- Inspections
- Corrective action
- Reporting

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

Table 15: Environmental and Social Management Plan (ESMMP)

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 and quantities of materials etc.	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Land acquisition and compensation for land and assets on land	In line with the RPF provisions; -Prepare and implement an **Abbreviated Resettlement Action Plan (A-RAP)** to guide land acquisition for the mini-grid, and wayleaves for power distribution. Further, the proponent will fast-track A-RAP preparation to ensure that land acquisition and contractor mobilization to the site is undertaken after the A-RAP is finalized, cleared, and disclosed. -The contractor will implement and adhere to agreements for temporal use of land and restoration of land after use. -Compensate affected communities in-kind (priority project) for the loss of land. -The construction activities will be restricted to within the allocated land and the immediate surroundings only. -After construction work, any land taken for a temporary basis for storage of material will be restored to their original form. -Consultations with the community on the low voltage lines.	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)
	-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 competition e.g., water. -Establish and operationalize an effective Grievance Redress Mechanism accessible	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)
	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**" -Do not allow children at the project site.	Construction Decommissioning	Contractor REREC	-Updated employment register indicating locals employed, their ages, national identification numbers etc. -Grievances raised, aggrieved persons and status on resolution etc.	Quarterly	20,000.00
GBV- SEA and SH	-Prepare an SEA/SH Prevention and Response	Construction Operations Decommissioning	Contractor REREC	-Minutes of awareness creation sessions for the	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.			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		
Forced Labor	-Adhere to the Employment Act which outlaws any form of forced labor. -Report any form of forced labor at the site. -Ensure that all workers have a national ID card or documentation to show they are adults (above 18 years).	Construction Decommissioning	Contractor REREC	-Number of reported cases of forced labor.	Quarterly	20,000.00
Risks related to Inadequate stakeholder engagement	-Prepare a stakeholder engagement/consultation plan (SEP) that is proportionate to the subproject and the identified stakeholders.	Construction Operations Decommissioning	Contractor REREC	-Availabiliy of and implementation of the Stakeholder Engagement Plan. -# of stakeholder consultations held	Quarterly	30,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-Timely and prior disclosure of project all project information, including project instruments, the full rights and entitlements of project affected persons, sub-project positive and negative impacts and opportunities, proposed subproject budget. -In line with the SEP, undertake adequate consultations prior to construction and throughout the project cycle with all segments of the community and other relevant stakeholders. -Prepare and implement a grievance redress mechanism to deal with grievances. -The grievance redress committee to include representatives from the community. -Sensitize stakeholders on SEP and GRM.			-Record of stakeholder consultations held (minutes of meetings and list of participants). -Information disclosed, to whom it was disclosed (men women, PWD, youth, vulnerable individuals and households etc., methods and languages used in the disclosure (culturally appropriate and accessible), grievances raised and status on resolution etc. -Concerns raised andactons raised.		
Exclusion of VMGs and vulnerable individuals and households	In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following.	Pre-construction Construction Operations Decomissioning	Contractor REREC	Minutes of consultative meetings with all community segments including	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	• Early identification and inclusion of VMGs and disadvantaged groups. • Meaningful consultation to effectively participate in the project. • Timely and prior disclosure of relevant project information to VMGs and disadvantaged groups. • Adequate and ongoing consultations with VMGs and disadvantaged groups in line with the SEP. • All concerns or grievances raised are fully resolved in a timely manner. • Access to culturally appropriate project benefits and opportunities.			VMGs and vulnerable individuals and households, grievances raised and status on resolution etc.		
Inaccessibility of project benefits to	-Consult VMGs and Vulnerable individuals and households on charges for sub project	Operations	O&M Contractor	-Interventions to enable those vulnerable access	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
VMGs and other vulnerable individuals due to affordability challenges	services, and put in place specific interventions to ensure the vulnerable equally access project benefits.		KPLC	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		
Inadequate grievances management	Constitute a Local Grievances Committee is in consultation with all community segments, and incorporates the existing local dispute resolution mechanism. -Implement a workers grievances mechanism. -Awareness on the culturally appropriate and accessible GRM to all community segments including VMGs, vulnerable individuals and households and CSOs -All reported grievances are	Construction Operations Decomissioning	Contractor REREC	-Local Grievances Committee in place, composition of committee, awareness of community and workers on project and worker GRMs, updated GRM logs, types of grievances -Availability of grievance redress process -Number of grievances reported	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.			-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 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	Construction Operations Decommissioning	Contractor REREC	-A Security Management plan -Number of reported crimes -Number of complaints	Monthly	300,000

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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 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	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)
	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					
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	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)
	disposal of construction materials 4. Use silt traps where necessary 5. Cover soil stock piles 6. Landscaping with grass on areas without electrical installation (lower areas) 7. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled.					
Contamination of soil from fossil fuels	1. Ensure 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	Construction	Contractor REREC	Records of any leakages from construction equipment/ vehicles.	Quarterly	50,000.00

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	7. Keep stockpiles and exposed soils compacted and re-vegetate as soon as possible. 8. Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas 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	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)
	3. Maintain equipment in good running condition – no vehicles to be used that generate excessive black smoke 4. Use of diesel which is Sulphur- free to run the power producing generators to be encouraged 5. The stack chimney of the generators will be increased from its normal height of 3 meters to 6 meters					
Solid waste generation	1. Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is top soil last; 2. Segregate waste 3. Provide litter collection facilities such as bins	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)
	4. Contractor to put in place and comply with a site waste management plan 5. The contractor should comply with the requirement of OSHA ACT 2007 and Building rules on storage of construction materials 6. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time 7. Recovery of materials remains and return to stores 8. Re-use of materials where possible 9. Proper budgeting to avoid waste generation 10. Proper disposal of waste in line with solid waste regulation					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	11. Construction wastes to be managed in accordance with construction standards in Kenya					
Impacts on Water Resources and Water Quality	1. Clear the necessary areas only. 2. Appropriate remedial measures shall be implemented by the contractor in the event of erosion. 3. Infrastructure shall be designed to ensure that contaminated run-off does not reach water source i.e., earth dam. 4. Contractor to develop an oil-spill containment plan as part of the emergency response plan. In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect. 5. No vehicle maintenance and service shall be done at project site	Construction	Contractor 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 sufficient capacity and	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)
	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. 2. Refueling and maintenance of vehicles	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)
	will not take place at the construction site. 3. Create awareness for the employees on site on procedures of dealing with spills and leaks 4. Vehicles and equipment must be serviced regularly and kept in good state to avoid leaks. 5. In case of spillage the contractor should isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent materials and/or other materials approved by materials. 6. All chemicals should be stored within the bunded areas and clearly labeled detailing the nature and quantity of chemicals within individual containers.					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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
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	Construction	Contractor REREC	Sources of raw materials (from local community)	Quarterly	Part of contractor's cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	estimation of actual construction materials to avoid wastage. 3. Reuse of construction materials where possible.					
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
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.	Construction	Contractor REREC	Energy consumption records	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.					
Occupational Health and safety Impacts	1. Use skilled personnel for activities which demand skills/technical tasks 2. Awareness creation/Tool box talks on safety to workers while at construction site 3. Workers coming to the site should be knowledgeable on safety precautions to take 4. Appropriate PPE (helmet, safety harness,	Construction	Contractor REREC	Records of any near misses, incident, and accidents. Records of corrective actions implemented if there was an accident.	Quarterly	1,000,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	boots, masks, climbing irons) 5. Proper general house keeping 6. Close supervision of workers 7. Risk assessment by contractor of the construction activities and implement mitigation measures appropriately 8. Adherence to occupational Safety and Health Act 2007 9. Availability of equipped first aid box on site 10. Provide safe drinking water for workers 11. Engagement of trained first aider on site 12. Ensure the WIBA cover is taken for the staff 13. Establish safety committees					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
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 communities prior and during construction on the dangers of these diseases 3. Informing workers on local cultural values and health matters.	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)
	4. Provision of condoms to workers 5. Allowing migrant workers time to be with their families 6. The contractor is impressed upon not to set a construction camp on site. 7. The contractor will provide public education/information about HIV/AIDS transmission and prevention measures. 8. Ensure equal treatment of workers 9. Provide all appropriate COVID-19 preventive measures including campaign to maintain individual measures at the workplace.					
Sanitary waste	Construct/ install pit latrines for both genders clearly labelled	Construction	Contractor REREC	Presence of separate and clean washrooms for	Quarterly	300,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
				both the gents and ladies		
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
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.	Operation	O&M Contractor KPLC	-Engine maintenance records -Oil spill containment plan	Quarterly	200,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.					
Increased oil Consumption	1. Efficient energy consumption 1. Install an energy-efficient lighting system	Operation	O&M Contractor KPLC	Energy consumption records	Quarterly	No additional cost
Increased storm water flow	1. Construct the drainage system in a way to follow natural drain of the water 2. Concrete only the required area and leave the rest of the land with vegetation like grass	Operation	O&M Contractor KPLC	Provision of a drainage system and a rain water harvesting system	Quarterly inspections	200,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	3. Construct rain water harvesting system on the control buildings/office and harness into storage tanks for use					
Fire Outbreaks	1. The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points 2. Detection/alarm systems that can detect fire should be and installed 3. A fire evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported. 4. Workers especially operators of the plant must be trained on fire management	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)
	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 and faulty taps should be fixed promptly.	Operation	O&M Contractor KPLC	Water usage records	Quarterly	20,000.00
Sanitary waste	1. Provide sanitary waste facilities for both genders clearly marked 2. Disposal of waste through septic tanks	Operation	O&M Contractor 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	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)
	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					
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	Operation	O&M Contractor KPLC	-Provision of PPEs and WIBA cover -Environmental audit reports	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	4. Annual environmental audits should be done 5. WIBA cover for staff is mandatory					
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
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	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)
	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					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	wire/conductors if found fallen on the ground o Report any incident regarding electricity at the local office –staff in charge of operating the Mini-grid					
Community Safety- Access to site by general public	1. Fencing off the facility to keep of community members, children and livestock from entering into the facility 2. Controlled access to the site only with prior approval 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	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)
	members in solving the conflicts 4. Solve all conflicts/grievances at the earliest time possible 5. Ensure all grievances are logged and closed 6. Monitoring the pattern of grievances to come up will long term measures					
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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Public Health Impacts – HIV/AIDs	1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff awareness and awareness campaigns for the community 2. Provision of condoms to workers 3. Allowing migrant workers time to be with their families	Operations	O&M Contractor KPLC	Number of awareness creation sessions conducted. -Availability of and distribution of condoms		20,000.00
Public health Impacts -Covid 19 disease	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	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. Make provision for testing and treating especially of workers 4. Provision of contact numbers for the nearest health facility for testing and treatment 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	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)
	exhaust emissions are lowered. 2. Company vehicles should be well maintained					
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.	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)
	5. Demolish mainly during the day when most of the neighbors are out working.					
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	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)
	5. Safe transportation to the disposal sites / designated area 6. Hazardous waste must be disposed by NEMA approved waste handler					
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

10.6 Monitoring

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

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

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

10.7 ESMP Monitoring Plan

The aim of environmental and social monitoring is to evaluate the effectiveness of the Environmental and Social Management Plan implementation by periodically monitoring the important environmental and social parameters within the impact area, so that any adverse effects can be detected and action taken in a timely manner. Throughout the project's operation, environmental monitoring is performed to detect changes in key environmental quality parameters that can be attributed to the project. The monitoring plan specifies the parameters to be monitored; the monitoring requirements; and the frequency and duration of monitoring for each of the environmental components. The monitoring plan also specifies the performance indicators, as well as the implementation and supervision responsibilities.
The monitoring plan shall be required during construction and operational phases and records kept. The schedule for monitoring ambient air quality, ambient noise quality, ground water quality, and wastewater quality both during the construction and operation phases of the project is given in the table above.

Table 16: Institutional Framework and Compliance/Implementation of the ESIA/ESMP

No	Institution	Role/Function
1	The National Environment Management Authority (NEMA	NEMA: ▪ Approve the ESIA Report ▪ Issue EIA License for project implementation ▪ Carry out independent Audit to determine compliance with ESMP
2	Directorate of Occupational Safety and Health Services (DOSHS)	DOSHS: ▪ Provides OSH permits for workplaces of the project including campsites and quarries ▪ Conduct inspections to ensure conformance to OSHA
3	Water Resources Authority (WRA)	WRA ▪ Provides necessary water abstraction permits for boreholes and surface water sources (rivers, streams etc.) ▪ Monitor water use in the region and provide guidance water use
4	National Land Commission (NLC)	NLC ▪ Verify the identified land for the purposes of ascertaining land ownership ▪ Transfer of land ownership details to the proponent
5	National Gender and Equality Commission	The Commission: ▪ Ensures that there is gender equality and equity throughout the implementation of the project. ▪ Representatives will monitor and evaluate gender quality and equity with regards to job provision and harassment cases on site to ensure compliance with the law
6	County Government of Marsabit	County Governments will: • Provide approval for the project & project site ▪ Approval of community land consent & verification • Provide support
7	Supervision Consultant	**Supervising Consultant** ▪ Will engage the following dedicated full-time safeguards staff to support risk management ✓ Supervising Engineer (RE) ✓ Social Safeguards Specialist ✓ Environmental Safeguards Specialist ▪ Review and approval of the ESMPs and other plans ▪ Day to day supervision of Contractor implementation of the ESMPs and other plans ▪ Regular reporting on the ESMP implementation ▪ Has full time Environmental, Health and Safety and Social Specialists
8	Contractor	**Contractor** ▪ Will engage the following dedicated full-time safeguards staff;

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

11 IMPACT SUMMARY AND CONCLUSION

11.1 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 Elle Borr Village, Uran ward, Sololo 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.

11.2 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

11.3 Conclusion

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

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.

12 REFERENCE

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- Government of Kenya: Waste Management Regulations, 2006
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- Community Land Act, 2016
- The Land Registration Act, 2012
- The Land Act, 2012
- The Energy Act, 2019
- The Constitution of Kenya, 2010
- Marsabit County Integrated Development Plan 2018-2022

13 APPENDICES

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

Appendix 1: Minutes of EIA Consultation Meeting

CENTRIC AFRICA LTD

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

MINUTES OF EIA CONSULTATION HELD AT ELBOR

Date: 20/01/2021	**Time:** 1630HRS
Venue: ELBOR	

ASSISTANT CHIEF
BANALE SUB-LOCATION
P. O. Box 123-60700,
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**	
	Opening prayer by one of the elder. Chief introduced to members, reminded them of allready pre team about KOREP project. Centric Africa Ltd, ESIA consultant, introduction, RERSEC Rep & County Energy department ~~Representative~~ Rep.	CHIEF
Min 2/22	**Opening Remarks**	
1	Team lead ESIA, informed the members abriefing of the project which is a solar installation project with main objective of informing the team about benefits environmental concerns and what must be done ensure Sustainable development.	CENTRIC
2	RERSEC Rep (Irene) ~~She~~ it was informed that the project is funded by, Worldbank and is meant only for marginalized part of Kenya. Marsabit County falls under identified counties and Elbor is one of region with Marsabit for the project. The project is meant to supply enough power, that shall serve all households, at affordable cost. The power shall be supplied for both households, schools, dispensaries and market place. The community agreed and allocated a communal piece of land and in return World Bank agreed to compensate the community	

Min 3/22	Remarks by the Consultant	
	projects: Elders were consulted and they provided three projects which, word bank shall have implemented at a cost of 1000 000/=ch. There was also established grievance resolution committee who duty is to ensure that issues affecting the community to word bank rep.	REREE IRENE
	ESIA Process and objectives to the project - The process of ESIA is done in compromity to the requirement of EMCA 1999 making public participation an integral part of sustainable development. - THE outcome of the process shall ensure that the community members well understands the Project effects of its interaction with environment and to people during 1) Preparation phase 2) Construction phase 3) operation phase 4) Decommissioning phase Some of identified impacts (expected) 1) Increased traffic hence the risk of accident, damage of the road environmental pollution due to exhaust fumes' 2) possible pollution of environments and underground sources - this might result from spillages of oil 3) Generation of waste. - Solid waste from excavations used material. - liquid waste / sanitary waste ('Contractor shall be requested to bring portable toilets to reduce pressure on existing resources) 4) Pressure to existing resources including water - Contractor shall be advised to ensure that a suitable source of water is identified and well used. 5) possible increased insecurity - Contractor shall consult with the chief and local administration and that names shall be provided and only authorised personnel shall carry out work. 6) Conflicts with Locals - Contractor shall be expected to consider the local for all non-skilled tasks. Only skilled ones shall be sourced from outside Benefits of the project 1) Enhanced security through street and household lighting 2) Enhanced education - lighting at schools / households 3) Enhanced medical / health care 4) Enhanced business 5) Employment during projects implementation 6) Enchanced infrastructure	CENTRIC AFRICA LTD Teamled.

Min 4/22	Concerns / Issues from participants	
1	Mudah Sora Qus: - Which project was forwarded to the developers as requested earlier? Jontoo Peter: - When will the said project be actualised Loko Gino'(Woman) - Will the contractor be a local contractor from Elbon village or not	Community member

Min 5/22	Responses given by the consultant	
	The three projects proved have all been forwarded to World bank, to decide which one shall be within the cost of 1000,000 Ksh. We are currently following up the approval procedure including NEMA after which the project shall start! – It depends on approvals The project is open to any contractor. The ministry is in the process of contacting potential Contractors but the project remains open, provided that the contractor meets the set standards.	

Min 6/22	**Acceptance/Rejection of the project**	
	Project Accepted by all members	
Min 7/22	**Adjournment**	

Minutes Prepared by: DICKSON ALUBALA Date: 20/01/2022

Position: Environmental Expert

Signature: .....

Minutes Confirmed by: RACHITA M. BORU Date: 20/01/2022

Position: Ag. Chief

Signature: .....

ASSISTANT CHIEF ADMINISTRATION
BANAM SUB COUNTY
P.O. BOX 123-60700,
MOYALE

REREC MAIN ATTENDANCE REGISTER Kenya Power

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

Venue: ELBOR ... BANALE SUB-LOCATION Date: 20/01/2022

Time: .....

ASSISTANT CHIEF BANALE SUB-LOCATION P. O. Box 123-60700, MOYALE

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Doyo Klario Dabasa	Elebor	0742038160	
2.	Qadich Jarso	Elebor	0799740655	
3.	Abakul Huga	Elebor	0746865791	
4.	Kari Kosi Dido	Elebor	0701248987	
5.	Boru Guyo	Elebor	N/A	
6.	Tume Tadi Jarso	Elebor	0702637187	
7.	Doketa Dida	Elebor	N/A	
8.	Galma Boru	Elebor	07185602.78	
9.	Dati Halakhe	Elebor	0796728899	
10.	ABDI - Mudh. Sora	Elebor	0714936299	

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REREC MAIN

Kenya Power

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

Venue: ELBOR Date: 20/01/2022

Time:

ASSISTANT CHIEF
BANALE SUB-LOCATION
P. O. Box 123-60700,
MOYALE

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Mudha Sora Ukitha	Elebar	0759142493	
2.	Dige Jarso Gae	Elebar	0729443760	
3.	Gelgallo Banaya	elebar	0111933657	
4.	Halkano Galgallo	Elebar	0725092183	
5.	Guyo Galgallo	Elebar	0791568084	
6.	Tadita - Duba	elebar		
7.	Malicha Umuro	Elebar	0725738519	
8.	Dalicha Halkano	Chief Elebar	0728929418	
9.	Abdi Haro	Elebar	0712391969	
10.	Dub Halakhe	elebar	0710416537	

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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: ELBOR

Date: 20/01/2022

Time:

ASSISTANT CHIEF
BANALE SUB-LOCATION
P. O. Box 123-60700,
MOYALE

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Shema Gurecha	Ellebor		
2.	HALMA DUBA	Ellebor	0703001137	
3.	JONCHORO BIDA	Ellebor	0715409676	
4.	Wario Gurecha	Ellebor	0794534747	
5.	Hassan Yatteni	Ellebor	0740068514	
6.	BORU DALU JARSO	Ellebor	0706893910	
7.	Galgallo Tuna Lio	Ellebor	0714439859	
8.	Dub Tadi Jarso	Ellebor	0701898403	
9.	Dub Dumbi Wario	Ellebor	0710610402	
10.				

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REREC MAIN

Kenya Power

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

Venue: ELLEBUR Date: 20/01/2022

Time:

ASSISTANT CHIEF
BANALE SUB-LOCATION
P. O. Box 123-60700,
MOYALE

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Iokho Gimo	Ellebur	0793816592	
2.	JARSO JILLO MUKHE	ELLEBOR	0719693255	
3.	Halkano Kullu Sora	Ellebur		
4.	ROBA GUFU ARERO	ELLE-BOR	0741559849	
5.	ABDUB GUFU Dalacha	Elle-Bor	0758644054	
6.	TURA HUKA	ELLE-BORR	0716971115	
7.	HUKA SORA DUBA	ELLE-BORR		
8.				
9.				
10.				

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REREC GRC Kenya Power

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

Venue: ELBOR – GRC

Date: 20/1/2022

Time: 5:45 PM

ASSISTANT CHIEF BANALE SUB-LOCATION P. O. Box 123-60700, MOYALE

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	MARICHA BORU	ELBOR	0725738519	
2.	DUB QUMBI	ELBOR.	0740610402	
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

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REREC

Kenya Power

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

Venue: ..... (Women Fed) .....

Date: ..... 20/9/2022 .....

Time: .....

ASSISTANT CHIEF
BANALE SUB-LOCATION
P. O. Box 123-60700,
MOYALE

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Tume Guyo	Elbar	0702637187	
2.	Guyatu Debaro	Elbar		
3.	Elema Willrama	Elbar	0768134364	
4.	Lokho Giro Halake	Elbar	0728779615	
5.	Bokaya Jarso	Elbar	0797985589	
6.	Jillo Huka Sora	Elbar		
7.	Gaimo Bonaya	Elbar		
8.				
9.				
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: ELLE-BOR Date: 20/01/2022

MALE FGD Time: 04:30pm

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Adm Duba	Elebor	0705001137	
2.	Boru Halake	Elebor		
3.	Guyo Wario	"	0719308491	
4.	Malicha Umuro	"	0725738519	
5.	Tadicha Dalacha	"		
6.	Wario Guracha	"	0794534741	
7.	Guyo Galgallo	"	0791568084	
8.	Halkano Halake	"		
9.	Dub Tadi	"	0701898403	
10.	Halkano Galgallo	"	0725092163	

REREC Kenya Power

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

Venue: ....Ell - Bor..... Date: ....20/1/2022.....

MALE Time: .....

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Gollo Sora	Elebor		
2.	Dub Halake	"	0710416537	
3.	Mudha Wario	"	0759142493	
4.	Tura Huka	"	0716971115	
5.	Abakula Huka	"	0746865791	
6.	Giresa Adhi	"		
7.	Huka Sora	"		
8.	Shama Guracha	"		
9.	Qanchoro Biqa	"	0715409676	
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: EL-BOR SOUTH

Date: 20/01/2022

Time:

ASSISTANT CHIEF
BANALE SUB-LOCATION
P. O. Box 123-60700,
MOYALE

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	JARSO JILLO	ELLE-BOR	0719698255	
2.	ROBA GUFU	ELLE-BOR	0741559849	
3.	~~DOT~~, HALAKHE GUYO	ELLE-BOR	0746728899	
4.	~~BULLE~~ WARO JARSO DOTI	ELLE-BOR		
5.	BORU DALU JARSO	ELLE-BOR	0706893910	
6.	DOTO HARRO DABASSA	ELLE-BOR	0742038160	
7.	GALICH JIRMO	ELLE-BOR	0799740655	
8.	Abdi Haro	Elle-Bor	0712391969	
9.	Abdub Guyo ~~Jattani~~	Elle-Lor	0758644084	
10.	Halakhe Jattani	Ellebor	0740068519	

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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: ELLE-BOR

Date: 20/01/2022

Time: 4 pm

ASSISTANT CHIEF
BANALE SUB-LOCATION
P. O. Box 123-60700,
MOYALE

#	Name	Position/Institution/ Location/Village	Phone No.	
1.	Qalicha Godana	ELLE-BOR	0710321117	
2.				
3.				
4.				
5.				
6.				
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Appendix 3: List of attendance and minutes of Land Acquisition

MINUTES OF COMMUNITY CONSULTATION MEETING HELD ON 23/10/2021 IN ELLE-BOR

AGENDA

- Public forum: Welcoming and opening remarks
- Project information: KOSAP and the Elle-Bor 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;

14 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 ELLE-BOR 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 Elle-Bor 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 Elle-Bor 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 1.399 hectares. Land in Elle-Bor, 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 PAPs. For example, charging of mobile phones will be easier and cheaper. Project PAPs 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 PAPs were the 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, accessible and developed in consultation with Elle-Bor 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 Elle-Bor

QUESTION/COMMENTS	ANSWER/REMARKS
Mudha Sora These things of energy is for how long to be reached here How much cost does it have	After we get land will put a tender and evaluation it will be awarded to a contractor. Construction will then start Connection fee is 1000 shillings. The beneficiary then buys tokens
Malich Umuko If these things, to reached or managed here, who was to be answerable? If you want to train is it the ministry	Contractor and implanting Agency (REREC) We don't offer training, this can be done privately
Lokho Giro If you want to transfer electricity from your neighbour , and your house is grass hut or it has mud is it possible	Yes

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
Malich Umoro	0067552	0725738519
Wato Saraka	0020701	-

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 agreed 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
Lokho Giro Halakite	12429077	-
Guyatu Dida Yattani	12431449	0706766084

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
Halkano Wato Saraica	24303912	0712317304
Dub Qumbi Wako	27673014	0710610402

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 their preferred projects for compensation

a) Staff house – 3 or 4 rooms
b) Repairing of classrooms
c) School fence

The community nominated the following as members of the GRC:

No	Name	Category	1D No.	Mobile No.
1.	Lokho Giro Halakite	Women	12429077	-
2.	Guyatu Dida Yattani	Women	12431449	0706766084
3.	Halkano Wato Saraica	Youth	24303912	0712317304
4.	Dub Qumbi Wako	Youth	27673014	0710610402
5.	Malich Umoro	Men	0067552	0725738519
6.	Wato Saraka	Men	0020701	-

8.0 CLOSING STATEMENT

The community in Elle Bor unanimously agreed to set aside land for Minigrid construction. A Land Identification form was signed by the representative of the community, the county government and the Implementing Agencies summarizing the process of land identification and the agreements reached with the community.

Photos of Community Baraza on land acquisition in Elle-Bor

List of attendance

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SITE ELLEBOR

MEETING VENUE ELLEBOR

DATE 23/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	KIOKO MAITHYA	10924666	0722176597	M	KERER	
2.	James Chege	24790566	0729905945	M	Rore	
3.	IRENE MATE	26961056	0729081220	F	KERER	
4.	Dorothy Kaguwa					
5.	Osman M. Gargaro	25749064	0727431554	M	Cam-Lomos	

	NAME	ID. NO	MOBILE	GENDER	VILLAGE	SIGN
6.	Abdub Guyo Dabacha	3774928	0758644084	M	Elleba	
7.	Bira Jarso Qae	32743623	0729443960	M	Elleba	
8.	Jilla Huka Sora	20360572	0757608829	F	Elleba	
9.	Tume Tadi Jarso	28835401	0702637187	F	Elleba	
10.	Martha Jarso Boru	8204174		F	Elleba	
11.	AGaya Boru Bida	0592439	0723379165	F	Elleba	
12.	Tume Godana Wako	21727791		F	Elleba	
13.	Ware Guyo Haro	30567334		F	Elleba	
14.	Tadicha Guyo Mamo	18137910		M	Elleba	
15.	Abdub Godana Wako	30565576	0/113423824	M	Elleba	
16.	Guyatu Bida Yatani	12431449	0706766084	F	Elleba	
17.	Halima Gelma Duba	22896493	0710353245	F	Elleba	
18.	loko Giro Halake	12672077		F	Elleba	
19.	Boru Guyo Babassa	24451912	0712135105	M	Elleba	

	NAME	I.D NO	MOBILE	GENDER	VILLAGE	SIGN
20.	Gulo Halake Kantoma	0205211	0746670457	m	Elleler	
21.	Malich Umuro Baru	0067552	0725738569	m	Elleler	
22.	Gollo Galgallo Tesa	34708293		m	Elleler	
23.	Tadi Jarso Doti	0205542		m	Elleler	
24.	Halake Tara Guyo	20692098	0791850125	m	Elleler	
25.	Dub Qubi Waqo	27673014	0710610402	m	Elleler	
26.	Guyato Dekano dida	22900422		F	Elleler	
27.	Konso Sora Shane	34073762	0727945335	m	Elleler	
28.	Tura dida Galgallo	29318383	—	m	Elleler	
29.	Halkano Wato Saraka	24803912	0712317304	M	Elleler	
30.	Wato Saraka	0020787		m	Elleler	
31.	Baru Guracha Bante	35363888	0764134548	m	Elleler	
32.	Dub Tadi Jirso	22896765	0701898403	m	Elleler	
33.	Abdub Guyo Galassa	27675052	0740689700	m	Elleler	

	Name	ID. No	mobile	Gender	Village	Sign
34.	Halkano tadicha Guyo	24449753	0740728344	M	Elleber	
35.	Jarso JILLO mukhe	22715085	0719693255	M	EllBor	
36.	Mudha Sora Ukicha	11387917	0759142493	m	Elleba	
37.	Wako Dcaba Bagaja	20336422	0704361260	m	Eleber	
38.	Halkano Galgallo Boru	22382884	0725092183	m	Ele bor	
39.	Dida Jillo Tura	0204113	0722283977	M	Ele bor	
40.	FATUMA MUDHA SORA	30540071	0746261912	F	Ele-bor	
41.	Sake Halake Boru	9560416	0700791831	F	Ele-ba	
42.	GALMA DUBA URMALA	8204143	0705001137	M	Elebr	
43.	Tume Koricha Duba	35751611		F	Elleba	
44.	Godana Guyo Jillo	29590902	0746778290	M	Elleba	
45.	Godana G. Sora	22772962	0723242235	M	chief	
46.	ABDI HARO SORA	31587023	0712391969	M	Ellebor	
47.	ROB GUFU ARERO	23014548	0741559849	M	Ellebor	

REPUBLIC OF KENYA

MINISTRY OF ENERGY

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ENVIRONMENTAL, SOCIAL SCREENING AND LAND ACQUISITION FOR PROPOSED SOLAR MINI-GRID FOR COMMUNITY FACILITIES, ENTERPRISES, AND HOUSEHOLDS.

SITE ....ELLE BOR.....

MEETING VENUE....ELLE BOR

DATE..22/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD MEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	KIOKO MATHYA	10924866	0722176597	M	ELBEC	
2.	TADICH GUYO MAMO	1213790		M	Elebor	
3.	MALICHA UMURO BORU	0067552	0725739559	M	Elbor	
4.	GOLLO Halake Kofoma.	0205211	0746670457	M	Elebor	
5.	Gufu Dalach Boru	9559365	0725113246	M	Elebor	

	NAME	ID. NO	MOBILE	GENDER	VILLAGE	SIGN
6.	Mudha Sora	11387917	0759142493	M	Elebor	
7.	Wato Saneta	0020701		M.	Elebor	
8.	Dub Tadi	22896765	0701898403	M.	Elebor	
9.	Tadi Jaso	02055472	—	M.	Elebor	Tadi Jaso
10.	Golo Galgallo	34708293	-	M.	Elebor	
11.	Gurach Bante	12432070	—	M.	Elebor	
12.	Dobaso Huko.	13709132	0701860280	M.	Elebor	
13.	Halkano Galgallo	22382884	0725092183	M	Elebor	
14.	WAKO Duba	20336422	0704361260	M	Elebor	
15.	ABOUS Guyo	27675058	07689700	M	Elebor	
16.	GALMA DUBA	82041143	0705001137	M	Elebor	
17.	Gracia G. Sora	22772986	0723244234	M	Chief	
18.						
19.						

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SITE ....ELLA-BOR.....

MEETING VENUE.....ELLA BOR.....

DATE...23/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD WOMEN

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	Dorothy Kagweria	8204174	—	F	—	
2.	Marta Jaso Doti	-	-	F	Gollo	
3.	Ware Guyo Hano	30587334	-	F	Ilorun Jaso	
4.	Agayo Boru Dida	8592439	[illegible]	F	Gollo	
5.	Tume Godana Wako	21727991	[illegible]	F	Dalacha	

	NAME	ID. NO	MOBILE	GENDER	VILLAGE	SIGN
6.	Lokko Giro Halake	-	-	F	chief	
7.	Guyatu Dida -Jattani	12431449	0706766604	F	Dokosano	
8.	Halima Galma Duba	22896493	0710383245	F	Ilman Duda	
9.	Tume Tadi Jaro	28835401	0702637187	F	Gollo	
10.	Jillo Huka Sora	-	-	F	Ilmanjaro	
11.	Robe Godana Wako	-	-	F	Ilmanjaro	
12.	Goliti Jaro Wako	34707148	-	F	Bonayai	
13.	Tume Halakhe Wario	0627367	-	F	Karayu	
14.	Guyatu Debano Dido	22960422	-	F	Dokisano	
15.	Agudo Jillo Bule	12429143	-	F	Guradi	
16.	Boka-o Debano Dida	20372558	-	F	Dokisano	
17.	Fatuma Mudha Sora	30540091		F	Malicha	
18.	Hala Dabasa Unge	0205235	-	F	Malicha	
19.	Saka ~~Buke~~ Halake Boru	9560416	-	F	Chief	

20.	Galmo Gollo -lattani	20362792	0712317046	F	Dalacha	
21.	Duki Boru-la Adi	—	—	F	Ilman Duke	
22.	Adhi Guyo Bante	12431834	—	F	Gollo	
23.	[illegible] Sacchani	11579342	0722583869	F	[illegible]	
24.	Boku-lo Jillo Mukhe	28835903	—	F	Gollo	
25.	Jillo Dura Wako	9691382	—	F	Bokisimo	
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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 ELLEBOR

MEETING VENUE ELLEBOR

DATE 23/10/2021

LIST OF ATTENDANCE/PARTICIPANTS LIST - FGD YOUTH

No	NAME	Identification number – ID No	Mobile No.	Gender Male/Female	Village	Sign
1.	James Chege	24790566	0728905945	M	Rerec	[signature]
2.	IRENE MATE	26961056	0729051220	F	REREC	[signature]
3.	Abdullahi Jillo	[illegible]	0722996912	M	NRC	[signature]
4.	Osman M. Galgalo	23749064	0727931354	M	[illegible]	[signature]
5.	Waqo Gufu Dalacha	38569887	0796357615	M	Dalacha	[signature]

	NAME	ID NO	MOBILE	GENDER	VILLAGE	SIGN
6.	Gabole Ituqo	21727699	0752926583	M	Dalacha	
7.	Guyo Adi	26808528	0795276978	M	Shukabi	
8.	Halake Diio	34632202	0745224697	M	Shurate	
9.	Abdub Godana	30565576	0113428247	M	Dalacha	
10.	Jaldo Bida Jara	38529844	0714927944	M	Dalacha	
11.	Abdi Guyo Dalacha	37749128	0758644084	m	Ilmanjara	
12.	Wako Jirso Dadi	30565732	—	m	Dakiyana	
13.	Abdi Haro Sora	31587023	0712391969	M	Malicha	
14.	Rob Gufu Arero	23014548	0741559868	m	Gurach	
15.	Malicha Dida Kule	31631029		m	Dakiyana	
16.						
17.						
18.						
19.						

Appendix 4: Abbreviated Resettlement Action Plan

1. Elle Borr Sub-project Site

The Elle Borr sub-project site is on unregistered community land and held in trust by the County Government of Marsabit on behalf of the community, in line with the Community Land Act 2016. The proposed site is uninhabited, has no structures, community facilities, or encumbrances, and it is used for, livestock grazing. Consultations leading to the identification and selection of the sub-project site are captured in the Environmental and Social Screening report for *Elle Borr. Refer to Chapter 6 of the ESIA for the comprehensive socio-economic profile.*

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

The number of project-affected persons (PAPs) is 2040 (approximately 340 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 1.399 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 6.6 of the ESIA for socio-economic Environment.*

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 Elle Borr community proposed the following areas of compensation namely: construction of Staff Houses for Elle-Borr Primary School, repairing of Classrooms for Elle-Borr Primary School and construction of School fence for Elle-Borr Primary school The value of the priority community project will be proportional to or higher than the value of land under acquisition. In addition, loss or damage to crops, trees, structures, and community facilities will be compensated in line with the provisions of the RPF, and as summarized in the entitlement matrix below.

3.1 Entitlement Matrix

Types of Impact	Person(s) Affected/Eligible 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 7 of the ESIA on public consultation and engagement.*

Once the compensation award and Bill of Quantities (BoQs) are known, the Implementing Agency (IA) will engage the community and agree on the community project to be executed as in-kind compensation. During these consultations, the IA and the community will define the roles and responsibilities of the community in monitoring the

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

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 Elle Borr 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 section 8.5 of the ESIA on the Grievance Redress Committees. Further, the community will constitute the A-RAP Implementation Committee responsible for coordinating community engagements on the A-RAP and monitoring the implementation and closure of the A-RAP. The representation of the committee will consider gender, vulnerability, and intergenerational sensitivities.

4.3 Summary of Consultations on Land Acquisition and Compensation Options

Date	Objective	Implementing Entities	Land Acquisition and Compensation Aspects Discussed	Key Issues Raised	Responses Given
October 23rd 2021	Environmental and Social Screening. Voluntary land donation (VLD). Constitution of the Locational Grievance Redress Committee (GRC).	Ministry of Energy (MoE) Kenya Power (KPLC) Rural Electrification and Renewable Energy Corporation (REREC)	Site identification and land allocation for the sub-project. Criteria for VLD. Community entitlements (forms of compensation and implications for each).	None.	None.
January 20th 2022	Environmental and Social Impact Assessment.	Consultants MoE KPLC REREC	Land acquisition through compulsory acquisition (not voluntary land donation). Selection of three priority community projects, whereby one is to be implemented as in-kind compensation for land.	Community requested for construction of staff houses and fence, repairing of classrooms for Elle-Borr Primary School.	The proponent has set aside KES 1 million to implement the priority in-kind compensation project. The value of the project will be proportional to or greater than the value of land. NLC will determine the value of land.
May 2023	Compulsory Land Acquisition.	NLC	Site inspection and inquiries. Land valuation. Award of compensation.		

5. Institutional Responsibility for Implementation of the ARAP

Entity	Role
Ministry of Energy	• Coordinate A-RAP implementation and provide budget for in-kind compensation.
National Land 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 8 of the ESIA for a detailed GRM.*

7. Implementation Timetable and Budget for the ARAP Implementation

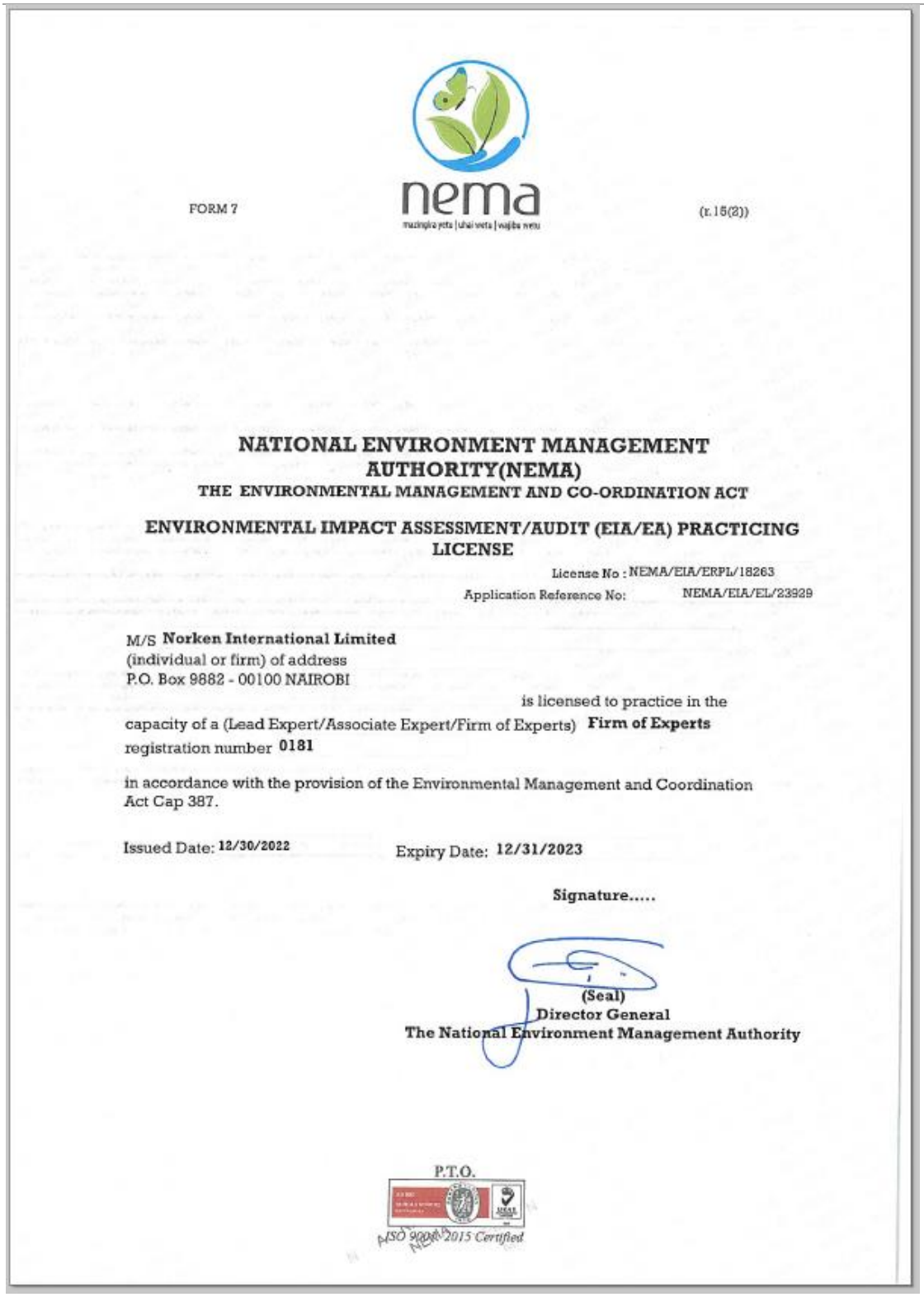
7.1 Timelines

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 5: Firm and Lead Expert EIA Practicing License



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NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/18263

Application Reference No: NEMA/EIA/EL/23929

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

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

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

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

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified

FORM 7 (r.15(2))

nema
mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

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

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registration number **1893**

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

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

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified