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BIDDING DOCUMENTS

For

Design, Supply, Installation, Testing & Commissioning of Solar PV Pumping System for Community Facilities (in Garissa, Mandera, Wajir, Kilifi, Kwale, Isiolo, Samburu, West Pokot, Turkana, Tana River, Marsabit, Taita Taveta, Narok & Lamu Counties), comprising of Eleven (11)

Volume III

Environmental, Social, Health and Safety Management Plan

Project: Kenya Off-grid Solar Access Project (KOSAP)

Purchaser: Rural Electrification and Renewable Energy Corporation (REREC).

2024

TABLE OF CONTENTS

1 Project Information

The Government of Kenya with support from the World Bank is implementing Kenya Off Grid Solar Access Project (KOSAP). The project will target 14 out of the 47 counties in Kenya that have been defined as marginalized by the Commission on Revenue Allocation (CRA). The 14 counties include; Garissa, Isiolo, Kilifi, Kwale, Lamu, Mandera, Marsabit, Narok, Samburu, Taita-Taveta, Tana River, Turkana, Wajir and West Pokot. KOSAP is intended to support the Government's initiatives of ensuring increased electricity access to Kenyans, particularly those in remote areas without national grid and those in Off-grid areas. The KOSAP components include:

- Component 1: Mini grids for community facilities, enterprises and households.
- Component 2: Stand-alone solar systems and clean cooking solutions for households
- Component 3: Stand-alone solar systems and solar water pumps for community facilities.
- Component 4: Implementation support and capacity building

This ESMP focuses on Component 3 b of the Kenya off-grid solar access project: Solar Pv pumping system for community facilities

Subcomponent 3B: Solar Water Pumps for Community Facilities

This subcomponent will support financing solar-powered pumping systems to increase sustainable access to water supply by equipping newly constructed boreholes without water pumps and retrofitting existing diesel-powered boreholes within the target counties. A private sector contractor will be competitively selected for each service territory to supply, install, and maintain solar-powered pumping systems. REREC, the Implementing Agency, will sign a contract with the contractor for the supply and installation of the stand-alone solar systems. The purpose of this component is to convert existing diesel water-pumping facilities to solar water pumping systems using diesel back-up, in community-based schemes. The schemes are operated by water service providers (WSPs) who are county government owned water utility companies or Community-based Organization (CBO) or Water Resources User Associations (WRUAs) working in collaboration with the county governments to manage boreholes, in the 14 KOSAP counties.

The electrification of these water pumping installations will be using only stand-alone photovoltaic systems. The scope of work covers design, supply, installation and commissioning of the equipment for community facilities in proper working order, a warranty period covering quality of workmanship, the provision of equipment warranties, spare parts, and training. Three years maintenance services shall be provided by the Supplier during the warranty period.

The key solar power infrastructures to be installed include photovoltaic (PV) panel modules, inverters, pumps, and diesel generators. The PV panel modules are critical for harnessing solar energy, and their specifications will be detailed to highlight their efficiency, durability, and suitability for local conditions. The inverters, which convert the generated solar power into usable electricity for the borehole system, will be examined for their performance characteristics and compatibility. The pumps, central to the water extraction process, will be assessed based on their capacity, efficiency, and reliability. Additionally, the diesel generators included in the system will provide a backup power source. The generators will have different fuel storage capacities according to different manufacturers. In addition, 100 L storage tanks have been included for sites considered for installation

The range of capacities for the key solar power infrastructures have been provided per Lots as indicated below;

Table 1: Range of Capacities per Lot

LOT 1: Isiolo and Marsabit				
	ISIOLO		MARSABIT	
Range	Highest	Lowest	Highest	Lowest
PV Array	12 KWp	5 KWp	36 KWp	7 KWp
Pump size	10.1 KW	4.2 KW	31.5 KW	5.7 KW
Genset	15.1 KW	6.3 KW	47.2 KW	8.6 KW
Inverter rating	12 KW	5 KW	36 KW	7 KW
LOT 2: Taita Taveta and Lamu				
	LAMU		TAITA TAVETA	
Range	Highest	Lowest	Highest	Lowest
PV Array	2 KWp	1 KWp	40 KWp	2 KWp
Pump size	1.5 KW	0.4 KW	35.3 KW	2.2 KW
Genset	2.3 KW	0.6 KW	52.9 KW	3.3 KW
Inverter rating	2 KW	1 KW	40 KW	2 KW
LOT 3: Kilifi and Tana River				
	KILIFI		TANA RIVER	
Range	Highest	Lowest	Highest	Lowest
PV Array	43 KWp	1 KWp	3 KWp	1 KWp
Pump size	37.2 KW	1.1 KW	2.5 KW	0.5 KW
Genset	55.8 KW	1.6 KW	3.7 KW	0.7 KW
Inverter rating	43 KW	1 KW	3 KW	1 KW
LOT 4 (Kwale) and LOT 5 (Narok)				
	KWALE		NAROK	
Range	Highest	Lowest	Highest	Lowest
PV Array	19 KWp	1 KWp	50 KWp	1 KWp
Pump size	16.8 KW	0.8 KW	43.8 KW	0.5 KW

Genset	25.1 KW	1.2 KW	61.4 KW	1 KW
Inverter rating	19 KW	1 KW	50 KW	1 KW
LOT 6 (Samburu) and LOT 7 (West Pokot)				
	SAMBURU		WEST POKOT	
Range	Highest	Lowest	Highest	Lowest
PV Array	24 KWp	1 KWp	13 KWp	3 KWp
Pump size	21 KW	0.9 KW	11.2 KW	2.2 KW
Genset	13.5 KW	1.3 KW	16.8 KW	3.3 KW
Inverter rating	24 KW	1 KW	13 KW	3 KW
LOT 8 (Turkana) and LOT 9 (Garissa)				
	TURKANA		GARISSA	
Range	Highest	Lowest	Highest	Lowest
PV Array	19 KWp	2 KWp	60 KWp	8 KWp
Pump size	16.6 KW	2.0 KW	52.9 KW	6.6 KW
Genset	24.9 KW	3.0 KW	79.4 KW	10 KW
Inverter rating	19 KW	2 KW	60 KW	8 KW
LOT 10 (Mandera) and LOT 11 (Wajir)				
	MANDERA		WAJIR	
Range	Highest	Lowest	Highest	Lowest
PV Array	24 KWp	3 KWp	32 KWp	2 KWp
Pump size	20.8 KW	2.2 KW	3.6 KW	1.5 KW
Genset	31.3 KW	3.4 KW	5.5 KW	2.2 KW
Inverter rating	24 KW	3 KW	32 KW	2 KW

The approximate solar PV array Capacity (KWp) across all LOTS has been provided in the table below:

Table 2:PV array Capacity for all Lots

LOT	*County*	*Number of Verified Recommended Boreholes*	*Approx. Solar Pv array Capacity(KWp)*

1	Isiolo & Marsabit	15	187
2	Taita Taveta & Lamu	34	238
3	Kilifi & Tana River	57	156
4	Kwale	28	141
5	Narok	35	431
6	Samburu	18	148
7	West Pokot	33	246
8	Turkana	33	360
9	Garissa	20	634
10	Mandera	28	372
11	Wajir	15	281
TOTAL		**316**	**3,194**

1.1 Environmental, Social, Health and Safety Management Plan

The aim of an Environmental and Social Management Plan (ESMP) is to ensure that social and environmental impacts, risks and liabilities identified are effectively managed during the construction, operation and decommissioning .The ESMP specifies the mitigation, adaptation, prevention and management measures to which the proponent is committed and shows how the Project will mobilize organizational capacity and resources to account for the factors evaluated in order to implement the compiled measures. The ESMP also shows how mitigation and management measures will be scheduled.

The ESHS Management Plan is a live document for project activities that will be updated as and when required. The ESHS Plan acts as a quick guide for contractors and project implementers to enhance positive impacts and eliminate or minimize the occurrence of negative impacts through proposed mitigations measures. The ESHS Plan relies on the following key principles:

- Compliance with local, national laws and World Bank Operational policies in the management of ESHS risks and impacts, and enhancement of benefits and opportunities.
- Transparency and inclusivity - The project team will engage in meaningful and transparent consultation with affected communities, particularly with vulnerable and marginalized groups, and other disadvantaged groups (persons with disabilities, women, youth, older persons, ethnic minorities etc.), to ensure that their views are registered and considered in the management of ESHS risks and impacts. Feasible stakeholder engagement techniques such as public forums and FGDs will be employed,

with meetings held in locations accessible to all, taking into account the disability, literacy and mobility challenges.

- Systematic assessment and tracking of ESHS risks- The project will aim at providing clear, constructive, timely responses to individuals, groups, and communities potentially affected by projects on potential grievances related to the social and environmental performance of the projects, corrects non-compliance where it has occurred, and shares the results of its review and any actions taken. During project implementation, any changes likely to have negative ESHS impacts must be communicated to affected persons prior to commencement/continued implementation of interventions to which the negative impacts relate to
- Harmonization with other projects and programs - The project will aim at maximizing efficiency and minimizing costs in complying with environmental and social safeguards.
- Gender Inequality Impacts: There's a risk of limiting women's access to project benefits such as jobs, by giving preference to men, as construction is considered a male industry. Therefore, the project will identify and integrate the different needs, constraints, contributions and priorities of women and men and where possible. It will aim at enhancing the positive gender impacts of projects by developing mitigating measures to reduce any potential gender specific and disproportionate adverse gender impact.
- Local Recruitment-The project will prioritize and maximize the hiring of local labour force, and as appropriate for skilled, semi-skilled and unskilled work, taking into account the various segments of the community (Persons with disabilities for work they can do, youth, women, men, minority VMGs and other disadvantaged groups).
- Climate resilience - The project will ensure that supported activities enhance climate resiliency and avoid unwarranted increases in greenhouse gas emissions.

1.2 Management Plan during construction phase

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 and community health and safety plan
- Emergency management and response plan (including fire response)
- Rehabilitation and site closure management plan
- SEAH Prevention and Response Action Plan-the provisions of the SEAH Prevention and Response Action Plan prepared under the project shall be cascaded to all contractors and sub-contractors.
- Stakeholder Engagement Plan
- Grievances Mechanism-the provisions of the GBV-responsive Grievance Mechanism under the project shall be cascaded to all contractors and sub-contractors. Further, contractors and sub-contractors shall be required to implement a Worker Grievance Mechanism.
- Local Recruitment Plan
- Security Management Plan

1.3 Objectives for the ESHS Management Plan

The main aim of the ESHS Management Plan is to ensure that the project complies with applicable national environmental, social, health and safety legal requirements and the donors especially the (WB) environmental and social safeguard policies. The areas of specification include:

- To outline mitigation measures against the possible degradation of the areas, safety and health, social risks prevention and response/mitigation
- To enhance positive impacts, benefits and opportunities under the project
- To ensure the project interventions are implemented in compliance with relevant environmental, social, health and safety requirements throughout its pre-construction, construction, operation and decommissioning phases of the project.
- To establish the roles and responsibilities for implementing and monitoring E&S compliance, provide adequate and qualified E&S Capacity and allocate adequate budgets
- To propose mechanisms for monitoring E&S compliance
- To provide adequate channels for grievance management and feedback for the different stakeholders throughout the project activity
- To establish proven mechanisms to correct/adjust the findings resulting from the monitoring activity and to include the input received throughout the project activity.

2 Legal and Regulatory Framework

There is a growing concern in Kenya and at global level that many forms of development activities cause damage to the environment. Consequently, there is a need to ensure that development activities do not cause damage to the natural resources upon which the economies are based. It is now an obligation that development projects must be economically viable, socially acceptable and environmentally sound. To meet this obligation, Environmental Impact Assessment has been advanced as a useful tool employed in the planning phases and across all project phases for protection of the environment from the negative effects of development activities.

The proposed project is no exception as it will have both positive and negative impacts on the environment and people during the different phases of the project cycle.

There are many ESHS challenges in Kenya today related to projects development and otherwise. Among the environmental and social problems are loss of biodiversity and habitat, land degradation, land use conflicts, child labour, forced labour , SEAH issues , water management and environmental pollution.

The key legislations and policies guiding mitigation of potential environmental and social risks anticipated within the project includes;

1. The Energy Act, 2019 and its supplementary regulations including:
    - The Energy (Energy Management) Regulations, 2012, and
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 (Noise and Excessive Vibrations Pollution Control) Regulations, 2009,
- EMCA (Emissions Control) Regulations,2006,
- EMCA (Wetlands, Riverbanks, Lake Shores and Sea Shore Management) Regulations, 2009

3. The Water Act 2016 and its supplementary regulations, including:
   Water Resources Management Rules, 2007
4. 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.
5. The Work Injury Benefits Act (WIBA) of 2007.
6. The Public Health Act (Cap 242);
7. The County Government Act 2012.
8. The Physical and Land Use Planning Act 2019);
9. The Wildlife Conservation and Management Act 2013.
10. The Traffic Act Cap 403 of 2009.

The key policies relevant for social risk include;

- Policy for the Prevention of HIV Infections among Key Populations in Kenya,
- The Gender and Development Policy (Sessional paper No.2 2019),
- National Gender and Equality Commission Act 2011,
- Gender Policy in Energy and, Public Participation Policy 2023,
- The Lands Act, 2012;
- The HIV/ AIDS Prevention and Control Act, 2006
- HIV/AIDS Prevention and Control (CAP 246A)
- The Sexual Offenses Act 2006,
- Children's Act 2022
- Persons with Disabilities Act, 2003

Relevant World Bank OPs that the project must adhere to:

- OP 4.01 (Environmental and Social Impact Assessment)
- OP 4.12 (Land Acquisition and Involuntary Settlement)
- OP 4.04 (Natural Habits)
- OP 4.10 (indigenous people)
- Op 4.11 (Cultural Heritage)

In addition, the project shall adhere to the World Bank general EHS guidelines.

3 Environmental, Social, Health and Safety Impacts

The potential negative ESHS impacts identified in the ESMP (pre-construction, construction, operation and decommissioning phases) are localized and temporary with the possibility of mitigation actions. The projected environmental and social risks and proposed mitigation measures for the various stages of the project includes:

3.1 Preconstruction Phase

No negative impacts are expected during the preconstruction phase. Preconstruction activities include the acquisition of required permits, definition of alignments and layout of construction limits, location and establishment of equipment storage of staging areas. This phase will include public consultation and communication with stakeholders and the general public on relevant project information, project benefits and opportunities, the scope and possible impacts and proposed mitigation measures, as well as the roles and responsibilities of the institutions involved the rights and entitlements of the beneficiary community, and a workable schedule for accessing water during implementation, prepared in consultation with the community and local leadership.

3.2 Construction Phase

Positive Impacts during Construction Phase

- Recruitment of local labor 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.
- Promotion of local economy - due to population influx caused by project workers who shall be involved in buying of goods and services

The projected impacts and risks during this phase are expected to be limited in scope but may include:

- Disturbance of existing water pumping and supply activities
- Disturbance to traffic: These could result in traffic congestion and perhaps risks of accidents.
- Temporary difficulty of access: during construction and installation of equipment, access may be limited to the adjacent areas near the boreholes. This is unlikely to be for an extended period.
- Air quality: emissions from the use of machines and dust production while excavating could result in health problems, noise annoyance to nearby residents and pedestrians and/or disturb nearby activities.
- Noise generation this could result from pneumatic drilling or car horns. the use of excavation machines and construction equipment could potentially impact on
- workers and neighborhood residents, some of the impact include health problems e.g. stress, poor concentration, productivity losses in the work place , communication difficulties and fatigue from lack of sleep
- 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.

- Dust Emissions: emanating from excavations (when panels are ground mounted) and transportation of materials during dry weather
- 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.
- Energy consumption: 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. Burning fossil fuel emits a number of air pollutants that are harmful to both the environment and public health as well as GHG emissions raising the carbon foot print of the areas,
- Fire Outbreaks: During construction of the project, fire hazards are likely to occur especially during activities such as welding (hot works).
- 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.
- Gender Based Violence (GBV) is any actual or attempted use of a position of vulnerability, differential power, or trust, for sexual purposes, including but not limited to, profiting monetarily and socially from the sexual exploitation of another. The project will manage two forms of GBV-Sexual Exploitation and Abuse (SEA) of community members by project workers and Sexual Exploitation (SH) amongst project workers.
- Child Labour- this may result from engaging underage children in construction activities against the law and the required standards
- Exclusion of VMGs and other disadvantaged groups from accessing project benefits and opportunities.
- Inadequate stakeholder engagement and grievance management.

3.3 Operations Phase

Positive impacts anticipated during operation phase includes;

- Enhancing provision of water within the community.
- No oil spills will be incurred
- Reduced fuel costs for the standby generator.
- Lower maintenance cost in comparison to relying on diesel generators
- Reduction in carbon footprint

The listed negative impacts could arise during stand-alone solar system operation and maintenance:

a) Generation of solid and E-wastes: The proposed standalone solar panels 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 and panels.

b) Electrical fires: Interference with power connection or erosion of battery terminals could cause electrical fires during operational phase

c) Falls from Height: Arise during maintenance activities undertaken on electrical wiring within community facilities and regular cleaning and maintenance of solar power system

d) Visual intrusion: Once complete, the standalone solar panels will present visual impacts, both by its physical presence and by visual impacts of its associated structures. Visual intrusion caused by the standalone solar panels may cause alteration to the natural scenery of the project area.

e) Theft of solar panel components: Especially those that are ground mounted and not well secured.

f) Gender Based Violence (GBV) is any actual or attempted use of a position of vulnerability, differential power, or trust, for sexual purposes, including but not limited to, profiting monetarily and socially from the sexual exploitation of another. The project will manage two forms of GBV-Sexual Exploitation and Abuse (SEA) of community members by project workers and Sexual Exploitation (SH) amongst project workers.

g) Exclusion of VMGs and other disadvantaged groups from accessing project benefits and opportunities.

h) Inadequate stakeholder engagement and grievance management.

3.4 Decommissioning Phase

Positive impacts anticipated during decommissioning phase includes;

- Employment opportunities for local community-where locals shall be engaged in non-skilled and semi-skilled works
- Development of small businesses-due to the engagement of locals who shall be involved in buying of goods and services

The life-cycle of PV panel is approximately 20 years. It is deemed that after 20 years it will not be cost-effective or practical to reuse the equipment as technology will have advanced thus making them obsolete and more expensive to install than newer technology. PV modules contain substances such as glass, aluminum and semiconductor materials. The other materials may include array framework, electrical cabling, electrical connectors, ducts, inverters, transformers etc. environmental impact that arise from these includes effect in air, soil and human health. The negative health effects of these toxins on human include brain, heart and skeletal system damage. E-waste such as mercury, lithium, lead and barium, then leak through the earth even further to reach groundwater. When these heavy metals reach groundwater, they eventually make their way into streams, rivers and lakes. Recycling and disposal of waste should be done by a company with a NEMA license and experience in this type of decommissioning projects.

3.5 Impacts on the Environment

a) Inconveniences caused by noise and nuisance- noise shall result from construction activities, and though temporary shall be a nuisance to those within the community facilities and their environs.

b) Influx of workers in construction sites- There will be increase in population of the area due to large number of people looking for employment opportunities thus social set up of project area may be affected resulting into different negative social impacts such as competition for resources, illicit behavior and crime

c) Soil erosion-Associated with vegetation clearance and ground breaking due to ground mounted panels. This will be as a result of surface runoff or blowing away of top soils by wind where excavated areas are not properly managed

3.6 Impacts on the Health and safety of workers and general population

a) 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.

b) Gender Based Violence (GBV) is any actual or attempted use of a position of vulnerability, differential power, or trust, for sexual purposes, including but not limited to, profiting monetarily and socially from the sexual exploitation of another. The project will manage two forms of GBV-Sexual Exploitation and Abuse (SEA) of community members by project workers and Sexual Exploitation (SH) amongst project workers.

c) Exclusion of VMGs and other disadvantaged groups from accessing project benefits and opportunities.

d) Inadequate stakeholder engagement and grievance management.

e) Child Labour

Environmental and social risks and mitigation measures

This section describes relevant environmental and social risks identified during the project preparation period (PPP). Since ESMP should serve as an active tool, additional risks that are identified during the project implementation will be included as they are identified.

Table 1 Environmental, Social, Health and Safety Management and Monitoring Plan

Risks and Impacts	**Mitigation Measures**	**Monitoring Indicators**	**Project Phase**	**Responsibility**	**Frequency**
Social Risks and Impacts					
Inadequate stakeholder engagement and management of grievances	Prepare and implement a stakeholder engagement plan and a grievance redress mechanism that is accessible to all. Engage all segments of the community, including VMGs, vulnerable individuals and households etc.) (Persons with disabilities, women, youth, older persons before commencement of project activities. Resolve grievances promptly and effectively.	-Minutes of meetings and signed list of participants. -Key opinions and concerns raised by communities and responses provided to them by REREC. -Agreements reached between REREC and the community. -Updated grievances log/register.	Construction, Operations and Decommissioning	REREC & Contractor's Social safeguard consultant	Quarterly
Labour Influx and related impacts Increased incidents of HIV/AID and communicable diseases, social disturbances, competition of resources.	• Prioritize locals for all unskilled labour • Create awareness and consult affected communities prior and during construction • Inform workers on local cultural values and health matters • Undertake regular sensitization and awareness creation among the staff (and communities) on HIV/AIDS and other sexually transmitted diseases • Provide condoms to workers	Minutes of trainings and sensitization sessions. Signed list of participants. Updated employment register. Updated grievance register.	Construction and decommissioning phases	REREC Contractor	Quarterly

GBV- Sexual Exploitation and Abuse of community members by project workers (SEA) and Sexual Harassment (SH) amongst workers	• Develop and implement a SEAH Action Plan (including plans for prevention, response and Grievances Mechanism to address the risk of SEA and SH. • Undertake regular sensitization and training for all project workers and project affected persons on SEA/SH prevention. • Ensure confidential reporting and handling of incidences of SEA/SH. • Implement the employee code of conduct (CoC) to be signed by all with physical presence on site. Ensure the employees understand the CoC. • Use survivor centered approaches when responding and dealing with SEA/SH. • Map referral services including psychosocial support and judicial services and facilitate the survivor to access them, if and when they choose to.		Construction, Operations and Decommissioning	REREC Contractor	
Child labour,	• Awareness to the community about child labour • Communicate to the contractor that child labour is illegal and adherence to employment act is required. • Ensure that all workers have a valid ID or can provide proof of age before employment • awareness to the community about child labour • Communicate to the contractor that child labour is illegal and adherence to employment act is required.	• xxxxx Updated employment register indicating locals employed, their ages, national identification numbers etc. • -Grievances raised, aggrieved persons and status on resolution etc. • Minutes of trainings and sensitization sessions.	Construction and Decommissioning phases	REREC Contractor	Quarterly

	• Ensure that all workers have a valid ID or can provide proof of age before employment				
Gender biases	• Uphold principles of gender equality through compliance on equitable distribution of employment opportunities, safe employment of women, including training opportunities, regular consultation with female employees and employ other measures that ensure physical safety and dignity of female workers.	• Updated employment register.	Construction, Operations and Decommissioning Phases	REREC Contractor	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 an ID to show they are adults (above 18 years). • Ensure the project sources solar panels and related accessories from distributors who do not engage in forced labour.	National ID card or documentation	Construction Decommissioning	Contractor REREC	Quarterly
Exclusion of Minority 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	• Availability of and implementation of the Stakeholder Engagement Plan. • Number of stakeholder consultations held • Record of stakeholder consultations held (minutes of meetings and list of participants).	Pre-construction Construction Operations Decommissioning	Contractor REREC	Quarterly

	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	• 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.			
Environment, Health and Safety Risks and Impacts					
Negative construction, operation, and decommissioning phase impacts and technology failure	Proper due diligence and construction management – including public consultation and information disclosure on the machine operation	Due diligence report and reporting on public consultations and information disclosure	Continuous	Contractor's safeguard team	
	Utilization of existing/ proven technologies	Logs of technology failures, interventions, and time before repair will be kept.	Continuous	contractor project engineer	
	Training of personnel on safety and operations	Logs of trainings of personnel on safety and operations will be kept	Continuous	Site Manager	
	Waste Management	Proper waste handling: through segregation and disposal according to type	Continuous	Site Manager	Daily
Infrastructure developed is vulnerable to climate change risks	Type of hazards; their frequency	Risk assessment Screening	Single measurement	REREC Environmental officer	

Construction works for the proposed -Solar water pumps for community Boreholes	Soil Erosion due to vegetation clearance especially during the rainy and sunny season during excavations of foundations (Applicable where stand-alone solar panels shall be ground mounted)	• Apply soil erosion control measures such as levelling of the project excavated site to reduce run-off velocity and increase infiltration of storm water into the soil. • Ensuring that once the trench excavations have been done a cable is laid and covered and compacted immediately. • Site excavation works to be planned such that they are completed and rehabilitated on time. • Backfilling of excavated sites to be done on time	Project Construction/ Decommissioning phase	Contractor	
	Noise & vibration	• Compliance with the legal requirements for noise impact specified in the gazette noise quality regulations. • Excavation equipment will have properly functioning silencers or mufflers (Applicable where stand-alone solar panels shall be ground mounted) • Implementation of Noise prevention program as stipulated in EMCA and OSHA subsidiary legislations for minimizing noise and vibration generation from construction activities • Notification of the community facilities management and neighbors about the construction schedule & activities, including blasting, should it be required	Project Construction/Decommissioning phase	Contractor	

		• Noise generating activities that take place near residential or sensitive institutional receptors will be restricted to between 0800 and 1700hrs, which is defined as 'daytime' in the Kenyan noise regulations • Provision of ear muffs for workers in high noise areas • Regular inspection & maintenance of construction machinery to minimize noise generation • Sensitize construction drivers and machine operators to switch off engines when not in use • Sensitize drivers hooting especially when passing through sensitive areas such as mosques etc. • Erecting safety signage in noisy areas • Using equipment with low noise ratings. Reduce number of people accessing a construction site at any given time			
	Dust emissions especially during the sunny days	• Minimize excavation especially during extreme dry seasons. • Sprinkle water on excavated soil when necessary and where water is available to reduce dust generation especially when covering the trenches. • Ensure strict enforcement of on-site speed limit regulations	Project Construction/Decommissioning phase	Contractor	Daily

		• Cover stock piles of fine materials with tarpaulin during windy conditions. Provide and enforce use of PPEs by construction workers			
	Occupation health andSafety	• The contractor shall be required to have a safety and health management plan whose details, a minimum, shall include: description of the project and execution method statements for various major tasks; hazard identification based on analysis of methods statements; risk assessment determining level of risks posed by the various identified hazards; proposed risk avoidance and prevention measures; responsibilities for implementation; emergency response plan (based on specific potential emergencies; change management; monitoring and reviews. This plan shall be in place and approved by the project manager before the contractor can be given greenlight to start civil works on site. • Ensure only qualified staff are employed to work in the facility. • All workers must be equipped with appropriate and adequate person protective equipment (PPE) such as; safety footwear, helmet among others.	Project Construction/Decommissioning phase	Contractor	Quarterly

		• WIBA cover for staff is mandatory			
	Slips and Falls from Height	• Carry out a risk assessment to identify hazards associated with work process and mitigate accordingly • Inspect all ladders and scaffolds used while working at height • Provide adequate personal protective equipment for use by contractor staff • Provide storage bags for portable tools used while working at height. • Carry out inductions and regular toolbox talks before commencement of work by staff			
	Fire outbreaks	• Contractor shall take all necessary precautions to prevent fires caused either deliberately or accidentally during construction process. • Contractor shall prepare a fire prevention and fire emergency plan (fire evacuation plan, fire escape plan, information distribution, training and training provision and emergency service liaison procedures) as part of the Environmental Plan to be submitted to REREC • The Contractor shall provide adequate firefighting appliances at specified localities on the worksite to			

		meet any emergency resulting from ignition of a fire. • No burning of any litter/ cleared vegetation on site • All working areas should be no smoking zones. The contractor should designate smoking zones. • Arrangements and labelling of battery terminals should be done adequately to prevent fire incidents • Conduct regular inspection and maintenance to ensure that there are; - no overloaded electrical systems; no incorrectly installed wiring; no live naked wires are continuously monitored • Contractor to ensure all fittings are tight and implemented using quality materials to prevent arcing and any loose connections.			
Work at Height	Slips and Falls from Height	• Carry out a risk assessment to identify hazards associated with work process and mitigate accordingly • Inspect all ladders and scaffolds used while working at height • Provide adequate personal protective equipment for use by contractor staff • Provide storage bags for portable tools used while working at height. • Carry out inductions and regular toolbox talks before	Contractor	Project Construction/Operation phase	

		commencement of work by staff			
Fire Hazards	Fire outbreaks	• Contractor shall take all necessary precautions to prevent fires caused either deliberately or accidentally during construction process. • Contractor shall prepare a fire prevention and fire emergency plan (fire evacuation plan, fire escape plan, information distribution, training and training provision and emergency service liaison procedures) as part of the Environmental Plan to be submitted to REREC • The Contractor shall provide adequate firefighting appliances at specified localities on the worksite to meet any emergency resulting from ignition of a fire. • No burning of any litter/ cleared vegetation on site • All working areas should be no smoking zones. The contractor should designate smoking zones. • Arrangements and labelling of battery terminals should be done adequately to prevent fire incidents • Conduct regular inspection and maintenance to ensure that there are; - no overloaded electrical systems; no incorrectly installed wiring; no live naked wires are continuously monitored	Contractor	Project Construction/Operation phase	

		• Contractor to ensure all fittings are tight and implemented using quality materials to prevent arcing and any loose connections.			
Water Consumption	Increased Water Demand especially during civil works (Applicable where stand-alone solar panels shall be ground mounted)	• Consultations with the project local committee on use of water in the community to avoid conflicts with the community • Promote recycling and reuse of water • Sensitize construction workers to conserve water by avoiding unnecessary use • Install water conserving taps that turn-off automatically when water is not being used. • Ensure prompt repair of broken and loose taps	Contractor	Project Construction/Operation/Decommissioning phase	
Solid waste generation and ensure efficient solid waste management	Increased solid waste generation	• Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Reduction at source 2. Recycling 3. Reusing 4. Incineration 5. Sanitary land filling. • Through accurate estimation of the dimensions and quantities of materials required. • Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time • Provide facilities for proper handling and storage of	Contractor	Project Construction/Operation/Decommissioning phase	

		construction materials to reduce the amount of waste caused by damage or exposure to the elements • Use building materials that have minimal or no packaging to avoid the generation of excessive packaging wastehiv • Waste collection bins to be provided at designated points			
	Generation of E-waste (Obsolete Solar Panels & inverters)	• Conduct regular inspection and maintain inspection reports on the status of solar panel systems • Have a contract with the supplier that requires for their collection and adequate disposal of E-waste • Liaise with county NEMA officers for list of approved waste handlers • ~~Assess disposal plans for E-waste~~ Implement E-waste management plan aligned to current GoK policies.	Contractor	Project Construction/Operation/Decommissioning phases	
Civil and structural works materials	Sourcing of Construction materials	• Source building materials from local suppliers who use environmentally friendly processes in their operations. • Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered. • Ensure that damage or loss of materials at the construction site is kept minimal through proper storage and use	Contractor	Project Construction phase	

		• Use at least 5%-10% recycled refurbished or salvaged materials to reduce the use of raw materials and divert material from landfills. • Request for supply of materials such as sand and ballast stones from local communities			
Air pollution	Exhaust emission	• Vehicle idling time shall be minimized • Regular maintenance of equipment to increase their efficiency and reduce generation of exhaust emission	Contractor	Project Construction phase	
Minimize release of liquid effluent	Generation of wastewater	• Provide means for handling sewage generated at the construction site-use of mobile toilet • Vehicles should not be serviced at the project site • Monitor effluent quality regularly to ensure that the stipulated discharge rules and standards are not violated	Contractor	Project Construction phase	
Minimize Oil Spills	Oil spills Hazards	• Care must be exercised not to spill any fossil fuels • No maintenance of vehicles or equipment on site • Construction vehicles must be maintained in good state and proper servicing to ensure no oils are likely to spill • Any contaminated soil shall be scooped and disposed of appropriately. • In case of spillage the contractor should isolate the	Contractor	Project Construction phase	

		source of oil spill and contain the spillage using sandbags, sawdust, absorbent materials • Develop oil spillage plan			
Increase of traffic	Traffic impacts on infrastructure	• All vehicles coming to the construction site should carry the recommended weight. • All drivers coming to the site must observe traffic rules and exercise courtesy to other road users. • Employ a road safety officer to oversee implementation of the traffic controls	Contractor	Project Construction phase	
Security of solar panel systems	Theft and damage of solar panel systems	• Develop and sign consent forms by the community facility management seeking for community facilities to have and provide security for solar panels. This will ensure community responsibility and project sustainability. • Liaise with government administrative officers to help provide security for solar panel systems • Sensitize community members on the importance of securing installed solar panel systems • Carry out regular inspections to ensure the solar panel systems are safe • Fence off areas where solar panels shall be ground mounted	Contractor	Project Construction/Operation phase	

Table 3: Environmental, Social, Health and Safety Price Schedule

Item	Description	Qty (1)	Unit Price		Total Price	
			Foreign Currency Portion *(specify currency)* **(2)**	**Local Currency Portion** *(specify currency)* **(3)**	**Foreign Currency Portion** *(specify currency)* **(1x2)**	**Local Currency Portion** *(specify currency)* **(1x3)**
ESHS 01	***Dust emission***					
	a. Sprinkling water on excavated soil when necessary and where water is available to reduce dust	1 Lot				
	b. Personal Protective equipment to be provided to employees and worn especially mask for dust.	1 Lot				
ESHS 02	***Worksite Safety, at height, accidents and Health Hazards to employees***	1 Lot				
	a. Provision of all appropriate PPEs to the contractor's employees					
	b. Necessary and appropriate warning signs in various points that are risky.	1 Lot				
	c. Provide a general register for adequate reporting of accidents	1 Lot				
	d. Provision of the first aid kits on site with trained first aiders.	1 Lot				
	e. Provide insurance to the workers as per Work Injury and Benefits Act (WIBA) requirements					
ESHS 03	***Fire hazards and outbreaks***					
	a. Labelling / signage of all equipment and compartments.	1 Lot				
	b. Adequate firefighting appliances at all sites to meet any emergency resulting from ignition of a fire.	1 Lot				
ESHS 04	***Traffic management***	1 Lot				
	a. Traffic marshals where/when required to control traffic					
ESHS	***Health concerns***					

05	a. The contractor to provide clean drinking water to members of staff.	1 Lot				
	b. Provision of adequate and mobile rest rooms to members of staff.	1 Lot				
	c. Regular sensitization and creation of awareness among the staff on HIV/AIDS and other sexually transmitted diseases	1 Lot				
	d. Provision of condoms	1 Lot				
ESHS 06	***Use of an integrated solid and E-waste management system***					
	a. Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements	1 Lot				
	b. Dispose waste more responsibly by contracting a registered NEMA waste handler who will dispose the wastes at designated sites or landfills only	1 Lot				
	c. Waste collection bins to be provided at designated points	1 Lot				
	d)Have a contract with the suppliers to collect obsolete equipment and -waste e.g. batteries, inverters, solar panels etc. for adequate disposal	1 Lot				
ESHS 07	***Generation of waste water***					
	a. Provide means for handling sewage generated at the construction site-use of mobile toilet	1 Lot				
ESHS 08	Provision of security					
EHS 09	Hiring of Social and Environmental safeguard specialist (10)					
ESHS 10	Conduct stakeholder engagement forums in a culturally appropriate manner	1 Lot				
	Conduct separate adequate public consultation for the VMGs where applicable					

NB: **ESHS costs will form part of the evaluated bid cost as shown in *Schedule 4 of Price Schedules***

ESHS costs are deemed to cover operations on all sites

4 Capacity development

4.1 EMSP Roles

4.1.1 Project Manager

The Project Manager has overall responsibility for the execution of the project and compliance with World Bank policies and ESMP. The Project Manager is supported by an administrative assistant and technical advisors.

4.1.2 Project Team

The project development team is responsible for

- Conducting and providing evidence of meaningful consultation (i.e., consultation that is free, prior and informed) with communities likely to be affected by environmental and social impacts, and with local stakeholders, and also for ensuring broad community support.
- Overseeing environmental and social assessment studies that need to be undertaken prior to project appraisal (Environmental summary report/Environmental screening). These studies will identify and assesses the potential opportunities for, risks to, and impacts on biological diversity and ecosystem services, including direct, indirect, cumulative and pre-mitigation impacts.
- Applying the mitigation hierarchy: to avoid potentially adverse impacts; if avoidance is not possible, to reduce and minimize potential adverse impacts; if reduction or minimization is not sufficient, to mitigate and/or restore; and as a last resort to compensate for and offset.

4.1.3 Site Manager

The Site Manager is responsible for team direction and ensuring that project is implemented according to all the design requirements and technical specifications. The Site Manager reports to Project Manager. His/her duties include:

- Review and approval of construction plan
- Approval of monitoring and audit schedules
- Update and maintenance of the project ESMP
- Verifying contractor environmental performance and compliance with the project goals

- Monitor construction activities to ensure that control measures are effective and ensure compliance with the ESMP
- Prepare monthly and other status reports on environmental monitoring, activities, compliance, etc.
- Coordinate with construction teams to ensure that environmental risks are identified, and appropriate controls are developed
- Coordinate environmental training for site personnel and subcontractors

4.2 Environmental and Social

4.2.1 The Environmental and Social specialist

- Undertake Environmental and Social screening
- Review and approve Environmental procedures, prepared by the contractor and identify any areas for improvement
- Evaluation of the environmental competence of all contractors (and sub-contractors) working on the project
- Conduct scheduled audits of contractors' activities with the support of the Supervision Site Manager
- Management of the environmental monitoring program, including noise, vibration and dust and review of the routine reports
- Management and monitoring of implementation of the project social standards in line with World-bank guidelines
- Environmental audit of subcontractors
- Undertake weekly site inspections, initiate actions, complete a bi-weekly environmental inspection report
- Ensure correct procedures are followed in the event of an environmental incident

4.2.2 Contractor

Contractor will be required to:

- Subscribe to the Goals and Objectives of ESMP
- Comply with all of the negotiated Project requirements, policies, procedures and systems
- Report to the Site Manager and Environmental Health and Safety Consultant any Incident/accident and the corrective action undertaken.
- Participate in training, induction programs and review programs as required
- Attend performance meetings as directed by the Project Team

4.3 Monitoring plan

The overall objective of environmental and social monitoring is to ensure that mitigation measures are implemented and are effective. Environmental and social monitoring will also enable response to new and developing issues of concern. The activities and indicators that have been recommended for monitoring are presented in the ESMP.

Environmental monitoring will be carried out to ensure that all project activities comply and adhere to environmental provisions and standard specifications, so that all mitigation measures are implemented. Monitoring should be undertaken at a number of levels.

Monitoring by the Contractor at work sites during construction under the direction and guidance of the Site Manager.

Internal Monitoring: It is the responsibility of the Project Team to conduct regular internal monitoring of the project to audit direct implementation of environmental mitigation measures contained in the ESMP. Their Project team should include an impact assessment specialist as well as a sociologist experienced with gender issues.

The responsibility for mitigation monitoring during the operation phase will be responsibility of the Environmental and Social Consultant hired by the Project Team. Environmental monitoring of the following parameters is recommended for the Project: Noise Levels Monitoring, Air Quality Protection, Soil Erosion Monitoring, Monitoring of Vegetation Clearing, Monitoring Rehabilitation of Work Sites and Monitoring of Accidents/Health

The Contractor's environmental inspectors must make sure that appropriate signs are posted at appropriate locations/positions to minimize/eliminate risk of safety hazards (e.g. electrocutions). The following parameters could be used as indicators: Presence of posted visible signs; Level of awareness of communities; Presence/absence of unique stands of indigenous trees along the power line establishment route; and Accident reports. Records on actual accidents associated with construction.

Waste Management Monitoring: The Contractor and Site-manager shall regularly monitor the management of wastes.

External Monitoring and Evaluation: Annual environmental audit should be conducted in line with national and World-bank requirements. Final evaluation should take place to evaluate the project – including its compliance with the ESMP. Annual reporting can be carried out directly by the Project Team. The Project Team will provide world-bank with reports on environmental compliance during implementation as part of their annual progress reports and annual environmental auditing reports.

The project affected persons should be represented through public participation forums to be held during the project.

Institutional Strengthening

Implementation of, and adherence to ESMP, is the responsibility of every member of the project team. All project personnel will be provided the requisite training and orientation/induction to enable their active and informed participation in the ESMP. Capacity building measures will be required to ensure that stakeholders involved in developing and implementing the various ESMP components have the technical, management and other skills to fulfil their roles. The key focus areas for capacity building will be:

- An intensive one-day training/orientation for Project Team on ESMP Process, Public Communication and Consultation, compliance with relevant policies and guidelines.
- The Site manager shall ensure that all workers have been made aware of the ESMP. The Site Manager shall regularly monitor that occupational health and safety requirements are implemented.
- The Environmental and Social Consultant shall audit that all requirements are met. Where occupational health and safety requirements are not being implemented relevant workers shall immediately be trained and instructed to implement these requirements

4.4 **Communication**

The affected communities and stakeholders should be consulted about the draft ESMP. Appropriate consultations with potentially-affected groups – including local communities, and women and men of different ages, ethnicities and status – will be carried out as early as possible in the process, to solicit their informed participation and as a basis for continuing consultations to address issues that may affect them over the course of the project.

Documentation of screening and categorization of the project must be disclosed publically prior to proceeding with the project. Since project affected people may not have reasonable access to the World-bank website, the project development team is also required to release locally the decision, and the results of any consultations, translated into the local language, in a culturally appropriate manner, to facilitate awareness by relevant stakeholders that the information is in the public domain for review.

Presentation of information produced as a result of impact assessment procedures is governed in general by Environmental and Social Safeguards Policies and Procedures

Furthermore, all other disclosures related inter alia to draft Environmental and Social Impact Assessments, ESMP, mitigation plans, screening reports, results of all stakeholder consultations and other documents will be made available in a timely manner in a place accessible to key stakeholders.

5 **Conclusion**

The generic ESHSMP provides for environmental, social, health and safety aspects that shall affect the entire project. Considering that the project sites have been identified -Safety, Health and Environment Department shall in the near future undertake site specific ESHSMP to appropriately inform the contractors of control measures in place during implementation of the project.