RURAL ELECTRIFICATION AND RENEWABLE ENERGY CORPORATION

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BIDDING DOCUMENTS

For Supply, Installation and Maintenance of Solar Mini-Grid - Kenya Off-Grid Solar Access Project

Environmental, Social, Health and Safety Management Plan

Project: Kenya Off-grid Solar Access Project (KOSAP)
Purchaser: Rural Electrification and Renewable Energy Corporation (REREC).

ENVIRONMENT, SOCIAL, HEALTH AND SAFETY MANAGEMENT PLAN FOR PROPOSED SOLAR MINI-GRID FOR MINI-GRIDS - KENYA OFF-GRID SOLAR ACCESS PROJECT

Contents

List of Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
EA	Environmental Assessment
EIA	Environmental Impact Assessment
ESIA	Environmental & Social Impact Assessment
EMCA	Environmental Management Act – 1999
ESHS	Environmental, Social, Health & Safety
ESHSMP	Environmental, Social, Health & Safety Management Plan
ESHSMMP	Environmental, Social, Health & Safety Management Monitoring Plan
GBV	Gender Based Violence
GRM	Grievance Redress Mechanism
K-OSAP	Kenya Off Grid Solar Access Project
HIV	Human Immunodeficiency Virus
IDA	International Development Association
EIA	Environmental and Social Impact Assessment
IP	Indigenous People
KP	Kenya Power
Kshs.	Kenya Shilling
L.N.	Legal Notice
MoE	Ministry of Energy
NEC	National Environment Council
NEMA	National Environment Management Authority
PIU	Project Implementation Unit
PLWD	People Living With Disability
PV	Photo-Voltaic
OP	Operational Procedure
OS	Operational Safeguards
REREC	Rural Electrification Renewable Energy Corporation
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
SHE	Safety, Health & Environment
WB	World Bank

1. Project Information

Rural Electrification Renewable Energy Corporation (REREC)/Kenya Power through assistance from World Bank (WB) plans to carry out component 1 of the Kenya Off-grid Solar Access Project, which shall be development of Solar Mini grids for Community Facilities, Enterprises, and Households in fourteen (14) Underserved Counties. This component will support electrification of areas where electricity supply through mini-grids represents the least cost option from a country perspective. This will support a regulated provision of electricity services to community facilities in remote areas within underserved counties. The project area will be split into multiple geographic lots based on geographic proximity, to optimize costs of field operations. The proposed project will be having two components in one, that is, a Hybrid Mini-Grids (PV (Photo Voltaic) and Diesel) and construction of Power line reticulation lines.

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 REREC and the Ministry of Energy & Petroleum (MoEP).

The implementing agencies of the project are Rural Electrification and Renewable Energy Corporation. REREC will be responsible for implementation of a total of 31 mini-grid.

Table showing location of Mini-grid project sites per County

Solar Mini-grid project sites per County			
Turkana County-REREC			
Mini Grid Sites	1. Kaikor	2. Kanakurdio	3. Kibish
	4. Kokuro	5. Oropoi	6. Nachukui
	7. Kalokol	8. Lochwangiamatak	9. Lomunyenakwan
	10. Lorengippi	11. Namukuse	12. Naposimoru
Isiolo County-REREC			
Mini Grid Sites	1. Eras Ha Boru	2. Garfasa	3. Malkadaka
	4. Bassa	5. Kipsing	
Marsabit County-REREC			
Mini Grid Sites	1. Dirdima	2. El-bor	3. Kargi
	4. Bori	5. Forolle	6. El Gadhe
	7. Bubisa	8. Gatab	9. Gas
	10. South Horr		
Samburu County-REREC			

Mini Grid Sites	1. Barsaloi	2. Tuum	3. Sereolipi
	4. Latakweny		

2. Environmental, Social, Health and Safety Management Plan

Environmental, Social, Health and Safety Management Plan (ESHSMP) for this project provides a logical framework within which negative environmental and socio–economic impacts shall be identified, mitigated, and monitored. In addition, the ESHSMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring shall be done. This amalgamated ESHSMP is specifically applicable to the proposed Solar Mini grids for Community Facilities, Enterprises, and Households under component 1.

The ESHSMP provides for environmental, social, health and safety aspects that shall affect the entire project. The ESHSMP is hybrid developed from amalgamating different ESIA reports ESHSMPs to ensure it captures all key environmental and social aspects in different environmental and social set ups. This is to ensure the contractors are appropriately informed of control measures in place during implementation of the project. Each site of the 142 Proposed mini grid will have its own site specific ESHSMP extracted and given to the contractor during project implementation. The contractor shall then develop a construction ESHSMP (CESHSMP) prior construction begins.

The ESHSMP covers information on the management and/or mitigation measures that shall be taken into consideration to address impacts with respect to the following project phases: design (Pre-construction), construction, operation, and decommissioning. It will be of critical importance during the implementation of the proposed project whose funding is expected from development partners to maintain the highest level of coordination from the different departments concerned. The Safety, Health and Environment safeguard representative from the contractor shall thereafter develop a site-specific Construction Environmental, Social, Health and Safety Management Plan (CESHSMP) that shall be implemented and monitored to ensure compliance with relevant legal framework in Kenya and international standards especially the World Bank safeguard policies.

3. Objectives for the ESHSMP

The main aim of the ESHSMP is to ensure that the project complies with applicable national environmental, social, health and safety legal requirements and the development partners especially the (WB) environmental and social safeguard policies. Further, the ESHSMP aims at identifying the program's potential environmental, socio-economic, and public safety benefits of the project as well as identify the potential negative environmental, socio-economic, health and safety impacts. To mitigate the negative impacts and enhance projects benefits the

ESHSMP describes measures that will be taken to prevent, minimize, mitigate and or compensate for adverse environmental and social impacts.

4. Legal and Regulatory Framework

Kenya has over 77statutes, which relate to environmental concerns. Most of these statutes are sector specific, covering issues such as land use, occupational health and safety, water quality, wildlife, public health, soil erosion, air quality etc. Previously, environmental management activities were implemented through a variety of instruments such as policy statements, permits and licenses and sectorial laws.

There was however need for stronger enforcement machinery to achieve better standards in environmental management. The enactment of the EMCA 1999 (Amended, 2015) provided for the establishment of an appropriate legal and institutional framework for the management and protection of the environment. Laws of particular concern in this project are:
Most of environmental management statutes are sector specific, covering issues such as public health, soil conservation, protected areas conservation and management, endangered species, public participation, water rights, water quality, air quality, excessive noise control, vibration control, land use among other issues. The regulatory framework directly governing the proposed mini-grids project include:

1. The Energy Act, 2019 and its supplementary regulations including:
    - The Energy (Energy Management) Regulations, 2012, and
    - The Energy (Solar Water Heating) Regulations, 2012.
2. The Environmental Management and Coordination Act (EMCA) 1999 and its 2015 amendment and its supplementary regulations including:
    - Environmental (Impact Assessment and Audit) Regulation, 2003,
    - EMCA (Waste Management) Regulations, 2006,
    - EMCA (Water Quality) Regulations, 2006,
    - EMCA (Air Quality) Regulations, 2016,
    - EMCA (Fossil Fuel Emission Control) Regulations, 2006,
    - EMCA (Noise and Excessive Vibrations Pollution Control) Regulations,2009,
    - EMCA (Emissions Control) Regulations,2006,
    - EMCA (Wetlands, Riverbanks, Lake Shores and Sea Shore Management) Regulations, 2009,
    - EMCA (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations,2006
3. The Water Act 2016 and its supplementary regulations, including:
    - Water Resources Management Rules, 2007.

4. The Lands Act, 2012;
5. The Urban Cities Act No. 13 of 2011;
6. The HIV/ AIDS Prevention and Control Act, 2006;
7. The Occupational Safety and Health Act, 2007 and its supplementary regulations and rules, including:
    - Factories (First Aid) Order 1963,
    - Factories (General Register) Order 1951,
    - Factories and other places of Work (Safety and health committees) Rules 2004,
    - Factories and other places of Work (Medical Examination) Rules 2005,
    - Factories and other places of Work (Noise Prevention and Control) Rules 2005,
    - Factories and other places of Work (Fire Risk Reduction) Rules 2007,
    - Factories and other places of Work (Hazardous Substances) Rules 2007.
8. The Work Injury Benefits Act (WIBA) of 2007.
9. The Public Health Act (Cap 242);
10. The County Government Act 2012.
11. The Physical Planning Act (Cap 286);
12. The Urban and Cities Act No. 13 of 2011.
13. The Climate Change Act of 2016;
14. The Wildlife Conservation and Management Act 2013.
15. The National Construction Authority (NCA) Act of 2011.
16. The Building Code By-Laws; and
17. The Traffic Act Cap 403 of 2009.

5. Main Environmental, Social, Health and Safety Impacts

1. Impacts during decommissioning phase.

The main activities considered under this Environmental, Social, Health and Safety Management Plan are:

Pre – construction phase includes.

a) Engaging project-affected persons including, Vulnerable and Marginalized Groups (VMGs) and vulnerable individuals and households (minority clans, PWDs, the elderly etc.).
b) Sensitizing the community on land acquisition for; acquiring land for generation assets and wayleaves, contractor facilities and workers camps.

c) Creating awareness to project-affected persons on environmental and pertinent social issues including HIV/AIDs, GBV-SEA-SH, the project grievances mechanism including the World Bank mechanisms such as the Grievances Redress Service and Inspection Panel.
d) Disclosing summaries of project instruments and plans to project-affected persons, including RPF, VMGF, ESMF, land acquisition strategy, SEP, GRM, SA, ESIA and VMGP in culturally appropriate languages, using feasible techniques, in accessible locations and in a timely manner to enable meaningful consultations on the instruments and plans.

- **Construction phase**: Site installation, topographic survey, layering, beaconing, and clearing of proposed installation sites, foundation excavation, concreting, transport of equipment and materials, installation of solar panels systems and commissioning activity.
- **Operating phase**: Solar system operation and maintenance.
- **Decommissioning phase**: Decommissioning activities and disposal of wastes from decommissioned materials.

Negative Impacts during Pre-construction Phase

Land Take – will result to land acquisition for the implementation of the project.

- No physical displacement will take place. E.g., No residential houses or businesses premises will be relocated.
- No economic displacement is anticipated.

5.1 Positive impacts

5 .1.1 Positive Impacts during Construction Phase

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

a) **Recruitment of local labour for unskilled and semi-skilled** works required during project construction and such shall include, digging of holes during excavations where panels will be ground mounted and manual lifting where necessary.
b) **Development of small businesses**-due to population influx caused by project workers who shall be involved in buying of goods and services

5.1.2 Negative Impacts during Construction Phase

Despite positive impacts associated with the project, there are some anticipated negative impacts as indicated below:

a) **Soil Erosion**-Associated with vegetation clearance and ground breaking where there shall be ground mounted panels. This will be due to surface runoff or blowing away of top soils by wind where excavated areas are not properly managed
b) **Noise and Vibrations**-Though temporary; noise emanating from excavation works and concrete mixing, where panels shall be ground mounted, welding and vehicles accessing the site will be a nuisance
c) **Vegetation Clearance and Biodiversity loss-** Loss of vegetation will occur during site clearance and excavation activities as well as during line construction where wayleaves will have be cleared of trees.
d) **Dust Emissions**- especially from excavations (when panels are ground mounted) and transportation of materials during dry weather
e) **Occupational Accidents and Workplace Hazards**- These result from non-routine hazardous activities being undertaken during construction phase such as working at height, welding and wiring among others.
f) **Energy consumptions**- The construction works will consume fossil fuels (mainly diesel) to run transport vehicles and construction machinery. Fossil energy is non-renewable and its excessive use may have serious environmental implications
g) **Fire Outbreaks**- During construction of the project, fire hazards could occur especially during activities such as welding.
h) **Increased water consumption**-During the construction of the project there will be increased demand for water by the construction workers and the construction works (where panels shall be ground mounted). Water will be mostly used in the construction works and for wetting surfaces. It will also be used by the construction workers for domestic use and consumption
i) **Health**- Risk of accidents and incidents are likely during construction activities. As already noted during construction, the safety and health of employees may be exposed to risk as a result of the use of tools and other machinery used during construction. Occupation safety and health risks includes accidents, fall from heights, pricks by sharp objects etc.
j) **Solid and E-waste generation**- Solid waste is anticipated to be produced during site preparation, civil works, spoil from excavations-where ground mounting shall be done and will include; pieces of metal, waste paper wrappings, conductor off cuts, broken panels, empty chemical containers and left over food stuffs
k) **Gender-Based Violence** Gender-based violence (GBV) is an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially ascribed (i.e., gender) differences between males and females. It includes acts that inflict physical, sexual, or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. GBV in project may manifest in forms of sexual

exploitation and abuse and workplace sexual harassment. The influx of workers in the project area may lead to the Sexual Exploitation and Abuse of community members by project workers and Sexual Harassment among project workers. These are the two forms of GBV identified and seeks to manage within the project.

l) **Population influx-** With an increase in population of the area the social set up may be affected resulting different negative social impacts such as competition for resources, and crime and Gender Based Violence (Sexual Exploitation and Abuse of community members by workers, and Sexual Harassment amongst project workers).

m) Exclusion of VMGs from the project engagement process, and access to culturally appropriate benefits and opportunities.

n) Lack of targeted interventions to ensure that vulnerable individuals and households effectively benefit from project-targeted interventions.

o) **Working at Height**-installation of distribution power line conductors on top of poles shall require working at height mostly above the recommended 3 feet thus extra precautionary measures must be put in place such as use of appropriate safety harnesses while working at height to ensure safety of persons working at height.

p) **Child labour –** this may result from engaging underage children in construction activities against the law and the required standards

q) **Forced labor**-use of forced labor at the construction site as well as by factories or distributors/suppliers of solar panels and other solar PV equipment required for the mini -grid projects.

r) **Gender Inequality Impacts:** The risk of limiting women access to project benefits such as jobs, by giving preference to men, as construction may be considered a male industry.

s) **Other forms of Gender based violence (GBV) at the community level:** The project may trigger or exacerbate other forms of GBV at the community level through its project activities.

5.2.1 Positive Impacts during Operating Phase

The positive impacts anticipated during project operation are as discussed:

a) Strengthening service provision in community facilities such as schools, health facilities and government offices

b) Improving access to electricity in Underserved Counties

c) Increase security within served community facilities and their environs

5.2.1 Negative Impacts during Operation Phase

While the project shall be of benefit to the target customers, there are a few negative impacts associated with its operation phase and these include:

a) **Generation of solid and E-wastes**- The proposed Mini-grid is expected to generate some amounts of solid waste during its operation phase. The type of the solid waste generated during the operation of the project will consist of paper, cables, meters, panels.
b) **Electrical fires**- Interference with power connection or erosion of battery terminals could be the leading causes of electrical fires during operational phase
c) Falls from Height-Arise from maintenance activities undertaken on electrical wiring within community facilities and regular cleaning and maintenance of solar power system
d) **Visual intrusion**-Once complete the Mini-grid will present visual impacts, both by its physical presence and by visual impacts of its associated structures. Visual intrusion caused by the Mini-grid may cause alteration to the natural scenery of the project area
e) **Gender Based Violence (SEA/SH)** - This is linked to the fact that some contractor workers will remain in the community for purposes of operating and maintaining the mini-grid. The risk of Sexual Exploitation and Abuse of community members by project workers and Sexual Harassment among workers is anticipated.
f) **Electrical burns and shocks and Electrocution-** electrical accidents are likely to occur during operation of the mini grid due to poor wiring, fallen electrical power lines or vandalism.
g) **Generation of Liquid waste**- the liquid waste will include those from sanitary facilities as well as used oil from generators.

5 .3.1 Positive Impacts during Decommissioning Phase

Positive impacts associated with decommissioning phase are as below:

a) **Employment opportunities for local community**-where locals shall be engaged in non-skilled and semi-skilled works
b) **Site Rehabilitation**-it will include replacement of top soil and re-vegetation which shall improve the visual and aesthetic state of the site
c) **Development of small businesses**-due to the engagement of locals who shall be involved in buying of goods and services

5.3.2 Negative Impacts during Decommissioning

Negative impacts anticipated during decommissioning phase include:

a) **Dust Emission-** Some dust will be generated during demolition works. This will affect demolition staff as well as the persons within the site-where solar panels are ground mounted
b) **Noise** -The demolition works will lead to significant deterioration of the acoustic environment within the project site and the surrounding areas. This will be as a result of the noise from demolition works.
c) **Generation of solid and E-waste**-Demolition of the Mini-grid and related infrastructure will result in generation of solid and other electrical waste. The waste will contain the materials used in construction including concrete, metal, wood, electric cables, solar panels and batteries. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment
d) **Gender Based Violence (SEA/SH)** - This is caused by the influx of workers in the project area, which may lead to the Sexual Exploitation and Abuse of community members by project workers and Sexual Harassment among project workers.

5.4 Negative Impacts on Environment, Social, health and safety.

a) **Inconveniences caused by noise**- noise shall result from construction activities, and though temporary shall be a nuisance to those within the community facilities and their environs.
b) **Soil erosion**-Associated with vegetation clearance and ground breaking where there shall be ground mounted panels. This will be due to surface runoff or blowing away of top soils by wind where excavated areas are not properly manage
c) **Occupational Accidents** – they occur in construction sites especially when access to work sites are not monitored, during machine use and when works are carried out under influence among others.
d) **Weakening of Social Capital**-Resulting from sharing community common resources such as water points with contractors. These common resources in normal circumstances act as community meeting points for decision making and deliberations of community matters thus use by non-community members shall interfere with community norms while at common resource sites.

6.0 Approach to Environmental Social, Health and Safety Impact Management

The proposed ESHSMP will be the responsibility of the REREC. This ESHSMP will inform the contractor in preparing and implementing the construction ESHSMP (C-ESHSMP). The section below presents the range of approaches that will be used to manage potential impacts of the proposed project. REREC as the proponents will have to constitute a team including project engineer, environmental and social specialist to coordinate implementation of the ESHSMP. The contractor on his part will have to appoint EHS officer and Social specialist to coordinate ESHSMP implementation during construction period. During construction PIU will ensure continuous supervision and monitoring of activities by the contractor as per recommendations in the ESHSMP. E&S reporting will be done on regular basis and captured in the construction site log, periodical Environmental &Social reviews with the Engineer, E&S monthly or quarterly reports. The PIU will be required to generate various reports including production of minutes of site visits and quarterly supervision reports.

To be generated on a monthly basis include Project Implementation Progress report, Environmental Monitoring reports, Social monitoring reports covering GBV, GRM, Labour related etc, Occupational Health and Public Safety reports, Accidents, near misses etc reports.

6.1 Responsibilities and Institutional Arrangements

There will be a capacity needs assessment undertaken to identify the strengths, weaknesses, opportunities and threats to REREC Training tools and programs will be customized to match the capacity needs identified. Capacity building will be through training and participation in the project implementation process. There will also be sessions for technology transfer to the REREC/ Kenya Power members of staff who will be charged with the responsibility of implementing future solar power projects.

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

6.1.1. Ministry of Energy

The MoE will provide overall coordination and oversight of the project including ESHSMP. 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.

6.1.2 KOSAP Project Implementation Unit (PIU)

The Project Implementation Unit (PIU) will guide implementation of the project. The PIU shall supervise the pre-construction, construction, operation and decommissioning phases of the

proposed Solar Mini-grid project for Community Facilities, Enterprises, and Households and associated power distribution lines. In the PIU Environmental, Social and 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.

6.1.3 REREC

It will be the duty of REREC to ensure that all legal requirements as pertaining to the development are met as specified by the law, including World Bank Safeguards and specifically OP4.01 (Environmental Assessment).

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

- 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 ESHSMP implementation
- Ensuring the project is on course in terms of timelines
- The REREC shall hand over the site to the contractor for implementation of the project after the social and environmental mitigation measures that are the responsibility of the REREC has been completed.
- The REREC will ensure that the ESIA is submitted to NEMA and a license is obtained.
- Monitoring of the technical aspects will also be done by the REREC appointed Project Engineer while monitoring of the ESHSMP will be done by the QRM department

6.1.4 County Governments

The County government is a key stakeholder. The roles of the county government includes giving relevant approvals needed, assisting in solving grievances that cannot be sorted at project level, monitoring progress of the ESHSMP project implementation among others.

6.1.5 National Environment Management Authority (NEMA)

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

6.1.6 Supervision Consultant

The consultant must appoint an ESHS officer who will be reporting on the ESHSMP implementation on Monthly basis

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.

6.1.7 Contractor

- Implement all the conditional approval conditions provided in the EIA License
- Implementation of the contractor related aspects of the ESHSMP and regularly reporting back to the Project REREC.
- 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.
- Ensure that the project has children protection champions.
- The REREC shall define the area of the site, which may be occupied by the contractor for use as storage, on the site
- The contractor shall refer to ESIA recommendation and ESHSMP while preparing CESHSMP
- 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 workmen.
- 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 in the first instance.
- 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 wheeled traffic and pedestrian.
- All work operations which may generate noise, dust, vibrations, or any other discomfort to the workers and/or guest of the client and the neighbors 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 REREC. He shall also remove from the site all rubbish and dirt as it is produced to maintain the tidiness of the premises and its immediate environs.
- No shrubs, trees, bushes or underground thicket shall be removed except with the express approval of the REREC.
- No blasting shall be permitted without the prior approval of the REREC and the local authorities.
- Borrow pits will only be allowed to be opened up on receipt of permission from the
- 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 according to the agreement with the local government.
- The contractor on his part will have to appoint EHS officer to coordinate ESHSMP implementation during construction period.
- The contractor on his part will have to appoint Social specialist and community liaison officer to coordinate social aspects of the ESHSMP implementation during construction period.
- Reporting on the ESHSMP will be done on regular basis and will be captured in the construction site log, periodical E&S reviews with the Engineer
- The contractor EHS officer will report on ESHSMP 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, high 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 and audits by contractor, engineer, or others, including authorities.

6.2 Environmental, Social, Health and Safety Monitoring Plan

Monitoring aims to ensure that mitigation and enhancement measures are implemented to feed into the normal project reporting and evaluation, which determines the success, failure and lessons learnt. This shall be done regularly after development of site specific ESHSMP to

ensure compliance with environmental standards and procedures including relevant Kenyan policies and legislations. The Kenya Power and REREC safeguards team will be responsible for the overall monitoring of the implementation of site specific ESHSMP. The contractor(s) shall be accountable for the implementation of the mitigation measures to the PIU during the construction and initial operation phases. The cost of implementing the various mitigation measures described in the ESHSMP to ensure that Environmental and Social risks are managed effectively shall be included in the overall budget of the contract between Kenya Power/ REREC and the contractor. It will be entirely the contractor's responsibility to come up, at the time of preparing its offer, with costing of various mitigation measures to put in place for various impacts highlighted in this ESHSMP. It is also expected that the contractor must have designated trained personnel to monitor Environmental, Safety and Health matters during construction works, and report regularly to PIU. The contractor's personnel on Environmental, Safety, Social and Health matters should be part of the project to provide advice on the implementation and monitoring of environmental and social measures and will be responsible for supervising and reviewing the works as regards environmental and social requirements, safety, and quality assurance systems and plan the supervision functions to ensure that works are implemented while protecting the social and environment aspects.

TABLE 1: ENVIRONMENTAL, SOCIAL, HEALTH AND SAFETY MANAGEMENT PLAN FOR PROPOSED MINI-GRIDS

(*Generic measures applicable to the whole project- Each of 31 sites will its ESHSMP given to the contractor During Implementation)

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
Local employment	-Prioritize hire of locals for all unskilled labor. -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 labor management practices (timely renumeration, equitable compensation for both genders for equal work etc.) -Create awareness to workers and the community on worker and project grievance redress mechanisms.	Construction Operations Decommissioning	Contractor REREC	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
Local Sourcing	-Source materials from local businesses/communities, and where necessary give opportunities to businesses owned or operated by vulnerable individuals.	Construction Decomissioning		Quarterly
Land acquisition and compensation for land and assets on land	In line with the RPF provisions; -Prepare and implement an **Abbreviated Resettlement Action Plan (A-RAP)** to guide land acquisition for the mini-grid, and wayleaves for power distribution. Further, the KPLC 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.	Pre- Construction	Contractor- *(contractors' facilities, workers camps)* KPLC- *(project land for generation assets)*REREC	-Land Acquisition and consultation report (consultation (minutes and lists of participants). -Type and amount of compensation paid to affected persons. - Priority community project

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	-Compensate affected communities in-kind (priority project) for the loss of land. -The construction activities will be restricted to within the allocated land and the immediate surroundings only. -After construction work, any land taken for a temporary basis for storage of material will be restored to their original form. -Consultations with the community on the low voltage lines. -The design of the distribution line will utilize the existing road reserves. However, any damage to structures, crops, trees, community facilities and other assets will be compensated in line with the RPF provisions.REREC			implemented and handed over to affected communities. -Signed agreements with communities on the use and restoration of their land.
Labor Influx and related impacts (SEA/SH,	-Tap into the local workforce to the extent possible to reduce labor influx. -Recruit local workforce to the	Construction Decomissioning	REREC, Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
HIV/AIDs and other STIs)	extent possible especially for unskilled and semi-skilled jobs. -Consult with and involve local community in project planning and other phases of the project. -Raise awareness among local community and workers on the need to have a good /cordial working relation -Sensitize workers regarding engagement with local community. -Make provision to provide resources needed by the workers if the need for such resources may result to competition e.g., water. -Establish and operationalize an effective Grievance Redress Mechanism accessible to community members. -The contractor and the project/community grievance redress committee to work closely address complains raised on time.			

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	-Include gender considerations in employment opportunities. -Provide appropriate compensation for work done. -Respect for community values/culture. -Prompt payment of workers as per the contractual agreements/terms.			
Child labor	-Employ workers who are 18 years and above, and with a valid national ID at the time of hire. -Implement and monitor the employment register regularly. Compliance with the national labor laws and labour management practices. -Put visible signage on site "**No Jobs for children**" -Do not allow children at the project site.	Construction Decomissioning	Contractor, REREC	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
GBV- SEA and SH	-Prepare an SEA/SH Prevention and Response Action Plan, to manage the SEA/SH risks. -The Action Plan to be proportionate to potential SEA/SH risks, and to include measures such as awareness creation for communities and workers; identification of referral services for survivors and a GRM that ensures confidential reporting of GBV cases. -Implement a code of conduct signed by all those with physical presence on site.	Construction Operations Decomissioning	Contractor REREC	Quarterly
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	Construction Decomissioning	Contractor REREC	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	to show they are adults (above 18 years).			
Risks related to Inadequate stakeholder engagement	-Prepare a stakeholder engagement/consultation plan (SEP) that is proportionate to the subproject and the identified stakeholders. -Timely and prior disclosure of project all project information, including project instruments, the full rights and entitlements of project affected persons, sub-project positive and negative impacts and opportunities, proposed subproject budget. -In line with the SEP, undertake adequate consultations prior to construction and throughout the project cycle with all segments of the community and other relevant stakeholders.	Construction Operations Decomissioning	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	-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.			
Exclusion of VMGs and vulnerable individuals and households	In line with the provisions of the ESMF, VMGF and Social Assessment ensure the following. • Early identification and inclusion of VMGs and disadvantaged groups. • Meaningful consultation to effectively participate in the project. • Timely and prior disclosure of relevant project information to VMGs and disadvantaged groups. • Adequate and ongoing consultations with VMGs	Pre-construction Construction Operations Decomissioning	Contractor REREC	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	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.			
Inaccessibility of project benefits to VMGs and other vulnerable individuals due to affordability challenges	-Consult VMGs and Vulnerable individuals and households on charges for sub project services and put in place specific interventions to ensure the vulnerable equally access project benefits.	Operations	REREC	Quarterly
Inadequate grievances management	-Constitute a Local Grievances Committee is in consultation with all community segments and incorporates the existing local dispute resolution mechanism.	Construction Operations Decomissioning	Contractor REREC	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	-Implement a workers grievances mechanism. -Awareness on the culturally appropriate and accessible GRM to all community segments including VMGs, vulnerable individuals and households and CSOs -All reported grievances are logged, dated, processed, resolved and closed out in a timely manner. -Proportionate representation of VMGs and vulnerable individuals in the local grievances committee. -GRM provides for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity.			
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	Operation	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	ensures confidentiality. The plan will include the necessary measures for prevention and response and must ensure survivor-based approach			
Environment, Health and Safety				
Vegetation clearance	1. Clear only the necessary areas 2. Ensure proper demarcation and delineation of the project area to be affected by construction works. 3. Specify locations for vehicles and equipment, and areas of the site which should be kept free of traffic, equipment, and storage. 4. Designate access routes and parking areas **5.** Re-vegetation including planting of trees around the plant/facility	Construction	Contractor	Once off

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
Soil erosion	1. Avoid ground-breaking during the seasons of high rainfall to avoid erosion. 2. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled. 3. Construction related impacts like erosion and cut slope destabilizing should be addressed through landscaping and grassing, carting away and proper disposal of construction materials 4. Use silt traps where necessary 5. Cover soil stockpiles 6. Landscaping with grass on areas without electrical installation (lower areas) 7. Monitoring of areas of exposed soil during rainy seasons to ensure that any incidents of erosion are quickly controlled.	Construction	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
Contamination of soil from fossil fuels	1. Ensure wastewater generated is discharged or drained into approved drainage facilities 2. Construction vehicles must be maintained in good state and proper servicing to ensure no oils are likely to leak 3. Care must be exercised not to spill any fossil fuels 4. Any contaminated soil shall be scooped and disposed-off appropriately. 5. No servicing vehicles on site	Construction	Contractor	Quarterly
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.	Construction	Contractor	Daily

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	4. Burning of woody debris & construction waste to be prohibited **5.** Use of personnel protective equipment (PPE) -masks should be provided to all personnel in areas prone to dust emissions 6. Restrict speed on loose surface roads during dry or dusty conditions 7. Keep stockpiles and exposed soils compacted and re-vegetate as soon as possible. 8. Construction trucks moving materials to site, delivering sand and cement to the site should be covered to prevent material dust emissions into the surrounding areas 9. Plant short trees to break speed of wind			

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
Vehicle exhaust and emissions from Generator	1. Drivers of construction vehicles must be sensitized so that they do not leave vehicles idling so that exhaust emissions are lowered. 2. Maintain all machinery and equipment in good working order to ensure minimum emissions of carbon monoxide, 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	Construction	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
Solid waste generation	1. Ensure spoil from excavations is arranged according to the various soil layers. This soil can then be returned during landscaping and then rehabilitation, in the correct order which they were removed that is topsoil 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	Construction	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	7. Recovery of materials remains and return to stores 8. Re-use of materials where possible 9. Proper budgeting to avoid waste generation 10. Proper disposal of waste in line with solid waste regulation 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	Construction	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	of the emergency response plan. In the event of an oil spill the procedures contained in the emergency response plan of the contractor will come into effect. 5. No vehicle maintenance and service shall be done at project site 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	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
Impacts from Hazardous materials -	1. Maintenance of construction vehicles will not be done on site 2. All hazardous products and waste should be labelled and handled properly to avoid contact with the ground 3. Dispose hazardous waste through a NEMA approved waste handler	Construction	Contractor	Quarterly
Accidental Oil Spills or Leaks	1. In the event of accidental leaks, contaminated top soil should be scooped and disposed of appropriately. 2. Refuelling 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	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	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	Construction	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	5. A fire risk assessment and evacuation plan should be prepared and must be posted in various points of the construction site including procedures to take when a fire is reported. 6. Designate an assembly point			
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	Quarterly
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	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	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	Quarterly
Occupational Health and safety Impacts	1. Use skilled personnel for activities which demand skills/technical tasks	Construction	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	2. Awareness creation/Toolbox talks on safety to workers while at construction site 3. Workers coming to the site should be knowledgeable on safety precautions to take 4. Appropriate PPE (helmet, safety harness, boots, masks, climbing irons) 5. Proper general house keeping 6. Close supervision of workers 7. Risk assessment by contractor of the construction activities and implement mitigation measures appropriately 8. Adherence to occupational Safety and Health Act 2007 9. Availability of equipped first aid box on site 10. Provide safe drinking water for workers 11. Engagement of trained first aider on site			

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	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	Daily
Public Health Impacts	1. Sensitize workers and the community on prevention and mitigation of HIV/AIDS and other sexually transmitted diseases, through staff training, awareness campaigns and community *Barazas.* 2. Awareness creation and consultations with local communities prior and during construction on the dangers of these diseases	Construction	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	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.			
Sanitary waste	**1.** Construct/ install pit latrines for both genders clearly labelled	Construction	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
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	Quarterly
Liquid Waste/Oils Generation	1. Proper storage of the oil is required to ensure no leakages 2. Frequent inspection and maintenance of the generator to minimize leakages. 3. No vehicles should be serviced or maintained at the Mini-grid area. 4. The waste oil or used oil must be disposed-off appropriately. 5. Proper training for the handling and use of fuels for the operators of the Mini-grid.	Operation	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	6. In the event of accidental leaks, contaminated topsoil should be scooped and disposed of appropriately.			
Increased oil Consumption	1. Efficient energy consumption 2. Install an energy-efficient lighting system	Operation	Contractor	Quarterly
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 rainwater harvesting system on the control buildings/office and harness into storage tanks for use	Operation	Contractor	Quarterly inspections

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
Fire Outbreaks	4. The power plant must contain firefighting equipment (Portable fire extinguishers) of recommended standards and in key strategic points 5. Detection/alarm systems that can detect fire should be and installed 6. A fire evacuation plan should be prepared and posted at strategic points and should include procedures to take when a fire is reported. 7. Workers especially operators of the plant must be trained on fire management 8. 'No smoking' signs shall be posted within the Mini-grid area 9. A fire Assembly point should be identified and marked	Operation	Contractor	Quarterly
Visual Impacts	1. Fence round the solar Mini-grid to keep off/screen the solar panels.	Operation	Contractor	Quarterly inspections

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
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	Quarterly
Sanitary waste	1. Provide sanitary waste facilities for both genders clearly marked 2. Disposal of waste through septic tanks	Operation	Contractor	Quarterly
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	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
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	Quarterly
Hazardous waste-damaged panels	1. Segregation from other waste streams 2. Proper disposal through a NEMA approved/licensed handler	Operation	Contractor	Quarterly
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	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
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 infrastructure e.g., not tying livestock on electric poles, no cutting earth wires that run	Operation	Contractor, Consumer	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	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 3. Maintain records of any person who comes to site	Operation	Contractor	Daily

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
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, REREC	Quarterly
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	Operation	Contractor	

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	2. Provision of condoms to workers 3. Allowing migrant workers time to be with their families			
Public health Impacts -Covid 19 disease	1. Social distance must be observed 2. Provision of hand wash facilities before access 3. Temperature check and monitoring of the temperature of workers and any other person coming to site 4. Enforce wearing of masks 5. Make provision for testing and treating especially of workers 6. Provision of contact numbers for the nearest health facility for testing and treatment 7. Adhering to any other measures from the ministry of health which may be issued from time to time	Operation	Contractor	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
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	Quarterly
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	Quarterly

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
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	Once off
Solid Waste Generation	1. Demolition contractor to adhere to the various manufacturer's guidelines and	Decommissioning	Contractor	Daily

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
	requirements regarding demolition and disposal 2. Segregation of waste in order to separate hazardous waste from non-hazardous waste and other streams of waste 3. Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements 4. Adequate collection and storage of waste on site 5. Safe transportation to the disposal sites / designated area 6. Hazardous waste must be disposed by NEMA approved waste handler			
Dust Emissions	Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard	Decommissioning	Contractor	Daily

Potential Impacts	Recommended Mitigation Measures	Project phase	Responsibility	Frequency
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	Once off

6.3 Implementation Schedule and Reporting

The project Implementing Agencies and the contractor in collaboration with the Ministry of Energy and community members will ensure compliance with the environmental and social monitoring aspects of the project. The Implementing Agencies shall monitor implementation of the mitigation measures. Arrangement for monitoring shall be developed depending on the project implementation duration. Reporting to the Ministry of Energy will be done quarterly by the PIU while the contractor will be submitting monthly report to inform on progress of implementation of ESHSMP. Kenya Power/REREC shall make quarterly site visits to determine the level of implementation on environmental, social, health and safety issues depending on the duration of the construction period.

6.4. Responsibility

The implementing Agencies Engineers shall supervise the pre-construction, construction, operation, and decommissioning phases of the proposed stand-alone solar systems for communities. However, several departments in Kenya Power and REREC shall be involved throughout the project cycle in the implementation of the proposed Mini-grids and services line, and they will be getting instruction from the Project Engineer. The contractor on the other side will be responsible on various issues like acquiring land for their construction and storage materials, if need be, construction of the mini-grid and associated facilities like lines and connection to the customers during the pre-construction and construction phases of this proposed project.

6.5. Monitoring

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

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

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

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

6.6 Plan Monitoring

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

6.6.1 Management Plan during Construction Phase

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

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

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

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

The Environmental and Social Management Monitoring Plan (*ESMMP*) will provide the basis for monitoring of potential Environmental, social and health Impacts associated with the project. The implementation of the Monitoring Plan together with the Environmental

and Social Management Plan will provide a benchmark for future environmental audits. The ESMMP provides effective observation and documentation of monitorable parameters that will help in analyzing the effectiveness of the proposed mitigation measures with the advantages of improving operational efficiency, promoting competitive advantage, improving risk management, reducing liabilities and improving business performance.

6.7. Environmental and Social Monitoring by Contractors

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

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

12. *External stakeholder e.g., community grievances*: grievance and date submitted, action(s) taken and date(s), resolution (if any) and date, and follow-up yet to be taken—grievances listed should include those received since the preceding report and those that were unresolved at the time of that report. Grievance data should be age and gender-disaggregated.
13. Major changes to contractor's environmental and social practices.
14. *Deficiency and performance management*: actions taken in response to previous notices of deficiency or observations regarding E&S performance and/or plans for actions to be taken—these should continue to be reported until REREC determines the issue is resolved satisfactorily.

The environmental and social parameters monitoring techniques for proposed project are summarized in table below.

Potential Environmental /Social impact	**Parameter to be monitored**	**Timing/Phase**	**Frequency**	**Responsibility to monitor**
Noise	Noise levels Records of noise measurements done by contractor within the project area and at nearest facility/residential units from the Solar mini-grid	Construction	Quarterly	REREC
		Operations	Annually	REREC
		Decommissioning	Once off	REREC
Vegetation and Habitat Loss	Number of trees cut. (records from contractor)	Construction	Once off	REREC
	Number of trees planted by contractor	Construction	Quarterly	REREC
	Maintenance (number of trees surviving)	Operations	Annually	REREC
	Rehabilitation (number of trees planted)	Decommissioning	Once off	REREC
Soil erosion	Assess size of rills or Gulleys forming from accelerated run off from compacted areas	Construction	Quarterly	REREC
		Operations	Annually	REREC
		Decommissioning	Once off	REREC

Potential Environmental /Social impact	Parameter to be monitored	Timing/Phase	Frequency	Responsibility to monitor
Water Demand	• Records of amount of water used in litres per month • Records of source of water	Construction	Quarterly	REREC
		Operations	Annually	REREC
		Decommissioning	Once off	REREC
Oil Spills	• Records of any leakages from construction equipment. • Records of all accidental spills and number of litres	Construction	Quarterly	REREC
		Operations	Quarterly	REREC
		Decommissioning	Once off	REREC
Fire hazards	• Number and type of serviced fire-fighting equipment in place • Records of any Fire incidences • Number of trained fire marshal	Construction	Quarterly	REREC
		Operations	Annually	REREC
		Decommissioning	Once off	REREC
Occupational Health and Safety Issues	• Records of incidences i.e near misses, and accidents e.t.c • Records of corrective actions implemented if there was an accident. • Number and records of trainings and tool box talks conducted accompanied by	Construction	Quarterly	REREC
		Operations	Annually	REREC
		Decommissioning	Once off	REREC

Potential Environmental /Social impact	Parameter to be monitored	Timing/Phase	Frequency	Responsibility to monitor
	signed list of attendance • Signages in place.			
Solid waste management	• Waste collection bins well labelled (organic waste, non-organic waste) • Separate bins for hazardous waste • Records of waste disposal	Construction	Quarterly	REREC
		Operations	Annually	
		Decommissioning	Once off	
Air quality	Records of equipment and vehicle serving Records of air Measurements	Construction and Decommissioning	Quarterly	REREC
Material sourcing	Records of material sources	Construction	Quarterly	REREC
Acquisition of land for mini-grids	• Signed land consent forms with community • Special permits for use of land from government agencies where applicable	Pre-construction	Once-off	REREC
Acquisition of way leaves	Signed way leave consent forms	Pre-construction	Once-off	REREC
Acquisition of land for contractors yard site and workers camp (if needed)	• Signed land consent forms with community	Pre-construction	Once-off	REREC
Project benefits and opportunities for local communities and opportunities to	• Signed minutes of community engagements and information disclosure	Construction Operations Decommissioning	Quarterly	REREC

Potential Environmental /Social impact	Parameter to be monitored	Timing/Phase	Frequency	Responsibility to monitor
source materials locally	including engagements with VMGs and vulnerable individuals and households especially on employment opportunities • Number of all community segments accessing project benefits and opportunities • Local recruitment plan • Updated employment register indicating gender of workers			
Gender inequality/gender biases	• Number of men and women accessing project benefits and opportunities • Number of men and women represented in GRM committee • Signed minutes of consultative meetings and signed list of attendance indicating (men and women) discussions and	Construction Operations Decommissioning	Quarterly	REREC

Potential Environmental /Social impact	Parameter to be monitored	Timing/Phase	Frequency	Responsibility to monitor
	concerns raised including agreements reached • Updated GRM logs			
Stakeholder engagement	• List of stakeholders identified and their needs • Stakeholder Engagement Plan • Number of stakeholder sessions held • Signed minutes of consultative meetings for different stakeholders • Signed list of participants records e.g. list of attendance • Information disclosed and to whom it was disclosed (men, women, youth, vulnerable individuals and households, vulnerable marginalized groups including methods and languages used in disclosure (culturally	Pre-construction Construction	Quarterly	REREC
		Operations	Annually	REREC
		Decommissioning	Once off	REREC

Potential Environmental /Social impact	Parameter to be monitored	Timing/Phase	Frequency	Responsibility to monitor
	appropriate and accessible and key concerns raised			
Labour influx and related impacts (GBV in the form of SEA and SH, risks of HIV/AIDs, substance abuse and crime	• Labour influx management plan • SEAH Prevention and Response Action plan • Signed minutes of awareness creation sessions held for the community and workers on SEA/SH and HIV including list of participants • Number of signed code of conduct for the workers • Documented referral service for GBV incidences • Updated GBV GRM logs highlighting types of grievances raised, date, resolution status or date of closure and escalation where necessary • No jobs for children under 18 years and no forced labor signages	Construction Operations	Quarterly	REREC
		Decommissioning	Once off	REREC

Potential Environmental /Social impact	Parameter to be monitored	Timing/Phase	Frequency	Responsibility to monitor
	• Updated register of all local staff • Policy document on GBV (SEA/SH) management and child protection • Number of reported SEA/SH cases			
Labor relations management	• Local recruitment plan • Labor management plan • Copies of signed employment contracts • Workers GRM	Construction Decommissioning	Quarterly	REREC
Access to electricity	• Number of households, business entities and community facilities connected to power	Construction	Quarterly	REREC
		Operations	Annually	REREC
Risk of VMGs and vulnerable individuals and households (PWDs, elderly, youth, poor female headed households, minority clans) from accessing project benefits	• Support being extended to vulnerable individuals and households • Number of VMG and vulnerable individuals and households connected to power	Pre-construction Construction	Quarterly	REREC
		Operations Decommissioning	Annually	REREC

Potential Environmental /Social impact	Parameter to be monitored	Timing/Phase	Frequency	Responsibility to monitor
Grievance redress mechanism	• Project GRM • Composition of the grievance redress committee members • Signed minutes of consultative meetings including VMGs and vulnerable individuals and households • Updated Complains/grievances logs highlighting types of grievances raised, date, resolution status or date of closure or escalation where necessary • Number of community members and project workers sensitized on GRM and signed list of participants •	Construction	Quarterly	REREC
		Operations	Quarterly	REREC
		Decommissioning	Once off	REREC
Management of Environmental and		Construction Operations	Quarterly	REREC

Potential Environmental /Social impact	Parameter to be monitored	Timing/Phase	Frequency	Responsibility to monitor
social risks and impacts	• Contractor ESMMP and specific plans reviewed by client • Budget lines and allocations for environmental and social safeguards management activities • Environmental and Social issues implementation records (reports)	Decommissioning	Once-off	REREC
Covid 19	• MOH Covid 19 guidelines/protocols in place. • Sensitization records on COVID to workers (list of attendance)	Pre-construction Construction	Quarterly	REREC
		Operations	Annually	REREC
		Decommissioning	Once off	REREC
Risks to Community health and safety	• Number of buildings or kiosks built on the way leave • Security measures put in place to protect public e.g fencing of site, control of access/records of people accessing site	Construction	Quarterly from start of Construction	
		Operations Decommissioning	Annually	

6.8. Conclusion

The Environmental, Social, Health & Safety Management Plan (ESHSMP) has been prepared to ensure that social and environmental impacts and risks identified during the ESIA process are effectively managed during the construction, operations, and decommissioning phases of the Project. The ESHSMP specifies the mitigation and management measures to which the Project REREC and the Contractor will be committed and shows how the Project will mobilize organizational capacity and resources to implement these measures. The ESHSMP 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's OPs on environmental and social sustainability.

The combined ESHSMP provides for environmental, social, health and safety aspects that shall affect the entire project. The ESHSMP is hybrid developed from different ESIA reports to ensure it captures all key environmental and social aspect in different environmental set ups. This is to ensure the contractors are appropriately informed of control measures in place during implementation of the project. Each site of the 142 proposed mini grid will have its own site specific ESHSMP extracted and given to the contractor during project implementation. The contractor shall then develop a construction ESHSMP priors construction begins.

Implementation of the mitigation measures proposed for all the identified, is expected to reduce the significance of the impacts to a minor or negligible level. The mitigation measures provided, and the management of residual impacts are presented in a set of Management Plans in the ESHSMP which has been described as a vehicle for the continued integrated management of all such impacts.

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