MINISTRY OF ENERGY

REPUBLIC OF KENYA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSEMENT REPORT FOR THE PROPOSED TUUM SOLAR MINI-GRID

PROJECT: KENYA OFF-GRID SOLAR ACCESS PROJECT

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

LOCATION : TUUM SUB-LOCATION, TUUM LOCATION, NYIRO WARD IN SAMBURU COUNTY

2023

CERTIFICATION

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

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

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Abbreviations

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

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

EXECUTIVE SUMMARY

E-1- Introduction and Project Brief

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

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

In Samburu County, one of the target counties, the Proponent is proposing to develop 10 No. mini grid facilities including Tuum 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 Tuum 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 Tuum site as a solar power facility, it falls within the medium risk project category as per the Kenyan legislative framework.

E-3 Approach and Methodology

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

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

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

E-4 Legislative Regulatory Framework

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

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

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

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

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

E-5 Environmental Setting

The project area in Tuum Sub-location, Samburu County, exhibits a semi-arid climate with irregular rainfall patterns and scarce natural resources. Water scarcity poses a significant challenge, affecting both the local population and livestock. The vegetation predominantly comprises drought-tolerant shrubs, thorny bushes, and arid-adapted grasses. Overgrazing and deforestation have resulted in land degradation and soil erosion, further exacerbating the environmental issues. Agricultural practices face hurdles due to limited fertile soils and inadequate irrigation infrastructure. The region is also prone to natural hazards like flash floods and sandstorms.

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

E-6 Project Description

The Tuum Mini Grid project aims to provide electricity to approximately 475 residential and 9 nonresidential consumers in Tuum Village at Tuum Sub-Location, Tuum Location, Nyiro Ward In Samburu County. The project will utilize solar photovoltaic panels, a Battery Energy Storage System, and a Diesel Generator to generate electricity.

The project will harness the energy of the sun through a minimum solar capacity of 135 kWp. Solar energy, a clean and sustainable source, will be the primary electricity generation method. To store excess solar energy and ensure a continuous power supply, a minimum usable battery capacity of 338 kWh will be deployed. A Diesel Generator with a prime rating of 100 kVA is integrated into the system to provide backup power during periods of low solar generation or high demand.Fuel Tank for Diesel Generator: A 2,000-liter fuel tank is provided to store diesel fuel for the generator, ensuring its continuous operation during extended periods of low solar or high demand. A minimum solar inverter capacity of 135 kW is used to convert direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use. With a minimum capacity of 100 kW, the battery inverter charger manages the energy flow to and from the battery storage system efficiently, optimizing the system's overall performance.

A 24.05-kilometer low voltage power distribution network is established to transmit electricity efficiently to the residential and nonresidential consumers. This network ensures a stable and reliable power supply while minimizing energy losses. The project features a 3.39-kilometer medium voltage network to facilitate power distribution from the generation sources to the low voltage network. A 100 kVA step-up transformer will be used to adjust voltage levels as needed to facilitate power transmission. The system is tailored to accommodate a peak demand of 81

kW, effectively addressing high-demand periods and ensuring uninterrupted access to electricity.

The estimated cost of the project is around **USD 764,239.00,** 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 Tuum Mini Grid approximately 1.213 hectares of land will be acquired in line with the national laws and World Bank provisions. In accordance with the World Bank's Operation Policy (OP) 4.12 on Involuntary Resettlement, an abbreviated Resettlement Action Plan (A-RAP) was prepared, outlining the principles and procedures for land acquisition and compensation. This plan is annexed to this ESIA.

E-7 Project Alternatives

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

E-8 Stakeholder Engagement

It is important to highlight that two forms of stakeholder engagement were carried out for the project. The first form as noted earlier, focused on the acquisition of land for the project and involved the Proponent and the implementing agency (KPLC). 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 5th February, 2021, a total of 79 stakeholders attended. The meeting provided an opportunity to discuss project details, including the preliminary design, positive and negative impacts, and mitigation measures. Stakeholders were encouraged to share their views and provide feedback on the project.

Some of the concerns raised by stakeholders included the power supply to the residential houses, type of safeguards to regulate access, cost of connection of power to the residential houses, supply of power to community facilities eg school, dispensary, chiefs office etc,. the ommunity members also wanted to know how the community will be secured from accidents caused by the mini grid. The study team addressed these concerns by assuring stakeholders that a chain-link fence supported by concrete poles would be constructed. They also stated that additional projects would be undertaken for the community as compensation, based on their priorities.

E-9 – Impacts and Mitigation Measures

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

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

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

Tables 1 to 3 below present summaries of anticipated impacts and their corresponding levels of significance, both pre- and post-mitigation.

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 and Decommissioning Phases Impacts

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

Table 3: Summary of Operation Phase Impacts

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

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

E-10 Environmental and Social Management and Monitoring Plan

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

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

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

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

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

E- 11 Conclusion

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

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

1 INTRODUCTION

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

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

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

1.1 CONTEXT

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

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

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

The project components are:

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

The MOE provides overall coordination of the project as well as lead in the implementation of components 2 and 4. Components 1 and 3 (a&b) will be implemented by the Kenya Power and Lighting Company (KPLC) and the Rural Electrification and Renewable Energy Corporation (REREC), respectively. KP will be responsible for implementation of a total of 99 mini-grid sites including the Tuum mini-grid which is the subject of this report while REREC will be responsible for a total of 57 mini-grids.

1.2 PROJECT OVERVIEW

The project site is located in Tuum village at Tuum sub-location, Tuum location, Nyiro ward in Samburu County. The proposed solar mini grid will be located on a 1.214 Hectares piece of land. The solar mini grid will comprise Solar panels, batteries, inertors, perimeter fence and 12.1 kilometers distribution line to cover a radius of approximately 3km. The project is expected to serve 484 consumers of which 475 are residential and 9 are non residential.

1.3 PURPOSE AND SCOPE OF WORK

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

1.4 ESIA METHODOLOGY

1.4.1 Screening and Scoping

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

1.4.2 Environmental Impact Assessment

The steps below were followed in the preparation of this ESIA Report .

1.4.2.1.1 Kick-off Meeting

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

1.4.2.1.2 Desk based review and baseline assessment

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

1.4.2.1.3 Project Description

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

1.4.2.1.4 Baseline Condition

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

1.4.2.1.5 Impact Assessment (IA) Prediction

The anticipated impacts generated by the project and subsequent evaluation of their significance is provided by this report. A suite of field data collection methods was deployed

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

Socio-cultural risks linked to Component 1 of KOSAP were identified during the assessment. These include, Labour influx, Gender Based Violence, Sexual Exploitation and Abuse, workplace Sexual Harassment, Spread of HIV/AIDS, STDs & other communicable diseases, Gender biases and inequality exclusion of vulnerable and marginalized groups (VMGs) and vulnerable individuals and households from accessing project decision making and governance structures, engagement processes, opportunities and benefits. The vulnerable individuals and households identified included: the poor, elderly persons, PWDs, the sick, poor women, poor Poor female headed households, child-headed households. The VMG's include ethnic minority communities that are present in Tuum area.

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

1.4.3 Environmental and Social Management Plan (ESMP)

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

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

The ESMP include an implementation schedule and budget cost estimates for the mitigation measures. It also describes institutional arrangements with regard to the implementation of the ESMP among the implementing agencies, and the mini-grid contractor(s). This has

specific responsibilities, procedures and resources required by each institutional actor engaged in implementing the ESMP.

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

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

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

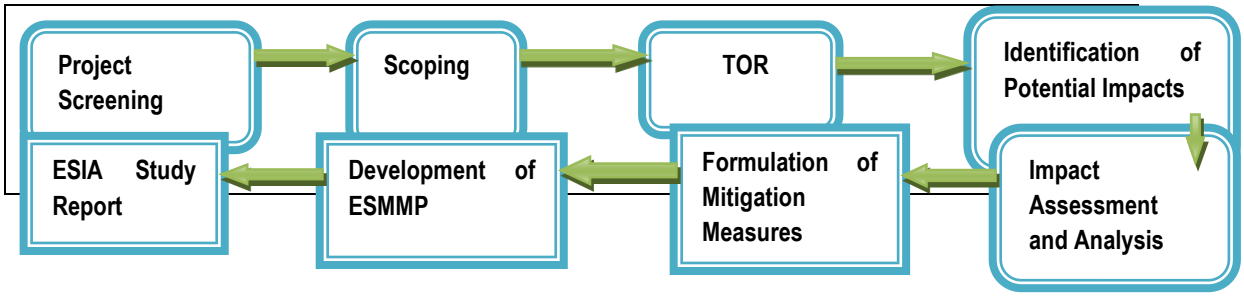

Figure 1: Summary of Environmental and Social Impact Assessment Methodology

1.4.4 Study Team

This ESIA process was conducted by 2 teams of experts that comprised the following professionals

Team 1 – 12/12/2020-first round of detailed consultations with the community was done during the screening process and it involved disseminating the project information to the community, site identification and screening for the mini-grid and constitution of the GRM and selection of GRM committee.

No.	Name	Institution
1.	Dorothy Kagweria	Ministry of Energy
2.	Wilfred Koech	Kenya Power
3.	Benson Lengalen	County Government of Samburu
4.	Winfred Omondi	Kenya Power
5.	Gideon Lekupe	County Government of Samburu
6.	Samwel Olela	REREC
7.	Wyclef Ngure	Ministry of Energy
8.	Richard Wida	Kenya Power
9.	Joseph Korir	Kenya Power
10.	Jediel Muriuki	Kenya Power
11.	Elsie Mworia	Kenya Power

Team 2 -Progressed the ESIA study.

S/No.	Name	Designation	Organization
1.	Wyclef Ngure	CREO	KOSAP (Samburu County)
2.	Mark Oyier	Senior Superintending Engineer	MoE
3.	Samwel Olela	Environmental Specialist	REREC
4.	Allan Owino	Environmental & Social Specialist	Centric Africa Ltd
5.	Patrick Mwangi	Environmental & Social Specialist	Centric Africa Ltd
6.	Matthew Mutua	Environmental & Social Specialist	Centric Africa Ltd
7.	Umulkheir Abdi	Environmental & Social Specialist	Centric Africa Ltd

1.5 LIMITATIONS/UNCERTAINTIES

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 assertained eg. the number of the VMG's, orphans,rate of HIV infections, number of cases of GBV etc.
- ✓ Limited information on some environmental aspects e.g. acquifers,GBV vulnerability etc.

1.6 LAYOUT OF THE REPORT

Table 4: Structure of the ESIA Report

SECTION	TITLE	DESCRIPTION
Section 1	Introduction	Introduction to the Project and ESIA scope and methodology adopted.

Section 2	Project Description	Technical description of the Project & related infrastructure and activities.
Section 3	Applicable Legal and Regulatory Framework	Discusses the applicable environmental and social regulatory framework and its relevance for the Project.
Section 4	Environmental, Ecology and Social Baseline	Outlines Environmental, Ecology and Social Baseline status in the study area of the Project
Section 5	Stakeholder Engagement and Grievance Redress	Provides an overview of the stakeholder engagement activities undertaken during the ESIA, stakeholder categorization and profiling Additionally, it details the provision of Grievance Redress Mechanism for the project
Section 6	Impact Assessment and Mitigation Measures	This section includes details of identified environmental impacts and associated risks due to Project activities, assessment of significance of impacts and presents mitigation measures for minimizing and /or offsetting adverse impacts identified.
Section 7	Environmental and Social Management Plan	Outline of the ESMP taking into account identified impacts and planned mitigation measures and monitoring requirements.
Section 8	Impact Summary and Conclusion	Summary of impacts identified for the Project and conclusion of the study.

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. It also presents the potential impacts on resources and receptors that could result from Project activities during the pre-construction, construction, operation and decommissioning stages.

Table 6 below provides a summary of the pertinent information of the proposed Tuum solar mini grid;

Table 5: Summary Information of the proposed Tuum Solar Mini-grid

S. NO.	PARTICULARS	DESCRIPTION
1.	Project location	The project is located in Tuum village at Tuum sub-location, Tuum location, Nyiro ward in Samburu County on coordinates 2°8'45"N 36°45'55"E. The proposed solar mini grid will be located on an approximately 1.214 Ha piece of land and the length of distribution line to cover a radius of approximately 1.5 km.
2	Land Size/Tenarure	The proposed solar mini grid will be located on a 1.214 Hectares piece of land next to the Tuum centre.
	Approx. population	4500
	Households	750
	Dominant ethnic group	The Samburu's
	Other minor ethnic groups	Turkana
3.	Minigrid Capacity	- PV Array (DC-kW) of 100kw; 200kWh Battery
4.	Minigrid Power	LV Circuit of 12.1km
5.	Distriubtion line	
6.	Target Consumers	484 (475 Residential and 9 Non Residential)
7.	Climatic condition	The annual rainfall is below 700m with annual mean temperatures of between 30^0C and 33^0C. The site has an altitude of 886.0m above sea level. It falls under the largest ecological zone within Samburu County occupying up to 80% of the County land. Rainfall in the area follows fairly erratic pattern varying significantly both in temporal and spatial scale. The area experiences both short and long rains with the driest months being January and February. Long rains season falls between March, April and May with the short rains falling between July, August and extending to September. The lowest temperature experienced in the area is at 24^0C in the coldest month of July.
9.	Site Conditions	The side is generally in open area with minimal fauna and flora.
10.	Road Accessibility	Murram road.
11.	Nearest Airport	None
12.	River/canal/nallah/ pond present in project footprint	None

S. NO.	PARTICULARS	DESCRIPTION
13.	Protected areas (National Park/ Sanctuary)/ Forest land within 10 kms	None
	Vulnerabilty within the community	• Poor households (Approximately 100 households) • Poor female headed households (Over 1000) • Orphans (Over 1000) • Persons Living with Disabilities (Approximatly 300) • The elderly (About 400)
	Existing grievance redress mechanisms	There are elders in the community who provide leadership and oversight to the community. These elders are responsible for dealing with conflicts or grievances or any issue in the community. Any of the grievances that is difficult to resolve is referred to the office of the Chief. Most of the grievances are solved by the elders and we rarely have any cases going to the chief

2.2 PROJECT LOCATION

The project site is located in Tuum village at Tuum sub-location, Tuum location, Nyiro ward in Samburu County. The proposed power MG will be constructed on approximately 1.213 Hectares of land on coordinates 2°8'45"N 36°45'55"E. The project site will be approximately 1.8km from the Tuum shopping centre and approximately 868.95m from Tuum primary school.

Figure 2: Project site

2.3 DESCRIPTION OF PROJECT FACILITIES, COMPONENTS AND ACTIVITIES

2.3.1 Project Components

2.3.1.1 Solar PV modules

The project will use PV Array (DC-kW) 100 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.

Solar Photovoltaic Panels: The project will harness the energy of the sun through a minimum solar capacity of 135 kWp. Solar energy, a clean and sustainable source, will be the primary electricity generation method.

Battery Energy Storage System: To store excess solar energy and ensure a continuous power supply, a minimum usable battery capacity of 338 kWh will be deployed.

Diesel Generator: A Diesel Generator with a prime rating of 100 kVA is integrated into the system to provide backup power during periods of low solar generation or high demand.
Fuel Tank for Diesel Generator: A 2,000-liter fuel tank is provided to store diesel fuel for the generator, ensuring its continuous operation during extended periods of low solar or high demand.

2.3.1.2 Inverters and Chargers

PV Inverter: A minimum solar inverter capacity of 135 kW is used to convert direct current (DC) electricity generated by the solar panels into alternating current (AC) electricity suitable for consumer use.
String Inverters: The project utilizes a maximum string inverter capacity of 50 kW to further enhance the efficiency of the electricity conversion process.
Battery Inverter Charger: With a minimum capacity of 100 kW, the battery inverter charger manages the energy flow to and from the battery storage system efficiently, optimizing the system's overall performance.

2.3.1.3 Power Distribution Network

Low Voltage (LV) Network: A 24.05-kilometer low voltage power distribution network is established to transmit electricity efficiently to the residential and nonresidential consumers. This network ensures a stable and reliable power supply while minimizing energy losses.

Medium Voltage (MV) Network: The project features a 3.39-kilometer medium voltage network to facilitate power distribution from the generation sources to the low voltage network. Step-Up Transformer: A 100 kVA step-up transformer will be used to adjust voltage levels as needed to facilitate power transmission.

Step-Down Transformers: Two 50 kVA step-down transformers are deployed for further voltage adjustment, ensuring optimal power distribution and accessibility.

2.3.1.4 Power Demand Metrics

Monthly Energy Demand: The project is designed to meet a monthly energy demand of 13,100 kWh, effectively addressing the specific energy requirements of the consumers in the area.
Daily Energy Demand: A daily energy demand of 437 kWh is proposed, ensuring a consistent and reliable power supply for various applications.

Peak Demand: The system is tailored to accommodate a peak demand of 81 kW, effectively addressing high-demand periods and ensuring uninterrupted access to electricity.

2.3.1.5 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.

2.3.1.6 Distribution lines

Tuum site will have a distribution line circuit of 12.1km in total. Supply of concrete poles for the distribution lines will be based on detailed survey and accessories like phase plates, circuit plates, number plates, danger plates, anti-climbing devices as per KPLC requirements/specifications. Erection of the Poles, fixing of insulator strings, stringing of conductor and earth wires along with all necessary line accessories and earthing will be as per KPLC requirements/specifications. . The connection cables shall be rodent proof to reduce cables being chewed by rodents on that could lead to short circuiting

2.3.2 Project Activities

2.3.2.1 Pre-Construction Activities

Prior to construction activities of the solar mini grid, the site will be prepared. Site preparation will involve erection of a perimeter fence, vegetation clearance, leveling and grading areas, construction of access roads, decommissioning of structures on site and setting up site security. This stage will also involve land acquisition for generation assets, wayleaves, contractor facilities, and worker's camps.

2.3.2.2 Construction Procedures and activities

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;

2.3.3 Construction Contractor

The construction contractor is responsible for building the physical infrastructure required for the mini-grid project. In this case, the infrastructure includes the installation of solar panels, battery storage systems, a diesel generator, inverters, and the low voltage power distribution network.
Their specific responsibilities will include site preparation, installation of solar panels, setting up the battery storage system, configuring the diesel generator, and laying down the distribution network.
The construction contractor will be responsible for ensuring that the components are installed correctly and meet the required standards for safety and performance. They may also manage the workforce, logistics, and project timeline to ensure that construction proceeds smoothly and is completed within the specified timeframe.

2.3.4 Operation and Maintenance (O&M) Contractor

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

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

2.3.4.1 Project Cost

The estimated project cost is **USD 764,239.00**

2.3.4.2 Land Tenure

Land ownership in Samburu is either under communal, public or private ownership. Communal land is managed by the communities while private land encompasses group ranches. Tuum site is on registered community land . The community has since offered the land to the project proponent for minigrid construction.

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 community land.

2.3.4.3 Compensation Details

Compensation for the land for the proposed project will be in kind; the Proponent will undertake some projects for the community. In Tuum, the community requested:

- Water reticulation from the existing springs to serve the community by installing solar powered pumps, dispensing unit and other amenities,
- Ward construction at the health centre for use by the community. The dispensary is also under staffed.
- There is no secondary school for boys or any mixed secondary school ithin the area.

2.4 RESOURCE REQUIREMENT

2.4.1 Workforce Requirement

Approximately 40 skilled, semi-skilled and unskilled labourers will be required at the construction stage. During the operation phase, about 15 no. staff will be required of which 8 will be skilled staff comprising : 0ne operations and maintenance head, 2 engineers, 5 technicians and 2 security guards. Unskilled staff will be approximately 5 and will be hired for grass cutting and module cleaning.

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

2.4.2 Water Requirement and Source

2.4.2.1 Construction Phase

It has been estimated that approximately 50,000 Litres of water will be required per day for civil works during construction stage. The civil works for the project might take 2 to 4 weeks and hence this quantity of water will be required at this period.Further, water will be required for workers at project site. However, this quantity of water requirement will vary depending on the mobilisation of construction workers at site. The water for the construction phase will be supplied by local water vendors.

2.4.2.2 Operation Phase

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

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

2.4.3 Raw Material Requirement

2.4.3.1 Construction Phase

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

2.4.3.2 Operation Phase

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

2.4.4 Power Requirement

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

2.4.5 Fire Safety and Security

2.4.5.1 Construction Phase

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

2.4.5.2 Operation Phase

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

The systems and equipment's will align to the Kenyan Fire Reduction Rules of 2007. The Fire protection and fighting systems will be maintained and serviced after every 6 months. The team managing the site will be trained on Fire safety as per the requirement on Fire Risk reduction rules. Further the proponent will be required to undertake Annual OSH Audits, Fire audits and Risk assessment as per the requirement of OSHA 2007 and the relevant subsidiary legislation. The maintenance of the site will also involve vegetation and weed control due to the fact that undergrowth weeds can cause shading. This will mainly be controlled by mainly Mowing and spraying herbicides.

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

3 BASELINE SETTINGS - ENVIRONMENT, ECOLOGY AND SOCIAL

3.1 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 and Lighting Company (KPLC), 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 500 m from operations and 200 m from the access road

Water

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

Flora and Fauna

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

Socio-economic/Social

The AoI for social receptors was fixed to include 2 km radial zone which has been developed based on the reconnaissance site visits and stakeholder consultations with the local community. The AoI for development of the social baseline is within Tuum Village which according to the administrative structure falls within Tuum 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).

3.1.1 Project Footprint Area

The proposed solar microgrid station is in Tuum Village, Tuum Sub location, Samburu North Sub County in Samburu County. The proposed project site is approximately 117km from Maralal town which is the County's headquarter. The area is characterised by highly permeable sandy soils with loose stones.

3.1.2 Study Area

The project site is located in Tuum Village, Tuum Sub location, Nyiro Ward, Samburu North Sub County in Samburu County. Based on the secondary information of the region, the sampling locations were identified to obtain the representative baseline information. Sampling points for air and noise were selected in proximity to the project site, vehicular traffic on main and access roads, settlements also taking consideration of the wind direction. Sampling locations for surface water quality was selected based on the drainage pattern of the area. Soil sampling locations were selected based on the land use and land cover of the study area. Locations of ecological and social surveys were also selected based on receptor locations; in addition, special emphasis is given to areas within 1.5 km radius of the project site and distribution lines.

3.2 ENVIRONMENT BASELINE

3.2.1 Land Use

The land use within the project area comprised of homesteads and used for livestock grazing. Crop farming is practiced during raining season only. The land use within a radius of 2km of the project site represent shrubland. The Tuum shopping centre is within the project area. Main institutions in the project area include Tuum primary school, AIC Tuum Girls and Tuum dispensary.The area is majorly semi-arid with a sparse population within the area.

Land ownership in Samburu falls into four categories namely; private, community and public. Communal land is managed by the communities while private land encompasses registered community land (Group ranch).

An abbreviated Resettlement Action Plan (A-RAP) outlining the principles and procedures for land acquisition and compensation is annexed to this ESI. 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 community land.

3.2.2 Topography

The topography of the Tuum is characterized with flat surface, sand and rock, the land flattens as you approach the proposed site.
Samburu County consists of several highlands, plateaus and lowlands including the famous Suguta Valley. High-level plateaus built by repeated floods of lava from the Rift Valley dominate the eastern part of the Suguta Valley with Kirisia rising to 2,500m above sea level being the highest point of the plateau.

Figure 3: Topography of the project area

3.2.3 Hydrogeology and Drainage

Main water sources in then project area constitute of surface and ground water. There are several seasonal riverbeds or "laggas" which during rainy seasons are filled with runoff water, making roads impassable and often leaving the area cut-off from the rest of the country.
The area is prone to seasonal flooding during the rainy seasons which makes roads impassable especially along seasonal water ways. The southwest plains of Samburu County and the Lorroki plateau receive between 500mm and 700mm of rain annually. The Nyiro and Ndoto Mountains and Mathew range receive the highest amount of rainfall between 750mm and 1250mm per annum. The central basin and the plains east of the Matthews Range are the driest parts of the county with annual rainfall of between 250mm and 500mm.

The physiography of the region influences the drainage pattern. The County fall in drainage areas number two (Kerio Valley) and number five (Ewaso Nyiro). The Ewaso Ng'iro River flows northwards about 30 km, then changes the direction to flow eastwards. After turning sharply east through the gap between the Mukogodo hills in the south and the Karissa hills in the north, the river flows through a 70m deep gorge for about 60 km in Barselinga.

3.2.4 Ecology

The project area's ecological conditions are influenced by the soil type, altitude, vegetation, rainfall pattern and human activities. The rainfall is usually erratic and short making it unfavorable for vegetation growth. The rainfall pattern and its distribution have been unreliable and erratic over the years as is evidenced from the annual figures derived from meteorological department. The project site and encompasses scarce tree species. Samburu county has a healthy ecological system that residents depend on for agriculture, tourism, water and many other benefits.

The county is divided into five ecological zones as follows: Tropical Aphine Zone: This zone covers an altitude of 1,980 to 2,040 m above sea level with an annual average rainfall of

between 600 mm and 800 mm. Temperatures range from 21.0°C to 25°C making it too cold for growing crops. It is used for sheep and cattle grazing. Upper Highland zone:
This zone covers an altitude of between 2,150 m to 2,600 m above sea level and receives an annual average rainfall of 900 mm to 1,000 mm. Temperatures range from 15.5°C to 19°C. The zone is suitable for Sheep, dairy cattle rearing as well as wheat and barley and forestry farming.

Samburu County is one of the counties with the largest number of wildlife outside protected area systems in Kenya. Some of the wild animals found in the County include; lions, cheetahs, leopards, giraffes, buffalos, waterbucks and various antelope species. The endangered species include Grevy's zebra, wild dog's African elephants and black rhino birds and different species of small wild game.
The County is one of the counties with the largest number of wildlife outside protected area systems in Kenya. Some of the wild animals found in the County include; lions, cheetahs, leopards, giraffes, buffalos, waterbucks and various antelope species. The endangered species include Grevy's zebra, wild dog's African elephants and black rhino birds and different species of small wild game. Samburu County boasts of Samburu Special five species of wildlife which are endemic to Samburu and a few other areas north of the equator. These are: Reticulated giraffe, Beisa Oryx, Grevys Zebra, Gerenuk and Somali Ostrich. There are also rare and endangered species such as Debrazza monkeys in the Ndoto and Matthews forests. There also hundreds of bird species.
The fauna found on the area are mainly domesticated animals such as cows, camel, donkeys, chicken, goats, and sheep.

Plate 1: Project area flora presentation

3.2.5 Water Resources

Water supply in Tuum is through a piping system from the Mt. Nyiro which is currently not in use. The pipes are broken don't thus the water cant be supplied to the existing water tank. Therefore, the community members fetch water from the springs which are below Mount Nyiro using jerrycans and buckets to their homesteads. There are usually seasonal rivers at the project area when its raining season.

Samburu County as a whole is classified as a water deficit region with the main sources of water for domestic and livestock use being water pans, dams and shallow wells. Others include protected and unprotected springs, drilled boreholes and roof catchments. The average

distance to the nearest watering point is approximately 3 kilometres in rural areas but it becomes much shorter in most urban and market centres to about 0.5 kilometres.

3.2.6 Ambient Air Quality

The proposed project area is located at neighbouring Tuum trading centre which can be described as generally peri-urban with interfaces of commercial developments. Most of the areas are vegetated and there are no major industrial developments. The air quality at the proposed project site is therefore considered to be generally good.

3.2.7 Ambient Noise Quality

In general, the project area is adjacent to the trading centre. The main source of noise is from motorists and from machines such as the generators used to supply power.

3.2.8 Soil Type

In the western parts of the county, the soil is mostly Sandy loam soils. Kirisia area has sandy loam and sandy clay soils, which are lithosol (shallow stony soils) and cambisols. In the areas covered by lithosols water run-off is common and erosion quite prevalent. Just as Kiriasia, Lorroki has loam soils as the dominant one. These soils are mostly well-drained phaezems. However, some parts of it is covered by shallow lithosols, including the surrounding of Suguta Marmar where the risk of flooding is classified as medium. The lithic phase of the soils encourages run-off during periods of high precipitation. In the northern part of the County consisting of Baragoi and Nyiro areas, the predominant soil covers are bouldery cambisols and lithosol. The soils are particularly more stoney and rocky on the southern slopes of Mt Nyiro and Ndoto mountains.

The project area soil is characterized by shallow sandy loam soils with rocky projections.

3.2.9 Climate and Meteorology

The project area with climatic condition that is strongly influenced by the altitude and physical features. The project area is classified as semi-arid.

The area comprises of an altitude of 600m and 1,450m above sea levels and an annual rainfall below 700m with annual mean temperatures of between 30^0C and 33^0C. Rainfall in the area follows fairly erratic pattern varying significantly both in temporal and spatial scale. The area experiences both short and long rains with the driest months being January and February. Long rains season falls between March, April and May with the short rains falling between July, August and extending to September. The lowest temperature experienced in the area is at 24^0C in the coldest month of July.

3.3 SOCIO-ECONOMIC ENVIRONMENT

3.3.1 Socio-economic status of Study Area

3.3.1.1 Demographic Profile

The study area is adjacent to the shopping centre composed of houses roofed by iron sheet and brick walls. The main group in the study area are the Samburu while the minority are the Turkanas.

The information shared on community profile by the area Chief, Alfred Leriano (Tuum location) showed that the location has a population of approximately 4500, and with an estimated

number of households to be 750 with an average of 5 people per household.

Table 6: Summary of demographic profile

Attribute	Magnitude/Number
Approx. population	4500
Households	750
Gender.	Male – 40% Female – 60%
Ave. No. per household	5 per household
Indigenous	Indigenous- 96% Settlers – 4%
Vulnerable classes	• Poor households (Approximately 100 households) • Poor female headed households (Over 1000) • Orphans (Over 1000) • Persons Living with Disabilities (Approximatly 300) • The elderly (Approximately 400)
Dominant ethnic group	Samburu
Primary religion	Christianity
Other groups	Turkana
Employment (formal/Informal)	Formal – 7% Informal – 93%

3.3.1.2 Educational Infrastructure

As per the observation and information sought from Tuum location, the area has two schools; Tuum primary school and Tuum Girls Secondary school. The area also has Tuum Dispensary.

3.3.1.3 Occupation and Livelihood Profile

The main livelihood activities undertaken by people in Tuum are pastoralism and business. Pastoralism is the main occupation undertaken while agriculture is done next to water bodies and in most cases where there is rainfall. Business activities is undertaken at Tuum shopping centre which serves Nyiro ward and communities within Samburu North Subcounty.

The main formal jobs at the area accumulates to 7%. The other 93% of the population is involved in informal employment.

3.3.1.4 Land Use

Land in Tuum is considered unproductive therefore suitable for pastoralism. Crop cultivation is done during rainy seasons. The main livestock kept include goats, camels and cattle.

3.3.1.5 Social and Physical Infrastructure

Public and private institutions found in the project area include: schools and health care facility as shown below;

- Tuum Primary School
- Tuum Girls Secondary School
- Tuum Dispensary

The main source water is spring which is down the mountains of Nyiro and during the rainy seasons the people rely on Seasonal rivers and streams.

Roads connectivity within the area is poor and not regularly maintained and the main access road to the project site is a Baragoi-Ngurunit-Laisamis Road. The main forms of transport within the area are motor vehicles/matatus, pickups and Motor bikes.

Figure 4: Tuum shopping centre

3.3.1.6 Vulnerable groups

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

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

- Poor households (Approximatly 100)
- Poor female headed households (Over 1000)
- Orphans (over 1000)
- Persons Living with Disabilities (Approximatly 300)
- The elderly (About 400)

The World Bank Operational Policy (OP 4.10) for Indigenous Peoples is applicable to the project due to the known presence of indigenous peoples (IPs)/vulnerable and marginalized groups (VMGs) at the project area. Tuum area is overwhelmingly IP/VMG area and is inhabited predominantly by the Samburu and the minority Turkana. The project should proceed to both phase II and Phase III which entails SA and VMGP respectively.

The project will not create new vulnerabilities or exacerbate existing vulnerabilities but it will come in hand to improve the lives of the vulnerable in the area. Project-targeted interventions as agreed upon with the proponent to enable vulnerable individuals and households to participate effectively and benefit from the project sustainably include giving them the first priority to jobs once the project commences and also subsidizing the amount to be paid for power connection once the project is done.

3.3.1.7 Gender based vulnerability

The society in the project area is characterized by a patriarchal family structure. During the Female Focus Group Discussion and indepth interviews it was reported that the men are the main controllers of resources that include land and assets.
The main challenges that women and girls face in the community include not being involved in decision making and poverty.

The men are responsible for ensuring the financial security of the family and thet there is food for the family. The women on the other hand are responsible for household activities such as fetching water, cooking, cleaning, taking care of the children. Female literacy was reported to be low.

3.3.1.8 Gender Based Violence

Gender based violence is one of the issues the women highlighted at the FGD. Family disputes are the main sources of GBV in the area.

3.3.1.9 Culture and heritage

No cultural site of significance was reported/observed within the project area. The area elders stated that there were cultural sites however the sites are more than 20km from the project area. Tuum is predominantly made up of the Samburu community whose main economic activity is pastoralism. The Samburu community in the project area are a patriarchal society; men typically speak for women and make decisions in the family.

3.3.1.10 Religion in the project area

The community members are predominantly Christians with churches such as AIC Tuum church within the locality.

3.3.1.11 HIV/AIDs prevalence

Prevalance rates of sexually transmitted illness and diseases in Tuum was confirmed to be low as reported by the heath officer at the Tuum health centre.

4 ANALYSIS OF ALTERNATIVES

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

4.1.1 Power Scenario in Tuum

This option involves maintaining the status quo.The no construct/no project alternative will not achieve the objectives of the project since the listed benefits will not be achieved. Failure to construct and operate the minigrid will lead to the failure of achieving one of the Kenya's national long-term development policies that aims to transform Kenya into a newly industrializing, middle-income country, by providing a high quality of life to all its citizens by 2030 in a clean and secure environment. Beneficiaries will be households, public and community institutions, enterprises and community facilities that cannot access electricity through the national grid and whose use of electricity will replace kerosene and other fuels for lighting and other activities like pumping water.

The existing sources of energy at Tuum 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 charging mobile phones and lighting in some of the households. Whereas wood fuel is utilized for cooking, heating water and providing for warmth.

4.1.2 Alternative Sources of Energy

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

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

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

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

Solar energy was a desirable option because:

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

4.1.3 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 Tuum centre and the community as a whole. The centre will continue to have no electricity and this will not help maximize usage and utilization of this

centre. It will involve several losses both to Tuum village, Nyiro ward and Samburu North 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 residents and the local people would remain unchanged.
- No employment opportunities will be created for Kenyans who will work in the project area.
- Increased rural poverty and crime in area.
- Discouragement for investors and loaners

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

4.1.4 Alternate Location for Project Site

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

The appropriateness of potential Mini-grid sites identified by the KPLC during the initial site visits was assessed in terms of various suitability criteria and technical restrictions stipulated by KPLC, as outlined below:

- Load growth - the location of Mini-grid first and foremost is informed by the existing and also load growth of an area. Technical studies show that the area will experience load growth over time and there is need to supply electricity.
- Size – proposed potential sites need to be sufficient for the average size of Solar Mini-grid and associated auxiliary facilities. Therefore, the size acquired must meet the required size. The proposed site is 1.213 hectares.
- Topography – consideration is given to the topography of potential sites whereby flat or gently sloping topography is preferred. An ideal gradient for the natural ground is 1:100. A gentle slope facilitates surface drainage and movement of vehicles and people on-site during construction. A steep slope requires costly levelling (cut and fill) for the construction of the solar Mini-grid. In addition, a steep slope inhibits movement, makes vehicle access problematic and increases the potential for environmental impacts during construction as well as operation e.g., steeper slopes have higher surface water flow rates and therefore higher erosive potential. The proposed site is flat and cost-effective during construction.
- Hydrology – consideration is given to the proximity of potential sites to adjacent water courses and wetlands where there may be potential impacts in terms of erosion and siltation of water courses, as well as implications associated with storm-water control at the Solar Mini-grid site. The site is not close to water resources or wetland and so no impact to water sources through siltation. Further, construction of drainage is not complicated.
- Geology and soils – consideration is given to the soil type present within the potential site whereby stable soil and founding conditions are preferable. Less stable soils, i.e., shallow, dispersive soils and soils with poor drainage present an erosion hazard if not managed correctly, and also require the instalment of additional, costly foundation infrastructure. The soils at the site are well drained.
- Flora and fauna – potential sites need to be assessed in terms of their ecological value at both a macro and micro scale i.e., within the site and the environment surrounding the site. Both a faunal and floral investigation may be required, with particular emphasis on ensuring the protection of endemic and red data species and their habitat, should they be

present. An identified site that has a high ecological value may be excluded from the list of potential sites. The site is not of a high ecological value.

- Visibility – highly visible sites i.e., on a ridge / elevated terrain are considered less favourable in that they have a high visual impact on the surrounding landscape. Sites that are hidden or out of site e.g., behind a hill, may be considered more suitable; the site is on flat part near chief's office and may not create sharp visual impact because it is not on an elevated point.
- Access – it is preferable that potential sites are located in close proximity to existing public roads so as to avoid the need for construction of new access roads of considerable length. Access is also important particularly as it relates to the transportation of the solar panels, batteries and generator to the site, which are heavy weights and requires the use of a low-bend vehicle. As such, long access routes with sharp bends are to be avoided and the site should not be located in an area that has excessively steep inclines or declines that could hinder access, particularly during periods of heavy rainfall; the site is well accessible as it along the road.
- Adjacent land use – adjacent land use has implications for access and required clearances for the power lines extending from the solar plant site, i.e., it is important that the land surrounding the Mini-grid is relatively clear of obstructions which might otherwise inhibit / obstruct the path of the power lines out of the Mini-grid. Current and future development planning of adjacent land use should therefore also be considered. The site and the developments around do not pose a hindrance for incoming and outgoing feeders.
- Public acceptability – public acceptance criteria relate to such issues as the possible adverse impact on public health, quality of life, and local land and property values. During the public consultations there was overwhelming support for the project with mitigation measures being put in place for the negative impacts.

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

4.1.5 Analysis of Alternative Construction Materials and Technology

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

4.1.6 Solid waste Management Alternatives

A lot of solid wastes will be generated from the proposed project site. An integrated solid waste management system is recommendable. First, the proponent will give priority to reduction at source of the materials. This option will demand a solid waste management awareness program in the management and the staff. Recycling and reuse options of the waste will be the second alternative in priority. This will call for a source separation program to be put in place. The third

priority in the hierarchy of options is combustion of the waste that is not recyclable. In this regard, a NEMA registered solid waste handler would have to be engaged. This is the most practical and feasible option for solid waste management considering the delineated options.

4.1.7 Conclusion

The proposed project site and project is the ideal alternative based on community need assessment and alternatives discussed above

5 APPLICABLE AND REGULATORY FRAMEWORK

5.1 INTRODUCTION

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

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

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

5.2 KENYA ELECTRICITY SUPPLY INDUSTRY (ESI)

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

- **Kenya Power Company:** responsible for distribution and retail supply of electrical energy to end users. Kenya Power purchases power in bulk from the Kenya Electricity Generating Company Limited (KenGen) and the Independent Power Producers (IPPs) through bilateral contracts or Power Purchase Agreements (PPAs) approved by the Energy and Petroleum Regulatory Authority (EPRA).

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

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

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

- **The Rural Electrification and Renewable Energy Corporation (REREC):** is established under Section 43 of the Energy Act, 2019 as a corporate body. The Corporation is the successor to the Rural Electrification Authority established under section 66 of the Energy Act No. 12 of 2006 (now repealed) and subject to this Act, all rights, duties, obligations, assets and liabilities of the Rural Electrification Authority existing at the commencement of this Act is to be automatically and fully transferred to the Corporation and any reference to the Rural Electrification Authority in any contract or document shall, for all purposes, be deemed to be a reference to the Corporation.

5.3 NATIONAL LEGAL FRAMEWORK REVIEW

The applicabe legal framework is illustrated in table 7 below.

Table 7: **Policy and Legislative Framework**

No	Legislation/ Guidelines	Description of the Legislation/Guideline	Relevance of the legislation/regulations in terms of license, permits, and other requirements
	NATIONAL POLICY FRAMEWORK		
1.	Vision 2030	Kenya Vision 2030 is the current national blueprint for development from its inception in 2008 until the milestone year of 2030. This plan is the national long-term development policy that aims to transform Kenya into a newly industrialised, middle-income country by 2030. The Vision is comprised of three key pillars (economic, social, and political), two of which are projected to be positively affected by project implementation.	Under Vision 2030, Energy is identified as one of the key sectors that form the foundation for sociopolitical and economic growth. Promoting equal opportunities across the entire Kenyan territory and enhancing access to competitively priced, reliable, quality, safe and sustainable energy is essential to the achievement of this vision.
2.	The Poverty Reduction Strategy Paper (PRSP) of 2001	The PRSP has the twin objectives of poverty reduction and enhancing economic growth. The paper articulates Kenya 's commitment and approach to fighting poverty; with the basic rationale that the war against poverty cannot be won without the participation of the poor themselves.	• The proposed project aims at provision and access of renewable electricity geared towards improved economic performance and thus will contribute to poverty alleviation in the project area.
3.	National Environmental Action Plan (NEAP) of 1994	The NEAP for Kenya was prepared in mid 1990s. It was a deliberate policy whose main effort is to integrate environmental considerations into the country 's economic and social development. The integration process was to be achieved through multi-sectoral approach to develop a comprehensive framework to ensure that environmental management and the conservation of natural resources forms an integral part of societal decision-making.	• The NEMA does not approve a development project unless the impacts of the proposed project are evaluated and mitigation measures proposed for incorporation in the project's development plan, which is in line with the requirements of the NEAP. • The project will be reviewed by NEMA for approval before implementation.

4.	Environmental and Development Policy (Session Paper No.6 1999)	As a follow-up to the foregoing, the goal of this policy is to harmonize environmental and developmental goals so as to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development. The Government will: 1. Ensure Strategic Environment Assessment (SEA), Environmental Impact Assessment, Social Impact Assessment and Public participation in the planning and approval of infrastructural projects. 2. Develop and implement environmentally-friendly national infrastructural development strategy and action plan. 3. Ensure that periodic Environmental Audits are carried out for all infrastructural projects	The proponent: • is undertaking an Environmental Impact Assessment, Social Impact Assessment and Public participation as part of the planning and approval of infrastructural projects. • Will ensure that periodic Environmental Audits are carried out for the project
5.	The National Energy and Petroleum Policy 2015	The overall objective of the energy and petroleum policy is to ensure affordable, competitive, sustainable and reliable supply of energy to meet national and county development needs at least cost, while protecting and conserving the environment. This policy stipulates the transformation of the Rural Electrification Authority (REA) to Rural Electrification and Renewable Energy Corporation (REREC) to be the lead agency for development of renewable energy resources.	The policy is relevant to the project in the sense that the project will provide sustainable and reliable energy supply and measures will be put in place to protect and conserve the environment during its development. REREC will be in charge of the development of the minigrid and maintenance.

6.	The Gender and Development Policy (Sessional paper no.2 2019)	The overall goal of this policy is to achieve gender equality by creating a just society where women, men, boys and girls have equal access to opportunities in the political, economic, cultural and social spheres of life. The anticipated outcome of this policy as enshrined in the Constitution that aligns to the project include: a) Equality and economic empowerment will be of both genders, b) Women and men will have equality of opportunity to participate in decision making and to contribute to the political, social, economic and cultural development agenda; c) Sexual and Gender based Violence will abate and men, women, boys and girls will live with dignity	• In the absence of appropriate measures, the project can exacerbate gender inequalities and sexual and gender based violence. In adherence to this policy, measures will be put in place to : • Ensure gender inclusivity in decision making, employment opportunity and access to the energy generated from the Mini-Grid • Mitigate social risks including sexual and gender based violence, and any form of discriminations
7.	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 a rural setting at Tuum area. The area is not economically empowered hence few HIV/AIDS prevention resources are available. This policy shall provide a framework to both the project proponent and contractor to address issues related to HIV/AIDS during the entire project phase.

NATIONAL LAWS AND LEGISTLATIONS

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	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

		development aspects of interest to the people of Kenya, and along which all national and sectoral legislative documents are drawn.	
2.	ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT, 1999 (AND THE AMENDMENTS OF 2015)	The EMCA is a framework environmental law in Kenya. This Act (assented to on January 14, 2000) provides a structured approach to environmental management in Kenya. With the EMCA coming into effect, the environmental provisions within the sectoral laws were not superseded; instead, the environmental provisions within those laws were reinforced to better manage Kenya's ailing environment.	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 National Environmental Management Authority (NEMA). The EIA/EA Regulations also provide information to project proponents on the requirements of either an EIA or EA as required by the EMCA.	• 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	These regulation provides for the sustainable management of water used for various purposes in Kenya. For effluent discharges into the environment and aquatic environment, a Proponent needs to apply directly to the NEMA. For discharges into public sewers, a Proponent needs to apply for the license to the relevant county. The regulation contains discharge limits for various environmental parameters into public sewers and the environment.	• These regulations will apply to the proposed project during the construction and operational phases. 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	These regulations are comprehensive and cover the management of various kinds of waste in Kenya. Generally, it is a requirement under the regulations that a waste generator segregates waste (hazardous and non-hazardous) by type and then disposes the them in an environmentally acceptable manner. Under the regulation, it is a requirement that waste is transported using a vehicle that has an approved "Waste Transportation License" issued by NEMA. Wastes generated in Kenya must be disposed of in a licensed disposal facility. Such a facility will require annual environmental audits to be undertaken by NEMA registered Lead Experts. The regulation requires that prior to generating any hazardous waste, a proponent shall undertake an EIA Study and seek approval from the NEMA. Labelling of hazardous wastes is mandatory under the regulation and the specific labelling requirements are provided in Rule 18. The treatment options for hazardous waste disposal provided in Rule 19 include incineration or any other option approved by the NEMA.	• During the construction and operation phases, the proposed project will generate various streams of wastes. For the most part, it is expected that the wastes will be non-hazardous in nature and can be disposed of in accordance with these regulations.
6.	L.N. 61: NOISE AND EXCESSIVE VIBRATION CONTROL REGULATIONS, 2009	The general prohibition of these regulations states that no person shall make or cause to be made any loud, unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health, or safety of others and the environment. The regulations further provide factors that will be considered in determining whether or not noise and vibration is loud, unreasonable, unnecessary, or unusual.	• 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 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.	The subsidiary legislations under the EMCA requires some or all the following types of permits to be available for inspection during the construction and operational phases of the project: ✓ Effluent Discharge License under Legal Notice 120: The Environment Management and Coordination (Water Quality) Regulations 2006; ✓ Waste Transport License under Legal Notice 121: The Environment Management and Coordination (Waste Management) Regulations 2006 for disposal of all types of wastes; and ✓ Noise Permit under Legal Notice 61: The Environment Management and Coordination (Noise and Excessive Vibration Control) Regulations, 2009.
8.	OCCUPATIONAL HEALTH AND SAFETY ACT, 2007	The Occupational Safety and Health Act (OSHA) was enacted to provide for the health, safety and welfare of persons employed in workplaces, and for matters incidental thereto and connected therewith. Part II of the Act provides the General Duties to which the occupier must comply with respect to health and safety in the workplace. Such duties include undertaking safety and health (S&H) risk assessments, S&H audits, notification of accidents, injuries and dangerous occurrences. A number of sections under this part shall be applicable to the proposed project. Part IV deals with the enforcement provisions that Directorate of Occupational Safety and Health Services (DOSHS) has under the Act. It discusses the instances when Improvement and Prohibition Notices can be issued as well as the powers of Occupational S&H officers. This part of the Act will be	The proposed project will be undertaken in compliance with the OSHA-2007 during the construction, design, and operational phases. During the construction phase, the contractors will be required to fully comply with the requirements of Legal Notice 40 titled: Building Operations and Works of Engineering Construction Rules, 1984 (BOWEC). Each contractor will develop and implement a formal construction health and safety plan for the entire construction phase duration in alignment with the OSHA and international health and safety best practices.

mandatory for the occupier to comply with for the proposed project.

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

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

Part VIII of the Act contains provisions for general safety of a workplace, especially fire safety. This part of the Act will apply to the proposed project during the design, construction, and operational phases.

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

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

		Part XIII of the Act stipulates various fines and penalties associated with non-compliance with the Act. It includes those fines and penalties that are not included in other sections of the Act and will be important for the Occupier to read and understand the penalties for non-compliance with S&H provisions. Part XIV of the Act is the last section of the Act and contains miscellaneous provisions which are not covered elsewhere in the Act. Some sections under this part of the Act will apply to the proposed project and it is in the interest of the occupier to read, understand, and ensure compliance.	
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. For the Proponent and Contractor, the OSHA and the S&H Committee Rules 2004 are important as they require compliance with the following measures: ○ Posting of an Abstract of the Factories and Other Places of Work Act in key sections of each area of the factory or other workplace; ○ Provision of first aid boxes in accordance with Legal Notice No. 160 of 1977; ○ Ensuring that there are an appropriate number of certified first aiders trained by an approved institution and that the certification of these first aiders is current;	The contractor will be required to constitute Health and Safety Committee to oversee safety and health at the construction site. The number of the committee members will be didacted by the number of staff hired by the contructor. The S&H Committee must meet at least quarterly, take minutes, circulate key action items on bulletin boards, and may be required to send a copy of the minutes to the DOSHS provincial office. Appropriate recordkeeping including maintenance of all current certificates related to inspection of critical equipment such as cranes, air compressors, lifts, pulleys, etc. Such inspections need to be undertaken by an approved person registered by the Director of the DOSHS.

		○ Provision of a General Register for recording, amongst other things, all incidents, accidents, and occupational injuries; ○ Appointment of a S&H Committee made up of an equal number of members from management and workers based on the total number of employees in the workplace; ○ Training of the S&H Committee in accordance with these rules; and ○ Appointment of a S&H management representative for the Proponent.	
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.	Some construction activities such as metal cutting and grinding, repair or maintainance of construction equipment could expose the construction workers during construction phase and operations and maintenance workers during operation phase to physical and chemical hazards. The contractor should that the workers exposed to such hazards 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) as follows: • 90 dB(A) over an 8-hour time weighted average (TWA) period over 24-hours; and • 140 dB(A) peak sound level at any given time. Additionally, the rules set permissible limits for community noise levels emanating from a workplace as follows: • 50 dB(A) during the day; and • 45 dB(A) at night. The Proponent is to ensure that	It is expected that during the construction phase of the project, there may be plant equipment that exceeds the threshold levels of noise stipulated under the Rules. It will therefore be incumbent on the contractor and his or her sub-contractors to ensure that their equipment is serviced properly and/or use equipment that complies with the threshold noise values given above. Alternatively, each contractor will be required to develop and implement a written hearing conservation programme during the construction phase.

		• 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.	
12.	L.N. 59: Fire Risk Reduction Rules, 2007	A number of sections of the rules apply to the proposed project as enumerated below. • Regulation 5 requires Proponents to ensure that fire resistant materials are used for construction of new buildings. A number of minimum specifications of materials are provided in this rule. • Regulation 6 requires that all flammable materials be stored in appropriately designed receptacles. Some of the flammable materials anticipated at the project site including; fossil fuel using running construction equipment and vehicles (during construction phase) and stand by generator (operation phase) • Regulation 7 requires that all flammable storage tanks or flammable liquid containers be labelled with the words "Highly Flammable" in English or Swahili. It is therefore practical for the Proponent to use a system similar to the Hazardous Material Identification System of labelling their product containers. The regulation requires a Proponent to consult the product's MSDS for appropriate labelling requirements.	The proponent is expected to comply with the requirements of L.N. 59: Fire Risk Reduction Rules, 2007 by i. Carrying out, and record, a fire risk assessment identifying any possible dangers and risks. ii. Reducing, or where possible remove, the risk of fire and take precautions to deal with the remaining risks. iii. PuTting in place protection measures if there are flammable or explosive materials used or stored on the premises. iv. Developing an emergency plan should a fire occur which includes evacuation procedures etc

- Regulation 8(3) requires a Proponent to have a Spill Prevention, Control, and Countermeasures (SPCC) plan. This may be important if there will be chemicals stored in the refuelling area at the construction site.
- Regulation 16 requires Proponents to ensure that electrical equipment is installed in accordance with the respective hazardous area classification system. It is also a requirement that all electrical equipment is inspected every six months by a competent person and the Proponent is required to keep records of such inspections.
- Regulation 22 provides a description of the functions of a fire-fighting team.
- Regulation 23 requires Proponents to mandatorily undertake fire drills at least once a year.
- Regulation 33 requires Proponents to have adequate fire water storage capacity. As a minimum this regulation requires Proponents to have at least 10 cubic meters of dedicated fire water storage capacity.
- Regulation 34 requires Proponents to develop and implement a comprehensive written Fire Safety Policy. This policy should contain a Fire Safety Policy Statement signed by the CEO, a Fire Safety Policy Manual and a brief summary of the Fire Safety Policy of the company.
- 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. THE ENERGY ACT, 2019	The Energy Act deals with all matters relating to all forms of energy including the generation, transmission, distribution, supply, and use of electrical energy, as well as the legal basis for establishing the systems associated with these purposes. The Energy Act also established Energy and Petroleum Regulatory Authority (EPRA) in place of the Energy Regulatory Commission (ERC), whose mandate is to regulate all functions and players in the energy sector. One of the duties of the EPRA is to ensure compliance with environmental, health, and safety standards in the energy sector, as empowered by Section 99 of the Energy Act, 2019. In this respect, the following environmental issues will be considered before approval is granted: • The need to protect and manage the environment and conserve natural resources; and • The ability to operate in a manner designated to protect the health and safety of the project employees, the locals, and other potentially affected communities. An ESIA approved by NEMA must support licensing and authorisation to generate and transmit electrical power. • Part VI Section 121 (1a) stipulates that the EPRA shall, before issuing a license, take into account the impact of the undertaking on the social, cultural or recreational life of the community. • Part VI Section 121(1b) stipulates that the EPRA shall, before issuing a license, take into account the	The proponent is in line with the Energy act regultions 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.

		need to protect the environment and to conserve natural resources in accordance with the Environmental Management and Coordination Act. • Part VI Section 136 (1a) stipulates that it shall be the duty of a transmission licensee to operate, maintain (including repair and replace if necessary) and protect its transmission grid to ensure the adequate, economic, reliable and safe transmission of electricity	
14.	THE ENERGY (SOLAR PHOTOVOLTAIC SYSTEMS) REGULATIONS, 2012	These regulations shall apply to a solar PV system manufacturer, importer, vendor, technician, contractor, system owner, a solar PV system installation and consumer devices. The Regulations prohibits any person from designing or installing any solar PV system unless he/she is licensed by EPRA.	The Regulations regulates, the design and installation of PV systems. The Proponent will ensure that persons engaged in the the designing and installation of the Mini-Grid are licensed by EPRA
15.	THE PUBLIC HEALTH ACT (CAP. 242)	The Act prohibits the project proponents from engaging in activities that cause environmental nuisance or those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety.	The proponent will be in line with the regulations of this act and will ensure suppression of infectious diseases and maintain proper sanitation during all the phases of the project.
16.	COMMUNITY LAND ACT, 2016	This Act is critical for the proposed project is within community land. Section 6(1) of the Act provides that 'county governments shall hold in trust all registered 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 registered community land'. Therefore, the proposed	The proposed project site falls on a public land. The community has since offered the land in kind for project use. The establishment of the minigrid will convert public 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.

	road project can access land or water resources in community land that may be registered and pay compensation to the County Government which the law authorizes to hold such monies in trust for the communities. Section 30(1) states that 'Every member of the community has a right to equal benefit from community land'. Section 26(1) provides that 'a community may set aside part of the registered community land for public purposes' and Sub-section (2) holds that 'where land is set aside for public purposes under Sub-section (1), the (Land) Commission shall gazette such parcel of land as public land'. This provisions offer a window for the proposed project to acquire land for project works legally for communities as necessary and to convert the same into public land. This is useful for the project as once done powerful groups will not have opportunity to exclude them on account of their socio - economic statuses. In any event, Section 35 holds that, 'subject to any other law, natural resources found in community land shall be used and managed- (a) Sustainably and productively; (b) For the benefit of the whole community including future generations; (c) With transparency and accountability; and (d) On the basis of equitable sharing of accruing benefits'. The concept of community land has been defined broadly enough to include VMGs. Women, children, old people and	The proponent should adhere to the provision of this legistalation

		future generations have been thought of as beneficiaries and thus their rights secured in this Act	
17.	HIV AIDS PREVENTION AND CONTROL (CAP 246A)	This Act is to promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS. It also seeks to positively address and seek to address conditions that aggravate the spread of HIV infection.	Like other projects, the proposed project is expected to attract new people to the project area seeking employment. This can lead to increased transmission of HIV/AIDS and other sexually transmitted diseases (STDs) as they engage in sexual relationships amongst themselves and/or local community members. In line with the requirements of this Act, the Contractors will create awareness and sensitize the workers and other persons on the risks of infections to foster prevention and control.
18.	THE PHYSICAL AND LAND USE PLANNING ACT, 2019	This Act of Parliament makes provision for the planning, use, regulation and development of land and for connected purposes. The objects of this Act related to the project include; (a) the principles, procedures and standards for the preparation and implementation of physical and land use development plans at the national, county, urban, rural and cities level; (b) the procedures and standards for development control and the regulation of physical planning and land use; (d) a framework for the co-ordination of physical and land use planning by county governments; (c) a framework for equitable and sustainable use, planning and management of land;	The proposed site is not in contravention of any Zoning regulations. The project site is within a public land; necessary county approvals will be sought by the proponent eg. 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 – Samburu County.

19.	The Sexual Offenses Act 2006	This is a comprehensive law that criminalizes a wide range of behaviors including rape, sexual assault, defilement, compelled or induced indecent acts with child imbeciles or adults, gang rape, child pornography, child trafficking, child sex tourism, child prostitution, exploitation of prostitution, incest by male and female persons, sexual harassment, deliberate transmission of HIV or other life threatening sexually transmitted disease, stupefying with sexual intent, forced sexual acts for cultural or religious reasons among others. The Act also has orders for medical treatment for victims including free HIV prophylaxis, emergency pregnancy pill and counselling. The Act provides stiff penalties in which most of the crimes attract minimum of ten years imprisonment which can be enhanced to life imprisonment.	Implementation of a project creates changes in a community in which it is implemented and is has potential to can cause shifts in power dynamics between community members and within households. For instance, male jealousy is a key driver of Gender Based Violence (GBV) which can be triggered by labor influx on a project when workers are believed to be interacting with community women. Hence, abusive behavior can occur not only between project-related staff and those living in and around the project site, but also within the homes of those affected by the project.
20.	The Children Act, 2012	Part 2 of the Act denotes the rights of the children and their welfare shall be protected from child labor and armed conflict i.e. Every child shall be protected from economic exploitation and any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development. The Act also notes that a shall be protected from sexual exploitation and use in prostitution, inducement or coercion to engage in any sexual activity, and exposure to obscene materials.	Sensitization to the community on the need to ensure the protection of children has been done and will continue throughout the project cycle. In addition, the contractor will sensitize workers against abuse and exploitation of children.

21.	Persons with Disability Act, Chapter 133	This Act provides for the protection of the rights of people with disabilities ensuring they are not marginalized and that they enjoy all the necessities of life without discrimination. The Act guarantees that (1) No person shall deny a person with a disability access to opportunities for suitable employment. (2) A qualified employee with a disability shall be subject to the same terms and conditions of employment and the same compensation, privileges, benefits, fringe benefits, incentives or allowances as qualified able-bodied employees. (3) An employee with a disability shall be entitled to exemption from tax on all income accruing from his employment.	The Act will be adhered to in order to ensure that persons with disability are included in all decision making that affects their lives. This will be monitored to make sure they are not excluded from project benefits and exposed to negative impact from the project that could adversely affect them.
22.	Land value amendment Act 2019	It aims at standardizing the value of land in Kenya for the primary purpose of enhancing efficiency and expediting the compulsory land acquisition process for public projects. It introduces Section 107A into the Land Act, which provides the criteria for the valuation of freehold and community land that is the subject of compulsory acquisition. Community Land, like freehold land, shall be valued based on the criteria outlined in Section 107A and the Land Value Index which will be jointly developed by the national government and county government. Section 5 introduces a list of the forms in which compensation can be made.	Land in Tuum project site is on public Community land. The a 1.214 Hectares allocated by the community for the proposed mini-grid will be acquired for the project. The MOE will pay compensation in kind through implementation of projects either in water, education and health sectors. The community will choose the project for purposes of compensation
23.	Land Registration Act, 2012	Section 27 (2) provides that a transfer without valuable consideration shall have the same effect as a transfer for valuable consideration when registered.	Once the KOSAP PIU finalizes stakeholder engagements in all the identified counties, the transfer process shall be commenced to ensure that the land rights are secured. This gives the project the required land security to allow project implementation, which is in compliance with this legal requirement.

5.3.1 Administrative Framework

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

Table 8. Administrative 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 outsource water for use during the construction period*

The Energy and Petroleum Regulatory Authority (EPRA):	Established by the Energy Act of 2019. The EPRA's mandate extends beyond electricity and includes natural gas (including petroleum), renewables and all other forms of energy. The generation, transmission, distribution, supply, import and export of electricity can only be carried out by parties in possession of a license or a permit issued by the EPRA. In the event that the capacity involved is for own use and less than 1 MW, authorization is not required. Although the generated electricity is expected to be less than 1 MW (0.3 – 1 MW), the fact that the generated electricity is intended for use in 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. The Energy and Petroleum Regulatory Authority (Authority) together with industry stakeholders have developed the Draft Energy (Mini-Grid) Regulations, 2021 (the 'Regulations'). The Regulations have been developed within provisions 10, 11 and 208 of the Energy Act, 2019 (the 'Act') and shall constitute Regulations to the Act. The Regulations will amongst others, provide guidance to mini-grid developers and other stakeholders on the tariff approval and licensing requirements. This will be directly applicable to the Tuum site.

5.4 INTERNATIONAL SAFEGUARDS REQUIREMENTS

The table below shows the applicability of World Bank Operational OPs to the proposed project in Tuum site;

S.No.	Safeguard Policy	Objective	Applicability
1.	Environment Assessment (Operational Policy, OP/BP 4.01)	The objective of this policy is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is considered to be the umbrella policy for the Bank's environmental 'safeguard policies.	The policy is applicable to this project because there are environmental and social concerns associated with the construction and operation of the proposed project. In response, REREC has commissioned and Environmental impact assessment in order to identify and address the potential impacts to a level that is acceptable.
2.	Natural Habitats (Operational Policy, OP/BP 4.04)	This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. The Bank supports, and expects borrowers to apply, a precautionary	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 Tuum that may not negatively affect diverse flora, fauna, and avifauna. The area is dependent on pastoralism. Additionally, caution will be taken to ensure minimum disruptions to habitats as guided by the ESMP.

		approach to natural resource management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal, and marine ecosystems. They include areas lightly modified by human activities but retaining their ecological functions and most native species.	
3.	Indigenous Peoples (Operational Policy 4.10)	The objective of this policy is to (i) ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; (ii) ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and (iii) ensure that indigenous peoples receive culturally appropriate, gender and inter-generationally inclusive social and economic benefits.	The policy is applicable because the inhabitants of Tuum who are Samburu and are classified as a marginalized groups in Kenya. The Samburu are main inhabitants of Tuum and the minority are the Turkana who are also the marginalized. The proponent will continue to engage the beneficiaries in a culturally appropriate way and allow for decision making in a free, prior and informed consent manner throughout the phases of the project.
4.	Involuntary Resettlement (Operational Policy, OP/BP 4.12)	The objective of this policy is to (i) avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; (ii) assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them; (iii) encourage community participation in planning and implementing resettlement; and (iv) provide assistance to affected people regardless of the legality of land tenure.	The policy is triggered for the entire project because there is land acquisition for the Mini-grid, Wayleaves, contractor facilities and worker's camps.

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

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

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

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

5.4.2 Resettlement Policy Framework (RPF)

The RPF states that K-OSAP component 1 (Mini grids for Community Facilities, Enterprises, and Households) which involves installation of mini grids will require land acquisition.

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

There will be no displacement of people/crops/etc.. The land is part of the wider parcel set aside by the community that they have allocated to the project and it will be acquired. Compensation for the land will be in Kind.

5.4.3 Vulnerable and marginalized Groups Framework (VMGF) for KOSAP

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

The purpose of the VMGF is to guide management of issues related to vulnerable and marginalised groups during the development and operation of proposed sub projects and to ensure effective mitigation of potentially adverse impacts while enhancing sharing of benefits.

The project area is inhabited by predominantly by the Samburu and the minorities are the Turkana.

The Samburu and the Turkana Communities falls under communities in Kenya who are categorized by the World Bank's OP 4.10 and the Constitution of Kenya, 2010, as vulnerable and marginalized groups.

6 STAKEHOLDER ENGAGEMENT

This section profiles the key stakeholders of the Tuum 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 for the stakeholder engagement;
iii. disclosure of information;
iv. consultation with stakeholders
v. addressing and responding to grievances; and
vi. reporting to stakeholders

6.1 STAKEHOLDER CONSULTATION AND DISCLOSURE REQUIREMENT FOR THE PROJECT

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

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 been explained in this chapter.

6.2 STAKEHOLDER CHARACTERISATION AND IDENTIFICATION

Stakeholders are classified in the following two categories;

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

- **Interested parties**- Stakeholders who have an indirect impact or are indirectly impacted by the project.

6.2.1 Stakeholder Mapping

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

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

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

Table 9: Identified Stakeholders

Stakeholder Groups	Project Affected Persons	Interested parties
Community	Local Labourers Land sellers Project beneficiaries	Pastoralists Local Community

	VMGs
Institutions	Faith Based Organisations Education institutions
Government Bodies	County Government District and local administration

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

Table 10: Stakeholder Significance and Engagement Requirement

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

6.3 STAKEHOLDER ANALYSIS

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

- **High Influence**: This implies a high degree of influence of the stakeholder on the project in terms of participation and decision making or high priority to engage with the stakeholder;
- **Medium Influence**: Which implies a moderate level of influence and participation of the stakeholder in the project as well as a priority level to engage the stakeholder which is neither highly critical nor are insignificant in terms of influence; and
- **Low Influence**: This implies a low degree of influence of the stakeholder on the project in terms of participation and decision making or low priority to engage that stakeholder. The intermediary categories of low to medium or medium to high primarily imply that their influence and importance could vary in that particular range subject to context specific conditions or also based on the responses of the project towards the community.

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

Table 11:Summary of Stakeholder Influence

Stakeholder Category	Relevant Stakeholders	Magnitude of Influence/Impact	Urgency/Likelihood of Influence	Overall rating of stakeholder rating
Project Affected Persons	Community land owners	Medium	Low	Minor
	Local Labourers and subcontractors	Small	Medium	Minor
	County Government of Samburu, District and local administration	Medium	Low	Minor
	FBOs, CBOs and Educational Institutions	Medium	Low	Minor
	VMGS			
	Local community			
Interested parties		Small	Medium	Minor
	Pastoralists	Small	Medium	Minor
		Medium	Low	Minor

6.3.1 Approach and methodology used in carrying out the Public participation

Owing to the different categories of the stakeholders, the ESIA team opted to employ various methods in engaging them. The methods included; face to face discussions for the national and county government officers and other interested parties, focused group discussions with the men, women and youth and a public baraza/meeting for the rest of the community members. A two weeks' notice was issued to the county leadership and the community in preparation for the consultations. Mobilization of the FGDs and the public baraza was done in coordination with the local leaders; youth, men and women.

6.4 KEY FEEDBACK RECEIVED DURING COMMUNITY CONSULTATIVE MEETING LEADING TO LAND IDENTIFICATION AND GRC CONSTITUTION – SCREENING LEVEL

Project: Proposed Tuum Solar Mini-grid

Venue of meeting; Tuum Market

The area chief called the meeting to order at 11.30 a.m. and opening prayer was done. Due to the fact that not all members of the KOSAP team could not speak the local dialect, it was necessary to have translations into the local language to ensure the information being shared was understood by all the members of the community. Translations were done by the Assistant chief.

The chief welcomed the project team and also members of Tuum Market and thanked all for attending the meeting. He told them ''since the main project team is here, be keen on the information they have brought to us about the project and be free to participate through questions and comments in order to make the meeting fruitful.

He welcomed Mr. Benson Director from the Ministry of Energy Samburu County to lead the team in speaking to the community.

Benson thanked the chief and the community members for turning up for the meeting. He explained that he had come with other officers to talk to the community on various issues in line with the proposed Mini-grid. He allowed the other team members to greet the people and make brief introductions. He told the community that each would be given a chance to talk on

specific areas in line with the project.

6.4.1.1 Positive Impacts/Benefits of the Project

Mr Koech informed members that even though power shall contribute to positive economic changes in the area, members have to be educated appropriately to ensure positive interaction with power for their safety, the safety of infrastructure and that of their properties. It is therefore important to educate members about the pros and cons of the proposed project. Mr. Koech sensitized members on public electrical safety and social welfare. He informed members that there shall be: Non skilled and semi-skilled job opportunities for local communities during construction phase and operation phase; improved healthcare services; improved communication services, affordable and clean energy; improved communication services as the community members shall be able to charge their phones, improved livelihood as there shall be more disposable income, business opportunities and improved security among others

6.4.1.1 Negative impacts of the project

	Negative impact	Mitigation measures by contractor
1	Vegetation clearance of the site identified.	• Clear only the areas that are needed to put up the mini-grid • After construction, do landscaping with grass to areas that have no electrical installation as opposed to living areas bare
2	Air pollution dust from construction activities	• Fence off construction site to reduce dust going to the public • Use of masks for workers
3	Air pollution dust from construction vehicles	• Limit vehicle speed to minimum possible when passing residential areas
4	Air pollution from vehicle emissions	• Maintain vehicles/service vehicles • No idling of vehicles
5	Solid waste	• Clear all solid waste and dispose appropriately
6	Land acquisition/take As you had been briefed before the site identified should; -must not result in displacement of community members - We must avoid land that is currently settled or which has squatters. -There will be an impact of forgoing the current land uses if any or future land uses for the sake of the project.	▪ REREC should ensure that all land acquisition procedures are documented and align to the RPF developed under this project. REREC to disclose to communities their rights and entitlements to compensation, to enable them choose their most preferred compensation options.
7	Occupation safety and health hazards e.g. accidents, fall from heights, pricks by sharp objects	▪ Use of proper personal protective equipment like gloves, overalls, helmet, safety shoes ▪ Allocating work according to skills ▪ Toolbox talks to workers to identify hazards and risky activities
8	Labor influx. The nature of the project will require technical skills that are not all available in this community. This will require movement of construction workers (labour influx) into this community. There are some risks that	▪ We shall establishment and operationalize an effective Grievance Redress Mechanism accessible to community members ▪ Reduction of labor influx by tapping into the local workforce

	are involved with labor influx and we need to mitigate them as follows to avoid negative impacts on our community.	
9	Risk of social conflict due to competition for resources and opportunities	▪ Awareness-raising among local community and workers on the need to have a good /cordial working relation ▪ Consultations with and involvement of local communities in project planning ▪ Provision of cultural sensitization awareness for workers regarding engagement with local community. ▪ Recruitment of local workforce to the extent possible especially unskilled and semi-skilled jobs ▪ Contactor shall make provision to provide resources needed by the workers if the need for such resources may result to competition e.g. water ▪ Working closely between contractor and the project grievance redress committee to address complains on time.
10	Increased or illicit behavior and crime (including prostitution, theft and substance abuse)	▪ Sensitization campaigns both for workers and local communities against such social evils ▪ Enforcement of sanctions (e.g., dismissal) for workers involved in criminal activities
11	Communicable diseases (including STDs and HIV/AIDS)	▪ Education/awareness about transmission of diseases ▪ Information campaigns on STDs among the workers and local community on ethics, morals, general good behavior and the need for the project to co-exist with the neighbours during the community and worker engagement forums. ▪ Provide condoms to employees
12	Gender-based violence including sexual harassment and exploitation, child abuse	▪ Information and awareness raising campaigns to you community members and specifically women and girls. ▪ Mandatory awareness creation for workers on required lawful conduct in the community and legal consequences for failure to comply with laws ▪ Report all complaints on gender-based violence or harassment through the GRM and also directly through CREO ▪ Working closely and Instruction of local law enforcement to act on community complaints on time ▪ Inclusion of GBV specific mitigation measures in the environmental and social management plan of contractor ▪ Requirement of contractor to have code of conduct

		for the workers and to implement them
13	Child labour	• Ensuring that children and minors are not employed directly or indirectly on the project. • Enforcement of Employment Act that requires contractor to adhere to minimum age • Allowing your children to be employed is illegal and punishable by law because it interferes with the children's right to education • Report any case to the chief's office
14	Demand for Material/resources e.g water	Contractor to consult with elders before using the water resources in the community to avoid conflicts.
15	*Oil Spill Hazards*	• Contractor not to repair vehicles or equipment on site • Maintain vehicles and equipment in good state
16	*Storm water and erosion*	• Contractor to put measures to harvest rainwater and control erosion during construction
17	*Wastewater/ effluent*	Contractor will provide sanitation facilities for workers
18	*Noise resulting from excavation machinery, vehicles and workers*	a) Contractor to work only during the day b) In case of blasting contractor to give notice to community through the village elders and chiefs office
19	Visual and Aesthetic Landscape Impacts	a) The visual negative impacts can be mitigated through putting up a wall round the facility to keep off/screen the project stacks, poles, cables, panels and transformers by the contractor. b) Proper siting decisions can help to avoid aesthetic impacts to the landscape.
20	Hazardous materials from damaged Panels- Photovoltaic panels may contain hazardous materials, and although they are sealed under normal operating conditions, there is the potential for environmental contamination if they were damaged or improperly disposed upon decommissioning.	▪ Proper planning and good maintenance practices can be used to minimize impacts from hazardous materials. ▪ Proper disposal of used or Damage solar batteries and panels using NEMA registered disposers for such wastes
21	Fuel storage on site	Contractor will undertake proper installation of the fuel storage tanks and dispensing system like having a budded wall 1.5 times the fuel storage tank. During operation implementing agency will ensure proper maintenance of the solar plank
22	Public safety –potential risk of shocks and electrocution	Proper wiring at houses and premises by a qualified technician

6.4.1.1 Public safety in regards to electricity

Public safety in regards to electricity

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

electrocutions.

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

6.4.1.2 Land requirements for the project

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

Jediel explained to the public forum that the proposed project will require an average of 2 acres of land. He asked them the nature of ownership of the land in the area and they answered that the ownership is communal where by the community has one title deed but no individual title deeds. They also noted that the land is not formally sub divided (implying not adjudicated). He explained to them that based on the ownership of land they had explained, their land falls under the category of community land and its use and management is governed by the Community Land Act 2016.

He educated the community on the following issues;

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

pay for consumption of power to KPLC

He noted that the government of Kenya had secured a loan from its development partners i.e. World Bank to implement the KOSAP project. The government through the Ministry of Energy proposes to use World Bank guidelines on voluntary land donation for the project.

He informed them that for voluntary land donation, there is a criterion which need be fulfilled to allow for voluntary donation to be acceptable. He explained the criteria as follows;

- The infrastructure must not be site specific.
- The impacts must be minor, that is, involve no more than 10 percent of the area of any holding and require no physical relocation.
- The land required to meet technical project criteria must be identified by the affected community, not by line agencies or project authorities (nonetheless, technical authorities can help ensure that the land is appropriate for project purposes and that the project will produce no health or environmental safety hazards).
- The land in question must be free of squatters, encroachers, or other claims or encumbrances.
- Verification (for example, notarized or witnessed statements) of the voluntary nature of land donations must be obtained from each person donating land.
- If any loss of income or physical displacement is envisaged, verification of voluntary acceptance of community-devised mitigatory measures must be obtained from those expected to be adversely affected.
- If community services are to be provided under the project, land title must be vested in the community, or appropriate guarantees of public access to services must be given by the private titleholder. KOSAP project proposes to have the land donated to be registered under one of the implementing agencies of the project i.e. KPLC but be assured that public access to services is guaranteed to the community members.
- We need to set up a Grievance mechanisms to help in addressing any issues/grievances that may arise in the course of the project implementation.

He noted that the team had visited the first site identified by the community and the project team had felt it was far away from the project beneficiaries. He then invited the chief to explain to the people the second site that the community elders had identified for donation to the project. The chief gave a description of the second site which the elders had identified, and the community agreed to have the Mini-grid set there.

Jediel asked the community to confirm that the land is communally owned and whether they were willing to donate land for the Mini-grid. The community members unanimously confirmed that the land belongs to the community and agreed to voluntarily donate the land for the solar Mini-grid.

6.4.1.3 Grievance Redress Mechanism

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

Project Committee Members/grievance redress committee.

S/No	Name	Village	Identification No.	Telephone No.	Category
1	Lesimalele john	Jangwa	24605582	0716321723	Elder
	Denis lesokoyo		4208208	0714879068	Women

2	Lparanda lerantileni	Nairobi Luiz	4202875	0706843154	Elder
	Naaramat Lepile		23010898	0704279948	Women
3	Steri lempi sikishoi	Karolwanga	23009952	0700270314	Elder
	Rachaela lengong'oliani		24389990	0704281847	Women
4	Lelampon leriano	Neriwe			
5	Kujam Lemiraa	Lauragi	11456436	0725574410	
	Nachomin leisiano		30519269	0741287257	Women
6	Soita Lepadaasa	Mara Mpere	11456405	0758406095	
7	Saikwa Lesaana	Lbukoi		0706015790	
8	John Lemeede	Town Centre	8733118	0727518914	
9	Estina Lerriano		31978178	0740965566	Youth
10	Lengaur Style		29961362	0727571583	Youth

6.5 KEY FEEDBACK RECEIVED DURING STAKEHOLDER CONSULTATION PROCESS

The general stakeholder consultation was done in a public meeting(Baraza) organized at the Tuum Shopping Centre. The meeting was chaired by the area assistant chief and assisted by the "Nyumba Kumi" leaders.

The ESIA team spearheading the process included the following;

NAME	ORGANISATION
Simon Mwangangi	ESS KPLC
Hottensia Kabuki	Norken International Limited
Allan Owino	Centric Africa Limited
Umulkheir Abdi	Norken International Limited
Martin Gitonga	Norken International Limited

The feeback received during the stakeholder consultation process have been summarized below:

Table 12: Public meeting feedback

Comments and Issues	Response from the consultant
How will the power be distributed.	The consultants informed the community that the solar power will be distributed inform of tokens and each household will be issued a token meter whereby the owner will purchase the electricity token and credits units to his/her metre.
The Grievance redress committee should prioritize the social welfare of the workers and prevent child labour at the site.	The welfare of the workers will be paramount and the contractor will be tasked to provide good working conditions for the workers. A social specialist will ensure that there are no cases of child labour at the site.
What will be the compensation methods or insurance cover incase of any accidents as a result of the project?	All the workers will be issued with Work Injury Benefit Act (WIBA) insuarence to cover the medical the medical expenses incase of any injuries experienced.
Will the small business owners in Tuum be considered to supply raw materials to be used by the contractor.	Yes the local business will be considered to supply some of the materials to be used in construction. The project will try as much as possible to uplift the livelihood of the locals during this phase.
Will the community members pay for the power? If so, how much?	The Consultant clarified that the power will be provided in terms of tokens and for each household the connection fee will be 1000 shillings and consumption will be detrmined by the number of units used.

Benefits of the Project

- The community was in support of the project. They noted that the project will beneficial to the community as it will:
    - The electricity will assist in water reticulation to the community members at least to reduce the distance covered.
    - Lighting will improve the security situation
    - Employment opportunities will increase for both the youth, men and the women due to increase in business opportunities and during the project construction phase.
    - Medical services will improve.
    - Business improvement. Business with thrive considering that power supply will help them do business till late.

Community Requests

- The community requested the following from the project:

    - 1st Priority to be water reticulation from the spring tht is below the Mountain.
    - 2nd Priority to be construction of more classrooms at the Mixed Tuum Secondary school.
    - 3rd to be construction of a ward at the Tuum dispensary.
    - The PLWDs made a request that they should be considered for employment during project implementation. They can be given opportunities in jobs they can handle such as in the managerial sections.
    - The women especially women that they need jobs to support their children and family as a whole because as reported in the Womwn FGD, they are left to provide for the families as the men look for pasture for the livestock.

Figure 5: Stakeholders engagement process

6.6 SUMMARY FEEDBACK RECEIVED DURING FOCUSED GROUP DISCUSSION

The Focus Group Discussions were held with Men, Women and the Youth as indicated in Table 13. The females' participants in the FGD were 8 in number with an age range of 18 to 65. The youth participants were 15 in number while the men were 19 and mainly household heads.

Table 13: FGD dates and attendance

Group	Date	Attendance	Venue
Men	5th February 2022	19	Tuum centre
Women	5th February 2022	8	Tuum centre
Youth	5th February 2022	15	Tuum Centre

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

CATEGORY	PROJECT COMMENTS
WOMEN	✓ The women indicated that they had heard of the project and understand what it entails. ✓ They stated that the project will reduce the challenges they've been facing in the community for example walking for long distance to fetch water for domestic use. ✓ The main community development priorities/needs according to women include. 1. Water-Improve the accessibility and availability through water reticulation. 2. Education- Construction of more class rooms at the Mixed secondary school. 3. Health-Improving the quality of health in the local Tuum dispensary by constructing a ward.
MEN	✓ The men indicated that they have heard about the project during the time the community gave out the land. The community collectively selected the site. ✓ The project will enable the area to improve economically and security wise. ✓ The electricity will assist in water reticulation to the community members at least to reduce the distance covered.
YOUTH	✓ The youth disclosed that they heard about the project back in 2020. ✓ They acknowledged that the project will have vast prositive impacts that include; improved security, attract investments, creation of employment and improve business.

Male FGD Session

✓

Youth FGD Session

7 GRIEVANCE REDRESS MECHANISM

7.1.1 Roles of the GRC

- ✓ Conducting extensive public awareness and consultations with the community
- ✓ Help ensure that local concerns raised by community members in regards to the project are promptly addressed by the proponent and the contractor.
- ✓ Resolve manageable disputes that may arise relating to the project. If it is unable to resolve/help refer such grievances to the proponent and the contractor.
- ✓ Ensure that the concerns of vulnerable persons such as the disabled, widowed women, orphaned children affected by the sub project are addressed.
- ✓ Assist the community in recording grievances, including helping those who cannot write or read.
- ✓ Help the vulnerable groups access project benefits
- ✓ Ensure that the community members are informed about the project

7.1.2 Grievance Redress Tiers

1. Local Grievance Redress Committee

This is the lowest level (forum) where the community will get project information and also ask questions. The project proponent has established project Local grievance redress committee (LGRC). The committee was reconstituted during the public meeting held at the Tuum centre where the community members elected their representatives to the LGRC. The Tuum LGRC is composed of 7 members including the following:

- ✓ 2 Female community representatives, elected by women, representing women and children related issues regarding the project.
- ✓ 2 Youth representatives, elected by youths, representing youths related concerns in the GRCs
- ✓ 2 Male representatives elected by the men of the community-It includes the area chief.
- ✓ 1 PLWD representative.

2. County Grievance Redress committee

It will comprise of members of the county working group. This committee is at the county level and will resolve complains or issues that are unable to be resolved at the locational/project level. The chairman of the project grievance redress committee at the community will forward issues/ complains to the county grievance redress committee through CREO who will also be responsible for giving feed back to the local committee.

3. National GRC

It will comprise of KOSAP Project Implementation Unit at the Ministry of Energy and the implementing agencies. Matters that could not be resolved at the county level will be escalated to this National GRC by the CEC.

4. Arbitration or legal redress in a court of law (the Environment and Land Court) and the Land Acquisition Tribunal

It's the last level of the GRM for the community or project affected persons and it will only be approached once all the three levels have been exhausted. Members of the project/ grievance redress committee will be chosen by the community members themselves. The committee chosen will be in charge of giving project information to the community and be a focal point for reporting project related issues of concern or grievances.

5. World Bank Grievance Redress Service(GRS)

The GRS will ensure that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond.

7.1.3 Disclosure

All the grievance redress mechanisms available to the sub-project will be disclosed to all affected persons and other stakeholders. The disclosure will include information on the reporting mechanisms, including telephone numbers, email addresses, postal addresses, and contact persons (where applicable), etc.

8 IMPACT ASSESSMENT AND MITIGATION MEASURES

8.1 INTRODUCTION

This section provides an assessment of potential environmental and social impacts from the proposed Projects as well as the proposed mitigation measures to avoid, reduce, remediate or compensate for potential negative impacts and to enhance positive impacts. A description of the assessment methodology used to assess the significance of potential impacts, taking into account impact magnitude and sensitivity of receptors and resources affected, is provided below. All the mitigation measures identified in this chapter have been collated into the Environmental and Social Management Plan ('ESMP') matrix. This is including Occupational Health and Safety

8.2 Impact Assessment Methodology

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

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

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

8.3 Defining Impact

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

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

8.4 ASSESSMENT OF SIGNIFICANCE

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

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

change and importance of the receptor. For a human receptor, the sensitivity of the household, community or wider societal group is considered along with their ability to adapt to and manage the effects of the impact; and

- The likelihood (probability) that the identified impact will occur. This is estimated based upon experience or evidence that such an outcome has previously occurred.

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

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

Table 14: Categories of Significance

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

For environmental impacts the significance criteria used in this ESIA is shown in Table 15: .

Table 15: Overall Significance Criteria for Environmental Impacts

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

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

8.5 Magnitude of Impact

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

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

For biophysical impacts, the definitions for the spatial and temporal dimension of the magnitude of impacts used in this assessment are provided in 3

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

Table 15 below (under Likelihood) provides an account of the key features (definitions) of each of the impact significance classifications (from Not Significant to High); specifically linking them to the need for mitigation measures.

8.6 Sensitivity of Resources and Receptors

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

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

8.7 Likelihood

Terms used to define likelihood of occurrence of an impact are explained in Table 16

Table 16: Explanation of Terms Used for Likelihood of Occurrence

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

8.8 Definition of mitigation measures

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

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

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

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

8.9 Assessing residual impacts

Impact prediction takes into account any mitigation, control and operational management measures that are part of the project design and project plan. A residual impact is the impact that is predicted to remain once mitigation measures have been designed into the intended activity. The residual impacts are described in terms of their significance in accordance with the categories identified in Table 15 above

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

8.10 KEY ENVIRONMENTAL IMPACTS – PRE-CONSTRUCTION AND CONSTRUCTION PHASE

8.10.1 Land take

The study area consists of public land with patches of open scrubland. The internal distributions lines will be laid by Kenya Power. Considering the land use of Tuum area, the distribution line will be located on public Land. The land procured for the project site was uncultivated, and undeveloped. During consultation, it was established that the land belongs to the community members.

The community has since offered to the land in kind for project use. The establishment of the minigrid will convert public land to industrial use for long term.

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

- Installation of PV modules;
- Establishment and operation of temporary structures such as temporary site office and store yard.
- Generation assets, wayleaves, contractor facilities, and worker's camps.
-

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

8.10.1.1 Embedded/In-built Control

- The construction activities will be restricted to within the allocated land and the immediate surroundings only.
- After construction work, any land taken for a temporary basis for storage of material will be restored to their original form.
- The existing earth roads at Tuum will be used for access to the project site.
- Liaison with local administration for good identification of the contractor yard that will have minimal effect to the community.
- Contractor and the proponent to consult with community on establishing the wayleaves across the community

8.10.1.2 Significance of Impact

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

8.10.1.3 Additional Mitigation Measures

- On completion of construction activities, land used for temporary facilities such as store yard should be restored to the extent possible;
- The land use in and around permanent project facilities should not be disturbed.
- Construction activities should be restricted to the designated area.
- Compensation for where there is loss of trees. Plant more trees and provide seedlings to counter tree loss

8.11 KEY ENVIRONMENTAL IMPACTS – CONSTRUCTION PHASE

8.11.1 Impact on Topography

The topography of the project site is an open area with gentle slope of about 1% and mild undulations. The elevation difference of about 10m is observed within the project site. The project area was observe to have stream lets or head cuts from erosion during the heavy rains. There are no water bodies that pass through the proposed project site. Typically, solar power projects do not undertake levelling of topography and since the proposed project, along with the access road, is mostly on a flat terrain the receptor sensitivity has been assessed to be low.

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

8.11.1.1 Embedded/In built Control

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

8.11.1.2 Significance of Impact

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

8.11.1.3 Additional Mitigation Measures

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

8.11.2 Impact on Soil Environment

8.11.2.1 Project Phases and Associated Activities

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

Construction Phase

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

Operation and Maintenance Phase

- Storage of oil and lubricants onsite;

- Disposal of municipal solid waste and waste water from site office; and
- Storage of waste materials onsite.

Decommissioning Phase

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

8.11.2.2 Significance of Impacts

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

8.11.2.3 Additional Mitigations

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

8.11.3 Impact on Air Quality

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

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

8.11.3.1 Embedded/in-built control

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

8.11.3.2 Significance of Impact

There are few Receptors (settlements) within 800m of the project site and the impact magnitude will be moderate and sensitivity medium hence the impact significance will be moderate.

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

what the weather conditions will be when specific construction activities are being undertaken. Therefore, the assessment of construction dust impacts is typically qualitative.

8.11.3.3 Additional Mitigation Measures

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

8.11.4 Impact on Ambient Noise

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

The main receptor will be the Tuum shopping centre which is within 359m from the site. There are some residents within the 100m from the site and will most likely be affected by increasing noise levels. The receptor sensitivity is therefore considered as medium. Impact magnitude is considered to be minor to medium considering the construction period of the project that will last for not more than 12 months and proximity to Tuum shopping centre.

8.11.5 Assessment Criteria for Impact on Ambient Noise

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

Construction activities including site preparation, piling work, construction of ancillary facilities;

Transportation of construction materials, machinery and personnel;
Operation of generator sets; and
Demolition activities during decommissioning phase.

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

8.11.5.1 Embedded/in-built control

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

8.11.5.2 Significance of Impact

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

8.11.5.3 Additional Mitigation Measures

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

8.11.6 Visual Intrusions and Changes in Landscape Impact

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

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

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

Even though the Mini grid facilities will be small, their geometric and sometimes highly reflective surfaces may have visual impacts. However, being visible is not necessarily the same as being intrusive. Aesthetic issues are by their nature highly subjective.

8.11.6.1 Embedded/In-built Control

Proper siting decisions can help to avoid aesthetic impacts to the landscape. The project site is located in open area with a little bit of settlement approximately 1.8km from the shopping centre and 868.95m from Tuum primary school.

8.11.6.2 Significance of Impact

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

8.11.6.3 Additional Mitigation Measures

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

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

8.11.6.4 Impacts on Waste Generation and Soil Contamination

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

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

8.11.6.4.1 Embedded/in-built control

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

8.11.6.4.2 Significance of Impact

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

8.11.6.4.3 Additional Mitigation Measures

- Contractor should ensure that no unauthorized dumping of used oil and other hazardous waste is undertaken at the site;
- Designated areas should be provided for Solid Waste and daily collection and period disposal should be ensured;
- Construction and Demolition Waste should be stored separately and be periodically collected by an authorized treatment and storage facility;
- All waste should be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels;

- A log book should be maintained for quantity and type of hazardous waste generated; and
- In case of accidental/unintended spillage, the contaminated soil should be immediately collected and stored as hazardous waste.

8.12 KEY SOCIAL IMPACTS – CONSTRUCTION PHASE

8.12.1 Land Uptake-Public land

The proposed project will entail the acquisition of a 1.214 Hectares land parcel for setting up the mini-grid. The land acquired may also be used to develop contractor facilities, worker's camps and other ancillary facilities e.g. storage and sanitary facilities. Loss of land used by the communities for livestock grazing may trigger land disputes. New settlements may arise due to migration of people to the centres near the mini-grid disrupting the existing community settlement patterns. The project proponents will use existing access roads to set up the low-voltage power distribution lines and will seek access from beneficiaries and clients in whose property they will undertake electricity connection to the power grid.

During the consultation, it was also reported that the community is not entirely dependent on the land for income. The land has is has minimal vegetation cover with chief's administrative office besides it. During rainy seasons the community utilizes the land for grazing their livestock. After implementing the embedded controls, the impact magnitude is assessed to be minor.

8.12.1.1 Source of Impact and Overview of Baseline Conditions

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

8.12.1.2 Embedded/In-built Controls

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

8.12.1.2.1 Significance of Impact

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

8.12.1.3 Additional Mitigation Measures

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

- Providing skills-based training interventions, especially for self-employment to the young and unemployed. This will enhance their employability and create potential for income generation through self-employment;
- Procuring resources from the local sources so as to induce more employment in the supply chain.
- Community compensation in kind. The community identifying projects admissible in Water, Health and Education sector within a radius of 10 km. During the public meetings the community identified water project for improvement.
- Undertake a ARAP (ARAP appended in this report)

8.12.2 Impact on Occupational Health and Safety

The construction activities include site preparation, infrastructure utilities installation, building structures. As a result, will be potential impacts on workers' health and safety due to exposure to risks through construction activities that lead to accidents causing injuries and death. The

most probable risks cause of accidental death and injury are:

- Safety risks such as: tripping; falling due to working at heights; potential fire due to hot work, smoking, failure in electrical installations; electric shocks.
- Health risks: Injuries such as: lifting, lowering, pushing, pulling and carrying; temporary or hearing loss which usually comes from noise generated from machinery used for excavation or piling work and from compressors and concrete mixers etc.; heat stress and working during high temperatures
- Occupational hazards due to dust and noise pollution from operating of heavy machinery and vehicular movement in the project sites.
- Safety risk due to working at heights during installation of power lines
- Risks of road accidents during the transportation of material and equipment to the project sites owing to the poor road network leading to Tuum village.
- The minigrid sites are located in ecological zones associated with flash flooding events. This poses a risk of washing away the mini-grid infrastructure including the power storage units i.e. the batteries making it necessary factor in site design considerations to mitigate against extreme flooding events.

8.12.2.1 Embedded/in-built control

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

8.12.2.2 Significance of Impacts

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

8.12.2.3 Additional mitigation measures

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

8.12.3 Impact on local economy and employment

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

gained a basic education. This will be a source of income for the labourers. Where possible, construction materials will be sourced locally in order to promote local businesses.
Thus, anticipated benefits of the Project include Direct employment opportunities mainly during construction of the mini-grids; indirect employment generated by the procurement of goods and services for the Project; induced employment related to jobs ensuing from the expenditure of incomes associated with direct and indirect. The local community is likely to benefit from the economic opportunities to be created from the following:

- Civil works during construction phase including, construction of solar PV module mounting area, transformer yard, inverter room, internal roads, laydown areas, labour camp, distribution line,
- Self- employment options for individuals possessing vocational or technical training skills like electricians, welders, fitters etc;
- Contracting opportunities for local's residents including men, women and youths. During the public meeting the community insisted that all the unskilled labour force must given to the locals.
- Creation of indirect employment for local community through establishing small shops like tea stalls, supply of intermediate raw materials, repair outlets, hardware stores etc. However, these are likely to be temporary.

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

8.12.3.1 Impact Significance

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

8.12.3.2 Enhancement Measures

- A significant segment of labour requirement during the construction phase will be sourced locally. While, the significance of the impact on economy and employment opportunities during the construction phase is understood to be positive, the following measures should be put in place to ensure that the local community receives maximum benefit from the presence of the project;
- Preference should be provided to local labour, sub-contractors or suppliers to pass on maximum economic benefit locally;
- Preference should be provided to the vulnerable population in the Study Area;
- The project proponent will establish a mechanism to audit sub-contractors and suppliers with respect to compliance of utilizing local labour and resources.

8.12.4 Community Health and Safety

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

Construction activities will involve the use of machinery and installation of distribution power lines. Furthermore, the movement of material and personnel via the access roads may result

in damage to human life or livestock due to accidents. The major community health and safety risks include structural failure of project infrastructure eg. power line, fire safety and management of emergency situations, noise generated from site, loose hanging lines and power surges

8.12.4.1 Embedded/in-built control

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

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

8.12.4.2 Significance of Impact

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

8.12.4.3 Additional Mitigation Measures

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

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

8.12.5 Labour Influx

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

8.12.5.1 Significance of Impact

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

8.12.5.2 Additional Mitigation measures

- In contract documents for the Contractor, MOE/REREC should make explicit reference to the need to abide by Kenyan law, international best practice and the ratified ILO conventions and MOE's policies in relation to health and safety, labour and welfare standards.

- In selection of a Contractor, MOE/REREC should refer to past performance in similar assignments as an indicator of future performance with respect to worker management, worker rights, health and safety as outlined in Kenyan law and international standards.
- Regular checks by MOE/REREC should be undertaken to ensure the relevant labour laws and occupational health and safety plans are adhered to at all times.
- All project workers should, as part of their induction, receive training on health and safety.
- the contractor should put in place mechanism to ensure no employee or job applicant is not discriminated against on the basis of his or her gender, marital status, nationality, ethnicity, age, religion or sexual orientation.
- All workers will have contracts which clearly state the terms and conditions of their employment and their legal rights. Contracts will be verbally explained to all workers where this is necessary to ensure that workers understand the provisions. Contracts must be in place prior to workers reporting to duty for the first time. The contract document will be enhanced by the Code of Conduct that will be provided by the Proponent.
- The Contractor will put in place a worker grievance redress mechanism accessible to all workers, whether permanent or casual, directly or indirectly employed. The Proponent worker grievance mechanism shall be open to the Contractor workforce in the event that their grievance is not adequately resolved by their direct employer. The Proponent will then have the authority to act to resolve this grievance.
- All project workers should have access to training on communicable diseases and STDs and community interactions in general. This training will be developed in collaboration with local health institutions.
- Carry out surveillance to ensure that no children are employed in the project, and to the extent possible by third parties related to the project and primary suppliers where such risk may exist

8.12.6 Child labour

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

8.12.6.1 Significance of Impact

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

8.12.6.2 Mitigation measures

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

8.12.7 Impacts on Cultural Heritage

Cultural and paleontological artifacts and cultural landscapes may be disturbed by the construction of the mini grid facilities. These could include community burial sites, sacred

shrines. It is expected that a number of workers will be on-site during project construction of the project including skilled, semi-skilled, and unskilled personnel. During the consultation and field survey, no cultural artefact was established at the proposed project site.

8.12.7.1 Significance of Impact

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

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

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

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

find will be appointed.

8.12.8 Gender Based Violence, SEA & SH

Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) may be committed against the communities by the construction workers and by staff during the operation and maintenance of the mini-grids. Incidences of Sexual Harassment (SH) may occur among the staff during construction, operation and decommissioning phases of the project. During the FGD with the women, they raised concerns stating that project implementation may lead to sexual harassment. This may be experienced while the women are searching for jobs and those giving the jobs may ask for sexual favours.

8.12.8.1 Significance of Impact

According to the FGDs conducted, t was noted that cases of GBV are experienced in the area and majorly due to family disputes. 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.

8.12.8.2 Mitigation measures

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

8.12.9 Exclusion of VMGs, Vulnerable Individuals and Households

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

The activities of component 1 envisages upon completion of MGs, that the relevant Implementing Agencies will connect customers from community facilities, enterprises and

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

During the ESIA study the community identified those considered vulnerable in the community include

- Poor households (Approximately 100)
- Poor female headed households (Over 1000)
- Orphans (Over 1000)
- Persons Living with Disabilities (Approximatly 300)
- The elderly (About 400)

8.12.9.1 Significance of Impact

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

8.12.9.2 Mitigation measures

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

8.12.10 Risk of Communicable Diseases; HIV/AIDS

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

8.12.10.1 Significance of Impact

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

8.12.10.2 Mitigation measures

- The Contractor should develop and implement pre-employment screening measures for workers, which should include applicable diseases. Individuals found to be suffering from these diseases will need to be sensitized on prevention of transmission to others and management of the disease prior to mobilisation to site.
- The Contractor should develop and implement a HIV/AIDS and other STIs policy and an information document for all workers directly related to the Project. The information document should address factual health issues as well as behaviour change issues around the transmission and infection of HIV/AIDS and other STIs.
- The Contractor will make condoms available to employees and communities neighbouring the site office during construction.
- All project personnel should be inducted on a Code of Conduct that gives guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.
- If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary action including dismissal from duty.

8.12.11 COVID-19 amongst workers and the community

This impact is triggered during Project Construction Phase and operation phase due to the Project attracting various categories of workers drawn from local, and national markets. This therefore pose risk of spread of COVID-19 and measures should be in place to curb this.
COVID – 19 is a highly infectious disease and since consultations are required during the project implementation, it will also pose a potentially high risk of infection to and among communities. It is important that alternative ways of managing consultations and stakeholder engagement are implemented to mitigate the impacts.

According to the Ministry of Health, currently Samburu County is the second last county of reported Covid 19 cases and infections with only 301 infections. No significant cases has been reported in Tuum area. If the status remain the same even at the time of implementation of the project then the significance of this impact pre-mitigation is considered to be moderate

8.12.11.1 Significance of Impact

The receptor sensitivity medium and and low magnitude, hence Moderate significance.

8.12.11.2 Mitigation Measures

- Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to main site;
- Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, doorknobs etc.;
- All workers and visitors accessing the site every day shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs;
- The project shall put in place means to support rapid testing of suspected workers for covid-19;
- Avoid concentrating of more than 5 workers at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;
- Sensitize all community segments and project workers on Covid 19 and precautionary measures that need to be observed;

- Avoid concentrating of more than 15 community members at one location. Where two or more people are gathered, maintain social distancing of at least 2 meters;
- The team carrying out engagements within the communities on one-on-one basis will be provided with appropriate PPE for the number of people they intend to meet;
- Restrict site access to only Authorised persons; and
- Continuously adhere to the MoH, WHO and World Bank guidelines on Covid-19 management.

8.13 KEY ENVIRONMENTAL IMPACTS – OPERATION PHASE

8.13.1.1 Waste Generation and management

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

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

8.13.1.2 Embedded/in-built control

The waste generated will be disposed of through approved NEMA waste handlers.
The hazardous wastes will be stored onsite at separate designated covered area provided with impervious flooring and disposed through NEMA approved hazardous waste handler.
During operation phase, the quantity of municipal waste and hazardous waste generated is less and probability of the hazardous waste generation is only during plant maintenance and therefore occasional. The waste generated would be routed through proper collection and containment.

8.13.1.2.1 Additional Mitigation measures

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

8.13.1.3 Significance of Impact

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

8.13.1.4 Additional Mitigation Measures

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

8.13.2 Impact on Water Environment

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

Discussions with the residents in Tuum confirmed that water is a major concern in the area. As noted earlier, the local community rely on surface water sources; Therefore the receptor (water resource) sensitive is assessed as high.

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

8.13.2.1 Embedded/in-built control

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

8.13.2.2 Significance of Impact

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

8.13.2.3 Additional Mitigation Measures

- Ensure proper cover and stacking of loose construction material to prevent surface runoff and contamination of receiving water point;

- The workforce will be given training towards proactive use of designated areas/bins for waste disposal and encouraged to use toilets. Open defecation and random disposal of sewage shall be strictly restricted;
- Construction workers to be sensitised about water conservation and encouraged use of water optimally;

- Regular inspection for identification of water leakages and preventing wastage of water from water supply tankers.
- Recycling/reusing water to the extent possible.
- The contractor should provide portable/mobile toilets for use on site

8.13.3 Landscape and Visual Impacts

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

8.13.3.1 Significance of Impacts

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

8.13.3.2 Suggested mitigation measures

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

- Signage related to the minigrid must be discrete and confined to entrance gates.
- The footprint of the operations and maintenance facilities, as well as parking and vehicular circulation, should be clearly defined, and not be allowed to spill over into other areas of the site;
- Construction of fencing or compound wall around the project boundary;
- Landscaping area around the solar farm site within the project with the participation of the local community. Some trees can be planted around the buffer zone to Camouflage or Facade or smokescreen the solar panels.

8.14 KEY ECOLOGICAL IMPACT- OPERATION PHASE

8.14.1 Collision and Electrical hazards from Distribution Infrastructure

A number of birds' species were identified during the impact assessment. These include somali ostrich, white faced whisling duck, oryx among others. The distribution lines and poles can potentially constitute an electrocution and collision hazard to birds.

8.14.1.1 Embedded/ in-built Control

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

8.14.1.2 Significance of Impacts?

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

8.14.1.3 Additional Mitigation Measures

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

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

8.15 KEY SOCIAL IMPACTS – OPERATIONS PHASE

8.15.1 Impact on Economy and Employment

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

During the operations phase, the requirement for unskilled and semi-skilled labour is expected to reduce to 5 and 15 respectively. The locally procured services will include maintenance work of the facility, 24-hour security, bush and undergrowth cleaning and housekeeping activities. In addition to this, the community will improve their livelihood and businesses by using the electricity from the project.

8.15.1.1 Significance of Impact

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

8.15.1.2 Additional Mitigation Measures

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

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

8.15.2 Occupational, Health and public safety Impacts

During the operational phase, it will involve direct use of electricity by the community and maintainance of the power lines. As a result, it will lead to potential impacts on workers' and community members health and safety due to exposure to risks through that lead to accidents causing injuries and death. The most probable risks include:

- Safety risks such as: tripping; falling due to working at heights during maintainance of the power lines
- Electric shocks in case of poor handling of electricity such as using wet hands, poor wiring and overloading of sockets.

8.15.2.1 Embedded/in-built control

- Community sensitization on health and safety issues
- Training of the workers on climbing techniques, and rescue of fall-arrested workers during maintenance;
- Proper electrical safety signages on the distribution poles

8.15.2.2 Significance of Impacts

The impact on occupational health and safety during the operational phase is evaluated

to be of moderate significance. All the operational activities will be in line with the safety measures hence high sensitivity and low magnitude.

8.15.2.3 Additional mitigation measures

- All workers (regular and contracted) should be provided with training on EHS policies and procedures during the operation stage;
- Monitor health and safety performance and have an operating audit system; and
- Appropriate safety harnesses and lowering/raising tools should be used for working at heights;and
- A safety or emergency management plan should be in place to account for natural disasters, accidents and any emergency situations within the community.

8.16 KEY ENVIRONMENTAL IMPACTS – DECOMMISSIONING PHASE

In the event of decommissioning of the Project, it is likely that any potential impacts would be similar to those in the construction phase, as broadly similar activities would be required and therefore impacts on the physical environment associated with this phase.

8.17 KEY SOCIAL IMPACTS – DECOMMISSIONING PHASE

8.17.1 Impact on Economy and Employment

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

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

8.17.1.1 Significance of Impact

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

8.17.1.2 Additional Mitigation Measures

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

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

- Rehabilitation of the project site will be carried out to restore the site to its original status or to a better state than it was originally. This will include replacement of topsoil and re-vegetation which will lead to restoration of the visual quality of the area.

8.18 CUMULATIVE IMPACTS

8.18.1 Cumulative Impact Assessment

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

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

9.1 INTRODUCTION

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

The key objectives of the ESMMP are:

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

The ESMMP outlined below addresses the identified potential negative impacts and mitigation measures of the proposed Mini-grid during pre-construction, construction, operational and decommissioning phases, based on the chapter of Environmental Impacts and Mitigation Measures of the potential negative impacts.
Monitoring 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. Monitoring will often focus on the effectiveness and impact of the ESMMP as a whole.

Table 17: Environmental Social Management and Monitoring Plan

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Local employment	-Prioritize hire of locals for all unskilled labour. -Implement a local recruitment plan that is fair and transparent (including recruitment processes that ensure inclusivity of both men and women, vulnerable individuals, minority clans, ethnic groups and VMGs. -Adhere to labour laws, and labour management practices (timely renumeration, equitable compensation for both genders for equal work etc.) -Create awareness to workers and the community on worker and project grievance redress mechanisms.	Construction Operations Decomissioning	Contractor Proponent	-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 Decomissioning		-Number and types of businesses sourced from, businesses owned and operated by vulnerable individuals, types	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
				and quantities of materials etc.		
Land acquisition and compensation for land and assets on land	In line with the RPF provisions; -Prepare and implement an **Abbreviated Resettlement Action Plan (A-RAP)** to guide land acquisition for the mini-grid, 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.	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)
	-After construction work, any land taken for a temporary basis for storage of material will be restored to their original form. -Consultations with the community on the low voltage lines. -The design of the distribution line will utilize the existing road reserves. However, any damage to structures, crops, trees, community facilities and other assets will be compensated in line with the RPF provisions.					
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	Construction Decomissioning	Proponent, Contractor	-Records of employees/updated employee register. -Number of local community employees and external employees/ updated employee register.	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	need to have a good /cordial working relation -Sensitize workers regarding engagement with local community. -Make provision to provide resources needed by the workers if the need for such resources may result to competition e.g., water. -Establish and operationalize an effective Grievance Redress Mechanism accessible to community members. -The contractor and the project/community grievance redress committee to work closely address complains raised on time. -Include gender considerations in employment opportunities. -Provide appropriate compensation for work done. -Respect for community values/culture.					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	-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 Decomissioning	Contractor, Proponent	-Updated employment register indicating locals employed, their ages, national identification numbers etc. -Grievances raised, aggrieved persons and status on resolution etc.	Quarterly	20,000.00
GBV- SEA and SH	-Prepare an SEA/SH Prevention and Response Action Plan, to manage the SEA/SH risks. -The Action Plan to be proportionate to potential SEA/SH risks, and to include measures such as awareness creation for communities and workers; identification of	Construction Operations Decomissioning	Contractor Proponent	-Minutes of awareness creation sessions for the community and workers on GBV-SEA/SH. -Code of conduct signed by all those with physical presence on site.	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.			-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 Decomissioning	Contractor Proponent	-Number of reported cases of forced labor.	Quarterly	20,000.00
Risks related to Inadequate stakeholder engagement	-Prepare a stakeholder engagement/consultation plan (SEP) that is proportionate to the subproject and the identified stakeholders. -Timely and prior disclosure of project all project information, including project instruments, the full rights and entitlements	Construction Operations Decomissioning	Contractor	-Availabiliy of and implementation of the Stakeholder Engagement Plan. -# of stakeholder consultations held -Record of stakeholder consultations held (minutes of	Quarterly	30,000.00

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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.			vulnerable individuals and households, grievances raised and status on resolution etc.		
Inaccessibility of project benefits to VMGs and other vulnerable	-Consult VMGs and Vulnerable individuals and households on charges for sub project services, and put in place specific interventions to ensure the vulnerable equally	Operations	Proponent	-Interventions to enable those vulnerable access project benefits. -Number of complaints raised	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
individuals due to affordability challenges	access project benefits.			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 logged, dated, processed,	Construction Operations Decomissioning	Contractor Proponent	-Local Grievances Committee in place, composition of committee, awareness of community and workers on project and worker GRMs, updated GRM logs, types of grievances -Availability of grievance redress process -Number of grievances reported -Number of grievances resolved in a timely manner	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	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 escalated to national courts and the World Bank Grievances Redress Service and Inspection Panel.		
Environmental Impacts						
Vegetation clearance	1. Clear only the necessary areas 2. Ensure proper demarcation and delineation of the project area to be affected by construction works. 3. Specify locations for vehicles and equipment, and areas of the site which should be kept free of traffic, equipment, and storage. 4. Designate access routes and parking areas	Construction	Contractor	-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)
	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	Construction	Contractor	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)
	through landscaping and grassing, carting away and proper disposal of construction materials 4. Use silt traps where necessary 5. Cover soil stock piles 6. Landscaping with grass on areas without electrical installation (lower areas) 7. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled.					
Contamination of soil from fossil fuels	1. Ensure waste water generated is discharged or drained into approved drainage facilities 2. Construction vehicles must be maintained in good state and proper servicing to ensure no oils are likely to leak 3. Care must be exercised not to spill any fossil fuels 4. Any contaminated soil shall be scooped and	Construction	Contractor	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	Construction	Contractor	-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)
	5. Use of personnel protective equipment (PPE) -masks should be provided to all personnel in areas prone to dust emissions 6. Restrict speed on loose surface roads during dry or dusty conditions 7. Keep stockpiles and exposed soils compacted and re-vegetate as soon as possible. 8. Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas 9. Plant short trees to break speed of wind					
Vehicle exhaust and emissions from Generator	1. Drivers of construction vehicles must be sensitized so that they do not leave vehicles idling so	Construction	Contractor	-Engine maintenance records - inspection of stacks	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	that exhaust emissions are lowered. 2. Maintain all machinery and equipment in good working order to ensure minimum emissions of carbon monoxide, NO_X, SO_X and suspended particulate matter 3. Maintain equipment in good running condition – no vehicles to be used that generate excessive black smoke 4. Use of diesel which is Sulphur- free to run the power producing generators to be encouraged 5. The stack chimney of the generators will be increased from its normal height of 3 meters to 6 meters					
Solid waste generation	1. Ensure spoil from excavations is arranged according to the various soil layers. This soil can	Construction	Contractor	Presence of well-maintained receptacles and	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is top soil last; 2. Segregate waste 3. Provide litter collection facilities such as bins 4. Contractor to put in place and comply with a site waste management plan 5. The contractor should comply with the requirement of OSHA ACT 2007 and Building rules on storage of construction materials 6. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of waste generated over time 7. Recovery of materials remains and return to stores 8. Re-use of materials where possible			centralized collection points		

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	9. Proper budgeting to avoid waste generation 10. Proper disposal of waste in line with solid waste regulation 6. 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	Construction	Contractor	-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)
	plan of the contractor will come into effect. 5. No vehicle maintenance and service shall be done at project site 7. 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 designed to contain and prevent refuse from being blown by wind, 11. Areas contaminated by spilled concrete and/or fuels and oils leaking from vehicles and machinery should be cleaned immediately	Construction	Contractor	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)
Impacts from Hazardous materials -	1. Maintenance of construction vehicles will not be done on site 2. All hazardous products and waste should be labeled and handled properly to avoid contact with the ground 3. Dispose hazardous waste through a NEMA approved waste handler	Construction	Contractor	Presence of well-maintained receptacles and centralized collection points	Quarterly	100,000.00
Accidental Oil Spills or Leaks	1. In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately. 2. Refueling and maintenance of vehicles will not take place at the construction site. 3. Create awareness for the employees on site on procedures of dealing with spills and leaks 4. Vehicles and equipment must be serviced regularly and kept in good state to avoid leaks.	Construction	Contractor	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)
	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.					
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	Construction	Contractor	-Records of any Fire incidences -Fire equipment and evacuation plan	Quarterly	100,000.00

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

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	3. Source and utilize a sustainable and reliable water supply for both construction and operation phase.					
Energy Consumption	1. Ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used. 2. Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. 3. Complementary to these measures, they monitor energy use during construction and set targets for reduction of energy use.	Construction	Contractor	Energy consumption records	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Occupational Health and safety Impacts	1. Use skilled personnel for activities which demand skills/technical tasks 2. Awareness creation/Tool box talks on safety to workers while at construction site 3. Workers coming to the site should be knowledgeable on safety precautions to take 4. Appropriate PPE (helmet, safety harness, boots, masks, climbing irons) 5. Proper general house keeping 6. Close supervision of workers 7. Risk assessment by contractor of the construction activities and implement mitigation measures appropriately 8. Adherence to occupational Safety and Health Act 2007 9. Availability of equipped first aid box on site	Construction	Contractor	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)
	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					
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	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	Construction	Contractor	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)
	during construction on the dangers of these diseases 3. Informing workers on local cultural values and health matters. 4. Provision of condoms to workers 5. Allowing migrant workers time to be with their families 6. The contractor is impressed upon not to set a construction camp on site. 7. The contractor will provide public education/information about HIV/AIDS transmission and prevention measures. 8. Ensure equal treatment of workers 9. Provide all appropriate COVID-19 preventive measures including campaign to maintain individual measures at the workplace.					

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Sanitary waste	**1.** Construct/ install pit latrines for both genders clearly labelled	Construction	Contractor	Presence of separate and clean washrooms for both the gents and ladies	Quarterly	300,000.00
Solid Waste Generation	1. Provide waste handling facilities such as labeled waste bins 2. Emphasis on prudent waste generation and give priority to reduction at source 3. Solid waste management awareness to operators 4. Operator to contract a NEMA licensed waste handler to collect and dispose solid waste	Operation	Contractor	Presence of well-maintained receptacles and centralized collection points	Quarterly	50,000.00
Liquid Waste/Oils Generation	*1.* Proper storage of the oil is required to ensure no leakages 2. Frequent inspection and maintenance of the generator to minimize leakages. 3. No vehicles should be serviced or maintained at the Mini-grid area.	Operation	Contractor	-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)
	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 2. Install an energy-efficient lighting system	Operation	Contractor	Energy consumption records	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Increased storm water flow	1. Construct the drainage system in a way to follow natural drain of the water 2. Concrete only the required area and leave the rest of the land with vegetation like grass 3. Construct rain water harvesting system on the control buildings/office and harness into storage tanks for use	Operation	Contractor	Provision of a drainage system and a rain water harvesting system	Quarterly inspections	200,000.00
Fire Outbreaks	1. The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points 2. Detection/alarm systems that can detect fire should be and installed	Operation	Contractor	-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)
	3. A fire evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported. 4. Workers especially operators of the plant must be trained on fire management 5. 'No smoking' signs shall be posted within the Mini-grid area 6. A fire Assembly point should be identified and marked					
Visual Impacts	1. Fence round the solar Mini-grid to keep off/screen the solar panels.	Operation	Contractor	Presence of a perimeter fence	Quarterly inspections	No additional cost
Water demand	1. Ensure prudent use of water. 2. Install water-conserving automatic taps. 3. Any water leaks through damaged pipes and faulty taps should be fixed promptly.	Operation	Contractor	Water usage records	Quarterly	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Sanitary waste	1. Provide sanitary waste facilities for both genders clearly marked 2. Disposal of waste through septic tanks	Operation	Contractor	Presence of separate and clean washrooms for both the gents and ladies	Quarterly	No additional cost
Flooding	1. Ensure drainage channels are free of any obstruction at all times i.e., not blocked 2. Construct more channels and or expand existing ones 3. Raise foundations of the solar panels and ensure a proper and from concrete base 4. Create flooding diversions and or spill ways to divert water from getting into the solar power facility	Operation	Contractor	-Provision of drainage system -Raised foundations for the structures	Quarterly	100,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Occupation health and Safety	1. Ensure only qualified staff are employed to work in the facility 2. All workers operating the Mini-grid must be equipped with appropriate and adequate person protective equipment (PPE) such as; safety footwear, helmet among others. 3. Operators must be skilled on firefighting management 4. Annual environmental audits should be done 5. WIBA cover for staff is mandatory	Operation	Contractor	-Provision of PPEs and WIBA cover -Environmental audit reports	Quarterly	100,000.00
Hazardous waste-damaged panels	1. Segregation from other waste streams 2. Proper disposal through a NEMA approved/licensed handler	Operation	Contractor	Presence of well-maintained receptacles and centralized collection	Quarterly	200,000.00
Noise and Vibration	1. Generator room should be sound proof to ensure no noise of a nuisance level will be produced. 2. Monitor noise levels	Operation	Contractor	Noise levels- Records of noise measurements done by contractor within the project area and at	Quarterly	Part of contractor's cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
				distances of 30m from the Solar mini-grid		
Shocks and electrocutions	1. Inspect the wiring of the houses before connecting power 2. Safety awareness campaigns to the community before connection of power on safety precautions such as: o Require community to engage a certified technician to do wiring in the premises o Use of quality materials while wiring o Refraining from individual illegal extensions of power lines to other houses o Observing safety measures while using electricity such as not touching sockets and switches with wet hands or wiping with wet cloths o Keeping off all electricity	Operation	Contractor, Consumer	-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)
	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					
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	Operation	Contractor	Presence of a controlled access and records of every person accessing the site	Daily	Part of contractor's cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
	3. Maintain records of any person who comes to site					
Risks related to poor or inadequate stakeholder engagement (Conflict)	1. Employ from the community to the extent possible 2. Engage the community members and other stakeholders in a timely manner 3. Work closely with the GRM committee members in solving the conflicts 4. Solve all conflicts/grievances at the earliest time possible 5. Ensure all grievances are logged and closed 6. Monitoring the pattern of grievances to come up will long term measures	Operation	Contractor, Proponent	Grievance records	Quarterly	20,000.00
Gender Based Violence –SEA and SH	To manage GBV risks, the contractor will prepare a SEA/SH Prevention and Response Action Plan that will include a GRM that ensures	Operation	Contractor	-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)
	confidentiality. The plan will include the necessary measures for prevention and response and must ensure survivor-based approach					
Public Health Impacts – HIV/AIDs	1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff awareness and awareness campaigns for the community 2. Provision of condoms to workers 3. Allowing migrant workers time to be with their families	Operation	Contractor	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	Operation	Contractor	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 6. Provision of contact numbers for the nearest health facility for testing and treatment 7. Adhering to any other measures from the ministry of health which may be issued from time to time					
Dust Emission	**1.** Trees can be planted around the plant/facility provided they do not cast shadows to the solar panels to act as wind breakers and hence decrease dust pollution 2. Ensure planting of grass around and within the facility compound	Operation	Contractor	Visual inspection	Quarterly	50,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Vehicle Exhaust Emissions	1. Drivers of the vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered. 2. Company vehicles should be well maintained	Operation	Contractor	Engine maintenance records	Quarterly	No additional cost

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Noise and Vibration	1. Install portable barriers to shield compressors and other small stationary equipment where necessary. 2. Use quiet equipment (i.e., equipment designed with noise control elements). 3. Co-ordinate with relevant agencies in case the noise produced will require a license. 4. Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible. 5. Demolish mainly during the day when most of the neighbors are out working.	Decommissioning	Contractor	Noise levels- Records of noise measurements done by contractor within the project area and at distances of 30m from the Solar mini-grid	Once off	20,000.00
Solid Waste Generation	1. Demolition contractor to adhere to the various manufacturer's guidelines and requirements regarding demolition and disposal	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)
	2. Segregation of waste in order to separate hazardous waste from nonhazardous waste and other streams of waste 3. Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements 4. Adequate collection and storage of waste on site 5. Safe transportation to the disposal sites / designated area 6. Hazardous waste must be disposed by NEMA approved waste handler					
Dust Emissions	1. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard	Decommissioning	Contractor	Visual inspection	Daily	20,000.00

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Monitoring Indicator	Frequency	Estimated Cost (Ksh)
Public Health-HIV/AIDS	The project will sensitize workers and the surrounding communities on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training and awareness campaigns/ to the community.	Decommissioning	Contractor	Records of awareness creation sessions conducted. -Availability of and distribution of condoms	Once off	20,000.00
	Total					4,380,000.00

9.2 STAKEHOLDER ENGAGEMENT PLAN AND GRIEVANCE MANAGEMENT POST-ESIA

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

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

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

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

9.2.1 Principles/Objectives of Stakeholder Engagement Plan

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

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

9.2.2 Approach for Stakeholder Engagement Plan

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

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

land for the Project.

9.2.3 Monitoring

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

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

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

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

9.2.4 Reporting

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

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

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

Stakeholder Engagement plan

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

S/N	Organization	Specific Stakeholder	Thematic Areas and Summary on Areas of interest	Key Message	Engagement / Grievance management	Expected Outcomes	Responsible	Timeline
		tors/sub-county administrators				resolution and implementation of the project activities.		
3.	Community	• Villages • Elders • Women • Youth • Opinion leaders • Vulnerable groups • VMGs	• Construction Environmental and Social Management Plan (CESMP) and applicable project activities of relevance to the community • General welfare for prosperity • Participation, involvement and consultations in social economic development activities	• Project GRM • Labour • Security • Community health and safety • Construction safety • Project staff / community relations • Good political will	• Consultative meetings • Participation in public barazas as organised by the contractor • Notices on notice boards at accessible spaces / places • GRM Hearings • Phone calls and SMS where applicable • Awareness creation public events as organised under construction Safety Programs • Door to door meetings as applicable	• Community to be engaged as required by the project documents eg. Stakeholder's report, ESIA • Engagement by Contractor as required in the Contract specifications which also cover the activities as required	• Social Safeguards Specialists • EHS Officer	• Quarterly • Monthly • As per GRM Processes
4.	Tuum Centre	• Hawkers • Retailers • Buyers	• General welfare for prosperity • Participation, involvement and consultations in social economic development activities.	• Project GRM • Labour • Security • Good political will				

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

S/N	Organization	Specific Stakeholder	Thematic Areas and Summary on Areas of interest	Key Message	Engagement / Grievance management	Expected Outcomes	Responsible	Timeline
					• Participation in discussions / events	s / awareness programs as organised by consultant / contractor's construction safety experts		social safeguards performance report
7.	Local media	• Contact persons in local FM stations / community radios to be determined	• Awareness creation on current issues. • Means of communication to reach larger community.	• Advocacy	• Radio infomercials • Radio discussion sessions	• Awareness raising • Information dispersal to wider audiences within the project area.	• As advised by MoE/KPLC on wider project communication strategy	• As advised by MoE/KPLC on wider project communication strategy
8.	Tuum Dispensary	• Medical Officer	• Program in. Health and nutrition programs	• Good Health • Sanitation on hygiene	• One on one meetings • Participation in discussions / events	• Discussions on and where applicable support on health programs. • Information sharing	• Social Safeguards Specialists • EHS officer	• As necessary

S/N	Organization	Specific Stakeholder	Thematic Areas and Summary on Areas of interest	Key Message	Engagement / Grievance management	Expected Outcomes	Responsible	Timeline
						during investigation		

9.3 GRIEVANCE REDRESS MECHANISM

One of the key roles of the Grievance Redress Committees, will be to address disputes led by the administrative chiefs. All PAPs will be informed how to register grievances or complaints, including specific concerns about land and environment. The PAPs will be informed about the dispute resolution process, specifically about how the disputes will be resolved in an impartial and timely manner.

The Land Acquisition Tribunal has the jurisdiction to hear and determine appeals from the decision of the NLC on the process of compulsory land acquisition of land. However, if a party is dissatisfied by the decision of the tribunal, they may appeal to the Environment and Land Court. The court will deal with land related disputes. However, the Land Act 2012 and Environment and Land Court Act 2011 advocates for Alternative Dispute Resolution (ADR) methods in tackling land related disputes. ADR approaches will be given preference and based on customary rules, arbitration, or third-party mediation. ADR will be promoted or defended as a resolution to disputes related to land. The affected persons and other stakeholders also have a right to access the World Bank Redress Service (GRS) and the World Bank Inspection Panel at no cost.

Grievance Redress Principles

The principles of grievance mechanism management that need to be observed include;

- All complaints and grievances are resolved as quickly as possible.
- That the resolution of complaints and grievances should be at the lowest possible level for resolution.
- All complaints that can be resolved, should be resolved immediately on the site. The focus of the GRM is to resolve issues in a customarily appropriate fashion at community level and record details of the complaint, the complainant and the resolution.

Grievance Redress Committee Capacity Building

A grievance redress mechanism and a committee were established in a culturally appropriate manner in consultation with the community during the consultations for ESIA and will be utilized post ESIA. The GRM committee will have the following roles; log the grievances, maintain records of the GRC meetings and grievances, resolve the grievances to the extent possible.

Grievance Procedures

a) *Registration* - Community members can inform the contractor about concerns directly and if necessary, through third parties. Once a complaint has been received, it will be recorded in a complaints log or data system. The log will be kept in hardcopy or electronic form. All reported grievances will be categorized, assigned priority, and routed as appropriate.

Grievance Log

The grievance logbook will ensure that each complaint has an individual reference number, and is appropriately tracked and recorded actions are completed. The information to be recorded will include:

- Name, age, gender of complainant;
- Date the complaint was reported;
- Date the grievance logged;
- Action taken;
- Date information on proposed corrective action sent to complainant (if appropriate);
- The date the complaint was closed; and
- Date response was sent to complainant.

b) *Sorting and Processing* - This step determines whether a complaint is eligible for the grievance mechanism and its seriousness and complexity. The complaint will be screened however this will not involve judging the substantive merit of the complaint.
The following guide will be used to determine whether a complaint is eligible or not:
Eligible complaints may include those where:

- The complaint pertains to the mini-grid project.
- The issues raised in the complaint fall within the scope of issues the grievance mechanism is authorized to address.

Ineligible complaints may include those where:

- The complaint is clearly not mini-grid project -related.
- The nature of the issue is outside the mandate of the grievance mechanism.
- The complainant has no standing to file.
- Other project or organizational procedures are more appropriate to address the issue.
- Closing Out and Escalation: Project-related grievances will be addressed and closed out as appropriate. The GRM will provide a channel for escalation e.g., through legal redress.

The proponent KPLC will monitor the activities of the stakeholder engagement and grievance management activities.
The three tiers if the GRM are as described below:

9.3.1 National Grievances Redress Committee (NGRC)

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

9.3.2 County Grievance Redress Committees (CGRC)

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

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

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

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

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

9.3.3 Locational Grievance Redress Committee (LGRC)

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

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

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

7. CBO representatives

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

The roles of LRCCs will include among others the following:

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

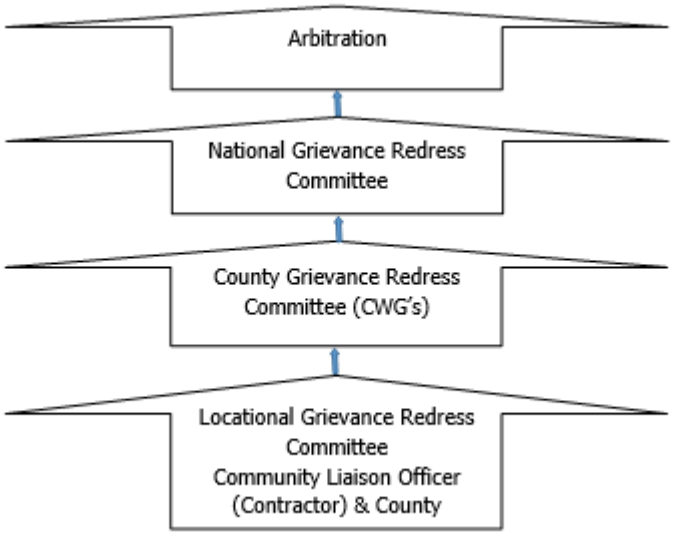

Figure 6: KOSAP Grievance Redress Mechanism

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

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

Responsibilities of the Community Liaison Officer include:

- Monitor day to day Implementation of the Project
- Address grievances as they arise on the project
- A member of the Locational and County Grievances Redress Management Committee to respond on issues that may have been brought to the attention of the committee

before escalating to the National Grievance Redress Committee
- Escalate grievances internally to get a lasting solution

Existence of a Local Grievance Redress Mechanism in Tuum

A Local grievance redress committee was reconstituted during the public meeting held at the Tuum centre where the community members elected their representatives to the LGRC. The Tuum LGRC is composed of 7 members including the following:

- ✓ 2 Female community representatives, elected by women, representing women and children related issues regarding the project.
- ✓ 1 Youth representatives, elected by youths, representing youths related concerns in the GRCs
- ✓ 2 Male representatives elected by the men of the Community-It includes the chief
- ✓ 1 PLWD representative
- ✓ Ward administrator

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

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

The mitigation measures shall include:

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

9.3.4 World Bank Grievances Redress Mechanism

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

9.3.4.1 World Bank Grievances Redress Service

The Grievance Redress Service (GRS) is an avenue for individuals and communities to submit complaints directly to the World Bank if they believe that a World Bank-supported project has or is likely to have adverse effects on them, their community, or their environment. The GRS enhances the World Bank's responsiveness and accountability to project-affected communities by ensuring that grievances are promptly reviewed and addressed. Complaints must be in writing and addressed to the GRS and sent through the following methods namely:
Those aggrieved or their representatives can report their complaints through the following mediums; (i) online by accessing the online form; (ii) Sending an email to grievance@worldbank.org or (iii) Submitting a letter to the world bank Headquarters in Washington DC, USA or World Bank Kenyan Country Offices.

9.3.4.2 World Bank Inspection Panel

The Inspection Panel is an independent complaints mechanism for people and communities who believe that they have been, or are likely to be, adversely affected by a World Bank-funded project. The Panel is an impartial fact-finding body, independent from the World Bank management and staff, reporting directly to the Board. The Inspection Panel process aims to promote accountability at the World Bank, give affected people a greater voice in activities supported by the World Bank that affect their rights and interests, and foster redress when warranted. In September 2020, the Board updated the resolution that created the Panel and added to the Panel functions. At the same time, the Board approved a resolution establishing the World Bank Accountability Mechanism (AM). The new AM began operations in early 2021 and houses the Panel to carry out compliance reviews and a new Dispute Resolution Service (DRS), which will give complainants another way to have their concerns addressed. Contacts for registration of complaints to the IP are; (i) Tel: +1 202 458 5200; and Email: ipanel@worldbank.org.

9.3.5 Government Management of Land Acquisition Disputes

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

9.4 MANAGEMENT PLAN

The contractor will prepare targeted management plans to deal with specific environmental and social aspects guided by the ESMP and any other emerging issues on the ground. The following management plans will be prepared and implemented during construction phase of the proposed project:

- Construction management plan
- Labour and human resources plan
- Workplace health and safety plan
- Community safety plan

- Emergency management and response plan
- Rehabilitation and site closure management plan
- Sexual Exploitation and Abuse and Sexual Harassment Prevention and Response Action Plan
- Labor Influx Management Plan
- Local Recruitment Plan
- Stakeholder Engagement plan
- Grievance Redress Mechanism

NOTE:
Stakeholder Engagement Plan; Grievances Redress Mechanism; Sexual Exploitation and Abuse and Sexual Harassment Prevention and Response Action Plan will be implemented throughout the project cycle.

9.5 LABOUR INFLUX MANAGEMENT PLAN

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

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

The plan shall consider these measures:

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

9.6 SEA/SH PREVENTION AND RESPONSE ACTION PLAN

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

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

9.7 CONSTRUCTION MANAGEMENT PLAN

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

a) Management of Fuels and other Hazardous Materials

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

b) Management of the Construction Site

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

c) Fire Prevention and Management

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

d) Management of Air Quality

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

e) Neighboring Landowner and Occupier Relations

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

f) Complaints Register

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

g) Construction Control

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

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

i) Control of material supply and burrow areas

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

9.8 REHABILITATION AND SITE CLOSURE PLAN

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

9.9 LOCAL RECRUITMENT PLAN

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

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

The mitigation measure is:

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

9.10 WORKPLACE HEALTH AND SAFETY PLAN

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

- The contractor shall comply with all relevant legislative requirements governing worker health and safety at the work place (e.g., OSHA 2007 and its subsidiary legislations).
- The contractor shall prepare and implement measures to minimize diseases likely to be contracted by the construction workers as a result of the proposed project such as HIV &AIDs and other communicable diseases
- The contractor shall have obligations of managing the safety of its employees by;
    - Provision of appropriate PPEs to employee
    - Training employees on competence
    - Employing competence and qualified staff
    - Provision of First Aid Kits onsite
    - Should have a trained first aider
    - Document and create awareness on safe work procedures and work instruction

- The contractor will manage accidents by having an emergence response plan which will include contacts for emergency service providers e.g., ambulances, fire brigade and nearest hospitals
- Health and safety performance will be continuously monitored, and procedures reviewed with the aim of eliminating risk as far as reasonably practicable.

9.11 COMMUNITY HEALTH AND SAFETY PLAN

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

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

9.12 EMERGENCY PREPAREDNESS PLAN

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

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

9.13 REHABILITATION AND DECOMMISSIONING MANAGEMENT PLAN

The rehabilitation and decommissioning management plan include the following:

9.13.1 Planning for Closure

a) The implementing agency shall investigate practical options for closure of the facility at least one year before decommissioning and submit a report to relevant authorities NEMA included.
b) The KPLC shall develop rehabilitation and decommissioning plan in conjunction with relevant stakeholders at least one year before the end of facility's operations.
c) The KPLC shall explore options of re-use and recycling of the facility's components/structures.

9.13.2 Decommissioning

a) The KPLC shall take into consideration the health and safety of personnel, contractors, neighbors and the public during the planning and implementation of the demolition process.
b) The KPLC shall undertake a further survey to identify any contaminated areas and remediate them accordingly.

9.13.3 Post Closure

REREC shall ensure that the facility's site is free of impacts associated with the closure and demolition

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

a) Monitoring of the rehabilitated site to confirm whether progress is satisfactory.
b) Outline of how land improvement and future land use will be affected by the past operations and decommissioning of the associated infrastructure.

9.14 INSTITUTIONAL IMPLEMENTATION ARRANGEMENTS FOR THE PROPOSED PROJECT

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

9.14.1 Proponent -Ministry of Energy

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

9.14.2 KOSAP Project Implementation Unit

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

9.14.3 The Implementing Agency (REREC)

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

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

9.14.4 County Government of Samburu

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

9.14.5 National Environmental Management Authority

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

9.14.6 Roles and Responsibilities of the Supervising Consultant

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

9.14.7 Roles and Responsibilities of the Contractor

- Implementation of the contractor related aspects of the ESMMP and regularly (monthly) reporting
- The contractor on his part will have to appoint an EHS officer and a Social Specialist to coordinate and report on the ESMMP implementation respectively.

- The contractor to engage a Community Liaison Officer to act as a link between the community and the contractor and support the Social Specialist.
- The contractor will also have the obligation of managing the E&S risks related to his/her operations.
- Maintaining the required level of stakeholder engagement and communication, including providing project schedule information to the public, accepting and resolving public grievances, advertising and hiring local workers.
- Maintain a working grievance redress mechanism.
- The contractor is to comply with all regulations and by-laws at the county level and other relevant regulations and laws
- The contractor shall refer to ESIA recommendations and the ESMMP when preparing the contractors- ESMMP and the specific plans
- The contractor shall provide water required for use in connection with the works including the work of subcontractors and shall provide temporary storage tanks, if required
- The contractor shall make his own arrangements for sanitary conveniences for his workers. Any arrangements so made shall be in conformity with the public health requirements for such facilities and the contractor shall be solely liable for any infringement of the requirements.
- The contractor shall be responsible for all the actions of any subcontractors whom he subcontracts.
- The contractor shall take all possible precautions to prevent nuisance, inconvenience or injury to the neighboring properties and to the public generally, and shall use proper precaution to ensure the safety of the community
- All work operations which may generate noise, dust, vibrations, or any other discomfort to the workers and/or visitors of the client and the local community must be undertaken with care, with all necessary safety precautions taken.
- The contractor shall take all effort to muffle the noises from his tools, equipment and workmen to not more than 70dBA
- The contractor shall upon completion of working, remove and clear away all plant, rubbish and unused materials and shall leave the whole site in a clean and tidy state to the satisfaction of the Proponent. He shall also remove from the site all waste
- No shrubs, trees, bushes or underground thicket shall be removed except with the express approval of the proponent.
- No blasting shall be permitted without the prior approval of the KPLC and the local authorities.
- Borrow pits will only be allowed to be opened up on receipt of permission from the approving authorities.
- The standard of workmanship shall not be inferior to the Kenya Bureau of Standards where existing. No materials for use in the permanent incorporation into the works shall be used for any temporary works or purpose other than that for which it is provided. Similarly, no material for temporary support may be used for permanent incorporation into the works.
- Disposing of the waste generated during construction activities in accordance to the ESMMP.

- The contractor EHS officer will report on ESMMP implementation during construction period. The aspect to be reported by the contractor will include safety issues i.e. hours worked, recordable incidents and corresponding Root Cause Analysis (lost time incidents, medical treatment cases), first aid cases, incidents and accidents, potential near misses, and remedial and preventive activities required (for example, revised job safety analysis, new or different equipment, skills training etc.); Environmental incidents and near misses;

noncompliance incidents with permits and national law; Training on E&S issues (dates, number of trainees, and topics); Details of any security risks; Worker & External stakeholder grievances and E&S inspections by contractor, including any authorities.

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

10 IMPACT SUMMARY AND CONCLUSION

10.1 INTRODUCTION

This chapter gives a summary of impacts conclusion and recommendations

10.2 SUMMARY OF IMPACTS IDENTIFIED AND ASSESSED

10.2.1 Construction Phase Impacts

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

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

10.2.2 Operational Phase Impacts

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

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

10.3 SA AND VMGP CONCLUSION

- The Tuum project has triggered the World Bank Operational Policy (OP 4.10) for Indigenous Peoples due to the known presence of indigenous peoples (IPs)/vulnerable and marginalized groups (VMGs) at the project area. Tuum area is overwhelmingly IP/VMG area and is inhabited predominantly by the Samburu pastoralist community. This is addition to The Kenya Constitution requirement to protect and promote the interests and rights of minorities and marginalized communities and the relevant laws and regulations of the Government of Kenya concerning VMG (Vulnerable and Marginalized Groups). The OP 4.10 Indigenous Peoples contributes to the Bank's mission of poverty reduction and sustainable development by guaranteeing that the development process fully takes due regard to the dignity, human rights and cultures of indigenous people. The Bank requires that the Borrower engage the IPs/VMGs in a process of Free, Prior and Informed Consultations. This was the basis of the public participation in Tuum with the Samburu community which resulted in broad community

support for the project by the affected IPs/VMGs. During the ESIA study the Samburu community members further identified members of the community they consider vulnerable by the community member. The vulnerable were identified to include; Poor households (Approximately 100), Poor female headed households (Over 1000), Orphans (Over 1000), Persons Living with Disabilities (Approximatly 300), The elderly (About 400).

Elements of the VGMP will be captured in the ESMP.

10.4 CONCLUSION AND RECOMMENDATIONS

With all the identified impacts, mitigation will reduce the significance of such impacts to a minor or negligible level. The mitigation measures provided and the management of residual impacts are described in the ESMP has been described as a vehicle for the continued integrated management of all such impacts.

An Environmental and Social Management Plan (ESMP) has been prepared to ensure that social and environmental impacts and risks identified during the ESIA process are effectively managed during the construction and operations of the Project. The ESMP specifies the mitigation and management measures to which the Project Proponent and the Contractor will be committed and shows how the Project will mobilize organizational capacity and resources to implement these measures. The ESMP also shows how mitigation and management measures will be scheduled and will ensure that the Project complies with the applicable laws and regulations within Kenya, as well as the requirements of WB OPs on environmental and social sustainability. Its recommended that the contractor prepares and implements the c-ESMP informed by the proponent's ESMP. The contractor should further prepare and implement the following social management plans and be approved by the proponent and the Bank before the contractor mobilizes to the site;

- Stakeholder Engagement Plan;
- Grievance Redress Mechanism;
- GBV-SEA/SH Prevention and Response Action Plan (*including the worker's code of conduct that outlines the prohibitive behaviour, sanctions, and measures to protect, e.g., whistleblowers), referral pathways such as psychosocial and legal support, and a Grievance Mechanism that is responsive to SEA/SH*);
- Local Recruitment Plan;
- Labor Influx Management Plan

The consultant is confident that every effort will be made by the Project Proponent and Contractor to accommodate the mitigation measures recommended during the ESIA process to the extent that is practically possible, without compromising the economic viability of the Project or having a lasting impact on the environment.

In summary, based on the findings of this assessment, the consultant finds no reason why the proposed Project, should not be moved to the next stage of Project planning and development, contingent on the mitigations and monitoring for potential environmental and socio-economic impacts as outlined in the ESMP

11 APPENDICES

APPENDIX 1 – ABBREVIATED RESETTLEMENT ACTION PLAN (A-RAP)

1. Tuum Sub-project Site

The Tuum sub-project site is on registered community land. Land in the community is mainly communal and is used mainly for livestock grazing and crop family only in raining season. Consultations leading to the identification and selection of the sub-project site are captured in the Environmental and Social Screening report for Tuum. *Refer to Chapter 3 of the ESIA for the comprehensive socio-economic profile or baseline information..*

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

The number of project-affected persons (PAPs) is 4500 (approximately 750 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 1.214 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 table 6 of the ESIA for the summary information of the proposed solar mini-grid.*

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. . In Tuum, the community requested:

- Water reticulation from the existing springs to serve the community by installing solar powered pumps, dispensing unit, and other amenities,
- Ward construction at the health centre for use by the community. The dispensary is also understaffed.
- There is a secondary school for boys or any mixed secondary school within the area.

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 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 registered community land, unregistered group ranches and registered group ranches (e.g., grazing, farming etc.).	Communities utilizing unregistered community land, unregistered group ranches, and registered group ranches.	Compensation in-kind as prioritized by the community.	
3. Loss of /Damage to Assets on Land			
Trees	Community members on	During detailed design for power distribution lines and construction of	REREC
Crops			

Structures	unregistered community land; community members utilizing public land; members of registered and unregistered group ranches and government entities.	the mini grid and community project, any crops, structures, trees, and community facilities shall be avoided to the extent possible. However, loss or damage to the above will be compensated/restored at full replacement cost,[1] in line with the provisions of the RPF.	
Community facilities e.g., water sources (earth pans, boreholes etc.).	Community members on unregistered community land, community members utilizing public land, and members of registered and unregistered group ranches.		

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

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

4.1 Engagement of Project -Affected Persons (PAPs)

Local administration and County Renewable Energy Officers (CREOs) supported the proponent and implementing agency (IA) to mobilize community members and other stakeholders for public consultations and engagement activities. National and county government entities, community segments (men, women, youth, elders, persons with disability, vulnerable and marginalized groups, etc.), NGOs, and local leaders were engaged through key informant interviews, community meetings, and focus-group discussions. The proponent and IA implemented appropriate measures to ensure PAPs effectively participated in the consultations. *Refer to Chapter 5 of the ESIA on public consultation and engagement.*

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

Figure 1:

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

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 Naipa Locational Grievance Redress Committee (LGRC) constituting a chairperson, secretary, and three members, was formed through community consensus. The committee comprises representation from men, women, youth, persons with disabilities, and ethnic minorities. The LGRC is responsible for engaging PAPs and resolving complaints. *Refer to chapter 6 of the ESIA on the Grievance Redress Committees.*

Further, the community will constitute the A-RAP Implementation Committee responsible for coordinating community engagements on the A-RAP and monitoring the implementation and closure of the A-RAP. The representation of the committee will consider gender, vulnerability, and intergenerational sensitivities

4.3 Summary of Consultations on Land Acquisition and Compensation Options

Date	Objective	Implementing Entities	Land Acquisition and Compensation Aspects Discussed	Key Issues Raised	Responses Given
December 12th 2020	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).	Kindly explain the land needed in terms of acres and how it should be to the community.	The land needed for the project is approximately 2-5 acres. It's should not be far from the community since it should allow the connectivity radius of 3km –
February 5th 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. reticulation from the existing springs to serve the community by installing solar powered pumps, dispensing unit, and other amenities, Ward construction at the health centre for use by the community, The dispensary is also understaffed. There is a secondary school for boys or any mixed secondary school within the area.	The proponent has set aside KES 1 million to implement the priority in-kind compensation project. The value of the project will be proportional to or greater than the value of land. NLC will determine the value of land.
May 2023	Compulsory Land Acquisition.	NLC	Site inspection and inquiries. Land valuation.		

			Award of compensation.		

5. Institutional Responsibility for Implementation of the ARAP

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

6. Procedures for Grievance Redress

The Project procedures for grievance redress were established through a public consultation process and informed by the existing conflict resolution structures in the community. The Grievance Redress Mechanism (GRM) comprises tiers at the project, county, and national levels. *Refer to Chapter 7 of the ESIA for a detailed GRM.*

7. Implementation Timetable and Budget for the ARAP Implementation

7.1 Timelines

The proponent will commission the community project by May 25th, 2025, before operationalizing the mini grid. The mini-grid contractor will implement the mini-grid and the community project simultaneously. The Supervision Consultant and IAs will implement a commitment register to ensure the mini-grid contractor can achieve the agreed-upon milestones. The register will be complete with clear and practical timebound indicators, which can be monitored by all parties – the PAPs, IAs, the Ministry, third-party monitor, and the Bank.

7.2 Budget

The proponent has set aside KES 1 million for the community project (budget captured in the ESMP). The compensation award from NLC and the Bill of Quantities will inform the final cost of the community project. The costs for in-kind compensation, stakeholder engagement,

grievance management (including the facilitation of the GRCs and the A-RAP Implementation Committee), and monitoring are covered under the project.

APPENDIX 2 – PUBLIC MEETING PARTICIPANTS' REGISTER

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

Venue: Tuum Barazu

Date: 05/02/22

Time: 3:00 p.m

#	Name	Position/Institution/ Location/Village	M/F	Phone No.	Signature
1.	LEKENIT FABIANO	TUUM	M	0758406610	[signature]
2.	LEKUPE JAVEL	TUUM	M	0795270295	[signature]
3.	LENGAUR HARON	TUUM	M	0746481404	[signature]
4.	LEDIKANY FRANCIS	TUUM	M	0791324801	[signature]
5.	SAWEL LEKORIO	TUUM	M	0113345594	[signature]
6.	SANTOS Lemoosa	Tuum	M	0758427219	[signature]
7.	SNIPER LENGPISIKICHOI	TUUM	M	0723359170	[signature]
8.	SAMUEL LESOKOYO	Tuum	M	0791018789	[signature]
9.	LPUNGO'KA LEPULELEI	Tuum	M	0759875383	[signature]
10.	Lkanchau Lencorin	TUUM	M	0759359746	[signature]
11.	LOIGERWA LEPARKIRAS	TUUM	M	0701522402	[signature]
12.	LTOIS LEMIRAA	Tuun	M	0797807838	[signature]
13.	SIWETI LEPARMIRAS	TUUM	M	0704655742	[signature]
14.	LENGUROD LPARALE	TUUM	M	0757304524	[signature]
15.	Ngari Patrick Mubngi	Centric Africa Limited	M	0716[illegible]	[signature]
16.	Samwel Odala	REREC	M	0734401562	[signature]
17.	ALLAN OWINO	CENTRIC AFRICA LTD	M	07299[illegible]4873	[signature]
18	Umulkheir Qaballe Abdi	CENTRIC AFRICA	F	0795023464	[signature]
19	Mathew Kasiva Mutua	Centric Africa Ltd	M	07[illegible]6480	[signature]
20.	MARK OYIER	MOE	M	0720326091	[signature]

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

Venue: Tuum Baraza Date: 5/02/2022

Time: 4:26 p.m.

#	Name	Position/Institution/ Location/Village	M/F	Phone No.	Signature
1.	ALFRED LERIANO	CHIEF	M	0727701190	
2.	FREDRICK LENGAWA	ADMIN (TUUM)	M	0722337981	
3.	JONATHAN LESIMALELE	ADMIN (EJUK)	M	0714510804	
4.	LTERNA LEPULELEI	YOUTH TUUM	M	0796184428	
5.	LESIMALELE JOHN	YOUTH	M	07163217 23	
6.	LELSON LEPIILE	ELDER	M	0723379313	
7.	LKATERIAN LEMEEDE	ELDER	M	0712961422	
8.	LEKUNTET LERIANO	ELDER	M	0718516577	
9.	LELAMBON LERIANO	ELDER	M	0715001033	
10.	MEJA LEKENIT	ELDER	M	0702949898	
11.	RAMPAISI LENGORIEN	ELDER	M	07	
12.	LKutayo LEPARKIRAS	ELDER	M	0703189673	
13.	LIAPEEN LEPULELEI	ELDER	M	0725145680	
14.	JOHN B: LEMEEDE	ELDER	M	0727518914	
15.	WYCLEF · M· NGURE	CREO	M	0725678988	
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ALFRED LERIANO DATE CHIEF TUUM LOC

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

Venue: Tuum Boyaza Date: 5/07/2022

Time: 4:26pm

#	Name	Position/Institution/ Location/Village	M/F	Phone No.	Signature
1.	ALICE LEKENI	Tuum	F	0115779680	
2.	KAARE LERIANO	Tuum	F	0799947052	
3.	TEIYIE LETOOLE	Tuum	F	—	
4.	NKERERI LENGAUR	Tuum	F	—	
5.	NENAIRO LENGAUR	Tuum	F	0745166930	
6.	ANN LERASUITAN	Tuum	F	0710242657	
7.	PRISCILLA LENKOPITO	Tuum	F	0705272292	
8.	BABY RAPHAELA	Tuum	F	0797207009	
9.	ASICHOE LEKENIT	Tuum	F	—	
10.	PAMELA LEOKOE	Tuum	F	0713436310	
11.	MPILANOI LERIANO	Tuum	F	21146958	
12.	NJOMOREN LEMPISIKICHOI	Tuum	F		
13.	SAMPEYAN SALOME	Tuum	F	0713471580	
14.	NTIYATON LERIANO	Tuum	F		
15.	LINET LERIANO	Tuum	F	0112227631	
16.	SARINI LENKOPITO	Tuum	F	0792076139	
17.	TAALE LEPATOITIE	Tuum	F		
18	ANNA LEAILONO	Tuum	F	0703635156	
19	ANDREW ODINGA	Tuum	M	0714[illegible]	
20.	SEBASTIN LEKASUYAN	TUUM	M	0704032086	

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APPENDIX 3 – FOCUS GROUP DISCUSSION PARTICIPANTS REGISTER

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

Venue: TUUM Date: 5/02/2022

Time: 4:26 pm

FGD MEN

#	Name	Position/Institution/ Location/Village	M/F	Phone No.	Signature
1.	ALEX LESAALE	TUUM LOCATION	M	0710411666	
2.	STEER LEKATAP	"	M	0728207507	
3.	LARO LESANIA	"	M	0723359613	laro
4.	LENGOBONI LERIANO	"	M	0718516577	
5.	SATOTI LESIMALELE	"	M	0716 321723	
6.	MEJA LEKENIT	"	M	0702949898	
7.	JONNATHAN LESIMALELE	"	M	0714254343	
8.	LPELENA LEMKANY	"	M	0712676945	
9.	LKITAIS LEPARKIRAS	"	M	0703136293	
10.	LOKUI LERIANO	"	M	0713514511	
11.	ZARAYO LERIANO	"	M	0706549917	
12.	JOSEPH LEPATOYIE	"	M	0728986155	
13.	PHILIP K. LESAANA	"	M	0742198594	
14.	LOOMP LERIANO	"	M	0718515531	
15.	STEVE LINO LEOLOM	"	M	0741287249	
16.	Lopukwe Leriano	"	M	0745015793	
17.	John B. Lemeede	"	M	0727518714	
18	BERLIN LEMIRAA	"	M	0720965106	
19	LEKISHON LETOLOA	"	M	0746048651	
20.					

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

Venue: Tuum Youth Date: 5/02/2022

Time: 4:26 pm

#	Name	Position/Institution/ Location/Village	M/F	Phone No.	Signature
1.	SAMUEL LESOKOTO	Tuum	m	0791018789	
2.	ISSAK LERANTIKENI	Tuum	m	0717801084	
3.	AKURUTI LENGAUR	Tuum	m	0113309740	
4.	BEN LENGUROO	Tuum	m	07106623 2	
5.	LOISIAN LORIAKWO	TUUM	m	0712574179	
6.	Mustafi Lemoosa	TUUM	M	0758427219	
7.	Caleb Lebihila	TUUM	M	0703904280	
8.	LOREU B. LEISIANO	Tuum	m	0707816241	
9.	SARAFINO LENAYEISHO	Tuum	M	0713265489	
10.	SAWEL LEKORIO	TUUM	M	0713345594	
11.	FRANCIS LEDIKANY	TUUM	M	0791324801	
12.	LEKENIT FABIANO	TUUM	M	0758406610	
13.	LJAZINI LENGAUR	TUUM	M	0759628689	
14.	KENNAH LERIANO	TUUM	M	0759481795	
15.	LEWIN LESAINIA	TUUM	M	0797084053	
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LERIANO CHIEF TUUM

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

Venue: Tuum FDG - Female Date: 5/02/2022

Time: 4:26 pm

#	Name	Position/Institution/ Location/Village	M/F	Phone No.	Signature
1.	ALICE LEKEMIT	Tuum	F	0115779680	
2.	KAARE LERIANO	Tuum	F	0799947052	K.L
3.	YEIYIE LETOOLE	Tuum	F	29489479	
4.	NENAIRO LENGAUR	Tuum	F	0745166930	
5.	NJOMOREN LEMPISIKICHOI	Tuum	F		
6.	ASICHOE LEKENET	Tuum	F		
7.	PRISCILLA LENKOPITO	Tuum	F	0705 272292	
8.	PAMELA LEPKOE	Tuum	F	07 13436310	
9.	NKERERI LENGAUR	Tuum	F	07 2514 5172	
10.	ANN LEKASUYAN	Tuum	F	07102426 57	
11.	MPILANOI LERIANO	Tuum	F	07 21146958	
12.	BABY RAPHAELA	Tuum	F	07 97207009	
13.	KIKAI LESAANA	Tuum	F	0742198594	
14.	EMMANUELASTEER LEKATAN	Tuum	F	0725207507	
15.	NATASHO LOLOKURIA	Tuum	F	0768093225	
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APPENDIX 4 – KEY INFORMANTS REGISTER

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

Venue: Tuum Barazu

Date: 05/02/22

Time: 3:00 p.m

#	Name	Position/Institution/ Location/Village	M/F	Phone No.	Signature
1.	LEKENIT FABIANO	TUUM	M	0758406610	[signature]
2.	LEKUPE JAVEL	TUUM	M	0795270295	[signature]
3.	LENGAUR HAROM	TUUM	m	0746481404	[signature]
4.	LEDIKANY FRANCIS	TUUM	M	0791324801	[signature]
5.	SAWEL LEKORIO	TUUM	M	0113345594	[signature]
6.	SANTOS Lemoosa	Tuum	M	07584 27219	[signature]
7.	SNIPER LEMPISIKICHOI	TUUM	M	0723359170	[signature]
8.	Samuel Lesokoyo	Tuum	m	079101878 9	[signature]
9.	LPUNGO'KA LEPULELEI	Tuum	m	0759875383	[signature]
10.	Lkanchau Lengoorin	TUUM	M	0759259746	[signature]
11.	LOIGERWA LEPARKIRAS	TUUM	m	0701522402	[signature]
12.	LTOIS LEMIRAA	Tuun	m	0797807838	[signature]
13.	SIWETI LEPARKIRAS	TUUM	m	0704655742	[signature]
14.	LENGUROO LPARALE	TUUM	M	0757304524	[signature]
15.	Ngari Patrick Mutongi	Centric Africa Limited	M	0716[illegible]	[signature]
16.	Samuel Odel	REREO	M	0734401562	[signature]
17.	ALLAN OWINO	CENTRIC AFRICA LTD	M	0729924873	[signature]
18	Umulkheir Qaballe Abdi	CENTRIC AFRICA	F	0795023464	[signature]
19	Mathew Kasina Mutua	Centric Africa Ltd	M	0717064[illegible]	[signature]
20.	MARK OYIER	MOE	M	0720326091	[signature]

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APPENDIX 5- MINUTES OF THE PUBLIC MEETING

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MINUTES OF EIA CONSULTATION HELD AT ....TUUM VILLAGE.....

Date: 05/02/2021	**Time:** 4:26pm.
Venue: TUUM VILLAGE	

PRESENT

List is attached

AGENDA

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

Item No	Description	Action by
Min 1/22	**Introduction**	
	The meeting started at 4:26pm with a word of prayers from a village elder. The area chief introduced the administrators and welcomed everyone who attended the meeting. Mr. Munene the CREO introduce the KOSAP team to the community.	
Min 2/22	**Opening Remarks**	
	Mr. Munene informed the community on KOSAP and its component. It was discussed that; KOSAP is funded by World Bank and implemented by the Ministry of Energy, Kenya Power and REREC.	

ALFRED LERIANO
DATE.....
CHIEF TUUM LOC

Page 1 of 5

Min 3/22	Remarks by the Consultant	
	Mr. Patric Ngari explained the processes of ESIA such as stakeholder Engagement, Identification of the potential Impacts and their mitigation measures e.t.c. He also described the benefits of KOSAP to be accrued by the beneficiaries, such as: Productive use of energy, employment opportunities Reduced indoor air pollution, reliable supply of Power to the households & Institution in Tuum. The consultant also explained the anticipated environmental Impacts of KOSAP such as the environmental exposure to hazardous and toxic materials, Impacts on the biodiversity, Impacts on air, soil and water quality, Visual Intrusions Impact, occupation Health and safety Risks e.t.c Mr. Alan Owino discussed the anticipated social Impacts of KOSAP such as Labour influx, child labour, Elite capture, Impacts on Cultural Heritage, exclusion of the VMGs, Increased insecurity cases The Consultants also discussed mitigation measures to the anticipated impacts such as Sourcing of construction materials and procuring of goods & services locally, safety awareness creation to the workers to observe all the safety precautions to ensure workers work safely, vegetation re-planting to offset cleared vegetation. e.t.c.	

ALFRED LERIANG DATE CHIEF TUUM LOC

Min 4/22	Concerns / Issues from participants	
	Lodip Leriano was concerned on how the power will be distributed Mr. John Lemedi was concerned on whether the community members will pay for the power. He was also concerned on the amount of payment Mr. Philip Lesana was concerned on the project's timelines. Mr. John Lesimalele was concerned on the compensation methods or insurance cover incase of any accidents as a result of the Project. Madam Pamela requested that the Grievance Redress Committee should prioritize the social welfare of the workers and prevent child labour at the site. Mr. Berlin was concerned on whether the small business owners in tuum will be considered to supply raw materials to be used by the contractor.	

ALFRED LERIANO
DATE
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Min 5/22	Responses given by the consultant	
	The consultants responded to all of the issues / concerns of the members. It was discussed that; The anticipated benefits of the project include Direct employment opportunities, mainly during construction of the mini-grids; in direct employment generated by the procurement of goods & services for the project; Induced employment related to jobs. All members i.e the skilled and un-skilled will be regarded for employment. > The connection fee to be paid by each household will be a thousand kenya shillings (1000) and payment will be done once only. > The solar power will be fairly distributed inform of tokens and each household will be issued a token meter whereby the owner will purchase electricity token and credits units to his/her meter. As they use the electricity his/her units are reduced untill they are exhausted prompting them to top up. > The contractor will ensure all workers are issued with (WIBA) work Injury Benefit Act insurance to cover the medical expenses incase of any injuries experienced.	

ALFRED LERIANO DATE..... Sign..... CHIEF TUUM LOC

Min 6/22	**Acceptance/Rejection of the project**	
	All participants accepted the project as they also agreed on a water project (Installation of new water distribution line and two collection points at the trading centre and a new line to the watering facility for the cattle.) as priority number one.	
Min 7/22	**Adjournment**	
	The meeting adjourned at 6:30 pm with a word of prayer from the village admin.	

Minutes Prepared by: Umulkheir Qabalo Abdi Date 05/02/2022

Position ERA Expert

Signature

Minutes Confirmed by: ALFRED LERIANO Date 05-02-2022

Position CHIEF

Signature

ALFRED LERIANO
DATE
CHIEF TUUM LOC

APPENDIX 6- LAND ACQUISITION MEETING MINUTES

Minutes of community consultation meeting leading to voluntary land donation and GRC constitution

Project Proposed Mini-grid at Tuum Market
Venue of meeting Tuum Market -Community Baraza
Date: 12/12/2020

AGENDAS

- Preliminaries
- Project description
- Positive Impacts of the project –Solar Mini-grid
- Negative Impacts of the project and mitigations measures
- Land requirements for the project
- Grievance Redress Mechanism and election of grievance redress committee for the project

Minute 1/KOSAP/2020: Preliminaries

The area chief called the meeting to order at 11.30 a.m. and opening prayer was done. Due to the fact that not all members of the KOSAP team could not speak the local dialect, it was necessary to have translations into the local language to ensure the information being shared was understood by all the members of the community. Translations were done by the Assistant chief.

The chief welcomed the project team and also members of Tuum Market and thanked all for attending the meeting. He told them ''since the main project team is here, be keen on the information they have brought to us about the project and be free to participate through questions and comments in order to make the meeting fruitful.

He welcomed Mr. Benson Director from the Ministry of Energy Samburu County to lead the team in speaking to the community.

Benson thanked the chief and the community members for turning up for the meeting. He explained that he had come with other officers to talk to the community on various issues in line with the proposed Mini-grid. He allowed the other team members to greet the people and make brief introductions. He told the community that each would be given a chance to talk on specific areas in line with the project.

KOSAP Team

No.	Name	Institution
1.	Dorothy Kagweria	Ministry of Energy
2.	Wilfred Koech	Kenya Power
3.	Benson Lengalen	County Government of Samburu
4.	Winfred Omondi	Kenya Power
5.	Gideon Lekupe	County Government of Samburu
6.	Samwel Olela	REREC
7.	Wyclef Ngure	Ministry of Energy
8.	Richard Wida	Kenya Power
9.	Joseph Korir	Kenya Power
10.	Jediel Muriuki	Kenya Power
11.	Elsie Mworia	Kenya Power

Table KOSAP Team – Samburu

Minute 2/KOSAP/2020- Kenya Off-grid Solar Access Project-Solar Mini-grids

The Director Environment informed members that the government through funding from World Bank intends to develop solar power Mini-grids in 14 underserved counties in Kenya and Samburu is one of them. They shall be solar Mini-grids under Kenya Off-grid Solar Access Project. He noted that KOSAP has many components which shall eventually be rolled out to community members at appropriate times, however; for this meeting the focus is consultation for acquisition of land for development of solar power Mini-grid.

Mr. Ngure then appreciated members for attending and reminded them that a team of consultants had initially visited the area to carry out a feasibility study for the proposed Mini-grid under KOSAP. Thus the current "*Baraza"* is a progress from the initial one and members shall have opportunity to air out their concerns pertaining the project as well as seek clarifications where necessary. He informed members that the team having assessed the proposed development site shall equally express their views with regard to the site.

The area chief informed KOSAP team that they have acknowledged the project and are in dire need of power thus they donated the land for they considered it suitable due to its centrality and proximity to market center, learning institutions and residential areas. He also noted that the proposed development site was considered well positioned as any development on the parcel of land shall not interfere with institutions expansion.

Mr. Ngure then informed members that due to the site's close proximity to the market center, residential areas and schools, all of them shall benefit from implementation from the project as it shall be installed through a radius of 3km from the Mini-grid. He also informed members that once completed, all persons who shall apply for power connection will benefit and the

connection fee would be one thousand Kenya shillings irrespective of distance from the Mini-grid within a three kilometer radius.

Mr. Korir explained to the community that it was necessary that we disclosed to the community that they are entitled to compensation. He further explained to the gathering the options that they are entitled to. The first thing was that the community may be willing to donate the land but are entitled to compensation for the land. This Compensation monies would however be held on their behalf in an escrow account by the County, and the monies plus accrued interest released to them upon registration. The other option of compensation explained to the community was that the community can also be compensated in kind. The community can request for compensation in kind like a well, or classrooms to be built or any other item that will benefit the community. Another option would be compensation on land for land. The community may request the Government to buy a similar piece of land for the community. To compensate for land donated for construction of the mini grid. He informed the meeting that they are at liberty to deliberate on the options given and make an informed decision.

Mr. Muriuki (Wayleave Officer) then informed members that the proposed project seeks to pursue land donation to help reduce the cost of project implementation. The section donated shall be converted to public land for purpose of implementation of the project. He informed members that despite the changes, it is also important to seek consent from the community before implementing any project on their land. He informed members that the land is voluntarily donated and there shall be no compensation made to that effect. This is because, the electrification project is highly subsidized for the benefit of the community. He also informed members that for purposes of connectivity they shall be required to allow for use of plot boundaries as way leaves and road reserves shall also be largely used as way leaves to allow for location of poles and stringing of conductors.

The community members requested Kenya Power to consider using concrete poles for durability as there are lots of termites in the area thus wooden poles would be susceptible to fast degradation.

Mr. Wida-Kenya Power County Business Manager for Samburu also informed members that once the project construction phase is completed, his office shall ensure connection of all customers who shall apply for supply. He also informed members that his office shall ensure continuous availability of stable power supply to customers.

Benefits of the Project

Mr Koech informed members that even though power shall contribute to positive economic changes in the area, members have to be educated appropriately to ensure positive interaction with power for their safety, the safety of infrastructure and that of their properties. It is therefore important to educate members about the pros and cons of the proposed project. Mr. Koech sensitized members on public electrical safety and social welfare. He informed members

that there shall be: Non skilled and semi-skilled job opportunities for local communities during construction phase and operation phase; improved healthcare services; improved communication services, affordable and clean energy; improved communication services as the community members shall be able to charge their phones, improved livelihood as there shall be more disposable income, business opportunities and improved security among others.

Minute 3/KOSAP/2020: Negative impacts of the project

Projects also have negative impacts. The proposed solar Mini-grid will have the following negative impacts and they I will present them alongside their mitigation measures.

Table : Impact mitigation measures

	Negative impact	**Mitigation measures by contractor**
1	Vegetation clearance of the site identified.	• Clear only the areas that are needed to put up the mini-grid • After construction, do landscaping with grass to areas that have no electrical installation as opposed to living areas bare
2	Air pollution dust from construction activities	• Fence off construction site to reduce dust going to the public • Use of masks for workers
3	Air pollution dust from construction vehicles	• Limit vehicle speed to minimum possible when passing residential areas
4	Air pollution from vehicle emissions	• Maintain vehicles/service vehicles • No idling of vehicles
5	Solid waste	• Clear all solid waste and dispose appropriately
6	Land acquisition/take As you had been briefed before the site identified should; -must not result in displacement of community members - We must avoid land that is currently settled or which has squatters. -There will be an impact of forgoing the current land uses if any or future land uses for the sake of the project.	▪ REREC should ensure that all land acquisition procedures are documented and align to the RPF developed under this project. REREC to disclose to communities their rights and entitlements to compensation, to enable them choose their most preferred compensation options.
7	Occupation safety and health hazards e.g. accidents, fall from heights, pricks by sharp objects	▪ Use of proper personal protective equipment like gloves, overalls, helmet, safety shoes ▪ Allocating work according to skills ▪ Toolbox talks to workers to identify hazards and risky activities
8	Labor influx. The nature of the project will require technical skills that are not all available in this community. This will require movement of construction workers (labour influx) into this community. There are some risks that	▪ We shall establishment and operationalize an effective Grievance Redress Mechanism accessible to community members ▪ Reduction of labor influx by tapping into the local workforce

	are involved with labor influx and we need to mitigate them as follows to avoid negative impacts on our community.	
9	Risk of social conflict due to competition for resources and opportunities	▪ Awareness-raising among local community and workers on the need to have a good /cordial working relation ▪ Consultations with and involvement of local communities in project planning ▪ Provision of cultural sensitization awareness for workers regarding engagement with local community. ▪ Recruitment of local workforce to the extent possible especially unskilled and semi-skilled jobs ▪ Contactor shall make provision to provide resources needed by the workers if the need for such resources may result to competition e.g. water ▪ Working closely between contractor and the project grievance redress committee to address complains on time.
10	Increased or illicit behavior and crime (including prostitution, theft and substance abuse)	▪ Sensitization campaigns both for workers and local communities against such social evils ▪ Enforcement of sanctions (e.g., dismissal) for workers involved in criminal activities
11	Communicable diseases (including STDs and HIV/AIDS)	▪ Education/awareness about transmission of diseases ▪ Information campaigns on STDs among the workers and local community on ethics, morals, general good behavior and the need for the project to co-exist with the neighbours during the community and worker engagement forums. ▪ Provide condoms to employees
12	Gender-based violence including sexual harassment and exploitation, child abuse	▪ Information and awareness raising campaigns to you community members and specifically women and girls. ▪ Mandatory awareness creation for workers on required lawful conduct in the community and legal consequences for failure to comply with laws ▪ Report all complaints on gender-based violence or harassment through the GRM and also directly through CREO ▪ Working closely and Instruction of local law enforcement to act on community complaints on time ▪ Inclusion of GBV specific mitigation measures in the environmental and social management plan of contractor ▪ Requirement of contractor to have code of conduct

		for the workers and to implement them
13	Child labour	• Ensuring that children and minors are not employed directly or indirectly on the project. • Enforcement of Employment Act that requires contractor to adhere to minimum age • Allowing your children to be employed is illegal and punishable by law because it interferes with the children's right to education • Report any case to the chief's office
14	Demand for Material/resources e.g water	Contractor to consult with elders before using the water resources in the community to avoid conflicts.
15	*Oil Spill Hazards*	• Contractor not to repair vehicles or equipment on site • Maintain vehicles and equipment in good state
16	*Storm water and erosion*	• Contractor to put measures to harvest rainwater and control erosion during construction
17	*Wastewater/ effluent*	Contractor will provide sanitation facilities for workers
18	*Noise resulting from excavation machinery, vehicles and workers*	c) Contractor to work only during the day d) In case of blasting contractor to give notice to community through the village elders and chiefs office
19	Visual and Aesthetic Landscape Impacts	c) The visual negative impacts can be mitigated through putting up a wall round the facility to keep off/screen the project stacks, poles, cables, panels and transformers by the contractor. d) Proper siting decisions can help to avoid aesthetic impacts to the landscape.
20	Hazardous materials from damaged Panels- Photovoltaic panels may contain hazardous materials, and although they are sealed under normal operating conditions, there is the potential for environmental contamination if they were damaged or improperly disposed upon decommissioning.	▪ Proper planning and good maintenance practices can be used to minimize impacts from hazardous materials. ▪ Proper disposal of used or Damage solar batteries and panels using NEMA registered disposers for such wastes
21	Fuel storage on site	Contractor will undertake proper installation of the fuel storage tanks and dispensing system like having a budded wall 1.5 times the fuel storage tank. During operation implementing agency will ensure proper maintenance of the solar plank
22	Public safety –potential risk of shocks and electrocution	Proper wiring at houses and premises by a qualified technician

Public safety in regards to electricity

Koech educated the community by highlighting the importance of using electricity safely. He said electricity is good but failure to take the precautions while interacting with it can result in electric shocks, fires and even electrocution/death. He emphasized the following

precaution/preventive measures to observe in order to prevent risk of electric shocks, fires and electrocutions.

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

Minute 4/KOSAP/2020: Land requirements for the project

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

Jediel explained to the public forum that the proposed project will require an average of 2 acres of land. He asked them the nature of ownership of the land in the area and they answered that the ownership is communal where by the community has one title deed but no individual title deeds. They also noted that the land is not formally sub divided (implying not adjudicated). He explained to them that based on the ownership of land they had explained, their land falls under the category of community land and its use and management is governed by the Community Land Act 2016.

He educated the community on the following issues;

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

- The community/beneficiaries of the project will pay Ksh 1000 for connection and also pay for consumption of power to KPLC

He noted that the government of Kenya had secured a loan from its development partners i.e. World Bank to implement the KOSAP project. The government through the Ministry of Energy proposes to use World Bank guidelines on voluntary land donation for the project.

He informed them that for voluntary land donation, there is a criterion which need be fulfilled to allow for voluntary donation to be acceptable. He explained the criteria as follows;

- The infrastructure must not be site specific.
- The impacts must be minor, that is, involve no more than 10 percent of the area of any holding and require no physical relocation.
- The land required to meet technical project criteria must be identified by the affected community, not by line agencies or project authorities (nonetheless, technical authorities can help ensure that the land is appropriate for project purposes and that the project will produce no health or environmental safety hazards).
- The land in question must be free of squatters, encroachers, or other claims or encumbrances.
- Verification (for example, notarized or witnessed statements) of the voluntary nature of land donations must be obtained from *each* person donating land.
- If any loss of income or physical displacement is envisaged, verification of voluntary acceptance of community-devised mitigatory measures must be obtained from those expected to be adversely affected.
- If community services are to be provided under the project, land title must be vested in the community, or appropriate guarantees of public access to services must be given by the private titleholder. KOSAP project proposes to have the land donated to be registered under one of the implementing agencies of the project i.e. KPLC but be assured that public access to services is guaranteed to the community members.
- We need to set up a Grievance mechanisms to help in addressing any issues/grievances that may arise in the course of the project implementation.

He noted that the team had visited the first site identified by the community and the project team had felt it was far away from the project beneficiaries. He then invited the chief to explain to the people the second site that the community elders had identified for donation to the project. The chief gave a description of the second site which the elders had identified, and the community agreed to have the Mini-grid set there.

Jediel asked the community to confirm that the land is communally owned and whether they were willing to donate land for the Mini-grid. The community members unanimously confirmed that the land belongs to the community and agreed to voluntarily donate the land for the solar Mini-grid.

Survey of the land and request for advance possession.

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

Korir told the community that connection of power will involve passing of electrical lines along the roads in order to reach their houses, business premises and public facilities and the route for passing the lines is called way leave. He noted that once the designs are done, the community will be notified of the exact routes during future consultations and that they will be required to give way leave consent (allowing the service lines to pass through their land in the extreme cases). He noted that the project will not compensate for way leaves due to budget constraints so that they can make an informed decision when the time comes.

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

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

Minute 5/KOSAP/2020: Grievance Redress Mechanism

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

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

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

Project Committee Members/grievance redress committee.

S/No	Name	Village	Identification No.	Telephone No.	Category
1	Lesimalele john	Jangwa	24605582	0716321723	Elder
	Denis lesokoyo		4208208	0714879068	Women
2	Lparanda lerantileni	Nairobi Luiz	4202875	0706843154	Elder
	Naaramat Lepile		23010898	0704279948	Women
3	Steri lempi sikishoi	Karolwanga	23009952	0700270314	Elder
	Rachaela lengong'oliani		24389990	0704281847	Women
4	Lelampon leriano	Neriwe			
5	Kujam Lemiraa	Lauragi	11456436	0725574410	
	Nachomin leisiano		30519269	0741287257	Women
6	Soita Lepadaasa	Mara Mpere	11456405	0758406095	
7	Saikwa Lesaana	Lbukoi		0706015790	
8	John Lemeede	Town Centre	8733118	0727518914	
9	Estina Lerriano		31978178	0740965566	Youth
10	Lengaur Style		29961362	0727571583	Youth

Table GRM – Committee

Plenary session

Koech explained to the community that community engagement and consultations will continue even in future during preparatory phases and also during operation phase. He then summarized the agenda of the meeting and the proceedings and invited the community members to a plenary session to ask questions and or make any comments. The plenary took the form of questions and answers as presented below.

Question and answers

Name of Person making the contribution (e.g. comment or question)	Question, Comment, Suggestion	Feedback/Responses by project team
Lengaur Style	Is there employment for the youth	Employment will be given to the community and the youth will benefit since first priority will be given to the community. The jobs will be in form of skilled and unskilled jobs - **Koech**
John Lemende	Kindly explain the land needed in terms of acres and how it's should be to the community	The land needed for the project is approximately 2-5 acres. It's should not be far from the community since it should allow the connectivity radius of 3km – **Jediel**
Epili	Since most of the houses are manyattaa , are we legible for the connection	Connection will be done to all house so long as the owner of the house follow the lay down procedure to reduce risk that can be caused by the power

Focus Group Discussion with the women

A focus group discussion was held with the women. The main objective of this discussion was to assess whether the women had understood the project and its requirements and to provide them an opportunity to air their issues/give their opinions on the project. Dorothy gave a summary of the project and its requirements again just to keep them abreast of the issues discussed in the public forum. She then asked the women whether they agree to the donation of community land to the project. The women said they support the donation of land for the project.

Focus group discussion with the youth

A separate discussion with the youth was also held. In this discussion Samwel gave a summary of the project and outlined the requirements for land donation. He asked the youth to feel free to air their opinions on the project. The youth said they support the project. He also asked them whether they agree to the donation of land for the project and they said they support the land donation for the project.

1.3 Vulnerable and Marginalized Groups

The social screening involved identification of vulnerable groups in the project area. The main tribe in Samburu County is the Samburu and few Turkana. The community according to the O.P 4.10 on indigenous and the vulnerable and marginalized groups under Kenya law are recognized as indigenous/vulnerable groups. The main concern would be to identify the vulnerable households within the community based on the following criteria; poor female

headed households, orphaned headed households, heads of households with special needs such as disabilities, the very old and very poor households.

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

1.4 Grievance Redress Mechanism

A grievances redress mechanism (GRM) will be put in place and operationalized to provide a forum and opportunity for the community to lodge complaints or concerns at the earliest time possible and with no cost. During the meeting, Koech explained that the community is allowed to raise any complain or request information in regarding the project. The first point of getting information or raise complain will be the project committee which will act as the grievance redress committee. The community chose the project committee and training of the committee is important to enable operationalize the GRM. The project will have a three-tier grievance redress mechanism as follows.

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

APPENDIX 7 – NEMA PRACTISING CERTIFICATES

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/18263

Application Reference No: NEMA/EIA/EL/23929

M/S **Norken International Limited**
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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

nema
mazingira yetu | uhai wetu | wajibu wetu

(r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

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

License No : NEMA/EIA/ERPL/18279

Application Reference No: NEMA/EIA/EL/23951

M/S **Isaiah Kegora**
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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